

Anxiety Disorders During Childhood and Adolescence: Origins and Treatment

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Key Words

child anxiety, temperament, development, prevention, review

Abstract

The present review summarizes our current knowledge of the development and management of anxiety in children and adolescents. Consideration is given to limitations of this knowledge and directions for future research. The review begins with coverage of the development and demographic correlates of anxiety in young people and then moves to systematic discussion of some of the key etiological factors, including genetics, temperament, parenting, and individual experiences. The second part of the review describes current treatment strategies and efficacy as well as factors thought to influence treatment outcome, including treatment features, child factors, and parent factors. The review concludes with brief coverage of some more recent developments in treatment including alternative models of delivery and prevention strategies.

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INTRODUCTION

It was not very many years ago that the lay public and even many health professionals believed that anxiety disorders were rare and low-impact problems in early life. However, the 1990s saw an explosion of research into childhood anxiety, and it is now realized that anxiety disorders comprise the most common disorders of childhood and adolescence and can involve marked impact on a child's development. This review

describes some of the most recent evidence and ideas on the nature and causes of anxiety disorders in childhood and adolescence as well as aspects of their management. Given the marked overlap and similarities between the various specific anxiety disorders, we largely discuss ideas relevant to anxiety disorders as an overall group. The bulk of our discussion focuses on research with separation anxiety disorder, social phobia, and generalized anxiety disorder. However, where relevant, data from populations suffering a specific phobia, posttraumatic stress disorder (PTSD), and obsessive-compulsive disorder are also incorporated.

Several population studies have attested to the high prevalence of anxiety disorders occurring prior to adulthood (Breton et al. 1999; Canino et al. 2004; Costello et al. 2003; Essau et al. 2000; Ford et al. 2003; Lewinsohn et al. 1993, 1997; Shaffer et al. 1996). Exact figures vary owing to differences in methods, instruments, populations, interviewers, and informants. Nevertheless, studies indicate that approximately 2.5% to 5% of children and adolescents meet criteria for an anxiety disorder at a given time (Breton et al. 1999; Costello et al. 2003; Ford et al. 2003; Lewinsohn et al. 1993, 1997). Prevalence appears to be relatively consistent over development, although two studies have reported slight increases in anxiety disorders in adolescence relative to preadolescence (Canino et al. 2004, Ford et al. 2003). Naturally, the prevalence of each specific anxiety disorder is less than the total noted above and is somewhat less consistent across studies (see **Table 1**).

Overall, childhood anxiety has a moderate to high impact on functioning and appears to lead to as much disability as other childhood disorders (Ezpeleta et al. 2001). The largest impact of child anxiety is on family processes (Ezpeleta et al. 2001), although anxiety disorders also affect children's functioning with peers, school, and recreation (Essau et al. 2000, Strauss et al. 1987). Indeed, several reports have shown that anxiety is negatively associated with popularity and social competence and is positively associated with victimization (Giora et al. 2005;

Table 1 Prevalence (%) of anxiety disorders in childhood and adolescence across four surveys

	Lewinsohn et al. 1993 ¹	Breton et al. 1999 ²	Ford et al. 2003 ³	Canino et al. 2004 ⁴
Separation anxiety disorder	0.2	0.9	1.2	1.5
Social phobia	0.9		0.3	1.5
Generalized anxiety disorder	0.5	2.8	0.7	1.0
Specific phobia	1.4	1.9	1.0	
Posttraumatic stress disorder			0.1	0.1
Obsessive-compulsive disorder	0.1		0.3	

¹Estimate based on point prevalence and adolescent report; age range 14–19 years.
²Estimate based on six-month prevalence and parent report; age range 6–14 years.
³Estimate based on point prevalence and parent report plus adolescent report if over 11 years; age range 5–15 years.
⁴Estimate based on 12-month prevalence and parent report plus adolescent report if over 11 years; age range 4–17 years.

La Greca & Moore 2005; Strauss et al. 1987, 1989). Longitudinal research has indicated that shy and anxiety-disordered children continue to show above-average levels of life interference into early adulthood (Caspi et al. 1988, Last et al. 1997).

COURSE AND NATURE

Age of Onset

Given the stability of anxiety disorders, the age of onset has proven to be a very difficult issue to address. Most common beliefs about the age of onset of various anxiety disorders have come from retrospective reports from adults. These reports have led to suggestions that a large proportion of specific phobias begin in early to middle childhood, social phobia in early to mid adolescence, obsessive-compulsive disorder in mid to later adolescence, and panic disorder in early adulthood (Kessler et al. 2005, Ost 1987). Data on the onset of generalized anxiety disorder tend to be less consistent, varying from “lifelong” (Rapee 1991) to adulthood (Kessler et al. 2005). Population studies have provided some, although not strong, support for these patterns. For example, the increased adolescent prevalence in anxiety reported by Ford et al. (2003) appears to have been mostly due to small increases during adolescence in obsessive-compulsive and panic disorder. Some evidence has also indicated decreases in prevalence of

separation anxiety disorder and specific phobias from early childhood to mid adolescence (Breton et al. 1999, Kashani & Orvaschel 1990). On the other hand, data on social phobia have not generally shown the expected increases during adolescence. Although one epidemiological study has shown an increase in social phobia with age (Canino et al. 2004), another population study has failed to support this pattern (Ford et al. 2003). Data on generalized anxiety disorder have tended to show little change with age (Breton et al. 1999, Ford et al. 2003).

Comorbidity

Anxiety disorders in children and adolescents rarely occur in isolation. Estimates suggest that 40% to 60% of anxious children meet criteria for more than one anxiety disorder (Benjamin et al. 1990, Kashani & Orvaschel 1990, Last et al. 1987). To some extent, this high level of comorbidity within anxiety disorders may reflect a poor diagnostic demarcation, although it is more likely to also reflect the common risk and maintenance factors shared between anxiety disorders. Several population studies have also indicated high levels of overlap between anxiety and other disorders (Angold et al. 1999). These studies have consistently pointed to a strong overlap between anxiety and depression (Brady & Kendall 1992), with anxious children being at 8 to 29 times the risk of additional depression (Angold et al. 1999, Costello et al.

Homotypic versus heterotypic continuity:

development or continuation of symptoms and disorders that are similar to, versus different from, type shown earlier in life

2003, Ford et al. 2003). Comorbidity between anxiety and externalizing disorders is markedly less than that with depression, and some more recent studies have shown little overlap with externalizing once other comorbid disorders have been statistically controlled (Costello et al. 2003, Ford et al. 2003). One marked difference between child and adult anxiety is a lack of clear comorbidity between child anxiety and substance use disorders, with at least one study showing that anxious boys are at significantly lower risk of demonstrating a concurrent substance use disorder (Costello et al. 2003).

Course

In addition to the issue of concurrent comorbidity described above, a more complete picture of anxiety in childhood may emerge when one considers comorbidity over time. Homotypic versus heterotypic continuity are constructs relevant to this issue (homotypic continuity is a future occurrence of the same constellation of disorder; heterotypic continuity is a future occurrence of other disorders). Although evidence has been slightly inconsistent, most evidence has indicated moderate to strong homotypic continuity in anxious children (Bittner et al. 2007, Costello et al. 2003, Keller et al. 1992, Last et al. 1996, Pine et al. 1998). In other words, young people meeting criteria for anxiety disorders at one time are at moderate-to-high risk to meet criteria for anxiety disorders as they move from childhood to adolescence (Bittner et al. 2007) and from adolescence to early adulthood (Pine et al. 1998). There is also some evidence for homotypic continuity within specific anxiety disorders (Bittner et al. 2007) and symptom clusters (Ferdinand et al. 2007), providing at least some evidence for the validity of specific anxiety diagnoses. From a different perspective, Gregory and colleagues (2007) have shown that more than 64% of adults with an anxiety disorder had been diagnosed with an anxiety disorder at or before age 18 years, and there was little difference in this pattern between specific disorders. Hence, a large proportion of anxious children are likely to con-

tinue with anxiety disorders for many years and even into adulthood, and a large proportion of anxious adults first began to experience their anxiety in childhood. However, many anxious children will lose their anxiety disorders over time, and a proportion of anxious adults will develop their anxiety disorder at a later stage.

Not only does anxiety in childhood predict later anxiety, but there is also evidence that it may be a marker for other mental health problems later in life. As in studies of cross-sectional comorbidity, the strongest relationships are between anxiety and later depression (Costello et al. 2003, Pine et al. 1998). These findings are consistent with data from longitudinal studies showing that anxiety symptoms in childhood predict later symptoms of depression (Cole et al. 1998). Finally, some evidence suggests that anxious children are at increased risk for later externalizing and substance use disorders (Bittner et al. 2007, Costello et al. 2003, Last et al. 1996).

Demographic Correlates

The demographic feature that is most clearly related to anxiety is gender, with females demonstrating almost twice the risk of males (Costello et al. 2003, Essau et al. 2000, Lewinsohn et al. 1997). However, this finding is not completely consistent, and some population studies have failed to demonstrate significant sex differences in prevalence of anxiety disorders (Canino et al. 2004, Ford et al. 2003). These inconsistencies may reflect differences between samples in age or proportion of specific disorders. The inconsistencies do not appear to be due to differences between specific disorders since all of the anxiety disorders (including obsessive-compulsive disorder) have shown gender differences in some studies and not in others. Gender differences in anxiety across development have rarely been examined; however, rates of depression show a dramatic shift in gender distribution following puberty that is not shown in anxiety (Hankin et al. 1998, Roza et al. 2003). In one of the only studies addressing this issue directly, the female preponderance of

anxiety disorders showed a steady increase over development, starting before 5 years of age and building across the childhood and early adolescent years (Roza et al. 2003).

In marked contrast to several other disorders, such as conduct disorder and depression, there are few consistent demographic correlates of childhood anxiety aside from gender. Anxiety does not appear to be consistently related to family size, parents' marital status, education level, or ethnicity (Canino et al. 2004, Ford et al. 2004, Lewinsohn et al. 1997). The main exception is reflected in some data indicating a small negative association with socioeconomic status, although results have not been consistent (Cronk et al. 2004, Ford et al. 2004, Xue et al. 2005).

DEVELOPMENT AND RISK FOR ANXIETY DISORDERS IN CHILDHOOD AND ADOLESCENCE

Genetic and Family Influence

A wealth of data has supported the familial aggregation of anxiety disorders (Hettema et al. 2001). More specifically, several studies have demonstrated that children with anxiety disorders are considerably more likely than are other children to have a parent with an anxiety disorder (Last et al. 1987, 1991; Lieb et al. 2000). Importantly, a number of studies with adults have suggested specificity in the family loading (Hettema et al. 2001). In one widely reported study, adults with one of three anxiety disorders, specific phobias, social phobia, or panic disorder with agoraphobia showed higher probabilities of having first-degree relatives with the same specific anxiety disorder (Fyer et al. 1995). Similar specificity has been shown in other family studies of adult anxiety disorders (Mendlewicz et al. 1993, Stein et al. 1998). Regrettably, similar studies have not been conducted based on children with anxiety disorders.

Several twin studies have demonstrated a moderate heritability to anxiety symptoms and

disorders in children and adolescents that is similar to that demonstrated in adults (Ehringer et al. 2006, Stevenson et al. 1992, Thapar & McGuffin 1995, Topolski et al. 1997). There appears to be little difference in heritability across specific anxiety disorders, and it is currently believed that the genetic component to child anxiety is probably common across the anxiety disorders, possibly including depression (Eley 1997, Gregory & Eley 2007). Molecular genetic associations with child anxiety have been less studied than with adult anxiety and have generally demonstrated inconsistent results (Gregory & Eley 2007).

One of the values of twin methodology is that it can be used to estimate not only the genetic contribution to a behavior, but also aspects of the environment (Eley & Lau 2005). Data from twin studies of child anxiety have consistently indicated that the majority of variance in anxiety can be attributed to environmental features that are unique to each twin (Gregory & Eley 2007). Of course, one of the limitations to this method is that variance attributed to individual environmental factors is confounded by measurement error. Nevertheless, the theoretical implications are that a considerable influence in the development of anxiety comes from environmental factors that make siblings different from each other.

Theoretical interest has also been focused on so-called shared environmental factors—that is, factors in the environment that are common to both twins, such as main effects of parenting, parent psychopathology, family demographic factors, or family stressors. Whereas twin studies of adult anxiety disorders have consistently failed to indicate a significant role for shared environmental factors (Hettema et al. 2001), data from studies of child anxiety have shown a more mixed picture (Gregory & Eley 2007). Several twin studies of anxiety in children attributed a significant proportion of variance in symptoms to shared environmental factors (Eley et al. 2003, Feigon et al. 2001, Stevenson et al. 1992, Topolski et al. 1997). In contrast, a few studies have failed to allocate significant variance in symptoms of anxiety to

Individual environmental factors:

factors in the environment that make twins different from each other

Shared environmental factors:

factors in the environment that are commonly experienced by both twins in a family

Inhibited

temperament: an early-identified pattern of responding characterized by consistent inhibited behaviors such as maintained proximity to safety figures, signs of distress or withdrawal in the face of novelty, and restricted and inhibited social behaviors

shared environmental factors (Legrand et al. 1999, Topolski et al. 1997). Reasons for these differences are unclear, but there do appear to be stronger estimates of heritability and weaker estimates of shared environmental influence in studies that use parent rather than child self-reports, populations of females, and older age groups (Eaves et al. 1997, Feigon et al. 2001, Gregory & Eley 2007, Thapar & McGuffin 1995). Theoretically, it has been argued that environmental influences will account for greater variance in the developmental period during which they have the greatest influence (Rapee & Spence 2004). For example, it would be expected that any shared environmental influence from parenting would account for the greatest variance in symptoms of anxiety during the early- to middle-childhood years, when parents exert their strongest influence on offspring.

