Anxiety in preadolescent children: what happens if we don’t treat it, and what happens if we do?

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Anxiety in preadolescent children: What happens if we don't treat it, and what happens if we do?

Abstract

In this paper, we review the area of anxiety in children under the age of 11 years. We explore the literature examining the continuity of anxiety symptoms and behavioral inhibition when they appear in children of this age, and show that when these are present, there is a high likelihood of significant anxiety in later childhood, adolescence, and beyond. We then focus on the growing area of treatment research. We show that there are a number of promising new avenues for managing anxiety disorders in this young age group. Many of these interventions involve a key role for parents in the treatment process, but others have demonstrated success employing modified cognitive behavior therapy directed at the child. Limitations to the conclusions, caused by the limited amounts research, small sample sizes and significant methodological difficulties, are discussed.

Introduction

Anxiety disorders in the preadolescent age group are common. A review by Cartwright-Hatton, McNicol, and Doubleday (2006) explored the prevalence of anxiety disorders in children aged under 12 years, and concluded that anxiety was the most prevalent psychological disorder in this age group, being consistently more common than depression, and, in most studies, than disruptive behavior disorders. The most robust studies cited in the review (i.e., those using a large, representative samples, requiring impairment for a diagnosis to be assigned) reported prevalence rates for ‘any anxiety disorder’ that clustered around the 3-5% mark.

Despite the apparent need for interventions that target anxiety in preadolescent
children, intervention research has, until recently, focused on older age groups. The typical intervention study has included participants with a mean age in the early teens, with a range from around 8 or 9 years to 15 or 16 years. The modest sample size reported in most studies has made separate analyses by age group inappropriate, so we do not know whether these interventions are truly appropriate for the younger participants, and cannot conclude anything about their utility with yet younger children. Given that all of these studies have employed cognitive behavior therapy (CBT) or a variant of this, there is good reason to suspect that younger children may not benefit as much as their older peers. In a detailed review of the cognitive-developmental capacities that are likely to be required for success in CBT, Grave and Blissett (2004), suggested that “self-reflection, perspective taking, understanding causality, reasoning, and processing new information, as well as linguistic ability and memory” (p. 402) were likely to be required. Whilst many of these skills are present in rudimentary forms at earlier ages, they may not be present to the levels required for formal CBT until the child reaches the formal operations period of development (Piaget, 1952) at around 11 years of age (Kendall & Choudhury, 2003; Kendall, Chu, Gifford, Hayes, & Nauta, 1998). In their review, Grave and Blissett (2004) concluded that there was strong evidence that cognitive developmental factors play a key mediating role in the success or otherwise of CBT with children, and that children aged 11 years or older were most likely to benefit from this approach. For these reasons, this paper will focus on outcomes for children who have yet to reach the age of 11 years.

In response to these concerns about the utility of CBT with preadolescent children, some researchers have begun to develop and test interventions that are specifically targeted at younger participants, and a small body of research is now available. One aim of this paper is to summarize and critically appraise this literature and draw some early conclusions about the potential for treatment of anxious preadolescent children. Clearly, treating anxious children is a laudable goal, even if its only impact is to relieve the immediate suffering of the child. But what happens to these children over time, if left untreated? Is it possible that many of them simply outgrow their difficulties? We feel that it is time to draw together the evidence relating
to outcomes of early anxiety difficulties, and consider the case for investing the considerable extra time, effort and funding resource that will be needed to produce the highest quality interventions for anxious young children.

We begin, therefore, with a review of the available literature exploring outcomes for anxious and inhibited children under 11 years of age (at baseline assessment). This is followed by a review of the small treatment literature that has focused specifically on pre-adolescent children (aged under 11 years) with anxiety problems.

**Outcomes of Anxiety in Children**

The current review aims to summarize all extant research (since 1990) that has examined the course of anxiety-related problems in children who were aged below 11 years at the beginning of the study (see Table 1). In searching the literature, it became apparent that whilst very few studies examined the course of pure anxiety, a larger number examined a range of anxiety-related problems and behavioral inhibition. In the interest of inclusiveness, in this review, studies that examined anxiety symptoms, anxious behavior, anxiety diagnoses, internalizing symptoms, internalizing disorders, mixed anxious/depressed symptoms, fear, and fearfulness were all included. The term ‘anxiety-related problems’ is used to refer to this group of difficulties. Similarly, the term ‘anxiety-related disorders’ is used to refer to diagnosable anxiety disorders and internalizing disorders, and the review reports and discusses studies employing these two classes of outcomes separately. Studies in the first class, those that use the anxiety disorders as their outcomes, make it possible to differentiate between the developmental course of normative anxiety and clinically significant anxiety. Studies in the second class, namely those that use a continuous measure of symptoms as their outcome, are, in turn, subdivided into two classes, based on the type of analysis that was used. These will be referred to here as, ‘mean level analyses’ and ‘trajectory modeling analyses’. Mean-level analyses provide insight into the mean level of anxiety in a population at two or more time points. So, for example, a ‘mean level’ study might tell us that at Time One, 8% of the
population was anxious, but at Time Two, 11% of the population was anxious, indicating that mean anxiety in the sample increased over the intervening period. However, because individual increases and decreases in scores can cancel each other out, mean-level analyses usually tell us little about the developmental course of anxiety for individuals or subgroups; some children may have experienced substantial increases in anxiety, whilst others experienced decreases, but this information remains hidden in the data. Trajectory modeling studies, however, take a longitudinal sample, and identify the subgroups of participants with distinct levels of anxiety, and distinct patterns of longitudinal change in this, that best fit the data. The stability of anxiety over time in each subgroup can be stable, linear, quadratic or cubic, as best fits the data. Note that a subdivision in mean-level or trajectory modeling analyses is not applied to studies that use disorders as outcome measure, because the dichotomous diagnostic outcome measures do not allow mean-level or trajectory modeling analyses (Nagin & Odgers, 2010; Nagin & Tremblay, 2005). Finally, there is now a significant body of research suggesting that children with high levels of behavioral inhibition might be at increased risk of anxiety disorders in later childhood. Although behavioral inhibition in itself cannot be classified as a disorder, it appears that it may be worthy of special attention if we wish to anticipate anxiety later in childhood. Therefore, we also review the evidence examining outcomes for children with high levels of this trait. Although there is some overlap between some of the terms included in the ‘anxiety-related symptoms’ category and the concept of ‘behavioral inhibition’, the latter is reviewed separately as it has developed a separate conceptual identity, with its own distinct terminology and methodology.

**Anxiety-related disorder outcome studies**

Studies of the course to anxiety related disorders (Bosquet & Egeland, 2006; Bufferd, Dougherty, Carlson, Rose, & Klein, 2012; Clark, Rodgers, Caldwell, Power, & Stansfeld, 2007; Keenan, Shaw, Walsh, Delli quadri, & Giovannelli, 1997) give the opportunity to
differentiate between the developmental course of normative anxiety and clinically significant anxiety. Keenan, Shaw, Delliquadri, Giovannelli and Walsh (1998), for example, examined whether internalizing symptoms at age 3 were associated with internalizing disorders at age 5 using a sample of children from low-income families ($n = 104$). When the children were 3 years old, mothers completed the Child Behavior Checklist (CBCL) (Achenbach, 1991) to measure children’s internalizing symptoms. When the children were 5 years old, mothers took part in the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS) interview (Puig-Antich & Chambers, 1978) to measure internalizing disorders. The results of this study indicated that internalizing symptoms reported when children were 3 years of age were significantly positively correlated with internalizing disorders when they reached the age of 5 ($r = .26$), but only for boys. Unfortunately, the relatively short follow-up period and relatively small number of participants limit the generalization of this study’s outcomes.

