

The impact of an Experimental Manipulation of Maternal Involvement on Children's
Anxiety and Avoidant Behaviours

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Abstract

Background: There is a growing body of literature supporting the association between maternal overinvolvement and child anxiety. Theory also suggests that perceived control in children acts as a mediator between overinvolvement and child anxiety. To date, only two experimental manipulation studies have sought to establish causal links in this relationship. This study aimed to establish whether firstly, maternal overinvolvement induces child anxiety and avoidant behaviour, and secondly, whether a child's perceived control mediates this relationship.

Method: This study used an experimental repeated-measures design. 38 children aged 8-11 years completed difficult tangram puzzles, in both a high involvement and low involvement condition. Mothers were instructed on how much involvement to give in each condition. Dependent variables were self-report anxiety and perceived control, and observed avoidant behaviour.

Results: Contrary to the research hypotheses, children showed significantly lower levels of avoidance in the high involvement condition than in the low involvement condition. There was a trend towards a significantly lower level of self-report anxiety in the high involvement condition. Children reported significantly lower levels of perceived control in the high involvement condition, although this was not related to increased anxiety or avoidance.

Conclusions: The results do not support models that propose overinvolvement causes child anxiety. A mediational model between perceived control, parental overinvolvement and child anxiety was unable to be tested due to the contrary findings. Methodological limitations were identified and areas for future research suggested.

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CHAPTER 1

Introduction

1.1 General Introduction

Anxiety disorders in children are amongst the most prevalent form of childhood psychopathology, with life time prevalence rates of 28.8% (Kessler, Berglund, Demler, Jin, & Walters, 2005). Anxiety disorders in children and adults can cause high levels of interference and impairment in quality of life, and can specifically cause social and academic impairments. A number of theoretical models have contributed to our understanding of anxiety, including genetic, cognitive and behavioural models. Of particular interest to this thesis is the influence of the environment in the development and maintenance of anxiety. Through increasing our knowledge of such influences, we can help to improve treatment approaches, as research suggests that treatment is currently only successful for approximately 55% of children treated (Cartwright-Hatton, Roberts, Chitsabesan, Fothergill & Harrington, 2004; Waters, Ford, Wharton & Cobham, 2009). A number of theories have been developed including the influence of parental anxiety, modelling of anxious behaviour, and the influence of parental rearing styles on children's anxiety. Numerous studies have provided evidence to suggest that parental control or overinvolved parenting is related to child anxiety. However, because of the methods employed in these studies, the authors have been unable to establish a causal role for overinvolved parenting in the development of child anxiety, and only two experimental manipulation studies have been identified in this thesis. Chorpita, Barlow and Brown (1998) have proposed a model whereby children's level of perceived control acts as a mediator between parental overinvolvement and child anxiety, however little research has investigated this relationship. The present study therefore aims to contribute to the research by experimentally manipulating maternal involvement to investigate whether an overinvolved parenting style leads to increased anxiety in children, and whether support can be found for

Chorpita, Brown and Barlow's (1998) model that proposes this relationship, is mediated by perceived control in children.

This introduction begins with an overview of childhood anxiety, including prevalence, co-morbidity, impairment, prognosis and current treatment approaches. This is followed by an overview of the main theoretical approaches to childhood anxiety, including genetic, behavioural and cognitive approaches. The chapter then moves on to focus on the influence of the environment, with an emphasis on theories of parental rearing styles in childhood anxiety. Evidence for the influence of parental overinvolvement in childhood anxiety is reviewed, critiqued and summarised, before research aims, rationale and hypotheses are presented.

1.2 Childhood Anxiety

1.2.1 Anxiety, Fear and worry in Normal Development

The terms 'anxiety', 'fear' and 'worry' are often used inter-changeably and for many years researchers have struggled to elucidate distinctions between these constructs. Anxiety is a complex phenomenon, and the use of the term 'anxiety' can be confusing and misunderstood. Clark and Beck (2010) state that for those theories of anxiety which offer guidance for research and treatment, definitions of 'fear' and 'anxiety' should be clearly distinguished. The authors offer two distinct definitions of 'fear' and 'anxiety'. They define fear as "a primitive automatic neurophysiological state of alarm involving the cognitive appraisal of imminent threat or danger to the safety and security of an individual". Anxiety is defined as "a complex cognitive, affective, psychological, and behavioural response system (i.e. threat mode) that is activated when the anticipated events or circumstances are deemed to be highly aversive because they are perceived as unpredictable, uncontrollable events that could potentially threaten the vital interests of an individual" (Clark & Beck, 2005, p. 5).