Anxiety Disorder and Temperament

Across most nosologies of temperament, a style characterized by shyness, inhibition, and withdrawal has been identified. This style has been variously referred to as shyness, behavioral inhibition, approach, or sociability (the latter two are reverse scored) (Kagan et al. 1984, Sanson et al. 1996, Windle & Lerner 1986). Some of the key features that characterize children high on this temperamental style include a long latency to approach or communicate with strangers, a tendency to stay within close proximity of safety figures, signs of distress or withdrawal in the face of novelty, and restricted and inhibited social behaviors (Hirshfeld et al. 1992, Kagan et al. 1984).

Similarities between an inhibited temperament and anxiety disorders in young people are obvious. As a result, theoretical models have pointed to an inhibited temperament as one of the main risk factors for development of an anxiety disorder (e.g., Chorpita & Barlow 1998, Hudson & Rapee 2004, Manassis & Bradley 1994). Unfortunately, difficulty in distinguishing between these constructs provides potential tautology for these theories. One of the key reasons that inhibition and anxiety are

so closely related may be that they are highly overlapped measures of essentially the same underlying construct. Although a complete discussion of this issue is beyond the scope of this review, most authors have argued that inhibition and anxiety disorder are closely related but separable constructs (Perez-Edgar & Fox 2005, Rapee & Spence 2004, Turner et al. 1996). One key distinction is likely to be the life interference associated with the symptoms—high levels of inhibition are characterized by many of the same symptoms as anxiety disorders but do not demonstrate the same impact on an individual's life. Once symptoms begin to overwhelm and affect quality of life, a disorder may be diagnosed. Hence, temperament and disorder will share many of the same risk factors, but disorder will also involve additional factors that influence life impact, such as age, gender, life goals, and culture (Rapee & Spence 2004). In the case of child anxiety, diagnosis may also be characterized by impact on parents' lives.

Pragmatically, most empirical research has distinguished temperament from anxiety disorder on a temporal basis. Hence, some evidence has shown that anxious children and adolescents are characterized by retrospective reports of inhibited and withdrawn behavior (Hayward et al. 1998, Rapee & Szollos 2003). Some of the most highly regarded research has shown that children high on inhibition in the early years of life are at considerably greater risk of displaying anxiety disorders several years later (Hirshfeld et al. 1992, Prior et al. 2000, Schwartz et al. 1999). These effects are likely to be complicated by multifinality. That is, children who display inhibited behaviors early in life appear to be at risk for a variety of disorders by adulthood, including depression and suicide (Caspi et al. 1996). In this way, inhibition shows similar characteristics to the personality style of neuroticism or negative affectivity (Rothbart 2007) and may be a relatively non-specific risk for later internalizing distress. One of the limitations of most of this research is that any anxiety disorders or symptoms at the time of initial assessment are not taken into account. It has been shown that even at preschool age,

inhibited children meet criteria for a number of anxiety disorders (Rapee et al. 2005). Hence, demonstrating that inhibition is a precursor to anxiety would require studies to follow inhibited children who do not yet meet criteria for anxiety disorders or at least to control for the presence of anxiety disorders statistically.

One source of evidence that is less open to this criticism comes from data looking at infant predictors of later anxiety. At least some retrospective data have shown that, relative to mothers of nonclinical children, mothers of clinically anxious children report greater difficulty in their child during the first 12 months of life, including more crying, sleeplessness, and pain (Rapee & Szollos 2003). These results concur with some prospective research that has shown that infants (around 3 to 6 months) who display high levels of motor and emotional reactivity to novelty have an increased risk of showing heightened inhibition by 2 to 6 years (Engfer 1993, Fox et al. 2001, Kagan & Snidman 1991, Sanson et al. 1996).

Of course, the data demonstrating that anxiety disorders may be preceded by a particular style of temperament may not really provide a major advance in understanding because our knowledge of the causes of temperament is no more advanced than is our knowledge of the causes of anxiety. It is often assumed that temperament reflects a fundamental biological process that is mostly genetically (or constitutionally) determined (Thomas & Chess 1977). Under this assumption, it could be argued that linking a particular temperament with anxiety disorders allows us to determine the biological basis of anxiety or at least a more fundamental endophenotype. However, measures of temperament reflect a constellation of behaviors that are multiply determined and almost certainly involve a combination of biological and environmental risk (Fox et al. 2005a, Turner et al. 1996). For example, genetic factors account for a magnitude of variance in inhibition similar to that found in anxiety disorders (Cherny et al. 1994, DiLalla et al. 1994, Robinson et al. 1992). Recent research has also shown significant gene-by-environment inter-

action in predicting inhibition at 7 years of age (Fox et al. 2005b). Therefore, the factors that provide risk for an inhibited temperament may well be those that also provide risk for anxiety disorders. On the other hand, some research has demonstrated interactions between inhibition and other risk factors in the prediction of anxiety, supporting the idea that inhibition may be an independent risk factor for anxiety (see below).

Parenting and Parent/Child Interaction

It is a truism that parents exert a powerful influence on child development, at least in the early years (Fox et al. 2005a). Following from this assumption, it is expected that extremes of parenting will lead to extremes of child behavior and ultimately to disorder. Perhaps surprisingly then, empirical evidence for the role of parent-child interactions in the development of emotional disorders has been difficult to identify, and this has been especially true for the development of anxiety disorders.

Traditionally, two styles of parenting have been connected with the childhood anxiety disorders: overprotective or overcontrolling parenting and negative or critical parenting (Rapee 1997). Several reviews have summarized evidence supporting an association between child anxiety symptoms and disorders and both styles of parenting (Bögels & Brechman-Toussaint 2006, McLeod et al. 2007, Rapee 1997, Wood et al. 2003). This evidence has come from both self-report studies based on questionnaires about children's perceptions of parental behavior as well as from laboratory-based observational studies of parent-child interactions. Of the two styles of parenting, the largest effect sizes and most consistent results have come from evaluation of overprotective parenting (Rapee 1997, Wood et al. 2003), whereas negative, critical parenting has been more commonly associated with depression (Rapee 1997). At present, data do not indicate moderation of parent-child interactions by parents' gender, children's gender, or age (McLeod et al. 2007).

Overprotective parenting: a pattern of parent-child interaction characterized by parental anticipation of potential threat leading to restriction of child engagement with situations or behaviors

One of the main limitations to this research is the inability for most studies to indicate direction of effects. It is equally possible that anxiety in a child elicits overprotective parenting or that overprotective parenting leads to child anxiety. In fact, theoretical models argue for reciprocal effects whereby each factor leads to the other (Hudson & Rapee 2004, Rubin & Mills 1991). Shared genetic influence may also confound interpretation. One attempt to determine the direction of effects independent of the influence of shared genes utilized a crossover design in which mothers of anxiety-disordered children and mothers of nonclinical children each interacted in turn with both a child with an anxiety disorder and a nonclinical child, neither of which was their own (Hudson et al. 2008). Results showed that mothers gave more help to anxious children irrespective of the clinical status of the mother's own child, suggesting that at least in this situation the child's anxiety may have elicited excessive help from mothers.

Surprisingly few studies have utilized longitudinal designs to examine the direction of influence between parenting and anxiety, and these have provided mixed support consistent with each direction of effect. One study demonstrated that parent perceptions of child shyness at 2 years of age negatively predicted parent encouragement of independence at age 4, but the reverse was not true (Rubin et al. 1999). On the other hand, in a one-year follow-up of preschool-aged children, maternal anxiety was shown to predict maternal overprotection, which one year later predicted symptoms of child anxiety, but child anxiety at time one did not predict later maternal overprotection (Edwards et al. 2009).

Determination of causal status is most powerfully demonstrated by experimental manipulation, yet there have been almost no attempts to manipulate parent-child interactions. In one pilot study, mothers of unselected children were asked to assist their child in preparation of a speech and were randomly allocated to either act in an overintrusive and overprotective manner or in a minimally involved but supportive manner (de Wilde & Rapee 2008). On a sub-

sequent speech, children whose mothers had previously acted in an overprotective manner displayed greater levels of overt anxiety.

Theories of the role of parent-child interactions in the development of anxiety also argue for the importance of interactions between temperamental characteristics of the child and parent behaviors. Although there has been some failure to support this suggestion (Moore et al. 2004), one longitudinal study in young children demonstrated that an interaction between inhibited behavior in the child and parent intrusiveness predicted child shyness two years later (Rubin et al. 2002). These results indicate the possibility of an interaction between the child's genes and the child's parental environment. In a preliminary test of this possibility, children's inhibition at age 7 was significantly predicted by a questionnaire measure of family support when the child was age 4, but only for those children with short alleles on the serotonin transporter gene (Fox et al. 2005b).

Modeling and Other Learning Influence

Common sense views as well as scientific theory suggest that anxiety may develop at least in part because of specific learning experiences during development (Field 2006b, Menzies & Clarke 1995, Mineka & Zinbarg 2006). An individual experiential or learning component to anxiety is also highly attractive in explaining the large proportion of variance in child anxiety accounted for by nonshared environmental factors. Several retrospective studies have reported the importance of direct conditioning experiences, modeling of threat, and negative verbal transmission in the onset of various children's fears (King et al. 1997, Merckelbach et al. 1996, Muris et al. 1997). However, well-controlled longitudinal studies are almost nonexistent.

There is a wealth of evidence that direct experience with aversive events (traumas) can precipitate a variety of fears in children (Murthy 2007, Yule et al. 1990). However, even in the case of severely traumatic events, the moderating effects of factors such as personality,

attribution, and social support are important (McNally 2001, Pine & Cohen 2002, Pynoos et al. 1999). Whether direct conditioning factors play a role in the development of more subtle fears and chronic child anxieties is harder to demonstrate. One situation in which some objective information is available is relevant to dental fears. In the dental situation, it is possible to use records to determine the number of objectively painful and unpleasant procedures a child has undergone to provide an approximate estimate of aversive experiences. Some research has indicated that children's dental fears are slightly related to objective aversive procedures but are more strongly related to subjective ratings of distress (ten Berge et al. 2002, Townend et al. 2000). One of the few longitudinal studies of the development of height fears in young people utilized a similarly crude measure to assess height-related aversive experiences: falls resulting in reportable injury (Poulton et al. 1998). The data indicated that injuries prior to age 9 predicted less height fear at age 18. Other longitudinal research has similarly indicated that a history of overnight hospitalizations (separations) in earlier childhood predicted less separation anxiety at age 18 (Poulton et al. 2001). Together, these data point to the potential importance of constitutional and/or prior experiential factors in the development of specific fears. This is not to say that conditioning factors are not important to the development of anxiousness, but rather that environmental experiences may be processed through a personality filter. This type of argument is consistent with conditioning models of the development of anxiety (Mineka & Zinbarg 2006).

Following from the data on parent-child interactions, one group of theories suggests the importance of vicarious learning by developing children through observation of their parents' behaviors and attitudes (Chorpita & Barlow 1998, Hudson & Rapee 2004). A parent acting in fearful and inhibited ways can provide the child with information relevant to specific or generalized threat or the value of avoidant coping. Several studies have now demonstrated

that very young children (12–24 months) are able to learn to fear specific objects by observing fearful reactions by their mothers in the presence of the object (de Rosnay et al. 2006, Gerull & Rapee 2002, Murray et al. 2008). On the other hand, observation by a young child of his or her mother acting in a calm way with a novel object can provide protection from the development of fear toward that object (Egliston & Rapee 2007). Moderation of this vicarious learning effect by the child's inhibited temperament has received mixed support (de Rosnay et al. 2006, Dubi et al. 2008), and the effects do not seem to be greater to so-called prepared stimuli (Dubi et al. 2008). Hence, whether this process actually reflects a phenomenon of relevance to the development of clinical anxiety is currently unclear. However, some self-report data have indicated that the extent to which mothers report expressing their own fears in front of their child is positively related to the child's anxiety and fearfulness in middle childhood (Muris et al. 1996). Combining these findings with the assumption that more anxious parents are likely to have more fears to express provides circumstantial support for the theory.

Parental expression of anxiousness is likely to promote not only vicarious but also verbal transmission of information. Consistent with this concept, it has been suggested that childhood fears might also be learned verbally. In a novel series of studies, Field and colleagues have demonstrated that children are capable of learning fearful behavior following verbal transmission of threat information about novel objects (Field 2006b, Field & Lawson 2003). Importantly, these verbally acquired fears have demonstrated several features of clinical fears, including interactions with trait anxiety (Field 2006a), concomitant attentional biases toward threat (Field 2006c), stability, and generalizability (Muris et al. 2003). Nevertheless, demonstrating that fears can be acquired verbally is very different from demonstrating that this is how clinical anxiety disorders are actually acquired. Longitudinal studies have generally not included measures of verbal transmission in their designs.

Dependent life

events: major environmental experiences in life that, by their nature, may be a result of the behavior of the child

Processing biases: a variety of cognitive methods of dealing with information from the environment in such a way that the methods tend toward a particular meaning (usually negative)

Life Events

The limited data on the role of negative life events in the development of childhood anxiety suggest a similar interaction between external events and internal processes. Evidence from the literature on posttraumatic experiences in children points to a central role for intrapersonal factors such as a history of previous disorder in the development of PTSD (Pine & Cohen 2002, Pynoos et al. 1999). In a similar fashion, some longitudinal research with a community sample of preschool-aged children showed that it was the impact of negative life events rather than the number of events that predicted anxious symptoms a year later and that the impact of life events was in turn predicted by the child's level of inhibition (Edwards et al. 2009).