Bosquet and Egeland (2006) focused on children whose mothers were selected during their pregnancy (via a public health clinic) for a longitudinal study. All mothers were considered as high-risk for enduring poverty and related risk factors ($n = 155$). Both parents and teachers reported on anxious/depressed symptoms when children were 5 years old, using the CBCL (Achenbach, 1991) and the Teacher’s Report Form (TRF, Achenbach & Edelbrock, 1986) respectively. A teacher reported on these symptoms again with the TRF when the children were 10 years old. Subsequently, when participants were 16 years old, the parents, teachers and adolescents completed the CBCL, TRF, and the Youth Self-Report (YSR, Achenbach, 1991) respectively, to report on anxious/depressed symptoms. Additionally, the adolescents took part in a K-SADS interview (Puig-Antich & Chambers, 1978) at age 17.5, in order to obtain information on anxiety symptoms and to assign DSM-III-R diagnoses. Approximately 9% of the participating adolescents received a lifetime diagnosis of one or more anxiety disorders, which was associated with higher anxiety symptoms from the age of 10 onwards. Furthermore, it was found that anxious/depressed symptoms at age 5 were *not* significantly associated with anxious/depressed symptoms at age 10, but anxious/depressed symptoms at age 10 were significantly associated with 16-year and
anxious/depressed and anxiety symptoms. Due to its relatively small sample size, the results of this study should be interpreted with care.

The study reported by Clark, Rodgers, Caldwell, Power and Stansfeld (2007) has the longest follow-up period and the largest sample size ($n = 9297$) of all the prospective longitudinal studies reported here. Internalizing problems were measured via teacher-based reports when children were 7 (and 11) years old, using the Bristol Social Adjustment Guides (Stott, 1971). When participants were 45 years old, they took part in an ICD-10 based diagnostic interview, the Revised Clinical Interview Schedule (Stott, 1969). It was reported that if children experienced internalizing problems at age 7 (or 11), they were 1.5 to 2 times more likely to have an anxiety or affective disorder at age 45. It was not reported what proportion of those participants who had an anxiety or affective disorder at age 45 had internalizing problems at age 7. Clark and her colleagues further demonstrated that the age of onset of the internalizing problems (i.e., 7 or 11) did not affect the odds of having an anxiety or affective disorder at age 45, suggesting that having anxiety symptoms in earlier childhood is as predictive of poor outcomes as having those symptoms in early adolescence. The large sample size and the long follow-up period make the results of this study of great value.

Bufferd, Dougherty, Carlson, Rose, and Klein (2012) studied the continuity of several disorders, including anxiety disorders, in young children ($n = 462$). Three-year-olds were checked for the presence of DSM-IV diagnoses by conducting The Preschool Age Psychiatric Assessment (Egger & Angold, 2004) with the child’s primary caregiver by telephone. A follow-up face-to-face measurement was performed when the children were 6 years of age. For anxiety disorders in general, significant homotypic continuity was apparent, i.e., an early anxiety disorder was more likely to lead a subsequent anxiety disorder than to a different category of disorder. Additionally, strict homotypic continuity (i.e., the continuity of specific types of anxiety) was present for five of the six types of anxiety disorders that they examined (specific phobia (SP), separation anxiety disorder (SAD), social phobia (SOP), agoraphobia, and selective mutism (SM)). Generalized anxiety disorder (GAD) did not show strict homotypic continuity, but, rather, decreased significantly over time. Unfortunately, the
procedure for the diagnostic assessment differed between the baseline and follow-up measurement (i.e., telephone versus face-to-face interview), which possibly affected the outcomes of the study.

**Anxiety-related symptom outcome studies**

**Mean level analysis studies**

The first study that used symptoms as an outcome measure and performed a mean-level analysis was performed by Ialongo, Edelsohn, Werhamer-Larsson, Crockett and Kellam (1995). They examined the continuity of anxiety symptoms, with a particular focus on the longitudinal outcomes of children who recorded the highest 33% of anxiety scores. Children were assessed with the self-report version of the Revised Children’s Manifest Anxiety Scale (Reynolds & Richmond, 1978) when they were 5 or 6 years old and again when they were 11 years old (n = 542). Self-reported anxiety symptoms at age 5 or 6 predicted self-reported anxiety symptoms at age 11 (odds ratio = 1.91). It should be noted, however, that this study was part of an overarching prevention study, in which children were offered interventions to reduce aggression and improve early learning. Although the children that took part in the current study constituted the control group of the overarching study, there is a risk that participation could have impacted on outcomes. The results of this study should, therefore, be interpreted with care.

Although the main purpose of Dallaire and Weinraub’s (2007) study was to examine infant-mother attachment security and later child anxiety, they also examined the role of early anxiety as a predictor of subsequent anxiety. To measure children’s anxious behaviors, they used the mother’s report on the CBCL (Achenbach, 1991) at age 3, and the mother’s, father’s and teacher’s report on the CBCL when children were 6 years old (n = 1364). Results suggested a significant predictive effect of anxious behaviors at age 3 on anxious behaviors at age 6. In fact, anxious behaviors at age 3 were found to be a stronger predictor of anxiety at age 6 than all other variables in the analysis (i.e., mother’s sensitivity, income, gender, negative life events, and attachment security). Interestingly, the predictive effect of anxious
behaviors was not unique to subsequent anxiety, but was also predictive of subsequent aggressive behaviors. However, although the study used multiple informants when children were 6 years old, anxiety measurement at age 3 was based only on the mother’s report.

Bayer, Hastings, Sanson, Ukoumunne and Rubin (2010) aimed to study both the continuity of childhood internalizing difficulties and the contribution of early childhood variables (including early internalizing symptoms), on middle childhood internalizing problems. They included 2-year-olds and followed them over a 5-year period (n = 93). Primary caregivers provided information on their child’s internalizing symptoms by completing the Children’s Moods, Fears and Worries Questionnaire (Bayer, Sanson, & Hemphill, 2006) when children were 2, 4 and 7 years of age. Bayer and colleagues reported a significant continuity of childhood internalizing difficulties from 2 to 7 years of age (r = .36) and from 4 to 7 years of age (r = .63). Internalizing symptoms when children were 2 and 4 years old predicted their internalizing problems at age 7. Unfortunately, this study’s small sample size limits the conclusions that can be drawn.

**Trajectory modeling analysis studies**

Côté, Tremblay, Nagin, Zoccolillo and Vitaro (2002) were the first to apply a trajectory modeling analysis. They recruited 6-year old children and examined them every year till they were 12 years old (n = 1865). Teachers reported on children’s fearfulness using the Social Behaviour Questionnaire (SBQ, Tremblay, Vitaro, Gagnon, Piché, & Royer, 1991). Their modeling procedure suggested that three distinct trajectory groups of fearfulness for boys, and three for girls, provided the best fit for the data. For boys, these were: a group with stable low levels of fearfulness (16.2% of the sample), a group with stable moderate levels of fearfulness (75.2%) and a group with stable levels of high fearfulness (8.6%). For girls, a three group model also yielded the best fit of the data: a group with initial low levels of fearfulness, which exhibited a steady linear increase over the course of the study (12.5% of the sample); a group with initially moderate levels of fearfulness, which exhibited initial increases, but then decreased over the six years of the study (70.1%); and finally a group that began with high
levels of fearfulness which increased further in the first few years and then decreased towards the end of the study (17.4%). Unfortunately, the measures used in this study were ones that are not commonly used in clinical studies, which reduces comparability. However, the study suggests that for boys, having high early levels of fearfulness is likely to predict continued fear, whereas for girls, the picture is less clear.

Duchesne, Vitaro, Larose and Tremblay (2008) applied a trajectory modeling approach to examine the course of anxiety in children ($n = 181$). They recruited 5-year-olds from the general population and continued to measure their anxiety over a 15-year period. Mothers provided information on anxiety symptoms by completing the Preschool Behavior Questionnaire (PBQ, Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992) annually. A four group model proved to be the best fit of their data: A ‘low’ group, a ‘moderate’ group, a ‘high’ group and a ‘chronic’ group, with prevalence estimates of respectively 10%, 39%, 41%, and 10% of the children. The ‘low’ group had a linear shape, with anxiety starting low and decreasing at a constant rate over 15 years. The ‘moderate’ group had a quadratic shape, with anxiety fluctuating over time. In the ‘high’ group, anxiety was high in kindergarten and, although it was still high after 15 years, anxiety did decline steadily over time. In the ‘chronic’ group, anxiety fluctuated and slightly decreased over time, but the level of anxiety remained higher than in the other groups, indicating that for some children with early high levels of anxiety (the 10% in the chronic group), the course was likely to be chronic. However, for a substantial proportion who were highly anxious in kindergarten (the 41% in the ‘high’ group) the outlook was much better. In addition, this study examined school-completion by age 20. It was reported that the probability of school non-completion was the highest for children in the ‘chronic’ anxiety group, suggesting once again that there was a core of around 10% of children who were in need of support. A limitation of this study is that anxiety measurement was based on mother report only; although teacher reports on hyperactivity, aggressiveness and prosociality were collected, teachers were not asked to provide information on child anxiety.