Fear is a natural and adaptive human response to a perceived danger or threat, which prepares us for defensive action (Beck & Greenberg, 1988). Specific fears are a normal part of development and are particularly common in childhood. Ollendick, King and Frary (1989) reported an average of 14 fears per child in a sample of Australian and American children and adolescents aged 7 to 17 years old. In a sample of 4 to 12 year-old children, Muris, Mercklebach, Gadet and Moulaert (2000) found that 75.8% of children reported fears, which were most commonly found in girls, and in children aged between 7 and 9 years. In some children, fear and anxiety can become excessive and cause significant impairment.

Worry has been defined as a cognitive process characterized by negative thoughts or images related to potential threat or danger (Borkovec, 1985). Worry has been viewed as the cognitive component of anxiety (e.g. Vasey, 1993; Vasey & Daleiden, 1994). Worry is common among children and in an early study, 70% of primary school aged children reported 10 or more events or objects that they were worried about (Orton, 1982). In another study, Silverman, La Greca and Wassterstein (1995) examined worry in school children aged 7 to 12 years. This study revealed few age-related differences, but they found that girls reported more worries than boys, and most commonly worries involved school, health and personal harm. Results showed that worry was significantly associated with anxiety, providing support for a link between these two constructs. In the Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR American Psychiatric Association, 2000) worry is a core feature of generalised anxiety disorder, but it also plays an important role in other anxiety disorders such as separation anxiety disorder and social phobia.

1.2.2 Childhood Anxiety Disorders

The DSM-IV (American Psychiatric Association, 2000) has identified six anxiety disorders in children: generalised anxiety disorder (GAD), social anxiety disorder (social phobia), separation anxiety disorder (SAD), specific phobia, obsessive-compulsive disorder

(OCD), and posttraumatic stress disorder (PTSD), all of which have been shown to have a major impact on children's functioning.

1.2.3 Epidemiology

1.2.3.1 Prevalence. Anxiety disorders are the most widespread form of psychological disorder (Kessler et al., 2005). Early epidemiological studies reported that approximately 9% of pre-pubescent children (Costello, 1989) and 10.7% of adolescents (McGee et al., 1990) met diagnostic criteria for an anxiety disorder. In a more recent British national survey of a large sample of 10,438 children and adolescents, the prevalence of any anxiety disorder was 3.8% (Meltzer, Gatward, Goodman, & Ford, 1999). A longitudinal study in the United States of America assessed 1420 children aged 9 to 16 years and found 3-month prevalence rates of 2.4% for anxiety disorders (Costello, Mustillo, Erkanli, Keeler & Angold, 2003). They also calculated 9.9% of children will have met diagnostic criteria for an anxiety disorder by the time they are 16 years old. Cartwright-Hatton, McNicol and Doubleday (2006) conducted a review of the literature examining prevalence rates in pre-adolescent children, and found rates between 2.6% and 41.2% in the 11 studies examined. Overall, clear variations in prevalence rates have been found, some of which could be due to differences in diagnostic criteria, interview tools and study methodologies (Cartwright-Hatton, McNicol, & Doubleday, 2006; Lépine, 2002).

1.2.3.2 Comorbidity. Anxiety disorders in children and adolescents are highly co-morbid with other anxiety disorders, affective disorders and conduct problems. Kendall, Brady and Verduin (2001) reported that 49.7% of anxious children aged between 8 and 13 years had more than one anxiety disorder, 4.6% were diagnosed with co-morbid depression and 25.4% were diagnosed with co-morbid externalising disorders. Angold, Costello and Erkanli, (1999) reviewed 21 general population studies and found significant rates of co-morbidity between anxiety disorders and depression in children and adolescents, as well as

with attention deficit hyperactivity disorder (ADHD) and anxiety disorders, and conduct disorder/oppositional disorder and anxiety disorders.

Co-morbidity with anxiety disorders is important because co-morbid disorders may moderate treatment outcome (Berman, Weems, Silverman & Kurtines, 2000; Kendall et al., 2001) as well as causing significant further distress and difficulties for children.