Research into the experience of negative life events in clinical populations of anxious children (aside from PTSD) has been quite limited. Studies have shown a greater number and impact of negative life events experienced by children with anxiety disorders compared with non-clinical controls (Goodyer et al. 1990, Rapee & Szollos 2003, Tiet et al. 2001). Few studies have distinguished events that are independent of the child's behavior from those that may be a result of the behavior or symptoms of the child. Nevertheless, at least some research has demonstrated a greater incidence of independent life events experienced by anxious children, thus indicating that the experience of events is not purely a result of being anxious (Allen et al. 2008, Eley & Stevenson 2000). Of course, establishing the occurrence of life events prior to onset of an anxiety disorder is extremely difficult because of the chronic nature of anxiety and the almost impossible task of determining precise onset. Therefore, research to date does not indicate the causal status of negative life events. However, at least one study has indicated a greater number of life events in the year preceding reported onset of the current episode of disorder among anxious children compared with an equivalent period among nonclinical controls (Allen et al. 2008).

In addition, there is some indication that anxious children who are part of a monozygotic twin pair are more likely to report independent negative events than is their nonanxious cotwin, indicating that the association of negative life events with anxiety is not genetically mediated (Eley & Stevenson 2000). Nevertheless, a cyclic relationship is likely whereby negative life events may trigger or exacerbate anxiety that, in turn, is likely to lead to further dependent life events.

In addition to acute life events, some evidence suggests that chronic adversities are associated with the onset of anxiety disorders (Allen et al. 2008) and that predisposing adversities may occur relatively early in life (Phillips et al. 2005). These data are supported by a few epidemiological studies that indicate an association between childhood anxiety disorders and low family socioeconomic status (Cronk et al. 2004, Lewinsohn et al. 1997, Xue et al. 2005). Similarly, although research with clinical anxiety disorders is rare, these effects are mirrored in data indicating an association between childhood anxiousness and broader family dysfunction, including physical and sexual abuse (Hudson 2005), as well as associations with peer victimization and relationship difficulties (Bond et al. 2001, La Greca & Moore 2005, Storch & Masia-Warner 2004).

Cognitive Factors

Information-processing biases are seen to be of central importance in the maintenance of adult anxiety disorders, and similar "downward-extended" views have been applied to child anxiety (Daleiden & Vasey 1997, Ehrenreich & Gross 2002, Hadwin et al. 2006). Regrettably, application of information-processing methods to children comes with a large number of methodological complexities (Alfano et al. 2002). Despite these difficulties, a growing number of studies, using both self-report and reaction-time measures, have demonstrated processing biases similar to those found with anxious adults (for reviews, see Alfano et al. 2002, Ehrenreich & Gross 2002, Hadwin et al.

2006). In general, anxious children appear to be characterized by biases toward threat in the form of attentional allocation, interpretation of ambiguity, and estimates of danger, although as is true for adult research, effects are often inconsistent. Two related issues that are not yet clear are at what age these processing biases first appear and whether the biases reflect a vulnerability factor.

Of relevance to the first issue, Kindt & Van den Hout (2001) have argued that all younger children are characterized by attentional vigilance for threat and that a developing ability to inhibit this vigilance by late childhood characterizes nonanxious children. Unfortunately, most studies have ignored developmental factors by combining children aged from mid childhood to mid adolescence. One study that did examine age effects within their relatively limited range (9–14 years) demonstrated larger differences in attentional bias to threat between clinically anxious and nonclinical children with increasing age (Vasey et al. 1995). In contrast, some early research utilizing a modified Stroop color-naming task with spider fearful children showed a discrepancy between phobic and non-phobic children that did not differ significantly across the age range of the study (6–13 years), although there was a trend in this direction (Martin et al. 1992).

A particularly interesting issue is whether information-processing biases can be identified in children who do not have an anxiety disorder but are at heightened risk for developing anxiety. Research examining biases in the interpretation of ambiguous stimuli in children of parents with anxiety disorders has shown mixed results (Schneider et al. 2002, Waters et al. 2008). Hence, it remains unclear whether information-processing biases may reflect a vulnerability to the development of anxiety disorders in children. In one interesting study, children of parents with PTSD showed slightly elevated color-naming latencies on a modified Stroop task, despite the fact that none of the children reported elevated levels of anxiety or met criteria for a diagnosis (Moradi et al. 1999). These results suggest that some form of parent

influence could affect the processing of threat in their children. Whether this increases risk for the development of anxiety disorders in these children is not known. In one of the few longitudinal studies in this area, certain cognitive processes in children (such as rumination and thought suppression) measured shortly following exposure to a trauma predicted severity of PTSD symptoms six months later (Ehlers et al. 2003), suggesting that certain cognitive biases may well reflect a vulnerability factor that interacts with aversive experiences to produce anxiety.

The Origins of Child Anxiety in Summary

A comprehensive understanding of the factors that lead a child to develop an anxiety disorder is well beyond our current state of knowledge. Nevertheless, several likely risk factors and their interrelationships are beginning to achieve some common agreement. A withdrawn and inhibited temperament is seen as a central component that elicits and interacts with other risks (Chorpita & Barlow 1998, Hudson & Rapee 2004, Perez-Edgar & Fox 2005, Rapee 2002). A core feature of this temperamental style that is likely to be key to the development of anxiety is an avoidant style of coping (Rapee 2002). Some authors have argued that another temperamental style, effortful control, may interact with inhibition to predict anxiety disorders (Perez-Edgar & Fox 2005). This is consistent with suggestions that it is a lack of a developing ability to inhibit attentional focus toward threat that characterizes anxious children (Kindt & Van den Hout 2001).

Early aspects of the parent-child relationship may modify and shape this temperamental style. An anxious parent is likely to anticipate potential dangers and thereby have a highly involved relationship with the child. This would be reflected in overprotective behaviors (Wood et al. 2003) and an anxious/ambivalent attachment style (Chorpita & Barlow 1998). This relationship most likely involves a reciprocal process whereby the child's avoidant coping

style may elicit more protective behaviors from the parent and the parent's anxiety may increase the likelihood of protective behaviors that in turn may enhance the child's avoidant coping (Rubin & Mills 1991). As the child develops, anxious parents are also more likely to communicate threat information, both overtly and covertly (Muris et al. 1996). Although regular exposure to heightened threat information early in life is likely to affect any child, those with an already inhibited temperament may be more open to incorporating these messages (Field 2006a). Finally, being raised within a general environment of family and neighborhood adversity provides a greater number of negative experiences and further reinforces a message of nonspecific threat.

Outside the family, the developing child will be exposed to an infinite combination of idiosyncratic experiences. Some experiences will provide specific threat information about particular stimuli. However, even in these cases, evidence suggests that the child's personality and methods of processing and responding to the world are likely to influence the extent to which this information is incorporated and affects future functioning (Mineka & Zinbarg 2006). Similarly, exposure to nonspecific life events is likely to have a greater impact on anxiousness when the stressors themselves are threat-based and when they occur to a child who is already inhibited (Eley & Stevenson 2000, Hudson & Rapee 2004). A child's avoidance and inhibition may also increase the likelihood of experiencing certain life events (Allen et al. 2008). Finally, an inhibited temperament may protect the child against certain experiences, especially those involving genuine risk (Poulton et al. 1998), but the lack of life experience with mild, benign risks may protect the child's avoidant and threat-based coping styles (Menzies & Clarke 1995), thereby leaving the child vulnerable to the later development of anxiety disorder.

The transition from temperament to disorder across development will depend on a complex interplay between these factors and hence to the extent or severity of distress. How-

ever, life interference and distress are themselves somewhat idiosyncratic and may be influenced by additional factors. The extent to which the inhibition is inconsistent with the child's gender, culture, or current goals will play an important role in the extent of personal and family distress (Rapee & Spence 2004). With respect to culture, for example, some studies have shown that parents from Thailand, a country dominated by Buddhist philosophy, are less distressed by children's extreme behaviors, including shyness and withdrawal, than are parents from the United States (Weisz et al. 1988). Similarly, anxious behaviors during childhood have been shown to predict positive adjustment in adolescence for Chinese young people, a culture where reticence and deference are perceived as positive attributes (Chen et al. 1999). Regarding a child's current goals, a given level of anxiousness may result in greater or lesser interference and distress depending on the outcomes and achievements that are important to that child at a given time. For example, adolescents with moderate separation fears may experience relatively little distress if they are content to stay near parents, but may experience considerable distress if it is extremely important to them to move away to college.

TREATMENT AND PREVENTION OF ANXIETY DISORDERS IN CHILDHOOD AND ADOLESCENCE

Empirically supported treatments for childhood anxiety disorders generally fall under the category of skills-based or cognitive-behavioral treatment (CBT). Skills-based packages for child anxiety commonly include psychoeducation, affect recognition, cognitive restructuring, relaxation, and gradual exposure (Kendall & Hedtke 2006, March & Mulle 1998, Rapee et al. 2006b). Programs vary in the extent to which they focus on these coping skills; nevertheless, the general aim is to enable children to identify their anxiety (the physical, cognitive and behavioral components) and to apply the skills to gradually face (rather than

avoid) anxiety-provoking situations. Additional education in areas such as assertiveness, social skills, and problem solving is also often included in treatment packages for anxious youth. The principle behind the use of these treatment components is to directly modify some of the key processes theoretically assumed to maintain anxiety in children.

The majority of CBT programs for child anxiety include the child's parents to some degree, but the extent of this involvement varies considerably. In some programs, parents receive only brief information, whereas in others, parents may be actively involved throughout the program. Programs providing a more intensive parent component typically include training of parents in behavior management strategies (e.g., positive reinforcement). Parents are also usually taught to encourage more courageous child behavior and are provided with skills to assist them in encouraging the child's independence (reducing controlling or overprotective parenting) (Rapee et al. 2000). Some programs also add a component to target parental anxiety to reduce any interference that the parents' own anxieties may create for the child's treatment progress (Cobham et al. 1998).

Techniques such as verbal instruction, activities, role play, and modeling are used to teach children the relevant skills. Homework also plays a significant part in most programs; much of the real-life practice occurs outside the therapy session (Hudson & Kendall 2002). Positive reinforcement is commonly used to reward children for participation and practice during therapy. Existing programs make use of both individual and group delivery of the treatment, and most evaluated programs range between 8 and 17 sessions.

Efficacy of Treatment

Randomized controlled trials have consistently shown that structured programs such as those described above produce marked reductions in disorder and symptoms in children relative to those assigned to a wait list (for reviews, see

Cartwright-Hatton et al. 2004, In-Albon & Schneider 2006, James et al. 2005). Overall, skills-based treatment packages result in approximately 55% to 60% of children recovering from an anxiety diagnosis following treatment versus approximately 30% of children in comparison conditions (Cartwright-Hatton et al. 2004, James et al. 2005). Maintenance of these results has also been demonstrated several years following completion of treatment (Barrett et al. 2001, Kendall et al. 2004).

Typically, treatment trials of anxious youths include heterogeneous groups of anxious children, primarily including principal diagnoses of generalized anxiety disorder, separation anxiety disorder, and social phobia. Young people with obsessive-compulsive disorder or PTSD have more commonly been treated in disorder-specific programs; however, some of the more generic programs have included small samples of these disorders. Thus, the majority of outcome studies provide information about the efficacy of generic CBT programs for the broad spectrum of anxiety disorders. Several randomized controlled trials have also focused on the treatment of specific anxiety conditions and have also shown positive results (e.g., Barrett et al. 2004, Beidel et al. 2000, Spence et al. 2000). An interesting empirical question is whether more focused programs that target a specific anxiety disorder produce larger effects than the more generic programs, but such comparisons do not currently exist.

The studies described above that utilize a wait-list comparison do not provide information on the need for specific strategies in facilitating change. So-called nonspecific mechanisms such as improved knowledge, therapeutic alliance, or child involvement may provide the active ingredients for improvement (Chu & Kendall 2004, Shirk & Karver 2003). Moving beyond wait-list controlled trials, studies comparing CBT packages to treatments not containing theoretically active techniques can provide some evidence for the role of specific skills-based strategies in facilitating change.

Only a handful of studies have utilized such nonspecific treatment controls in the child

Skills-based treatment:

psychological treatment that includes a key educational component and has as its central focus training of the individual in new skills and ways of dealing with the world

anxiety field (Kendall et al. 2008, Last et al. 1998, Silverman et al. 1999b). Several of these studies have failed to show significant differences between a comprehensive CBT program and a nonspecific treatment package (i.e., treatments without active training in specific cognitive-behavioral techniques). However, when close attention is paid to the content of the control treatments, it appears that the educational components used have involved a significant amount of information on active skills. In fact, Kendall and colleagues (2008) reported that independent observers rated the nonactive control condition in their study as consisting of 65% CBT. Thus, conclusions about the enhanced benefits of CBT compared with treatments not containing CBT techniques are limited.

A few studies have shown more promising results when comparing a specific program of purportedly active treatment ingredients with a treatment containing mostly nonspecific components (Beidel et al. 2000, Hudson et al. 2008, Muris et al. 2002). Although the control conditions in these studies included some psychoeducation, they did not include cognitive-behavioral rationales or the delivery of cognitive-behavioral techniques. Instead, these comparison treatments relied on strategies such as relationship building, emotional disclosure, and symptom monitoring. Results from these studies provide some evidence that efficacy in treatment outcome might be partly attributable to specific cognitive-behavioral techniques and strategies, over and above effects due to nonspecific therapy factors. However, the size of effects indicates that current specific cognitive-behavioral techniques may provide only a relatively small additional benefit.

In summary, the evidence suggests that generic skills-based treatment packages are more efficacious for the management of childhood anxiety disorders than is providing no treatment at all; limited evidence suggests that such packages outperform conditions with a reduced focus on cognitive-behavioral rationales and strategies. Despite these promising results,

there remains a sizeable proportion of anxious children who do not improve following treatment with state-of-the-art treatment packages. Hence, continued modification and improvements to treatments are essential, and this may be informed by an understanding of factors that influence treatment outcome.