Feng, Shaw and Silk (2008) provide unique insight into the course of anxiety in boys from low-income families ($n = 290$). Mothers reported on the boys’ anxiety symptoms with the
CBCL (Achenbach, 1991) when children were 2 years old and continued to do so on six occasions during the 8-year follow-up period. Based on trajectory modeling, four distinct anxiety trajectories were identified as the best fit of the data: A ‘low’ group with stable low levels of anxiety, which included 50.8% of the children; a ‘low-increasing’ group, which had low anxiety at age 2 that increased steadily over eight years, with 8.8% of the children; a ‘high-declining’ group, with high initial anxiety that declined to the mean level of the whole sample over time, which included 32.5% of the children; and finally, a ‘high-increasing’ group, exhibiting severe and persistent anxiety (i.e., scoring two standard deviations above the sample’s mean at age 10) which included 7.9% of the children. This study, therefore, also suggests that there are two subgroups of children who display early anxiety: a larger group (32.5% of the whole sample) which experiences significant declines in anxiety over time, and a smaller (7.9% of the whole sample) subgroup, in which early anxiety is maintained into middle-late childhood. In addition, this study examined whether trajectory group membership predicted having an internalizing disorder at age 9 and 10. Both the mothers and the boys provided information on the presence of DSM-IV anxiety disorders using the K-SADS interview (Puig-Antich & Chambers, 1978). Initial high levels of anxiety predicted anxiety disorders in 9- and 10-year-olds, and predicted even more strongly for children whose anxiety symptoms increased over the years. Unfortunately, the results of this study cannot be generalized to the entire population, because of the specific selection of boys from low-income families.

Côté and colleagues (2009) followed a group of one and a half-year-olds annually until they were 5 years of age \( (n = 1759) \), which is the youngest starting point of all studies reported here. They assessed depressive and anxiety symptoms using items selected from the Preschool Behavior Questionnaire (Tremblay et al., 1992) and items selected from the CBCL (Achenbach, 1991b). The assessments were based on maternal reports only. Results of the trajectory modeling procedure pointed to three distinct trajectories of depressive and anxiety symptoms: A group of children with a low and relatively stable level of anxiety (including 29.9% of the children), a group of children with a moderate level of anxiety that increased over
time (55.4% of the children), and a group of children with high anxiety that kept increasing over the three-and-a-half year time span (14.7% of the children). Although the authors provide some strong arguments for measuring anxiety and depression together, the unique operationalization of depressive and anxiety symptoms (i.e., items were selected from two existing questionnaires, but the measure did not cover phobias and panic) complicates the comparison of outcomes of this study to outcomes of other studies.

The most recent study on the continuity of early anxiety related problems is reported by Broeren, Muris, Diamantopoulou and Baker (2013). They applied a trajectory modeling analysis, and this is, to the best of our knowledge, the only study to explore the continuity of different types of anxiety (i.e. social anxiety, separation anxiety, generalized anxiety and specific fears). At baseline, they included children aged 4 to 9 years and performed follow-up measurements one and two years later ($n = 196$). Anxiety symptoms were measured with the parent report of the Preschool Anxiety Scale-Revised (Edwards, Rapee, Kennedy, & Spence, 2010). The modeling results indicated that for social anxiety, four subgroups best fit the data: A stable low group (26.8%), a stable moderate group (39.7%), a stable high group (24.1%), and a stable very high group (9.4%). For separation anxiety, three distinct subgroups provided the best fit, with the majority of children in a stable low group (63.4%), and the remainder in a stable moderate (30.4%) or a stable high group (6.3%). For generalized anxiety, the model yielding the best fit for the data included just two distinct trajectories: A large stable moderate group (88.2%) and a minority of children in the increasing-decreasing group (11.2%) in which anxiety steadily increased until children were 7 years of age and then steadily decreased over the remaining period of the study. Finally, for specific fears, the best fitting model also included two distinct trajectories, namely a very large group of children (97.3%) with a moderate level of specific fears that declined over time and a group of children who showed a decrease of anxiety from 8 years on after an initial increase (2.7%). The results of this study suggest that the stability of early anxiety symptoms is dependent on the type of symptom experienced. For social anxiety and separation anxiety symptoms, there was high stability. For generalized anxiety and specific fear symptoms, those who began with high levels of
symptoms experienced initial increases to age 7 or 8, but thereafter experienced declines in symptoms.

The final study, reported by Buss (2011), could not be assigned to either of the subdivisions of the study types. Their anxiety-related measure at baseline was, uniquely, assessed via observation: degree of fear was systematically observed while 2-year-old children performed different tasks with varying threat levels (e.g., puppet show, stranger episode). When children were 4 years old \( (n = 65) \), their internalizing problems were measured using mother-report CBCL (Achenbach, 1991) and the mother and teacher-based reports of the MacArthur Health and Behavior Questionnaire (Armstrong & Goldstein, 2003). Results showed that those children who showed high levels of fear to both high and low threat stimuli, i.e., who were indiscriminate in their fear, were most likely to be rated as high on internalizing problems by parents three to four years later. This prediction was better than prediction from behavioral inhibition (see below) and from overall fear levels. Buss concludes that children who show fear across all settings, regardless of how frightening the setting is, are the ones that we need to be concerned about. Unfortunately, over its follow-up period of two years, this study suffered from significant attrition, with more than 40% of the participants dropping out.

Taken together, these 13 prospective longitudinal studies show overall support for the broad homotypic continuity of early anxiety-related problems. However, anxiety-related problems and disorders do not only show broad homotypic continuity but also heterotypic continuity: studies included in the current review suggested that anxiety-related problems in younger children were a risk factor for oppositional-defiant disorders (Bufferd et al., 2012), aggression (Dallaire & Weinraub, 2007), and affective disorders later in life (Clark et al., 2007). Similarly, the studies included in the current review also demonstrated negative associations between anxiety-related problems and subsequent competence (Bosquet & Egeland, 2006), school non-completion (Duchesne et al., 2008), and adaptive functioning (Ialongo et al., 1995).
Behavioral inhibition

The studies described above give some indication that early anxiety does not always (or even often) resolve spontaneously, and that outcomes for children experiencing it can be poor. However, there is growing awareness that children need not display clinical symptoms of anxiety in order to be at risk of subsequent anxiety disorder. For younger children, particularly, it is recognized that high levels of behavioral inhibition can be a risk factor for later anxiety difficulties. In this section, we consider anxiety-related outcomes for children who display high levels of behavioral inhibition. The construct was first described by Kagan et al. (1994) who observed that a substantial minority of the young children who were tested in his laboratory displayed a consistent tendency to react with distress, restraint, and withdrawal when being confronted with unfamiliar people or settings. A study by Robinson, Kagan, Reznick, and Corley (1992) has demonstrated that this temperament feature has a genetic basis. In a sample of 178 monozygotic and dizygotic same-sex twin pairs who were assessed at ages 14, 20, and 24 months, these researchers found heritability estimates ranging between .51 and .64. Not surprisingly, various studies have noted that behavioral inhibition shows considerable stability over time, and this seems particularly true for children who display extremely high or low levels of this temperamental characteristic. For example, Kagan, Reznick, and Snidman (1988) demonstrated that 75% of the children who had been classified as either ‘inhibited’ or ‘uninhibited’ retained their status at a 6-year follow-up. A longitudinal study by Gest (1997) even demonstrated that observational ratings of behavioral inhibition characteristics in childhood (at ages 8 to 12) were predictive of the very same characteristics in early adulthood (at ages 17 to 24).