1.2.3.3 Impairment. Children with anxiety disorders have a significant impairment to their quality of life (Massion, Warshaw & Keller, 1993) as well as social and academic impairment (Beidel & Turner, 2005; Wood, 2006). Essau, Conradt, and Petermann (2000) reported anxiety disorders in 18.6% of German adolescents aged 12 to 17 years, with a high majority of these adolescents being severely psychosocially impaired in their daily life and activities during their worst occurrence of anxiety. Anxiety problems in adolescence have also been associated with substance abuse (Eisen, Youngman, Grob, & Dill, 1992), school failure (Benjamin, Costello, & Warren, 1990; Goodyear & Altham, 1991) and suicidal behaviour (Rich, Sherman, & Fowler, 1990; Simonds, McMahon, & Armstrong, 1991).

1.2.3.4 Prognosis. Anxiety disorders appear to be stable and can persist for prolonged periods of time. Last, Perrin, Hersen and Kazdin (1996) found that at a 4 year follow up of children aged between 5 and 18 years, 82% of children were free from their intake anxiety disorders, but 30% of children had developed new psychiatric disorders, 16% of whom had developed a new anxiety disorder. This suggests that although a child's psychiatric picture might change over time, children diagnosed with anxiety disorders are at risk of developing other psychiatric problems throughout their childhood. In a naturalistic study, Keller et al. (1992) also found a low rate of recovery in children with anxiety disorders aged between 6 and 19 years. They estimated that 46% of anxiety disordered children would remain with a clinical diagnosis for at least 8 years, supporting the notion that anxiety in children may be chronic in nature.

Retrospective evidence from adults suggests that many anxious adults report their anxiety to have originated in childhood (Rapee & Barlow, 1993). Pine, Cohen, Gurley, Brook and Ma (1998) found that an anxiety disorder during adolescence, presents a two to threefold increased risk for recurrent anxiety during early adulthood. In a nationally representative survey, the median age of onset for anxiety disorders was 9 years old (Kessler et al., 2005).

1.2.4 Treatment Approaches

In light of the prevalence rates and the negative consequences of anxiety disorders, in recent years there has been an increase in research into the treatment of anxiety disorders for children and adolescents. The majority of research trials carried out have used Cognitive Behaviour Therapy (CBT), a treatment informed by principles of behavioural and cognitive theories. The focus on CBT as the main form of treatment is due to its success in treating adults with a range of disorders, although some authors have cast doubt on whether children have the intellectual capacity and maturity to use CBT, without major modifications (Grave & Blissett, 2004). Yet in a review of the literature of treatment outcomes of CBT for a wide range of disorders, the authors found large effect sizes for both adult and childhood anxiety disorders (Butler, Chapman, Forman, & Beck, 2006). The treatment for children using CBT is very similar to that of adults, and children are required to work with a therapist, using generic CBT techniques, such as thought challenging and exposure to anxiety provoking situations. It has therefore been important that such treatment outcomes in children are assessed in order to establish whether CBT is an effective intervention for use with children.

Cartwright-Hatton et al. (2004) reviewed the effectiveness of CBT as a treatment for anxiety disorders in children and adolescents under 19 years old. Their review included 10 of the first randomised controlled trials of CBT. Overall, the remission rate for those in the CBT group was 56%, compared with 34.8% in the control groups, yet whilst many children

benefited from CBT, over a third of these children maintained an anxiety disorder diagnosis at the end of treatment. This review suggests that there is still room for improvement in treatment, and due to the increasing understanding of the influence of the family in the development and maintenance of anxiety disorders (Bogels, & Brechman-Toussaint, 2006; Wood, McLoed, Sigman, Hwang, & Chu, 2003) much of the recent treatment research has examined the efficacy of family-based CBT (FCBT). In a review of this research, Creswell and Cartwright-Hatton (2007) were able to draw few firm conclusions. Overall, FCBT was better than no treatment at all, however it was less clear whether it was better than CBT with the child only. In circumstances where diagnostic tools were used, there was a trend towards FCBT being superior to child CBT.