Factors that Influence Treatment Outcome

A wide variety of factors may affect the efficacy of cognitive-behavioral treatments for child anxiety, including the methods of assessing outcome; child factors including age and gender; type of disorder; severity and comorbidity; treatment factors such as group versus individual, dose, and content; and parent factors including parent anxiety and inclusion. Although several trials have attempted to examine the role of moderating variables in treatment for child anxiety, this has often been done in a posthoc and atheoretical manner. Therefore, only limited conclusions can be drawn regarding many of the variables examined.

Assessment of outcome. Outcome in treatment trials of child anxiety is usually assessed across multiple informants and a range of indices including diagnostic status, clinician ratings, child self-report, and parent report. The extent to which a given treatment reduces symptoms of anxiety depends in part on which outcome measure is most heavily emphasized.

A number of studies have shown significant reductions in children's self-reported anxiety following treatment with uncontrolled effect sizes of around 0.7–0.8 (Barrett et al. 1996a, Flannery-Schroeder & Kendall 2000, Muris et al. 1999, Spence et al. 2000). Hence, children themselves perceive improvements in their anxiety following active treatment (Seligman et al. 2004). Numerous studies have also reported significant reductions from pre- to post-treatment based on parent reports of child anxiety symptoms (Barrett et al. 1996a, Rapee 2000, Silverman et al. 1999a, Spence et al. 2000). However, the reduction in

children's anxious symptomatology reported by parents appears to be nearly twice as large as that reported by children (Prins & Ollendick 2003).

It is also worth noting that although children's reports have commonly shown reductions in anxiety following treatment, similar reductions over time are often reported by children on a wait-list. Hence, several studies have failed to demonstrate significant time-by-condition interactions on specific child self-report measures (Barrett et al. 1996a, Hudson et al. 2009, Silverman et al. 1999a). In these studies, children report significant reductions in anxiety symptoms irrespective of whether they are in active treatment, a pattern that is not reflected as strongly on parent-report measures or clinician-rated diagnostic data. General research on parent-child concordance has shown that anxiety-disordered children and adolescents often report less distress and fewer symptoms of anxiety than do their parents (Rapee et al. 1994, Schniering et al. 2000, Schwab-Stone et al. 1994). In addition, general reports indicate that anxious children may endorse unusually low scores on cognitive measures of anxiety in some situations despite being diagnosed with an anxiety disorder based on data from multiple informants (Kendall & Chansky 1991). In the case of studies showing significant main effects but no time-by-condition interactions, the significant decrease in anxiety reported by wait-list children is usually not consistent with parent report or clinician-rated diagnostic data. A number of possible explanations exist for this lack of concordance between child report and other indicators of treatment change. It is possible that at post assessment, there are powerful expectancy and social desirability influences on children's reports across conditions (Dadds et al. 1998), or there may be a desire to "fake good" or downplay reported symptoms (Kendall & Chansky 1991). There is also evidence that underreporting in some situations may be related to other variables, such as age and cognitive level (Brown & Kodadek 1987, Fallon & Schwab-Stone 1994, Perez et al. 1998). For example, age and cognitive

level have been shown to account for 53% of the variance in lie scale scores on the Revised Children's Manifest Anxiety Scale (Brown & Kodadek 1987), and younger children (under 12 years) generally show poor test-retest reliability on anxiety instruments (Schniering et al. 2000).

To date, the largest treatment effects have been reflected in remission of child anxiety disorder as assessed by structured diagnostic interview or other formal diagnosis. Effect sizes calculated for anxiety diagnostic outcomes compared to wait list are moderate to high (Chu & Harrison 2007, James et al. 2005). These data are difficult to compare across studies owing to a clear confound in reporting. Whereas some studies define recovery as the absence of only the primary diagnosis at post treatment, others use a more conservative definition that requires the child to be free of all anxiety diagnoses. Hence, it is difficult to make direct comparisons between treatment outcome studies, even on the common metric of diagnostic status.

Comorbidity. To date, very few studies have examined the impact of comorbidity on treatment efficacy in childhood anxiety disorders. This is despite the fact that numerous studies have documented that among anxious children, high rates of comorbidity are associated with greater overall severity and life interference (Bernstein et al. 1996, Brady & Kendall 1992, Kendall 1994, Manassis & Menna 1999). It is commonly assumed that treatment outcome and long-term prognosis in childhood disorders in general may be reduced by the presence of other disorders (Lewinsohn et al. 1995), and some authors have suggested that treatment of comorbid conditions should involve separate treatment of the principal and comorbid problems (Kendall et al. 1992, Oei & Loveday 1997). The limited available evidence suggests that the influence of comorbidity may vary depending on the nature of the concurrent difficulties.

Two similar studies demonstrated little impact of comorbid conditions on treatment outcome for children with anxiety disorders (Kendall et al. 2001, Rapee 2003). In both

studies, the existence of either additional anxiety disorders or additional nonanxiety disorders failed to produce significant reductions in treatment response compared with children suffering only a single anxiety disorder. Furthermore, there was also no significant impact of comorbidity at 12-month follow-up in one study (Rapee 2003), although the nonanxiety comorbid group showed a slight worsening at follow-up based on parent reports. However, effects were not consistent across all measures, and power was low at follow-up, suggesting that long-term results should be interpreted with caution. Based on evidence from the adult literature (Brown et al. 1995), it is possible that these treatment gains in children with nonanxiety comorbidity may not be maintained over time. Hence, it appears that nonanxiety comorbidity may not influence the effects of treatment for child anxiety, at least in the short term. However, one of the main limitations of these two studies is that neither had a sizeable number of children with mood disorders, thus restricting conclusions with respect to nonanxiety comorbidity primarily to children with externalizing disorders.

In the only study to examine this issue directly, Berman and colleagues (2000) analyzed predictors of outcome for 106 clinically anxious youth treated with an exposure-based cognitive-behavioral program. In line with the work described above, when comorbid diagnoses were examined as a whole, comorbidity was not a significant predictor of treatment outcome. However, when broadband disorders were considered separately, externalizing disorders remained nonsignificant predictors of outcome, whereas depressive disorders were significantly associated with poorer treatment effects. Although this study is not without its own limitations, in particular a small sample size, it is one of the first to demonstrate clear links between comorbid depression and adverse outcomes for child anxiety. Interestingly, from the reverse perspective, comorbid anxiety has also been shown to adversely affect treatment outcome among clinically depressed adolescents (Brent et al. 1998). These preliminary

findings suggest that depression may disrupt the typical course of treatment in anxious youth and vice versa.

Theoretically, these results are consistent with models of emotion that delineate a general negative affectivity factor common to anxiety and depression, in addition to specific depression components around low positive affectivity and specific anxiety components around physiological arousal (Clark & Watson 1991). Treatment for youth with comorbid anxiety and depression may need to address all three components, and it may be that the low positive affectivity associated with low motivation, withdrawal, and lethargy interferes with the completion of tasks for anxiety reduction, in particular exposure. Externalizing problems, on the other hand, do not involve anhedonia and would therefore not affect exposure in this way. In support of this notion, research has shown that although anxious and oppositional children share threat-related beliefs about ambiguous situations, oppositional children do not demonstrate avoidance tendencies in the way that anxious children do (Barrett et al. 1996b). Interestingly, in treatment for depression in youth, it is these interfering factors around motivation, inactivity, and lethargy that are generally targeted first (Kazdin & Weisz 1998, Lewinsohn et al. 1996). Hence, there may be clinical value in the use of specific treatment packages for adolescents with comorbid anxiety and mood disorders (Schniering & Rapee 2007).

Parent anxiety status. Given the important role that parental anxiety is afforded in models of child anxiety, it would be expected that severity of parent anxiety should be a clear prognostic indicator. Studies on this issue have generally examined the association between child treatment outcome and parent self-reported fear, anxiety, or negative affect (Berman et al. 2000; Cobham et al. 1998; Dadds et al. 1997, 1999). Although some studies have failed to show an influence (Wood et al. 2006) or have provided mixed results (Cobham et al. 1998), the bulk of the literature has indicated that parent anxiety attenuates child outcomes (Berman et al.

2000; Crawford & Manassis 2001; Crawford et al. 2001; Dadds et al. 1997, 1999; Rapee 2000). Some evidence also indicates that this association is stronger for younger children than for adolescents (Berman et al. 2000). In line with models of emotion that argue for a negative affectivity factor (Clark & Watson 1991), parent symptoms of depression, hostility, and paranoia have also been shown to predict treatment efficacy for anxious children (Berman et al. 2000). These findings suggest that parent emotional distress in general may interfere with treatment, particularly for younger children.

Interestingly, little is known about the mechanisms by which parent anxiety affects child outcomes, and the treatment implications of these findings are unclear. On the one hand, parent anxiety may reflect a genetic marker indicating greater severity or chronicity of child disorder. On the other hand, anxious parental behavior may itself maintain the child's anxiety, for example, by modeling of anxious thoughts and behaviors or via parenting behaviors such as overprotection or criticism. In one of the only studies to directly target parent anxiety in treatment (Cobham et al. 1998), the majority of measures failed to show any significant differences between children whose parent's anxiety was treated and those whose parent's anxiety was not addressed. This may suggest that parents' anxieties are not causally associated with reduced treatment efficacy. However, in that study, the parent anxiety intervention failed to significantly reduce parent anxiety, leaving the question still unanswered. It is also possible that a more specific parent focus would be more valuable. For example, enhancement of treatment for child anxiety might be best achieved by reducing parents' negative affect, overprotective parenting behaviors, or modeling of anxious behaviors.

Inclusion of parents in treatment. A number of studies have shown that family-based CBT that incorporates parents into treatment is superior to the wait-list condition (Rapee et al. 2006a, Shortt et al. 2001, Silverman et al. 1999a). However, a more pertinent question is

whether the addition of a family component enhances treatment packages that target only the child. A small number of reviews have collated evidence from studies comparing child-focused CBT to CBT with a family component (CBT + FAM) (Creswell & Cartwright-Hatton 2007; C. Deveney, A.J. Baillie, J.L. Hudson, & R. Rapee, manuscript submitted; James et al. 2005). One of the limitations in examining this body of work is that there is little consistency in the content of the familial component of CBT + FAM interventions, which makes comparisons difficult. As is often found in other areas of child psychopathology such as depression, the focus of the familial component varies widely from study to study. Parent components of treatment might include assistance with implementation of skills outside therapy sessions, training in child management skills, modeling of nonanxious behaviors, managing parents' own emotions, using skills to address parent anxiety, and addressing dysfunctional patterns of communication and family dynamics. Many studies incorporate several of these strategies within the one program, and therefore it is not possible to determine which of the above components are most essential in treatment.

Not surprisingly then, studies examining the benefit of parent involvement in treatment have shown an inconsistent pattern of results. When studies comparing CBT to CBT + FAM are considered individually, results do not support a strong difference between conditions (Barrett 1998, Cobham et al. 1998, Nauta et al. 2003, Wood et al. 2006). Based on both child and parent reports as well as diagnostic data, few significant differences have emerged between treatments with and without family components. One of the difficulties in interpreting these findings is that the majority of studies have limited power to detect effect sizes of small-to-moderate magnitude, which may be expected when comparing two active treatment conditions. Indeed, Creswell & Cartwright-Hatton (2007) point out that a substantial number of the studies comparing CBT to CBT + FAM indicate a beneficial effect of including parents on child diagnostic

outcomes, but statistical significance is often not reached. To help overcome the problems associated with low statistical power, Deveney and colleagues (C. Deveney, A.J. Baillie, J.L. Hudson, & R. Rapee, manuscript submitted) conducted a meta-analysis of studies comparing CBT to CBT + FAM. Results demonstrated a clear benefit for family-based treatment when assessed by changes on children's diagnostic status. Consistent with estimates by James et al. (2005), the remission rate for anxiety disorder was 74% for CBT + FAM compared to 56% for child-only CBT, providing some support for the importance of parental involvement in treatment. However, no difference was demonstrated between conditions when assessed via questionnaires, making definite conclusions difficult to draw.

From a developmental perspective, it would be expected that parental involvement would be moderated by age and that the benefit of a parental contribution would be strongest for younger children and decrease in adolescence. Only one published study to date has addressed this issue in anxious children. Barrett and colleagues (1996a) compared child-only CBT with CBT + FAM across younger (7–10 years) and older (11–14 years) children. Results showed that age interacted with treatment condition such that CBT + FAM was superior for younger but not older children. This suggests that the inclusion of parents may be beneficial for young children but may not be necessary for adolescents.

Sociodemographic variables. In general, limited research is available on predictors of outcome in child anxiety, and studies have been underpowered to reliably examine the impact of sociodemographic variables such as age, gender, and ethnicity. Treatment trials have included boys and girls ranging in age from 7 to 18 years and have most commonly reported results collapsed across age and gender. Developmentally, these studies cover a very broad age range and several key developmental stages, so it might be expected that treatment effects may show some age-related differences.

Perhaps surprisingly then, studies that have examined age as a predictor of outcome have reported little evidence for differences in outcome across younger and older children, and age has not proven to be a significant moderator in analyses (Berman et al. 2000, Kendall et al. 1997, Rapee 2000, Shortt et al. 2001, Silverman et al. 1999a, Spence et al. 2000, Treadwell et al. 1995, Wood et al. 2006). However, most studies have suffered relatively low power to examine age interactions. In addition, the majority of samples are restricted to children under 15 years, and the number of postpubertal adolescents included in the data is very low. Hence, it is possible that differences in treatment outcome for older child samples, especially among older adolescents, would be detected in studies with sufficient power.

Studies that compared treatment outcome between girls and boys have generally failed to report a moderating influence of gender on treatment response (Berman et al. 2000, Kendall et al. 1997, Rapee 2000, Shortt et al. 2001, Silverman et al. 1999a). Similarly, ethnicity and parental income have not been found to be directly related to treatment outcome in anxious children (Berman et al. 2000, Kendall et al. 1997, Treadwell et al. 1995).