More importantly, within the context of the present article, there is clear evidence indicating that behavioral inhibition acts as a vulnerability factor for the development of anxiety problems in children and adolescents. One of the first studies that found support for this notion was conducted by Biederman and colleagues (1990) who conducted structured clinical interviews to assess psychiatric disorders in two samples of children: a sample of children of patients with panic disorder and agoraphobia (Rosenbaum et al., 1988) and a
longitudinal cohort of inhibited and uninhibited children that had been followed from a very young age (Garcia Coll, Kagan, & Reznick, 1984). In both samples, it was found that inhibited children showed significantly more anxiety disorders than the uninhibited children. Interestingly, when the combined samples were re-assessed after three years, it was noted that inhibited children had displayed a significant increase of anxiety problems from baseline to follow-up, whereas such an increase was not observed in the uninhibited group.

Since the pioneering research by Biederman and colleagues, many studies have confirmed that behavioral inhibition is associated with a broad range of anxiety symptoms and disorders in children (e.g. Broeren & Muris, 2010; Hudson, Dodd, & Bovopoulos, 2011; Hudson, Dodd, Lyneham, & Bovopoulos, 2011; Shamir-Essakow, Ungerer, & Rapee, 2005; Vreeke et al., 2012). Yet, there is increasing evidence indicating that behavioral inhibition is a risk factor that is particularly involved in the pathogenesis of social anxiety disorder. For instance, Biederman et al. (2001) assessed psychopathology in a large sample of 2-, 4-, and 6-year-old children with and without behavioral inhibition. Although multiple anxiety disorders again tended to be more common among inhibited children, the only significant difference was observed for social phobia: that is, 17% of the children in the inhibited group met the diagnostic criteria of this disorder versus only 5% in the uninhibited group. A similar result was obtained in a prospective study by Muris, Van Brakel, Arntz, and Schouten (2011) who followed a sample of 261 children aged 5 to 8 years, of which 124 were behaviorally inhibited and 137 were control children, over a 2-year period. Assessments took place on three occasions to measure children’s level of behavioral inhibition, various anxiety disorder symptoms, and a number of other vulnerability factors for anxiety pathology (e.g., insecure attachment, overprotective/anxious parenting, parental anxiety). Results, first of all, indicated that behavioral inhibition was fairly stable over time. Furthermore, this temperament characteristic was highly predictive of social anxiety symptoms but not of other anxiety disorder symptoms. Finally, the contribution of behavioral inhibition to children’s social anxiety symptoms remained significant when controlling for other vulnerability factors.
In another longitudinal investigation by Schwartz, Snidman, and Kagan (1999), children were followed for an even longer time period. A structured diagnostic interview for assessing anxiety disorders diagnoses was conducted in 79 13-year-old children who had been classified as either inhibited or uninhibited in their second year of life. The researchers observed a significant association between behavioral inhibition and social anxiety disorder but not with any of the other types of anxiety problems. The link between behavioral inhibition and social phobia was robust: 61% of the adolescents who had been identified as inhibited as toddlers had current symptoms of social anxiety, as compared to 27% of those who had been identified as uninhibited. When looking at clinical diagnosis, 34% of the adolescents in the inhibited group met the criteria for a severely impairing social phobia versus only 9% of the youths in the uninhibited group.

**Conclusion – trajectory of early anxiety and anxiety precursors**

The following four conclusions can be drawn based on the overview of studies on the continuity of early anxiety and the outcomes of behavioral inhibition. First, only four studies on the course to diagnosable anxiety have been performed so far, with follow-up periods ranging from three to 45 years, but all four (Bosquet & Egeland, 2006; Bufferd et al., 2012; Clark et al., 2007; Keenan et al., 1997) of these showed that having anxiety-related problems or disorders predicts having an anxiety related disorder later on. It should be noted that only one of the studies on the course to diagnosable anxiety looked at the continuity of anxiety disorders per se, whereas other studies only checked the predictive value of anxiety-related symptoms on the risk of developing an anxiety disorder. Clearly, more studies in younger children are needed on the course to diagnosable anxiety to draw firm conclusions on the continuity of and course to diagnosable anxiety. However, overall, this study type indicates continuity of anxiety over time.

Second, the three anxiety-related symptom outcome studies (Bayer, et al., 2010; Dallaire & Weinraub, 2007; Ialongo, et al., 1995) that applied a mean level analysis, reported a significant positive relationship between anxiety-related symptoms measured in children and
subsequent anxiety-related symptoms. Follow-up periods of these studies ranged from three to six years. Thus, this category of study consistently shows continuity of anxiety over time.

Third, five studies examined the course of anxiety-related symptoms in subgroups of children, by the use of trajectory modeling approaches (Broeren et al., 2013; Côté et al., 2002, 2009; Duchesne et al., 2008; Feng et al., 2008). All of these studies found that the majority of children had a low or moderate level of anxiety, but at the same time also reported a small group of children with high levels of anxiety-related problems (estimations of included children ranged from 7.9 to 17.4%). When we look at the continuity of the symptomatology in the subgroups with high levels of anxiety related problems, results are mixed. Stability of symptoms was only found for boys (but not girls) in the study of Côté and colleagues (2002), and for social anxiety and separation anxiety (but not generalized anxiety and specific fears) in the study reported by Broeren and colleagues (2013). The studies reported by Feng et al. (2008) and Côté et al. (2009) showed that the anxiety level of children in these high-anxious groups kept increasing over time, whilst other studies showed either a slight decrease (Duchesne et al., 2008) or a steady decrease after an initial increase for girls (Côté et al., 2002), and for generalized anxiety and specific fears (Broeren et al., 2013). However, only five studies that apply a trajectory modeling approach have been performed so far. More of this type of study is needed before firm conclusions on the continuity of separate trajectories of anxiety related symptoms could be drawn.

Fourth, the available evidence suggests that the temperament-based factor of behavioral inhibition represents a significant vulnerability factor for the development of anxiety problems in youths. A clear trend can be observed in the literature that behavioral inhibition is particularly relevant for the aetiology of social phobia (see also Claus & Blackford, 2012). It is also good to keep in mind that behavioral inhibition is just one factor that is involved in the aetiology of anxiety problems in youths. Anxiety disorders have a multifactorial origin (Muris, 2007), and so temperamental vulnerability alone is often insufficient to produce this psychopathological outcome.
In summary, the 13 studies on the continuity of anxiety-related problems that were included in this review yield clear support for a broad homotypic continuity of anxiety, indicating that early anxiety is a major risk factor for anxiety later in childhood or adulthood. However, because of the fact that most studies looked at broad concepts of anxiety-related difficulties (e.g., internalizing problems) and did not examine the course of specific types of anxiety, it is too premature to draw any conclusions about the strict homotypic continuity of specific anxiety disorders. In addition to homotypic continuity, anxiety also shows heterotypic continuity and negatively affects several domains of children’s quality of life. Furthermore, high levels of behavioral inhibition are associated with poor longer-term outcomes. Given these findings, we strongly argue against a wait-and-see policy of dysfunctional anxiety in preadolescent children. But what happens if we treat these children? Do we have the appropriate technologies available to achieve remission of early anxiety disorders or vulnerability to them? In the next section, we will examine the small but growing field of treatment research for preadolescent children.

**Treatment of Preadolescent Anxious Children**

Until recently, studies focusing on the treatment of anxiety disorders in preadolescent children were scarce. However, anxiety disorders affect a substantial proportion of children (see above) and there are reasons to believe that intervening at this young age might be particularly beneficial. First, children are developing rapidly; they are eager to learn new skills, and they are malleable in many respects. As a consequence, it could be easier to change their anxious thoughts and behaviors in comparison to older children whose behavior patterns have become more stable and integrated (Hirshfeld-Becker & Biederman, 2002). Secondly, if intervention takes place early in life, the impairment and distress caused by anxiety disorders will interfere less with the child’s home-, school- and social-life (Hirshfeld-Becker et al., 2008).