In a more recent study, Waters et al. (2009), compared the efficacy of a group based CBT (GBGT) delivered exclusively to parents of young anxious children (aged 4 to 8 years) with the same group intervention delivered to both children and parents, relative to a waitlist control group. Both treatments were superior to the waitlist condition with 55.3% of children in the parent only group and 54.8% of children in the parent and child group no longer meeting criteria for their initial intake anxiety disorder diagnosis. This was maintained in both groups at 6 month and 12 month follow up. However, this study has a number of limitations. It may not have had the power to detect differences between the active treatments, due to a relatively small sample size. Additionally, the follow-up interviews were conducted by the therapist who was the primary facilitator in both treatment groups, and therefore results may have been subject to bias.

Overall, the research seems mixed, and although the majority of studies have found CBT or FCBT to be superior to no treatment at all, the highest rate of remission reported was 56%, which still leaves almost half of children treated with their initial intake diagnosis. The components of FCBT also varied between studies, including; treatments devised to parallel

the child CBT, behaviour management, interventions to help parent's manage their own emotions and model positive responses to anxiety, interventions to modify parental cognitions, and those aimed at improving family communications. Such studies are therefore difficult to compare and these variations might explain some of the inconsistencies in the research. The lack of a coherent model of how parental factors might contribute to the aetiology and maintenance of child anxiety might also explain some of the inconsistencies within the research. One strategy of improving the efficacy of treatments for childhood anxiety is to develop the specific models to provide a more coherent picture of parental influences. In particular, this thesis aims to contribute to models of parental rearing and child anxiety, in an attempt to further support the research examining the relationship between overinvolved / controlling parental styles and child anxiety, and to attempt to ascertain the direction of effects.

1.3 Theoretical Approaches

A number of theories and models have been used to explain the aetiology and maintenance of childhood anxiety disorders. In this section, genetic, temperamental, cognitive, and behavioural models will be discussed. This will be followed by the presentation of environmental influences in section 1.4.

1.3.1 Genetic Influences

Genetic components of anxiety are probably the most widely studied. There are three main types of behavioural genetic studies within the literature; family studies, twin studies and adoption studies. Family studies look at shared genetic influences between family members. The main limitation of family studies is that families also share an environment, therefore they are unable to distinguish between whether a similarity between family members is due to genetic influences or shared family environment (Eley & Lau, 2005). Twin studies allow researchers to investigate similarities and differences between

monozygotic (MZ) twins, who share all of their genes and environment, and dizygotic (DZ) twins, who share approximately half of their genes and all of their environment. Estimates of heritability are worked out by the differences in correlations between MZ and DZ twins, as genetic influences are assumed to lead to greater similarity in MZ compared with DZ twins. However, twin studies are also limited by the equal environment assumption, which proposes that DZ and MZ twins share an environment to the same degree. However, this assumption has been questioned with the suggestion that the physical similarities between MZ twins leads them to be treated more similarly than DZ twins (Gregory & Eley, 2007). Eley and Lau (2005) state that the best way to validate data from twin and family studies is to utilise adoption studies. In adoption studies, it is assumed that similarities between adopted families are due to a shared environment, whereas similarities between the adopted child and their biological parents are related to genetic influences. This data is said to allow for direct estimates of genetic and shared environment influences (Eley & Lau, 2005). However, all of these studies have been criticised for their lack of generalisability, as twin and adopted families may not be entirely representative of the population as a whole.

A number of family studies have attempted to investigate familial influences. Last, Hersen, Kazdin, Orvaschel and Perrin (1991) assessed first- and second-degree relatives of children with anxiety disorders, and found that relatives of anxiety disordered children showed a higher prevalence of anxiety disorders than relatives of non-clinical children. In a review of such studies, Hettema, Neale and Kendler (2001) reported findings from seven family studies, all of which reported significant associations between panic disorder and generalised anxiety disorder in the participants, and in their first degree relatives.