Mechanisms of Change

Cognitive and behavioral factors are implicated in the development and maintenance of child anxiety, and changes in approach/avoidance behaviors and cognitions are seen by many to be crucial for treatment change (Rapee et al. 2000, Treadwell & Kendall 1996). Although CBT has been shown to be efficacious compared to wait list, the majority of clinical trials have not measured process variables, and the mechanisms by which treatment produces effects are not well understood. As previously discussed, some research has demonstrated that cognitive behavioral components add a small but significant therapeutic benefit beyond nonspecific treatment effects for anxiety disorders in children, although these results are not consistent (Beidel et al. 2000, Hudson et al. 2008, Last

et al. 1998, Muris et al. 2002, Silverman et al. 1999b). Hence, there are likely to be considerable common therapeutic mechanisms as well as some more-specific mechanisms that are important to successful outcome. In a meta-analysis of mediators of change in anxious youth, Chu & Harrison (2007) showed that CBT for anxiety was associated with moderate-to-large changes in cognitive, behavioral, coping, and physiological processes, with the largest effects reported for behavioral processes. In line with these results, other research has shown that reductions in negative self-statements and threat interpretations are significantly related to improvement (Creswell et al. 2005, Kendall 1984, Treadwell & Kendall 1996) and that reductions in avoidance behaviors are critical to treatment change (Silverman et al. 1999b, Williams 1996). These data suggest that to maximize treatment outcome, strategies may need to target specific maladaptive beliefs and avoidance behaviors. However, large studies that directly examine mediation of change currently do not exist.

As noted above, an even greater proportion of the variance in the effects of efficacious treatments is likely to be due to processes that are more common across therapeutic strategies and populations, including therapeutic alliance and treatment engagement. As for other childhood disorders, there is some evidence that therapeutic alliance mediates outcome in child anxiety (Hughes & Kendall 2007, McLeod & Weisz 2005); however, other studies have failed to find such a relationship (Kendall 1984; Kendall et al. 1997; M. Southam-Gerow, D.A. Jensen, A. Gelbwasser, B.C. Chu, & J.R. Weisz, unpublished manuscript). To date, only one study has examined the relationship between a child's willingness to participate in therapy, or treatment engagement, and treatment outcome (Chu & Kendall 2004). Results indicated that engagement as assessed in the latter stages of treatment was significantly associated with treatment outcomes. Taken together, these results suggest that therapeutic alliance and involvement may influence treatment outcome; however, research is still limited and the direc-

tion of effects is also not clear. In other words, it is very possible that even if these relationships are demonstrated, it may be that early treatment successes lead to increases in alliance and engagement.

Alternate Methods of Treatment Delivery

In recent years, a number of efforts have been made to move from standard, individual application of treatment to a broader dissemination of these programs via alternate methods of implementation. Alternate methods of delivering treatment have important applications as cost-effective alternatives in general community settings and for populations that have difficulty reaching services. One alternate method of treatment delivery with marked cost implications is bibliotherapy, which involves the presentation of treatment components via written or computerized media, with little or no therapist contact. Several studies have now shown that variations of bibliotherapy can provide an efficacious treatment alternative in the management of child anxiety to standard treatments that rely on face-to-face contact (Lyneham & Rapee 2006, Rapee et al. 2006a, Spence et al. 2006, Thienemann et al. 2006). In one randomized controlled trial, 7- to 12-year-olds were assigned to bibliotherapy, standard group treatment, or a wait list (Rapee et al. 2006a). The bibliotherapy program used a "parent as therapist" model wherein parents implemented treatment with the aid of written materials and no therapist contact. Parent bibliotherapy demonstrated benefit for children relative to wait list but was not as efficacious as standard group treatment (Rapee et al. 2006a). Further research has shown that outcomes can be enhanced by supplementing bibliotherapy with input from a therapist via telephone or email (Lyneham & Rapee 2006). A number of studies also provide evidence supporting computer-based technologies in the treatment of child anxiety (Cunningham et al. 2008, Dewis et al. 2001, Spence et al. 2006). For example, Spence and colleagues showed that half the sessions in

Early intervention: providing treatment for a problem early in its development, potentially before it meets criteria for a diagnosis or causes marked personal impairment

Selective interventions: providing intervention to individuals who score high on one or more risk factors for a disorder, regardless of whether the individuals actually have the disorder

a treatment program for child anxiety could be conducted over the Internet with no significant loss in efficacy. Taken together, these findings suggest that a number of alternative methods of delivery provide efficacious treatment options for families in the general community and especially for those isolated from traditional treatment services.

Early Intervention and Prevention

As understanding of the development of anxiety improves, researchers are moving into a stronger position to produce programs that might prevent the development of anxiety disorders. This exciting possibility has already begun to receive some attention, although most programs to date have not been theoretically driven. Programs have been aimed at the universal, the indicated, and the selective levels of intervention (Donovan & Spence 2000, Rapee 2008).

At the universal level, several trials have evaluated the efficacy of a program applied across whole school grades in reducing symptoms of anxiety and depression (Barrett & Turner 2001; Barrett et al. 2005, 2006; Hunt et al. 2004; Lowry-Webster et al. 2001). In general, significantly greater reductions in symptoms of anxiety have been reported by children undergoing active intervention relative to those receiving no intervention, but symptoms of depression have typically not shown significant differences. However, effects on symptoms of anxiety have been small and this has led to inconsistencies across measures (Lowry-Webster et al. 2001) and across time (Barrett et al. 2005). Interestingly, stronger effects appear to be found in children (grade 6) than in adolescents (grade 9) (Barrett et al. 2005, 2006). Despite the fact that effects with universal intervention for anxiety have been small, such small effects can be extremely important when applied across entire populations. Unfortunately, some attempts to replicate these effects have failed to demonstrate significant differences between active and nonactive interventions (Hunt et al. 2004; Laye-Gindhu et al. 2005, cited in

Miller 2008); hence, the value of universal interventions for children anxiety remains to be confirmed.

Slightly larger effects have been shown in a few indicated (early intervention) programs conducted in schools. In the first of this work, Dadds and colleagues (Dadds et al. 1997, 1999) selected children aged 7–14 years who scored high on self-report measures of anxiety symptoms or were identified by teachers as anxious but not disruptive. Although 65% of the children met criteria for a mental disorder at preintervention, it is unlikely that many would have previously sought treatment. Results on diagnostic status indicated that children in the active intervention showed significantly greater reductions in clinical diagnoses in comparison with monitoring only children at 6-month and 24-month follow-up but not at post intervention or 12-month follow-up. Data on parent- and child-reported symptoms of anxiety failed to show significant differences between groups. Slightly stronger effects were reported in a small study focusing on children from low-socioeconomic backgrounds, almost none of whom had sought previous treatment for their anxiety (Mifsud & Rapee 2005). In this study, children in the active intervention demonstrated significantly greater reductions in anxious symptoms than did children in the monitoring-only intervention, according to both teacher and self-reports. Hence, these data point to the possibility of disseminating treatments for child anxiety to populations who would not otherwise receive help and possibly reducing the onset of anxiety early in life. As for the results of universal interventions, the effects of selective interventions need replication and extension in further studies.

The ability to modify key risk factors for the development of anxiety (selective intervention) has received very little attention to date. A small early trial of anxious-withdrawn preschool children focused on improving a range of parent-child factors, mostly centering on maternal intrusiveness (LaFreniere & Capuano 1997). Results demonstrated improvements in children's social competence, but not in the key

variable of anxiety-withdrawal. One of the only large-scale trials focusing more clearly on childhood anxiety targeted preschool-aged children who scored high on maternal-reported and laboratory-observed inhibition (Rapee et al. 2005). Parents attended a brief, six-session, group program aimed at teaching skills to help their child reduce inhibition. Twelve months later, children whose parents attended the program demonstrated significant reductions in anxiety disorders relative to children in a monitoring-only condition. However, levels of child inhibition were significantly and similarly reduced in both groups. In a more recent extension of this research, children were targeted if they showed especially high levels of inhibition and also had at least one parent with an anxiety disorder (Kennedy et al. 2008). Data at six months showed significantly greater reductions in children whose parents attended the education program on both existing anxiety disorders and laboratory-observed inhibition. These early data point to the exciting possibility that future anxiety and depressive disorders may one day be prevented.

CONCLUSIONS

The past decade has seen an explosion of research into the understanding and management of childhood anxiety disorders. There is growing understanding of the role of several key factors in the development and precipitation

of anxiety, and in turn, these are beginning to facilitate some exciting possibilities in prevention. Treatment outcome for child anxiety is also good and shows some of the larger effect sizes among childhood disorders.

Nevertheless, we are still a long way from really understanding why one person develops an anxiety disorder while another does not. Considerably more research is needed, particularly research focused on gene-environment and temperament-environment interactions. Our current knowledge of the role and mechanisms of environmental factors is especially poor and needs far more theoretical and empirical refinement. Even in areas where empirical evidence is more extensive, such as temperamental withdrawal or parent-child interactions, it is still not possible to make strong causal claims, and far more effort is needed in conducting experimental and population-based longitudinal studies.

Similarly, there is considerable room for improvement in the treatment of child anxiety. Well-designed studies examining factors that influence outcome are still very rare, as are large studies devoted to the examination of mechanisms underlying change. Better understanding of these factors is necessary to begin to increase treatment effects.

Given the flurry of research activity in the field over the past decade, it is likely that a review similar to the current one written in another 10 years will see a markedly different picture of the understanding of child anxiety.

SUMMARY POINTS

1. Anxiety disorders in children have a high prevalence and moderate life impact.
2. There is a moderate genetic influence in the development of anxiety in children.
3. Twin studies indicate involvement from individual and, to some extent, common environmental factors.
4. Features of inhibited temperament are demonstrated very early in development and increase risk for anxiety directly as well as in interaction with most other risk factors.
5. The strongest evidence for treatment efficacy for anxious children currently comes from generic treatment packages that address different forms of anxiety.

6. Research into factors that affect treatment efficacy is generally not well conducted and tends to show inconsistent effects.
7. Good efficacy has begun to be shown by “nontraditional” treatment delivery, including self-help and computer delivery.
8. Some promising though small effects are being shown by prevention strategies.

DISCLOSURE STATEMENT

The authors are not aware of any biases that might be perceived as affecting the objectivity of this review.

LITERATURE CITED

- Alfano CA, Beidel DC, Turner SM. 2002. Cognition in childhood anxiety: conceptual methodological and developmental issues. *Clin. Psychol. Rev.* 22:1209–38
- Allen JL, Rapee RM, Sandberg S. 2008. Severe life events and chronic adversities as antecedents to anxiety in children: a matched control study. *J. Abnorm. Child Psychol.* 36(7):1047–56
- Angold A, Costello EJ, Erkanli A. 1999. Comorbidity. *J. Child Psychol. Psychiatry* 40:57–87
- Barrett PM. 1998. Evaluation of cognitive-behavioral group treatments for childhood anxiety disorders. *J. Clin. Child Psychol.* 27:459–68
- Barrett PM, Dadds MR, Rapee RM. 1996a. Family treatment of childhood anxiety: a controlled trial. *J. Consult. Clin. Psychol.* 64:333–42
- Barrett PM, Duffy AL, Dadds MR, Rapee RM. 2001. Cognitive-behavioral treatment of anxiety disorders in children: long-term (6-year) follow-up. *J. Consult. Clin. Psychol.* 69:135–41
- Barrett PM, Farrell LJ, Ollendick TH, Dadds MR. 2006. Long-term outcomes of an Australian universal prevention trial of anxiety and depression symptoms in children and youth: an evaluation of the FRIENDS Program. *J. Clin. Child Adolesc. Psychol.* 35:403–11
- Barrett PM, Healy-Farrell L, March JS. 2004. Cognitive-behavioral family treatment of childhood obsessive-compulsive disorder: a controlled trial. *J. Am. Acad. Child Adolesc. Psychiatry* 43:46–62
- Barrett PM, Lock S, Farrell LJ. 2005. Developmental differences in universal preventive intervention for child anxiety. *Clin. Child Psychol. Psychiatry* 10:539–55
- Barrett PM, Rapee RM, Dadds MR, Ryan SM. 1996b. Family enhancement of cognitive style in anxious and aggressive children. *J. Abnorm. Child Psychol.* 24:187–203
- Barrett PM, Turner C. 2001. Prevention of anxiety symptoms in primary school children: preliminary results from a universal school-based trial. *Br. J. Clin. Psychol.* 40:399–410
- Beidel DC, Turner SM, Morris TL. 2000. Behavioral treatment of childhood social phobia. *J. Consult. Clin. Psychol.* 68:1072–80
- Benjamin RS, Costello EJ, Warren M. 1990. Anxiety disorders in a pediatric sample. *J. Anxiety Disord.* 4:293–316
- Berman S, Weems CF, Silverman WK, Kurtines WM. 2000. Predictors of outcome in exposure-based cognitive behavioral treatments for phobic and anxiety disorders in children. *J. Consult. Clin. Psychol.* 64:333–42
- Bernstein DA, Borchardt CM, Perwien AR. 1996. Anxiety disorders in children and adolescents: a review of the past 10 years. *J. Am. Acad. Child Adolesc. Psychiatry* 35:1110–19
- Bittner A, Egger HL, Erkanli A, Costello EJ, Foley DL, Angold A. 2007. What do childhood anxiety disorders predict? *J. Child Psychol. Psychiatry* 48:1174–83
- Bögels SM, Brechman-Toussaint ML. 2006. Family issues in child anxiety: attachment, family functioning, parental rearing and beliefs. *Clin. Psychol. Rev.* 26:834–56
- Bond L, Carlin JB, Thomas L, Rubin K, Patton G. 2001. Does bullying cause emotional problems? A prospective study of young teenagers. *Br. Med. J.* 323:480–84