As for older children, most treatments for younger children are based on cognitive-behavioral therapy (CBT). Although there are arguments suggesting that CBT with young
children might be problematic (see Grave & Blissett, 2004), some studies show that with age-appropriate adjustments, young children may be able to engage in CBT. Doherr, Reynolds, Wetherly, and Evans (2005), for example, found that most non-referred 5- to 7-years-olds could name and identify multiple feelings, link emotions to thoughts, and produce multiple explanations of hypothetical scenarios. Similarly, Berry and Cooper (2012) showed that self-reported high-anxious 6- and 7-year-olds from the general population were equally as competent as their low-anxious peers in producing different rationales accounting for ambiguous social situations involving others or themselves. Furthermore, Quakley, Reynolds, and Coker (2004) demonstrated that by adding simple cues (e.g., pictures and thought balloons), the performance of non-referred children aged 4 to 7 years in distinguishing thoughts, feelings and behaviors was enhanced.

Hirshfeld-Becker, Micco, Mazursky, Bruett, and Henin published an excellent and detailed review in 2011 of the treatment adjustments and trials for young anxious children, with a focus on children aged under 8 years. It seemed that CBT, if adjusted to the young age of the children, might also be an option for the treatment of anxiety problems in young children. However, that review did not include treatment studies developed for children aged between 8 and 10 years, and since it was published, a number of new trials have emerged.

Below we review studies that use CBT to reduce anxiety disorders in young children aged under 11 years (see Table 2). We first describe CBT-based treatments directed at parents only. Thereafter, we discuss treatments involving both parents and children. Case studies were not included. Most of the studies outlined below include children with various and multiple anxiety disorders (e.g., SAD, SOP, SP, GAD, and Selective Mutism [SM]), assessed with semi-structured diagnostic interviews, unless otherwise indicated. In line with the DSM-V (APA, 2013), studies exclusively focusing on the treatment of obsessive-compulsive disorder (OCD) or post-traumatic stress disorder (PTSD) were excluded from this review, as these disorders are no longer represented in the anxiety section of the manual. We excluded studies
where any of the participants were aged 11 years or older, even if the majority of participants were younger.

**CBT (and its derivatives) aimed at parents only**

As mentioned previously, it is sometimes argued that preadolescent children lack the cognitive development necessary for engaging fully in CBT, especially if developmental adjustments to treatment are lacking (Grave & Blissett, 2004). Therefore, one solution has been to work with parents, without working directly with the children (Cartwright-Hatton et al., 2011). There are a number of additional benefits to this approach. First, parents who successfully help their child overcome anxiety issues are likely to experience increased confidence in their role as parents. Second, children could be saved the experience of needing treatment (Van der Sluis, Van der Bruggen, Brechman-Toussaint, Thissen, & Bögels, 2012). The third benefit relates to parents’ role in the development and maintenance of anxiety: A meta-analysis by McLeod, Weisz and Wood (2007), for instance, showed that 18% of the variance in child anxiety could be explained by parental level of autonomy granting. Fourth, if parents learn effective skills for reducing anxiety, they may also be able to help their children overcome possible future anxiety problems (Van der Sluis et al., 2012). Finally, if parents are the only agents of change in the treatment, they may be more motivated to bring change in their child’s behavior. If the child also receives treatment, parents may feel inclined to take less responsibility, as they assume that the therapist will take chief responsibility for managing the anxious behavior of their child (Waters, Ford, Wharton, & Cobham, 2009). In line with these arguments, several studies have directed their intervention at the parents only. Most of the treatment studies discussed below focussed on delivering CBT via the parents, but also modified parenting styles.

Cartwright-Hatton and Rapee were amongst the first authors to focus on the treatment of anxiety in preadolescent children. First, after noticing a decrease in young children’s internalizing symptoms when parents followed a standard parenting skills training programme
for children referred with externalizing problems (Cartwright-Hatton, McNally, White, & Verduyn, 2005), Cartwright-Hatton, McNally, and White (2005) examined an intervention that covered psycho-education in the cognitive model of anxiety, in addition to general parent training skills. Children’s \( n = 11 \) internalizing scores decreased significantly from pre-test to post-test and were maintained at three-month follow-up.

Subsequently, Cartwright-Hatton et al. (2011) conducted a randomised waitlist-controlled trial in which they evaluated ‘Timid to Tiger’, an intervention of 10 weekly 2-hours sessions with the goals of providing children a calm and consistent home environment and teaching parents basic CBT skills to help their child overcome their anxiety. The sample comprised parent(s) of 74 children aged 2 to 9 years. Directly after treatment, intention-to-treat (ITT) analyses showed that children in the intervention group improved significantly: remission rates were 57% for primary anxiety disorder and 32% for all anxiety disorders. For controls, outcomes were 15% and 6%, respectively. Results were maintained at 1-year follow-up with 54% and 46% of the treated children no longer meeting criteria for their primary anxiety disorder and any anxiety disorder, respectively (7% of the children had received further treatment during this period). Results for the control group were 24% and 9%, respectively, even though 38% of these children received further treatment during this follow-up period.

At that same time, further evidence for the efficacy of CBT interventions directed at parents of preschool children was shown in RCT studies conducted by Rapee, Kennedy and colleagues (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005; Kennedy, Rapee, & Edwards, 2009) and their follow-up studies (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2010; Rapee 2013). While these studies were developed as prevention studies (6 - 8 sessions) for temperamentally vulnerable children, approximately 90% (Rapee et al., 2005) to 100% (Kennedy et al., 2009) of the samples already met criteria for at least one anxiety disorder. Besides anxiety education, parent management skills and learning CBT skills to parents, the content of the programs included raising awareness of high-risk periods in the child’s life (Rapee et al., 2005; Kennedy et al., 2009), and was later extended to also include social skills improvement, for example (Kennedy et al., 2009). In both studies using original samples \( n = \)
146 preschoolers in Rapee et al., 2005; \( n = 71 \) preschoolers in Kennedy et al., 2009), the two

group CBT-based programs were demonstrated to be significantly more effective in decreasing

anxiety disorders than the control group. However, around 50\% of the children in both studies

still met criteria for an anxiety disorder at 6-month follow-up (Kennedy et al., 2009), and one

year follow-up (Rapee et al., 2005), respectively. For the study by Rapee et al. (2005), follow-

up studies were conducted, with the following results: at 2-year follow-up 38\% vs. 68\% and at

3-year follow-up 40\% vs. 69\% of the children in the intervention and monitoring group met

criteria for an anxiety disorder, respectively (Rapee et al., 2010).

Recently, an 11-year follow-up study was published (Rapee, 2013). Children \( n = 103 \) now had a mean age of 15.4 years and results showed that female (but not male) adolescents

from the prevention group showed less anxiety symptoms (maternal report) and related

interference (adolescent report) compared to the control group. Although there were no

significant differences on number of anxiety disorders between the two groups, adolescent

females (but again not males) from the prevention group showed less internalizing disorders

(i.e. depression) than the controls (Rapee, 2013). Together, these results seem to suggest that a

brief CBT-based parent education prevention program can reduce the number of anxiety

disorders/ symptoms in vulnerable inhibited preschoolers, however, most benefits may be

evident in the long term.

Additional studies without control groups also show promise: For example, a study by

Van der Sluis et al. (2012) consisted of 26 clinically referred anxious children (diagnoses not

assessed) aged 4 to 7 years and their families. The intervention ‘Confident Kids’ included four

2-hour group meetings and thereafter, four individual telephone calls. Parents were educated

about anxiety, learned effective cognitive and behavioral techniques to manage their child’s

anxiety, as well as their own, and they were taught to conduct hierarchical exposures with their

child. Results of the study suggest that a brief intervention can reduce anxiety symptoms in

children according to parents, children (medium effect sizes) and teacher (small effect size),

and positively change parenting behaviors of mothers.
Another investigation by Eisen, Raleigh, and Neuhoff (2008) explored the effects of a cognitive-behavioral parent training for parents of six children (mean age = 8.7 years, age range 7 to 9 years) with SAD as principal diagnosis. The intervention had duration of 10 weeks, with individualized sessions of 1.5 hours per week. The intervention incorporated education about anxiety, cognitive restructuring, exposure, relaxation, contingency management, self-control skills, and relapse prevention. After the intervention, 83% no longer met criteria for SAD, based on parent ratings. Results maintained at 6-month follow-up.