- Brady EU, Kendall PC. 1992. Comorbidity of anxiety and depression in children and adolescents. *Psychol. Bull.* 111:244-55
- Brent DA, Kolko DJ, Birmaher B, Baugher M, Bridge J, et al. 1998. Predictors of treatment efficacy in a clinical trial of three psychosocial treatments for adolescent depression. *J. Am. Acad. Child Adolesc. Psychiatry* 37:906-14
- Breton J-J, Bergeron L, Valla J-P, Berthiaume C, Gaudet N, et al. 1999. Quebec Child Mental Health Survey: prevalence of DSM-III-R mental health disorders. *J. Child Psychol. Psychiatry* 40:375-84
- Brown MS, Kodadek SM. 1987. The use of lie scales in psychometric measures of children. *Res. Nurs. Health* 10:87-92
- Brown TA, Antony MM, Barlow DH. 1995. Diagnostic comorbidity in panic disorder: effect on treatment outcome and course of comorbid diagnoses following treatment. *J. Consult. Clin. Psychol.* 63:408-18
- Canino G, Shrout PE, Rubio-Stipec M, Bird HR, Bravo M, et al. 2004. The DSM-IV rates of child and adolescent disorders in Puerto Rico. *Arch. Gen. Psychiatry* 61:85-93
- Cartwright-Hatton S, Roberts C, Chitsabesan P, Fothergill C, Harrington R. 2004. Systematic review of the efficacy of cognitive behavior therapies for childhood and adolescent anxiety disorders. *Br. J. Clin. Psychol.* 43:421-36
- Caspi A, Elder GH Jr, Bem DJ. 1988. Moving away from the world: Life-course patterns of shy children. *Dev. Psychol.* 24:824-31
- Caspi A, Moffitt TE, Newman DL, Silva PA. 1996. Behavioral observations at age 3 years predict adult psychiatric disorders: longitudinal evidence from a birth cohort. *Arch. Gen. Psychiatry* 53:1033-39
- Chen X, Rubin KH, Li B, Li D. 1999. Adolescent outcomes of social functioning in Chinese children. *Int. J. Behav. Dev.* 23:199-223
- Cherny SS, Fulker DW, Corley RP, Plomin R, DeFries JC. 1994. Continuity and change in infant shyness from 14 to 20 months. *Behav. Genet.* 24:365-79
- Chorpita BF, Barlow DH. 1998. The development of anxiety: the role of control in the early environment. *Psychol. Bull.* 124:3-21
- Chu BC, Harrison TL. 2007. Disorder-specific effects of CBT for anxious and depressed youth: a meta-analysis of candidate mediators of change. *Clin. Child Family Psychol. Rev.* 10:352-72
- Chu BC, Kendall PC. 2004. Positive association of child involvement and treatment outcome within a manual-based cognitive-behavioral treatment for children with anxiety. *J. Consult. Clin. Psychol.* 72:821-29
- Clark LA, Watson D. 1991. Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *J. Abnorm. Psychol.* 100:316-36
- Cobham VE, Dadds MR, Spence SH. 1998. The role of parental anxiety in the treatment of childhood anxiety. *J. Consult. Clin. Psychol.* 66:893-905
- Cole DA, Peeke LG, Martin JM, Truglio R, Seroczynski AD. 1998. A longitudinal look at the relation between depression and anxiety in children and adolescents. *J. Consult. Clin. Psychol.* 66:451-60
- Costello E, Mustillo S, Erkanli A, Keeler G, Angold A. 2003. Prevalence and development of psychiatric disorders in childhood and adolescence. *Arch. Gen. Psychiatry* 60:837-44
- Crawford AM, Manassis K. 2001. Familial predictors of treatment outcome in childhood anxiety disorders. *J. Am. Acad. Child Adolesc. Psychiatry* 40:1182-89
- Crawford TN, Cohen P, Midlarsky E, Brook JS. 2001. Internalizing symptoms in adolescents: gender differences in vulnerability to parental distress and discord. *J. Res. Adolesc.* 11:95-118
- Creswell C, Cartwright-Hatton S. 2007. Family treatment of child anxiety: outcomes, limitations and future directions. *Clin. Child Fam. Psychol.* 10:232-52
- Creswell C, Schniering CA, Rapee R. 2005. Threat interpretation in anxious children and their mothers: comparison with nonclinical children and the effects on treatment. *Behav. Res. Ther.* 43:1375-81
- Cronk NJ, Slutske WS, Madden PAF, Bucholz KK, Heath AC. 2004. Risk for separation anxiety disorder among girls: paternal absence, socioeconomic disadvantage, and genetic vulnerability. *J. Abnorm. Psychol.* 113:237-47
- Cunningham MJ, Wuthrich VM, Rapee R, Lyneham H, Schniering CA, Hudson JL. 2008. The Cool Teens CD-ROM for anxiety disorders in adolescents: a pilot case series. *Eur. Child Adolesc. Psychiatry*. In press
- Dadds MR, Holland DE, Laurens KR, Mullins M, Barrett PM, Spence SH. 1999. Early intervention and prevention of anxiety disorders in children: results at 2-year follow-up. *J. Consult. Clin. Psychol.* 67:145-50

- Dadds MR, Perrin S, Yule W. 1998. Social desirability and self-reported anxiety in children: an analysis of the RCMAS Lie Scale. *J. Abnorm. Child Psychol.* 36:311-17
- Dadds MR, Spence SH, Holland DE, Barrett PM, Laurens KR. 1997. Prevention and early intervention for anxiety disorders: a controlled trial. *J. Consult. Clin. Psychol.* 65:627-35
- Daleiden EL, Vasey MW. 1997. An information-processing perspective on childhood anxiety. *Clin. Psychol. Rev.* 17:407-29
- de Rosnay M, Cooper PJ, Tsigaras N, Murray L. 2006. Transmission of social anxiety from mother to infant: an experimental study using a social referencing paradigm. *Behav. Res. Ther.* 44:1165-75
- Deveney C, Baillie AJ, Hudson JL, Rapee R. 2009. Family involvement in CBT for anxious youth: a meta-analysis. Manuscr. submitted
- de Wilde A, Rapee RM. 2008. Do controlling maternal behaviours increase state anxiety in children's responses to a social threat? A pilot study. *J. Behav. Ther. Exp. Psychiatry* 39:526-37
- Dewis LM, Kirkby KC, Martin F, Daniels BA, Gilroy LJ, Menzies RG. 2001. Computer-aided vicarious exposure versus live graded exposure for spider phobia in children. *J. Behav. Ther. Exp. Psychiatry* 32:17-27
- DiLalla LF, Kagan J, Reznick J. 1994. Genetic etiology of behavioral inhibition among 2-year-old children. *Infant Behav. Dev.* 17:405-12
- Donovan CL, Spence SH. 2000. Prevention of childhood anxiety disorders. *Clin. Psychol. Rev.* 20:509-31
- Dubi K, Rapee RM, Emerton JL, Schniering CA. 2008. Maternal modeling and the acquisition of fear and avoidance in toddlers: influence of stimulus preparedness and temperament. *J. Abnorm. Child Psychol.* 36:499-512
- Eaves LJ, Silberg JL, Maes HH, Simonoff E, Pickles A, et al. 1997. Genetics and developmental psychopathology: 2. The main effects of genes and environment on behavioral problems in the Virginia Twin Study of Adolescent Behavioral Development. *J. Child Psychol. Psychiatry* 38:965-80
- Edwards SL, Rapee RM, Kennedy S. 2009. A prospective examination of risk for anxiety symptoms in preschool-aged children. Manuscr. submitted
- Egliston K-A, Rapee RM. 2007. Inhibition of fear acquisition in toddlers following positive modelling by their mothers. *Behav. Res. Ther.* 45:1871-82
- Ehlers A, Mayou RA, Bryant B. 2003. Cognitive predictors of posttraumatic stress disorder in children: results of a prospective longitudinal study. *Behav. Res. Ther.* 41:1-10
- Ehrenreich JT, Gross AM. 2002. Biased attentional behavior in childhood anxiety: a review of theory and current empirical investigation. *Clin. Psychol. Rev.* 22:991-1008
- Ehringer MA, Rhee SH, Young S, Corley R, Hewitt JK. 2006. Genetic and environmental contributions to common psychopathologies of childhood and adolescence: a study of twins and their siblings. *J. Abnorm. Child Psychol.* 34(1):1-17
- Eley TC. 1997. General genes: a new theme in developmental psychopathology. *Curr. Dir. Psychol. Sci.* 6:90-95
- Eley TC, Bolton D, O'Connor TG, Perrin S, Smith P, Plomin R. 2003. A twin study of anxiety-related behaviours in pre-school children. *J. Child Psychol. Psychiatry* 44:945-60
- Eley TC, Lau JYF. 2005. Genetics and the family environment. In *Psychopathology and the Family*, ed. JL Hudson, RM Rapee, pp. 3-19. Oxford, UK: Elsevier
- Eley TC, Stevenson J. 2000. Specific life events and chronic experiences differentially associated with depression and anxiety in young twins. *J. Abnorm. Child Psychol.* 28:383-94
- Engfer A. 1993. Antecedents and consequences of shyness in boys and girls: a 6-year longitudinal study. In *Social Withdrawal, Inhibition, and Shyness in Children*, ed. KH Rubin, JB Asendorpf, pp. 49-79. Hillsdale, NJ: Erlbaum
- Essau CA, Conradt J, Petermann F. 2000. Frequency, comorbidity, and psychosocial impairment of anxiety disorders in German adolescents. *J. Anxiety Disord.* 14:263-79
- Ezpeleta L, Keeler G, Alatin E, Costello EJ, Angold A. 2001. Epidemiology of psychiatric disability in childhood and adolescence. *J. Child Psychol. Psychiatry* 42:901-14
- Fallon T, Schwab-Stone M. 1994. Determinants of reliability in psychiatric surveys of children aged 6-22. *J. Child Psychol. Psychiatry Allied Discipl.* 35:1391-408
- Feigon SA, Waldman ID, Levy F, Hay DA. 2001. Genetic and environmental influences on separation anxiety disorder symptoms and their moderation by age and sex. *Behav. Genet.* 31:403-11

- Ferdinand RF, Dieleman G, Ormel J, Verhulst FC. 2007. Homotypic versus heterotypic continuity of anxiety symptoms in young adolescents: evidence for distinctions between DSM-IV subtypes. *J. Abnorm. Child Psychol.* 35:325–33
- Field AP. 2006a. The behavioral inhibition system and the verbal information pathway to children's fears. *J. Abnorm. Psychol.* 115:742–52
- Field AP. 2006b. Is conditioning a useful framework for understanding the development and treatment of phobias? *Clin. Psychol. Rev.* 26:857–75
- Field AP. 2006c. Watch out for the beast: fear information and attentional bias in children. *J. Clin. Child Adolesc. Psychol.* 35:337–45
- Field AP, Lawson J. 2003. Fear information and the development of fears during childhood: effects on implicit fear responses and behavioral avoidance. *Behav. Res. Ther.* 41:1277–93
- Flannery-Schroeder E, Kendall PC. 2000. Group and individual cognitive-behavioral treatments for youth with anxiety disorders: a randomised clinical trial. *Cogn. Ther. Res.* 24:251–78
- Ford T, Goodman R, Meltzer H. 2003. The British child and adolescent mental health survey 1999: the prevalence of DSM-IV disorders. *J. Am. Acad. Child Adolesc. Psychiatry* 42:1203–11
- Ford T, Goodman R, Meltzer H. 2004. The relative importance of child, family, school and neighbourhood correlates of childhood psychiatric disorder. *Soc. Psychiatry Psychiatr. Epidemiol.* 39:487–96
- Fox NA, Henderson HA, Marshall PJ, Nichols KE, Ghera MM. 2005a. Behavioral inhibition: linking biology and behavior within a developmental framework. *Annu. Rev. Psychol.* 56:235–62
- Fox NA, Henderson HA, Rubin KH, Calkins SD, Schmidt LA. 2001. Continuity and discontinuity of behavioral inhibition and exuberance: psychophysiological and behavioral influences across the first four years of life. *Child Dev.* 72:1–21
- Fox NA, Nichols KE, Henderson HA, Rubin KH, Schmidt LA, et al. 2005b. Evidence for a gene-environment interaction in predicting behavioral inhibition in middle childhood. *Psychol. Sci.* 16:921–26
- Fyer AJ, Mannuzza S, Chapman TF, Martin LY, Klein DF. 1995. Specificity in familial aggregation of phobic disorders. *Arch. Gen. Psychiatry* 52:564–73
- Gerull FC, Rapee RM. 2002. Mother knows best: effects of maternal modelling on the acquisition of fear and avoidance behaviour in toddlers. *Behav. Res. Ther.* 40(3):279–87
- Giora A, Gega L, Landau S, Marks I. 2005. Adult recall of having been bullied in attenders of an anxiety disorder unit and attenders of a dental clinic: a pilot controlled study. *Behav. Change* 22:44–49
- Goodyer IM, Wright C, Altham P. 1990. Recent achievements and adversities in anxious and depressed school-age children. *J. Child Psychol. Psychiatry* 31:1063–77
- Gregory AM, Caspi A, Moffitt TE, Koenen K, Eley TC, Poulton R. 2007. Juvenile mental health histories of adults with anxiety disorders. *Am. J. Psychiatry* 164:301–8
- Gregory AM, Eley TC. 2007. Genetic influences on anxiety in children: what we've learned and where we're heading. *Clin. Child Fam. Psychol. Rev.* 10:199–212
- Hadwin JA, Garner M, Perez-Olivas G. 2006. The development of information processing biases in childhood anxiety: a review and exploration of its origins in parenting. *Clin. Psychol. Rev.* 26:876–94
- Hankin BL, Abramson LY, Silva PA, McGee R, Moffitt TE. 1998. Development of depression from preadolescence to young adulthood: emerging gender differences in a 10-year longitudinal study. *J. Abnorm. Psychol.* 107(1):128–40
- Hayward C, Killen JD, Kraemer HC, Taylor CB. 1998. Linking self-reported childhood behavioural inhibition to adolescent social phobia. *J. Am. Acad. Child Adolesc. Psychiatry* 37:1308–18
- Hettema JM, Neale MC, Kendler KS. 2001. A review and meta-analysis of the genetic epidemiology of anxiety disorders. *Am. J. Psychiatry* 158:1568–78
- Hirshfeld DR, Rosenbaum JF, Biederman J, Bolduc EA, Faraone SV, et al. 1992. Stable behavioral inhibition and its association with anxiety disorder. *J. Am. Acad. Child Adolesc. Psychiatry* 31:103–11
- Hudson JL. 2005. Interparental conflict, violence, and psychopathology. In *Psychopathology and the Family*, ed. JL Hudson, RM Rapee, pp. 53–72. Oxford, UK: Elsevier
- Hudson JL, Doyle A, Gar NS. 2008. Child and maternal influence on parenting behavior in clinically anxious children. *J. Clin. Child Adolesc. Psychol.* In press
- Hudson JL, Kendall PC. 2002. Showing you can do it: homework in therapy for children and adolescents with anxiety disorders. *J. Clin. Psychol.* 58:525–34