Coming from a slightly different rationale, others have also investigated the treatment of SAD in young children, but using (a CBT-based modified version of) Parent-Child Interaction Therapy (PCIT), a treatment originally developed to reduce children’s externalizing behaviors. PCIT consists of two phases: child-directed interaction (CDI) and parent-directed interaction (PDI). During CDI the goal is to strengthen the parent-child relationship. Thereafter, once parents master the CDI skills, parents learn to use effective discipline strategies to manage their child’s behavior in PDI (Brinkmeyer & Eyberg, 2003). A unique aspect of PCIT is that parents are coached in the treatment through a ‘bug-in-the-ear’ microphone. Although children attend the sessions as well, the therapists only verbally instruct and give feedback to the parent (Puliafico, Comer, & Pincus, 2012). Accordingly, small trials provide preliminary support for standard (unmodified) PCIT as treatment for SAD in young children (Chase & Eyberg, 2008; Choate, Pincus, Eyberg, & Barlow, 2005).

However, in the most recent studies, anxiety-focused modifications have been made to PCIT: First, Pincus, Santucci, Ehrenreich, and Eyberg (2008) adapted their standard PCIT treatment, as their study showed that although standard PCIT did decrease SAD severity, it did not resolve the disorder. Therefore, these researchers added ‘Bravery-Directed Interaction’ (BDI) to their PCIT, a treatment phase focusing on anxiety, implemented after the child-directed and before the parent-directed phase. In BDI, parents are educated about anxiety, they learn to apply CDI skills during separation situations, and they are taught how to implement separation exposures and provide corresponding rewards. Preliminary results of 34 children
included in their RCT study showed significant reductions in SAD from pre- to posttest (Pincus et al., 2008).

Second, Comer et al. (2012) investigated the 12 session ‘CALM program’ (two parent-only sessions), an intervention in which the PDI phase is omitted and exposures are added. Parents are coached in the session while performing exposure tasks with their child. The authors further expanded the PCIT approach by piloting this treatment modification of PCIT in nine young children aged 4-8 years with not only SAD, but also SOP, GAD and/or SPs as primary diagnosis. Results showed that 86% of the treatment completers (67% ITT) were free of all anxiety disorders at post-treatment.

To conclude, altogether, the results discussed so far suggest that several different modes of CBT treatment, directed at parents of anxious children, are more effective in decreasing children’s anxiety disorders than a waitlist control group. We now turn to studies that have included the young children themselves in the therapy.

**CBT treatments (and derivatives) aimed at parents and their children**

First, studies with most emphasis on parents are outlined, after which, studies in which the therapist spends most time with the children are discussed. For many treatment programs, the child sessions were explicitly adapted to the younger child, by including stories, games and puppets for example (e.g., Monga, Young, & Owens, 2009).

**Programmes with most time spent with parents**

Two randomized waitlist-controlled trials find support for the efficacy of CBT for parents and children, where the emphasis is on parents. First, after successfully piloting their intervention ‘Being Brave’ in a small sample of nine anxious children aged 4 to 7 years with 67% no longer meeting criteria for any anxiety disorder at post-intervention and 2-year follow-up (Hirshfeld-Becker et al., 2008), Hirshfeld-Becker et al., (2010) conducted a randomized controlled trial. The sample consisted of 64 children and their parents who were randomly assigned to the CBT intervention or the control group. The intervention started with 6 parent-
only sessions, followed by 8 to 13 parent-child sessions, and ended with one additional parent-only session. Parent-only sessions taught parents about anxiety management for themselves (e.g., psycho-education, cognitive restructuring, and modelling coping skills) and their child (e.g., graded exposures and contingency management) and relapse prevention. In the parent-child sessions, further attention was given to help children manage their anxiety through, for example, relaxation, coping plans and exposure. Outcomes for the treatment condition surpassed the control condition significantly: 59% of the completers ($n = 29$; ITT 50%) in the intervention were without anxiety disorders at post-treatment (6 months), compared to 18% ($n = 28$; ITT 17%) in the control condition. Importantly, for the completers, these results maintained at the 1-year follow-up.

A second RCT study was conducted by Schneider et al. (2011). They randomized 21 children to treatment (CBT and parent training) and 22 children to the waitlist. For all children (aged 5-7 years) SAD was the primary diagnosis, but comorbidity was common. The ‘TrennungsAngstprogramm Für Familien’ (‘separation anxiety programme for families’) treatment involved 16 sessions delivered over 12 weeks. In the first 4 weeks, parents and children separately received weekly sessions of 50 minutes, in which psycho-education specifically about SAD, the relation between thoughts-feelings-behaviors, and dysfunctional beliefs were discussed, and goals for treatment were identified. Additionally, parents learned behavior-management strategies. The remaining 8 sessions were divided, with the first part of the session with parent(s) and child together, and the second part with parents alone. In the combined parents-child sessions, the therapist first conducted an exposure with the child in the presence of the parent. Thereafter, parents performed the exposure task with their child, and they carried out the other exposure tasks in the home environment. The other combined sessions were often used to discuss progress and to plan new exposures. The parent-only parts of the sessions, for example, covered further shaping of parental discipline techniques and cognitive restructuring. This intervention was compared to a 12-week waitlist group. ITT analyses at 4-week follow-up showed SAD remission rates of 76% in the intervention group,
compared to 14% in the control group. One- and 2-year follow-up data are currently being collected.

Monga et al. (2009) also examined the efficacy of a parent-child intervention, but their design was not randomized and controlled. The intervention used in this study was ‘Taming Sneaky Fears’, a 12-weekly, 1-hour group CBT programme, in which both parents and children (5-7 years) were treated, but separately from each other (with the exception of the first session which was only for parents, and the second session that started with parents and children together). In child-groups children learned, for example, to recognize their feelings, apply relaxation and to think ‘brave thoughts’. In the parent groups, parents learned CBT skills to help their children overcome their anxiety. Waitlist measures were available for approximately 1/3 of the total sample; results on changes in anxiety disorders were not reported, however, CGAS (Children’s Global Assessment Scale) scores showed no change during this waitlist period. Results further showed that at post-treatment, 44% of the children were free of all anxiety disorders, whereas 72% were free of at least one anxiety disorder.

Programmes with most time spent with children

In contrast to the studies outlined above, in other parent-child treatment studies the therapist spends most time with the child rather than the parents. First, a randomized clinical trial was carried out by Shortt, Barrett, and Fox (2001) in a slightly older sample of children (age range 6 to 10 years). The researchers randomly allocated 71 children who met inclusion criteria of having a primary diagnosis of SAD, SOP or GAD to a family-based group CBT (the FRIENDS programme, \( n = 54 \)) or a 10-week wait list (\( n = 17 \)). The treatment consisted of 10 weekly sessions for the child. Children learned to recognise their anxious feelings, relaxation, attention training, to perform exposure tasks, reward themselves, make internal attributions for achievements, make friends and construct a friend network. Parents followed a family skills component for a total duration of six hours, in which parents learned to manage their own anxiety, implement contingency management and planned ignoring, challenge dysfunctional thoughts, increase communication skills as well as problem solving skills and to find partner-
and broader network support. The sessions were organised as follows: 10 minutes of parent and child together in the group, followed by a 50-60 minutes child group session (5 to 13 children per group), and then parents re-enter the group for an additional 5 minutes. Thereafter, 30-40 minute parent sessions took place. Officially, two booster sessions were also included at 1- and 3-months after treatment, but attendance to these sessions was very low. Post-treatment results of completers \((n = 64\) in total) indicated that the treatment was superior to the waitlist, with 69% compared to 6% of the children diagnosis-free. At post-intervention, children from the waitlist group with an anxiety disorder received treatment as well. The 1-year follow-up data from both treated groups (available for \(n = 63\)) showed that 68% no longer met criteria for any anxiety disorder. This study showed that a combined parent-child group CBT with most emphasis on child treatment was more effective in reducing anxiety disorders than no treatment.

Second, Minde, Roy, Bezonsky, and Hashemi (2010) examined the effects of individual CBT in 37 referred younger children aged 3 to 7 years (anxiety disorders were not assessed with semi-structured interviews). Treatment comprised on average 8 sessions, with a mean treatment duration of 17 weeks. Sessions were divided, with the child alone for the first 40 minutes, and the family together for the last 20 minutes. Children practiced exposure tasks (with or without response prevention) from a hierarchy both in the session and at home, and they learned to ‘talk back to the brain’ when they had anxious thoughts. In the second part of the session, parents were informed about the first part of the session with the child, and parents told the therapist about their progress at home. Parents also received psycho-education about anxiety, were given relevant literature when appropriate, and were advised on how to handle co-morbid disorders. Important to note was the addition of medication in the case of 10 children (i.e., Fluoxetine \(n = 6\); Concerta \(n = 3\); and Risperidone \(n = 1\)). These children were offered medication either at the beginning of the treatment (because they were heavily affected by their symptoms), or if they showed no improvement after four to five weeks. After treatment, the authors found a significant decrease in emotional problems according to both parents and teachers. However, due to the addition of medication in 27% of the sample and the
lack of a (waitlist) control group, these gains found in this study cannot be entirely attributed to the treatment offered.

In summary, treatment studies focussing both on parent(s) and their children show decreases in anxiety disorders that are significantly higher than the recovery rates in the waitlist control groups. More (RCT) studies are needed before firm conclusions can be drawn about the difference in effect between CBT parent-child treatment studies in which most time is spent with parents compared to studies in which most time is spent with children.

Comparing parent-only treatment with parent-child treatment

Overall, it seems that several different methods of providing CBT are effective, and it is not yet clear if one is superior for preadolescent children (i.e. parent only versus parent-child treatment). As far as the authors know, only one study (Waters et al., 2009) has attempted to compare these approaches in young children (4-8 years). The intervention used was the ‘Take ACTION’ program. In both treatment conditions, parents received 10 weekly, 1-hour group sessions involving psycho-education, parent management strategies, strategies for assisting their children, coping plans for parents, and improving communication and problem solving skills. In the parent-child condition, the children also received 10 weekly sessions of 1 hour. Children’s treatment covered psycho-education, relaxation techniques, cognitive restructuring (‘calm thoughts’), gradual exposure, social- and problem solving skills, and finding supportive others. In both conditions, parents received their own workbook and they worked at home with the child on their homework (regardless of treatment group). In essence, the results indicated no significant difference in outcomes for the two groups, both of which were more effective than the waitlist group. More specifically: completer analyses (n = 25 parent only; n = 24 parent-child; n = 11 waitlist) showed that at post-test in the parent-only condition 84% and 60% (ITT: 55% and 45%), in the parent-child condition 74% and 61% (ITT: 55% and 55%), and in the waitlist condition 18% and 9% (ITT: 18% and 18%) of the children were free of their primary anxiety disorder and all anxiety disorders, respectively. At 1-year follow-up results were maintained. Results for completers showed that in the parent-only condition 86%
and 64% (ITT: 55% and 40%), in the parent-child condition 84% and 64% (ITT: 55% and 52%) of the children lost their principal anxiety disorder/ additional anxiety disorders, respectively. Thus, although both treatments were superior to the waitlist condition, one treatment condition was not found to be superior above the other. As the authors note, this could possibly be explained by insufficient power to encounter differences due to low sample size.

**Conclusions on Treatment of Young Anxious Children.**

The results of these studies, and particularly the RCTs, are promising and suggest that young children with anxiety disorders can be effectively treated with CBT. Whether to include only parents, or both parents and children, remains unclear, and there are arguments against and in favour of each. More between-group studies, with larger sample sizes, that include an active treatment control condition in addition to a waitlist condition are necessary to address this question. It should also be noted that most of the studies discussed lack longer-term follow-up data, with few exceptions (Hirshfeld-Becker et al., 2008; Rapee et al., 2010, 2013) and more research on this matter is necessary as well.

**General Conclusions**

The results of this review indicate that, when left untreated, younger children probably do not ‘grow out’ of their anxiety problems, or out of high levels of behavioral inhibition. Instead, they continue to be at increased risk of anxiety disorders, and of other distressing outcomes as they enter later childhood and beyond. Far more research is needed to consolidate these results; in particular, very little is known about the outcomes of the specific anxiety disorders, rather than anxiety in general, and although there are hints that outcomes for early anxiety may be different for girls and boys, it is too early to draw any firm conclusions. However, it is clear that a ‘wait and see’ policy in response to early anxiety or behavioral inhibition may not always be appropriate, and in the past decade, several approaches to the treatment of anxiety/high behavioral inhibition in pre-adolescent children have been
developed. Although (controlled) treatment outcome research is just beginning to emerge, results from the early trials are promising, and it seems that a range of approaches, using CBT- or parenting-based interventions, and delivered directly to the child, or via their parents, might be fruitful. However, the job has only just begun. We need far more rigorous investigation of these new approaches; we still know far less about how to treat these young children than we do about treating their older counterparts, and far less than we do about treating anxious adults. At the moment, anxious children, in the UK at least, are very poorly served. A large, British survey of child and adolescent mental health service use, (Ford, Goodman, & Meltzer, 2003), reported that only 17.7% of 5- to 15-year-olds with emotional disorders (including anxiety) had received intervention from specialist mental health services. This figure was even lower for pre-adolescent children (although no figures are available specifically for anxiety disorders), and was approximately the same proportion (across all disorders) as had received help from religious leaders and alternative medicine practitioners. This is a pity. The benefits to children, their families, and society as a whole, of treating these children as early as possible, cannot be overstated. From a purely economic perspective, it makes sense to treat these disorders before they have begun to accrue significant costs, and whilst the child has the maximum years of healthy life to gain.

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**References**


Table 1
**Prospective Studies on the Continuity of Anxiety Related Problems* with Onset before Age 11**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Study type</th>
<th>Study/country</th>
<th>Main baseline measure(s)</th>
<th>Main outcome measure(s)</th>
<th>Age at baseline (yrs;mnths)</th>
<th>Age at final measurement (yrs;months)</th>
<th>N at final measurement</th>
<th>Relevant (significant) findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ialongo et al., 1995</td>
<td>•</td>
<td>United States (Maryland)</td>
<td>Anxiety symptoms</td>
<td>Anxiety symptoms</td>
<td>5;0 to 6;0</td>
<td>10;0</td>
<td>542</td>
<td>Anxiety symptoms at age 5 to 6 predicted anxiety symptoms at age 10</td>
</tr>
<tr>
<td>Keenan et al., 1998</td>
<td>•</td>
<td>United States (Pennsylvania)</td>
<td>Internalizing symptoms</td>
<td>DSM-III-R internalizing disorders</td>
<td>3;0</td>
<td>5;0</td>
<td>104</td>
<td>Internalizing symptoms at age 3 were associated with internalizing disorders at age 5</td>
</tr>
<tr>
<td>Côté et al., 2002</td>
<td>•</td>
<td>Canada</td>
<td>Fearfulness</td>
<td>Fearfulness</td>
<td>6;0</td>
<td>12;0</td>
<td>1865</td>
<td>Distinguished three generally fearfulness groups: 1) low-stable; 2) moderate-stable; 3) high-stable (girls: 17.4%; boys: 8.6%)</td>
</tr>
<tr>
<td>Bosquet &amp; Egeland, 2006</td>
<td>•</td>
<td>Minnesota Longitudinal Study of Parents and Children</td>
<td>Anxious/depressed symptoms</td>
<td>Anxiety diagnoses. Anxious/depressed symptoms,</td>
<td>5;3</td>
<td>17;6</td>
<td>155</td>
<td>Anxious/depressed symptoms at age 10 were significantly associated with anxiety diagnoses at age 17.5</td>
</tr>
<tr>
<td>Clark et al., 2007</td>
<td>•</td>
<td>1958 British Birth Cohort</td>
<td>Internalizing problems</td>
<td>ICD-10 anxiety diagnoses</td>
<td>7;0</td>
<td>45;0</td>
<td>9297</td>
<td>Internalizing disorders at age 7 were associated with a 1.5-2-fold increase in risk for midlife anxiety and affective disorder</td>
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<tr>
<td>Dallaire &amp;</td>
<td></td>
<td>National</td>
<td>Anxious</td>
<td>Anxious</td>
<td>3;0</td>
<td>6;0</td>
<td>1364</td>
<td>Anxiety behavior symptoms at age 3</td>
</tr>
</tbody>
</table>