- Hudson JL, Rapee RM. 2004. From anxious temperament to disorder: an etiological model of generalized anxiety disorder. In *Generalized Anxiety Disorder: Advances in Research and Practice*, ed. RG Heimberg, CL Turk, DS Mennin, pp. 51–76. New York: Guilford
- Hudson JL, Rapee RM, Deveney C, Schniering CA, Lyneham HJ, Bovopoulos N. 2009. Cognitive behavioral treatment versus an active control for children and adolescents with anxiety disorders: a randomized trial. *J. Am. Acad. Child Adolesc. Psychiatry*. In press
- Hughes AA, Kendall PC. 2007. Prediction of cognitive behavior treatment outcome for children with anxiety disorders: therapeutic relationship and homework compliance. *Behav. Cogn. Psychother.* 35:487–94
- Hunt C, Andrews G, Crino R, Erskine A. 2004. The effectiveness of a school-based early intervention strategy for anxiety and depressive disorders: a 2-year follow-up. *World Cong. Behav. Cogn. Ther.* Kobe, Japan
- In-Albon T, Schneider S. 2006. Psychotherapy of childhood anxiety disorders: a meta-analysis. *Psychother. Psychosom.* 76:15–24
- James A, Soler A, Weatherall R. 2005. Cognitive behavioural therapy for anxiety disorders in children and adolescents. *Cochrane Database Syst. Rev.* 4:1–26
- Kagan J, Reznick JS, Clarke C, Snidman N, Garcia-Coll C. 1984. Behavioral inhibition to the unfamiliar. *Child Dev.* 55:2212–25
- Kagan J, Snidman N. 1991. Infant predictors of inhibited and uninhibited profiles. *Psychol. Sci.* 2:40–44
- Kashani JH, Orvaschel H. 1990. A community study of anxiety in children and adolescents. *Am. J. Psychiatry* 147:313–18
- Kazdin AE, Weisz JR. 1998. Identifying and developing empirically supported child and adolescent treatments. *J. Consult. Clin. Psychol.* 66:19–36
- Keller MB, Lavori PW, Wunder J, Beardslee WR, Schwartz CE, Roth J. 1992. Chronic course of anxiety disorders in children and adolescents. *J. Am. Acad. Child Adolesc. Psychiatry* 31:595–99
- Kendall PC. 1984. Behavioral assessment and methodology. In *Annual Review of Behavior Therapy: Theory and Practice*, ed. GT Wilson, CM Franks, KD Brownell, PC Kendall, 9:39–94. New York: Guilford
- Kendall PC. 1994. Treating anxiety disorders in children: results of a randomized clinical trial. *J. Consult. Clin. Psychol.* 62:100–10
- Kendall PC, Brady EU, Verduin TL. 2001. Comorbidity in childhood anxiety disorders and treatment outcome. *J. Am. Acad. Child Adolesc. Psychiatry* 40:787–94
- Kendall PC, Chansky TE. 1991. Considering cognition in anxiety-disordered children. *J. Anxiety Disord.* 5:167–85
- Kendall PC, Flannery-Schroeder E, Panichelli-Mindel SM, Southam-Gerow M, Henin A, Warman M. 1997. Therapy for youths with anxiety disorders: a second randomized clinical trial. *J. Consult. Clin. Psychol.* 65:366–80
- Kendall PC, Hedtke KA. 2006. *Cognitive-Behavioral Therapy for Anxious Children: Therapist Manual*. Ardmore, PA: Workbook Publ.
- Kendall PC, Hudson JL, Gosch E, Flannery-Schroeder E, Suveg C. 2008. Cognitive-behavioral therapy for anxiety disordered youth: a randomized clinical trial evaluating child and family modalities. *J. Consult. Clin. Psychol.* 76:282–97
- Kendall PC, Kortlander E, Chansky TE, Brady EU. 1992. Comorbidity of anxiety and depression in youth: treatment implications. *J. Consult. Clin. Psychol.* 60:869–80
- Kendall PC, Safford S, Flannery-Schroeder E, Webb A. 2004. Child anxiety treatment: outcomes in adolescence and impact on substance use and depression at 7.4-year follow-up. *J. Consult. Clin. Psychol.* 72:276–87
- Kennedy SJ, Rapee RM, Edwards SL. 2008. Early intervention for preschool-aged children at risk for anxiety disorders. Manuscr. submitted
- Kessler R, Berglund P, Demler O, Jin R, Walters EE. 2005. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch. Gen. Psychiatry* 62:593–602
- Kindt M, Van Den Hout M. 2001. Selective attention and anxiety: a perspective on developmental issues and the causal status. *J. Psychopathol. Behav. Assess.* 23:193–202
- King NJ, Clowes-Hollins V, Ollendick TH. 1997. The etiology of childhood dog phobia. *Behav. Res. Ther.* 35:11

- La Greca AM, Moore HH. 2005. Adolescent peer relations, friendships, and romantic relationships: Do they predict social anxiety and depression? *J. Clin. Child Adolesc. Psychol.* 34:49–61
- LaFreniere PJ, Capuano F. 1997. Preventive intervention as a means of clarifying direction of effects in socialization: anxious-withdrawn preschoolers case. *Dev. Psychopathol.* 9:551–64
- Last CG, Hansen C, Franco N. 1997. Anxious children in adulthood: a prospective study of adjustment. *J. Am. Acad. Child Adolesc. Psychiatry* 36:645–52
- Last CG, Hansen C, Franco N. 1998. Cognitive-behavioral treatment of school phobia. *J. Am. Acad. Child Adolesc. Psychiatry* 37:404–11
- Last CG, Hersen M, Kazdin AE, Francis G, Grubb HJ. 1987. Psychiatric illness in the mothers of anxious children. *Am. J. Psychiatry* 144:1580–83
- Last CG, Hersen M, Kazdin AE, Orvaschel H, Perrin S. 1991. Anxiety disorders in children and their families. *Arch. Gen. Psychiatry* 48:928–34
- Last CG, Perrin S, Hersen M, Kazdin AE. 1996. A prospective study of childhood anxiety disorders. *J. Am. Acad. Child Adolesc. Psychiatry* 35:1502–10
- Last CG, Strauss CC, Francis G. 1987. Comorbidity among childhood anxiety disorders. *J. Nerv. Ment. Dis.* 175:726–30
- Legrand LN, McGue M, Iacono WG. 1999. A twin study of state and trait anxiety in childhood and adolescence. *J. Child Psychol. Psychiatry* 40:953–58
- Lewinsohn PM, Clarke GN, Rohde P, Hops H, Seeley JR. 1996. A course in coping. In *Psychosocial Treatments for Child and Adolescent Disorders*, ed. ED Hibbs, PS Jensen, pp. 109–35. Washington, DC: Am. Psychol. Assoc.
- Lewinsohn PM, Hops H, Roberts RE, Seeley JR, Andrews JA. 1993. Adolescent psychopathology: I. Prevalence and incidence of depression and other DSM-III-R disorders in high school students. *J. Abnorm. Psychol.* 102:133–44
- Lewinsohn PM, Rohde P, Seeley JR. 1995. The clinical consequences of comorbidity. *J. Am. Acad. Child Adolesc. Psychiatry* 34:510–20
- Lewinsohn PM, Zinbarg R, Seeley JR, Lewinsohn M, Sack WH. 1997. Lifetime comorbidity among anxiety disorders and between anxiety disorders and other mental disorders in adolescents. *J. Anxiety Disord.* 11:377–94
- Lieb R, Wittchen H-U, Hofler M, Fuetsch M, Stein MB, Merikangas KR. 2000. Parental psychopathology, parenting styles, and the risk of social phobia in offspring: a prospective-longitudinal community study. *Arch. Gen. Psychiatry* 57(9):859–66
- Lowry-Webster HM, Barrett PM, Dadds MR. 2001. A universal prevention trial of anxiety and depressive symptomatology in childhood: preliminary data from an Australian study. *Behav. Change* 18:36–50
- Lyneham HJ, Rapee RM. 2006. Evaluation of therapist supported parent-implemented CBT for anxiety disorders in rural children. *Behav. Res. Ther.* 44:1287–300
- Manassis K, Bradley SJ. 1994. The development of childhood anxiety disorders: toward an integrated model. *J. Appl. Dev. Psychol.* 15:345–66
- Manassis K, Menna R. 1999. Depression in anxious children: possible factors in comorbidity. *Depress. Anxiety* 10:18–24
- March J, Mulle K. 1998. *OCD in Children and Adolescents: A Cognitive Behavioral Treatment Manual*. New York: Guilford
- Martin M, Horder P, Jones GV. 1992. Integral bias in naming of phobia-related words. *Cogn. Emot.* 6:479–86
- McLeod BD, Weisz JR. 2005. The Therapy Process Coding System-Alliance scale: measure characteristics and prediction of outcome in usual clinical practice. *J. Consult. Clin. Psychol.* 73:323–33
- McLeod BD, Wood JJ, Weisz JR. 2007. Examining the association between parenting and childhood anxiety: a meta-analysis. *Clin. Psychol. Rev.* 27:155–72
- McNally RJ. 2001. Vulnerability to anxiety disorders in adulthood. In *Vulnerability to Psychopathology: Risk Across the Lifespan*, ed. RE Ingram, JM Price, pp. 304–21. New York: Guilford
- Mendlewicz J, Papadimitriou G, Wilmotte J. 1993. Family study of panic disorder: comparison with generalized anxiety disorder, major depression and normal subjects. *Psychiatr. Genet.* 3:73–78
- Menzies RG, Clarke JC. 1995. The etiology of phobias: a nonassociative account. *Clin. Psychol. Rev.* 15:23–48

- Merckelbach H, Muris P, Schouten E. 1996. Pathways to fear in spider phobic children. *Behav. Res. Ther.* 34:935-38
- Mifsud C, Rapee RM. 2005. Early intervention for childhood anxiety in a school setting: outcomes for an economically disadvantaged population. *J. Am. Acad. Child Adolesc. Psychiatry* 44:996-1004
- Miller LD. 2008. Facing fears: the feasibility of anxiety universal prevention efforts with children and adolescents. *Cogn. Behav. Pract.* 15:28-35
- Mineka S, Zinbarg R. 2006. A contemporary learning theory perspective on the etiology of anxiety disorders: It's not what you thought it was. *Am. Psychol.* 61:10-26
- Moore PS, Whaley SE, Sigman M. 2004. Interactions between mothers and children: impacts of maternal and child anxiety. *J. Abnorm. Psychol.* 113:471-76
- Moradi AR, Neshat-Doost HT, Taghavi R, Yule W, Dalgleish T. 1999. Performance of children of adults with PTSD on the Stroop color-naming task: a preliminary study. *J. Trauma. Stress* 12:663-71
- Muris P, Bodden D, Merckelbach H, Ollendick TH, King NJ. 2003. Fear of the beast: a prospective study on the effects of negative information on childhood fear. *Behav. Res. Ther.* 41:195-208
- Muris P, Meesters C, van Melick M. 2002. Treatment of childhood anxiety disorders: a preliminary comparison between cognitive-behavioral group therapy and a psychological placebo intervention. *J. Behav. Ther. Exp. Psychiatry* 33:143-58
- Muris P, Merckelbach H, Collaris R. 1997. Common childhood fears and their origins. *Behav. Res. Ther.* 35:929-37
- Muris P, Merckelbach H, Gadget B, Moulaert V, Tierney S. 1999. Sensitivity for treatment effects of the screen for child anxiety-related emotional disorders. *J. Psychopathol. Behav. Assess.* 21:323-35
- Muris P, Steerneman P, Merckelbach H, Meesters C. 1996. The role of parental fearfulness and modelling in children's fear. *Behav. Res. Ther.* 34:265-68
- Murray L, de Rosnay M, Pearson J, Sack C, Schofield E, et al. 2008. Intergenerational transmission of social anxiety: the role of social referencing processes in infancy. *Child Dev.* 79:1049-64
- Murthy R. 2007. Mass violence and mental health—recent epidemiological findings. *Int. Rev. Psychiatry* 19:183-92
- Nauta MH, Scholing A, Emmelkamp PM, Minderaa RB. 2003. Cognitive-behavioral therapy for children with anxiety disorders in a clinical setting: no additional effect of cognitive parent training. *J. Am. Acad. Child Adolesc. Psychiatry* 42:1270-78
- Oei TPS, Loveday WAL. 1997. Management of comorbid anxiety and alcohol disorders: parallel treatment of disorders. *Drug Alcohol Rev.* 16:261-74
- Ost LG. 1987. Age of onset in different phobias. *J. Abnorm. Psychol.* 96:223-29
- Perez RG, Ascaso LE, Massons JMD, Caparro NO. 1998. Characteristics of the subject and interview influencing the test-retest reliability of the Diagnostic Interview Schedule for Children and Adolescents-Revised. *J. Child Psychol. Psychiatry Allied Discipl.* 39
- Perez-Edgar K, Fox NA. 2005. Temperament and anxiety disorders. *Child Adolesc. Psychiatr. Clin. N. Am.* 14:681-706
- Phillips NK, Hammen CL, Brennan PA, Najman JM, Bor W. 2005. Early adversity and the prospective prediction of depressive and anxiety disorders in adolescents. *J. Abnorm. Child Psychol.* 33:13-24
- Pine DS, Cohen JA. 2002. Trauma in children and adolescents: risk and treatment of psychiatric sequelae. *Biol. Psychiatry* 51:519-31
- Pine DS, Cohen P, Gurley D, Brook J, Ma Y. 1998. The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. *Arch. Gen. Psychiatry* 55:56-64
- Poulton R, Davies S, Menzies RG, Langley J, Silva PA. 1998. Evidence for a nonassociative model of the acquisition of a fear of heights. *Behav. Res. Ther.* 36:537-44
- Poulton R, Milne BJ, Craske MG, Menzies RG. 2001. A longitudinal study of the etiology of separation anxiety. *Behav. Res. Ther.* 39:1395-410
- Prins PJ, Ollendick TH. 2003. Cognitive change and enhanced coping: missing mediational links in cognitive behavior therapy with anxiety-disordered children. *Clin. Child Fam. Psychol. Rev.* 6:87-105
- Prior M, Smart D, Sanson A, Oberklaid F. 2000. Does shy-inhibited temperament in childhood lead to anxiety problems in adolescence? *J. Am. Acad. Child Adolesc. Psychiatry* 39:461-68