* The continuity of anxiety related problems refers to the persistence of anxiety symptoms or diagnoses from early childhood to late childhood or early adolescence.
<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Methodology</th>
<th>Age Range</th>
<th>N</th>
<th>Findings</th>
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</thead>
<tbody>
<tr>
<td>Weinraub, 2007</td>
<td>Institute of Child Health and Human Development Early Child Care Research Network, United States</td>
<td>behavior symptoms</td>
<td>behavior symptoms</td>
<td>predicted anxiety behavior symptoms at age 6</td>
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<tr>
<td>Duchesne et al., 2008</td>
<td>Canada</td>
<td>Anxiety symptoms</td>
<td>Anxiety symptoms</td>
<td>5;0</td>
<td>12;0</td>
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<tr>
<td>Feng et al., 2008</td>
<td>United States (Pennsylvania)</td>
<td>Anxiety symptoms; DSM-IV anxiety diagnoses</td>
<td>Anxiety symptoms</td>
<td>2;0</td>
<td>11;0</td>
</tr>
<tr>
<td>Côté et al., 2009</td>
<td>Canada</td>
<td>Depressive and anxiety symptoms</td>
<td>Depressive and anxiety symptoms</td>
<td>1;6</td>
<td>5;0</td>
</tr>
<tr>
<td>Bayer et al., 2010</td>
<td>Longitudinal Study of Young Children’s Social Development, Australia</td>
<td>Internalizing symptoms</td>
<td>Internalizing symptoms</td>
<td>2;0</td>
<td>7;0</td>
</tr>
<tr>
<td>Buss, 2011</td>
<td>United States (Pennsylvania)</td>
<td>Observed fear</td>
<td>Internalizing symptoms</td>
<td>2;0</td>
<td>4;0</td>
</tr>
<tr>
<td>Bufferd et al., 2012</td>
<td>United States (New York)</td>
<td>DSM-IV anxiety diagnoses</td>
<td>DSM-IV anxiety diagnoses</td>
<td>3;0</td>
<td>6;0</td>
</tr>
<tr>
<td>Broeren et al., 2013</td>
<td>Netherlands</td>
<td>Anxiety symptoms</td>
<td>Anxiety symptoms</td>
<td>4;0 to 9;0</td>
<td>6;0 to 11;0</td>
</tr>
</tbody>
</table>
Note. a Anxiety related problems: anxiety symptoms, anxious behavior, anxiety diagnoses, internalizing symptoms, internalizing disorders, anxious/depressed symptoms, fear, and fearfulness. b DSM: Diagnostic and Statistical Manual; c ICD: International Classification of Diseases; d n.a.: not applicable.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Primary anxiety disorder</th>
<th>RCT (Y/N)</th>
<th>N</th>
<th>Child age range (years)</th>
<th>Results for intervention group(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatments aimed at parents</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cartwright-Hatton et al., 2005a</td>
<td>Not assessed</td>
<td>N</td>
<td>11</td>
<td>4-9</td>
<td>Reductions in internalizing scores at post-test, maintained at 3 month follow-up</td>
</tr>
<tr>
<td>Cartwright-Hatton et al., 2011</td>
<td>SP, SOP, GAD, SAD, OCD, PTSD, panic disorder, no AD (n=4)</td>
<td>Y</td>
<td>74</td>
<td>2.7-9</td>
<td>57% resolved primary AD and 32% resolved all ADs (ITT). Results maintained at 1-year follow-up</td>
</tr>
<tr>
<td>Rapee et al., 2005, 2010, 2013</td>
<td>SAD, SOP, SP, no AD (n=14)</td>
<td>Y</td>
<td>146</td>
<td>3-5.2</td>
<td>At 1-year follow-up 50% free of ADs. At 2 and 3 years follow-up around 60% AD free. At 11 year follow-up, adolescent females showed less internalizing disorders.</td>
</tr>
<tr>
<td>Kennedy et al., 2009</td>
<td>SOP, GAD (n=1)</td>
<td>Y</td>
<td>71</td>
<td>3-4</td>
<td>47% free of all ADs at 6 months</td>
</tr>
<tr>
<td>Van der Sluis et al., 2012</td>
<td>Not assessed</td>
<td>N</td>
<td>26</td>
<td>4-7</td>
<td>Reduced anxiety symptoms at posttreatment</td>
</tr>
<tr>
<td>Eisen et al., 2008</td>
<td>SAD</td>
<td>N</td>
<td>6</td>
<td>7-9.5</td>
<td>83% SAD free at posttest, results maintained at 6-month follow-up</td>
</tr>
<tr>
<td>Pincus et al., 2008</td>
<td>SAD</td>
<td>Y</td>
<td>34</td>
<td>4-8</td>
<td>Reductions in SAD from pre- to posttest (note that these are preliminary results)</td>
</tr>
<tr>
<td>Comer et al., 2012</td>
<td>SAD, SOP, SP</td>
<td>N</td>
<td>9</td>
<td>4-8</td>
<td>Posttreatment, 86% of completers (67% ITT) were free of all AD’s</td>
</tr>
<tr>
<td><strong>Treatments aimed at parents and their children</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hirshfeld-Becker et al., 2008</td>
<td>SOP, OCD, SAD, no AD (n=1)</td>
<td>N</td>
<td>9</td>
<td>4-7</td>
<td>67% resolved ADs at posttest, results maintained at 2-year follow-up</td>
</tr>
<tr>
<td>Hirshfeld-Becker et al., 2010</td>
<td>SOP, SAD, GAD, agoraphobia, SP</td>
<td>Y</td>
<td>64</td>
<td>4-7</td>
<td>59% of completers (50% ITT) AD free at 6-month posttreatment, results maintained at 1-year follow-up</td>
</tr>
<tr>
<td>Schneider et al., 2011</td>
<td>SAD</td>
<td>Y</td>
<td>43</td>
<td>5-7</td>
<td>76% SAD free at 4 weeks follow-up (ITT)</td>
</tr>
<tr>
<td>Monga et al., 2009</td>
<td>SOP, SAD, GAD, SM</td>
<td>N</td>
<td>32</td>
<td>5-7</td>
<td>72% free of at least one AD and 44% free of all ADs at posttreatment</td>
</tr>
<tr>
<td>Shortt et al., 2001</td>
<td>SOP, SAD, GAD</td>
<td>Y</td>
<td>71</td>
<td>6.5-10</td>
<td>69% diagnosis free at posttreatment, results maintained at 1-year follow-up</td>
</tr>
<tr>
<td>Minde et al., 2010</td>
<td>Not assessed with a semi-structured interview</td>
<td>N</td>
<td>37</td>
<td>3-7</td>
<td>Decreased emotional symptoms post treatment. Note however that 10 children also received additional medication during the CBT treatment</td>
</tr>
</tbody>
</table>

**Parent only treatment vs. parent and child treatment**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Primary anxiety disorder</th>
<th>RCT (Y/N)</th>
<th>N</th>
<th>Child age range (years)</th>
<th>Results for intervention group(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waters et al., 2009</td>
<td>GAD, SAD, SOP, SP</td>
<td>Y</td>
<td>80</td>
<td>4-8</td>
<td>Parent only: 84% and 60% completers free of their primary AD/ all ADs at posttest (ITT 55% and 45%); Parent+child: 74% and 61% completers (ITT 55% and 55%). Results maintained at 6 month and 1-year follow-up</td>
</tr>
</tbody>
</table>

**Note.** AD = anxiety disorder; GAD = generalized anxiety disorder; ITT = intent-to-treat analyses; N = no; OCD = obsessive-compulsive disorder; PTSD = posttraumatic stress disorder; SAD = separation anxiety disorder; SM = selective mutism; SOP = social phobia; SP = specific phobia; Y = yes.
In their article, the authors report the preliminary results of an RCT study that they are conducting in which they made cognitive-behavioral adjustments to their Parent-Child Interaction Therapy.