- Pynoos RS, Steinberg AM, Piacentini JC. 1999. A developmental psychopathology model of childhood traumatic stress and intersection with anxiety disorders. *Biol. Psychiatry* 46:1542–54
- Rapee RM. 1991. Generalized anxiety disorder: a review of clinical features and theoretical concepts. *Clin. Psychol. Rev.* 11:419–40
- Rapee RM. 1997. Potential role of childrearing practices in the development of anxiety and depression. *Clin. Psychol. Rev.* 17:47–67
- Rapee RM. 2000. Group treatment of children with anxiety disorders: outcome and predictors of treatment response. *Aust. J. Psychol.* 52:125–29
- Rapee RM. 2002. The development and modification of temperamental risk for anxiety disorders: prevention of a lifetime of anxiety? *Biol. Psychiatry* 52:947–57
- Rapee RM. 2003. The influence of comorbidity on treatment outcome for children and adolescents with anxiety disorders. *Behav. Res. Ther.* 41:105–12
- Rapee RM. 2008. Prevention of mental disorders: promises, limitations, and barriers. *Cogn. Behav. Pract.* 15:47–52
- Rapee RM, Abbott M, Lyneham H. 2006a. Bibliotherapy for children with anxiety disorders using written materials for parents: a randomized controlled trial. *J. Consult. Clin. Psychol.* 74:436–44
- Rapee RM, Barrett PM, Dadds MR, Evans L. 1994. Reliability of the DSM-III-R childhood anxiety disorders using structured interview: interrater and parent-child agreement. *J. Am. Acad. Child Adolesc. Psychiatry* 33:984–92
- Rapee RM, Kennedy S, Ingram M, Edwards SL, Sweeney L. 2005. Prevention and early intervention of anxiety disorders in inhibited preschool children. *J. Consult. Clin. Psychol.* 73:488–97
- Rapee RM, Lyneham HJ, Schniering CA, Wuthrich V, Abbott MA, et al. 2006b. *The Cool Kids® Child and Adolescent Anxiety Program Therapist Manual*. Sydney: Cent. Emot. Health, Macquarie Univ.
- Rapee RM, Spence SH. 2004. The etiology of social phobia: empirical evidence and an initial model. *Clin. Psychol. Rev.* 24:737–67
- Rapee RM, Szollos AA. 2003. Developmental antecedents of clinical anxiety in childhood. *Behav. Change* 19:146–57
- Rapee RM, Wignall A, Hudson JL, Schniering CA. 2000. *Treating Anxious Children and Adolescents: An Evidence-Based Approach*. Oakland, CA: New Harbinger
- Robinson JL, Kagan J, Reznick JS, Corley R. 1992. The heritability of inhibited and uninhibited behavior: a twin study. *Dev. Psychol.* 28:1030–37
- Rothbart MK. 2007. Temperament, development, and personality. *Curr. Dir. Psychol. Sci.* 16:207–12
- Roza SJ, Hofstra MB, Van Der Ende J, Verhulst FC. 2003. Stable prediction of mood and anxiety disorders based on behavioral and emotional problems in childhood: a 14-year follow-up during childhood, adolescence, and young adulthood. *Am. J. Psychiatry* 160:2116–21
- Rubin KH, Burgess KB, Hastings PD. 2002. Stability and social-behavioral consequences of toddlers' inhibited temperament and parenting behaviors. *Child Dev.* 73:483–95
- Rubin KH, Mills RSL. 1991. Conceptualizing developmental pathways to internalizing disorders in childhood. *Can. J. Behav. Sci.* 23:300–17
- Rubin KH, Nelson LJ, Hastings P, Asendorpf J. 1999. The transaction between parents' perceptions of their children's shyness and their parenting styles. *Int. J. Behav. Dev.* 23:937–57
- Sanson A, Pedlow R, Cann W, Prior M, Oberklaid F. 1996. Shyness ratings: stability and correlates in early childhood. *Int. J. Behav. Dev.* 19:705–24
- Schneider S, Unnewehr S, Florin I, Margraf J. 2002. Priming panic interpretations in children of patients with panic disorder. *Anxiety Disord.* 16:605–24
- Schniering CA, Hudson JL, Rapee RM. 2000. Issues in the diagnosis and assessment of anxiety disorders in children and adolescents. *Clin. Psychol. Rev.* 20:453–78
- Schniering CA, Rapee R. 2007. Improved treatment of comorbid anxiety and depression in adolescents: preliminary data from a randomized controlled trial. *Presented at World Cong. Behav. Cogn. Ther.*, Barcelona
- Schwab-Stone M, Fallon T, Briggs M, Crowther B. 1994. Reliability of diagnostic reporting for children aged 6–11 years: a test of the Diagnostic Interview Schedule for Children-Revised. *Am. J. Psychiatry* 151:1048–54

- Schwartz CE, Snidman N, Kagan J. 1999. Adolescent social anxiety as an outcome of inhibited temperament in childhood. *J. Am. Acad. Child Adolesc. Psychiatry* 38:1008–15
- Seligman LD, Ollendick TH, Langley AK, Baldacci HB. 2004. The utility of measures of child and adolescent anxiety: a meta-analytic review of the Revised Children's Manifest Anxiety Scale, the State-Trait Anxiety Inventory for Children, and the Child Behavior Checklist. *J. Clin. Child Adolesc. Psychol.* 33:557–65
- Shaffer D, Fisher P, Dulcan MK, Davies M, Piacentini J, et al. 1996. The NIMH diagnostic interview schedule for children version 2.3 (DISC-2.3): description, acceptability, prevalence rates, and performance in the MECA study. *J. Am. Acad. Child Adolesc. Psychiatry* 35(7):865–77
- Shirk SR, Karver M. 2003. Prediction of treatment outcome from relationship variables in child and adolescent therapy: a meta-analytic review. *J. Consult. Clin. Psychol.* 71:452–64
- Shortt AL, Barrett PM, Fox TL. 2001. Evaluating the FRIENDS program: a cognitive-behavioral group treatment for anxious children and their parents. *J. Clin. Child Psychol.* 30:525–35
- Silverman WK, Kurtines WM, Ginsburg GS, Weems CF, Lumpkin PW, Carmichael DH. 1999a. Treating anxiety disorders in children with group cognitive-behavior therapy: a randomized clinical trial. *J. Consult. Clin. Psychol.* 67:995–1003
- Silverman WK, Kurtines WM, Ginsburg GS, Weems CF, Rabian B, Serafini LT. 1999b. Contingency management, self-control, and education support in the treatment of childhood phobic disorders: a randomized clinical trial. *J. Consult. Clin. Psychol.* 67:675–87
- Spence SH, Donovan C, Brechman-Toussaint M. 2000. The treatment of childhood social phobia: the effectiveness of a social skills training-based, cognitive-behavioural intervention, with and without parental involvement. *J. Child Psychol. Psychiatry* 41:713–26
- Spence SH, Holmes JM, March S, Ottmar VL. 2006. The feasibility and outcome of clinic plus internet delivery of cognitive-behavior therapy for childhood anxiety. *J. Consult. Clin. Psychol.* 74:614–21
- Stein MB, Chartier MJ, Hazen AL, Kozak MV, Tancer ME, et al. 1998. A direct-interview family study of generalized social phobia. *Am. J. Psychiatry* 155:90–97
- Stevenson J, Batten N, Cherner M. 1992. Fears and fearfulness in children and adolescents: a genetic analysis of twin data. *J. Child Psychol. Psychiatry* 33(6):977–85
- Storch EA, Masia-Warner C. 2004. The relationship of peer victimization to social anxiety and loneliness in adolescent females. *J. Adolesc.* 27:351–62
- Strauss CC, Frame CL, Forehand R. 1987. Psychosocial impairment associated with anxiety in children. *J. Clin. Child Psychol.* 16:235–39
- Strauss CC, Lease CA, Kazdin AE, Dulcan MK, Last CG. 1989. Multimethod assessment of the social competence of children with anxiety disorders. *J. Clin. Child Psychol.* 18:184–89
- ten Berge M, Veerkamp J, Hoogstraten J. 2002. The etiology of childhood dental fear: the role of dental and conditioning experiences. *J. Anxiety Disord.* 16:321–29
- Thapar A, McGuffin P. 1995. Are anxiety symptoms in childhood heritable? *J. Child Psychol. Psychiatry* 36:439–47
- Thienemann M, Moore P, Tompkins K. 2006. A parent-only group intervention for children with anxiety disorders: pilot study. *J. Am. Acad. Child Adolesc. Psychiatry* 45:37–46
- Thomas A, Chess S. 1977. *Temperament and Development*. New York: Brunner/Mazel
- Tiet QQ, Bird HR, Hoven CW, Moore R, Wu P, et al. 2001. Relationship between specific adverse life events and psychiatric disorders. *J. Abnorm. Child Psychol.* 29:153–64
- Topolski TD, Hewitt JK, Eaves LJ, Silberg JL, Meyer JM, et al. 1997. Genetic and environmental influences on child reports of manifest anxiety and symptoms of separation anxiety and overanxious disorders: a community-based twin study. *Behav. Genet.* 27(1):15–28
- Townend E, Dimigen G, Fung D. 2000. A clinical study of child dental anxiety. *Behav. Res. Ther.* 38:31–46
- Treadwell KR, Flannery-Schroeder E, Kendall PC. 1995. Ethnicity and gender in relation to adaptive functioning, diagnostic status, and treatment outcome in children from an anxiety clinic. *J. Anxiety Disord.* 9:373–84
- Treadwell KR, Kendall PC. 1996. Self-talk in youth with anxiety disorders: States of mind, content specificity, and treatment outcome. *J. Consult. Clin. Psychol.* 64:941–50
- Turner SM, Beidel DC, Wolff PL. 1996. Is behavioral inhibition related to the anxiety disorders? *Clin. Psychol. Rev.* 16:157–72

- Vasey MW, Daleiden EL, Williams LL, Brown LM. 1995. Biased attention in childhood anxiety disorders: a preliminary study. *J. Abnorm. Child Psychol.* 23:267–79
- Waters AM, Craske MG, Bergman R, Treanor M. 2008. Threat interpretation bias as a vulnerability factor in childhood anxiety disorders. *Behav. Res. Ther.* 46:39–47
- Weisz JR, Suwanlert S, Chaiyasit W, Weiss B, Walter BR, Anderson WW. 1988. Thai and American perspectives on over- and undercontrolled child behavior problems: exploring the threshold model among parents, teachers, and psychologists. *J. Consult. Clin. Psychol.* 56:601–9
- Williams SL. 1996. Therapeutic changes in phobic behavior are mediated by changes in perceived self efficacy. In *Current Controversies in the Anxiety Disorders*, ed. RM Rapee, pp. 344–68. New York: Guilford
- Windle M, Lerner RM. 1986. Reassessing the dimensions of temperamental individuality across the lifespan: the Revised Dimensions of Temperament Survey (DOTS-R). *J. Adolesc. Res.* 1:213–30
- Wood JJ, McLeod BD, Sigman M, Hwang W, Chu BC. 2003. Parenting and childhood anxiety: theory, empirical findings, and future directions. *J. Child Psychol. Psychiatry* 44:134–51
- Wood JJ, Piacentini J, Southam-Gerow M, Chu BC, Sigman M. 2006. Family cognitive behavioral therapy for child anxiety disorders. *J. Am. Acad. Child Adolesc. Psychiatry* 45:314–21
- Xue Y, Leventhal T, Brooks-Gunn J, Earls FJ. 2005. Neighborhood residence and mental health problems of 5- to 11-year-olds. *Arch. Gen. Psychiatry* 62:554–63
- Yule W, Udwin O, Murdoch K. 1990. The “Jupiter” sinking: effects in children’s fears, depression and anxiety. *J. Child Psychol. Psychiatry* 31:1051–61



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