Recently, most studies have utilised twin samples. In large population-based twin studies, genetics have been found to account for approximately 30-40% of the variance in anxious symptomatology and disorders (Kendler, Neale, Kessler, Heath & Eaves, 1992a,

1992b, 1993). In a review of family and twin studies by Hettema et al. (2001), estimated heritabilities across the anxiety disorders were also found to be within the range of 30-40%. Evidence has been found for the heritability of both symptoms of anxiety (Thapar & McGuffin, 1995; Topolski et al. 1997) and anxiety disorders (Bolton et al., 2006) in studies using twin children. Thapar and McGuffin (1995) found anxiety symptoms in childhood to be genetically heritable when rated by parents, accounting for 59% of the variance. However, when self-rated symptoms were considered, transmission was best explained by shared environmental factors, these accounting for 55% of the variance. Authors report that these results suggest that parents and twins are rating aetiologically different constructs. Although genetic factors have been found to account for some of the variance in anxious symptomatology and disorder, environmental factors may play an equally important role in the development and maintenance of anxiety in children. In a recent review of the literature on genetic influences on anxiety in children, Gregory and Eley (2007) concluded that environmental factors are at least of equal importance to genetic factors.

1.3.2 Temperament and anxiety

Temperament and personality factors have been implicated in the development of anxiety disorders. Clark and Watson (1991) proposed a tripartite model of anxiety and depression, which states that both anxiety and depression consist of a general 'distress factor' that is shared by both disorders, defined as the temperamental core of negative affectivity or neuroticism. The model proposed three factors said to account for the relation of anxiety and depression; positive affect (PA), negative affect (NA) and physiological hyperarousal (PH). Depression is said to have a distinctive factor characterised by low PA, whereas anxiety has a distinctive factor characterised by high PH. NA is a common factor for both depression and anxiety.

The concept of behavioural inhibition (BI) has been implicated as a temperamental variable which provides a vulnerability to anxiety. It has been described as the consistent tendency to display fear and withdrawal in situations that are novel or unfamiliar (Rosenbaum et al., 2000). Behaviourally inhibited children are said to be easily aroused and distressed as infants, shy and fearful as toddlers, shy in unfamiliar environments and with strangers as pre-schoolers, and introverted, quiet and cautious at school (Kagan, 1994). Kagan (1994) reported that in children, behavioural inhibition develops as a result of exposure to unfamiliar objects, people and stressful situations. BI is displayed in approximately 15% of typically developing children (Fox, Henderson, Marshall, Nichols, & Ghera, 2005). Behavioural inhibition is measured by behavioural criteria, such as proximity to parents, and verbal displays of distress and physiological dimensions, including heart rate and its variability, blood pressure, muscle tension and pupil dilation (Kagan, Reznick, Snidman, Gibbons, & Johnson, 1988).

A growing number of studies have suggested that behavioural inhibition is often an antecedent to anxiety disorders in children. In a series of longitudinal studies, Biederman and colleagues (Biederman et al., 1993; Biederman, Rosenbaum, Hirshfield, & Faraone, 1990) assessed behavioural inhibition in high-risk children of parents with panic disorder with agoraphobia. They compared these children with children of parents with other psychiatric diagnoses, with a sample of inhibited and uninhibited children from an original series of longitudinal studies by Kagan and colleagues (Kagan, Reznick, & Gibbons, 1989; Kagan, Reznick, & Snidman, 1987; Kagan et al., 1988) and with a paediatric outpatient control group. Biederman et al. (1990) found non clinical behaviourally inhibited children to display higher rates of phobias and lower rates of oppositional defiant disorders than uninhibited children. Behaviourally inhibited children who had parents with panic disorder and agoraphobia had increased risk for multiple anxiety, overanxious, and phobic disorders. In a 3-year follow-up

study, similar results were found; inhibited children were found to have higher rates of multiple psychiatric disorders, multiple anxiety disorders, avoidant disorder, separation anxiety disorder and agoraphobia, compared to uninhibited children (Biederman et al., 1993). In a more recent study, Biederman et al. (2001) assessed behavioural inhibition through observing groups of children. The authors found that behavioural inhibition in children was exclusively associated with increased risk for avoidant disorder and social phobia.

1.3.3 Cognitive Models

Anxiety is said to involve the selective processing of information perceived as signifying a threat or danger to one's personal safety or security (Beck, Emery & Greenberg, 1985). Information processing theories explain these distorted beliefs in anxiety to have developed from a selective bias for threatening information. There is strong experimental evidence that attentional bias (Bradley, Mogg, & Williams, 1995; McNally, 1996; Williams, Mathews, & MacLeod, 1996) and interpretation bias is increased in anxious adults and children (Hadwin, Frost, French, & Richards, 1997; Taghavi, Moradi, Neshat-Doost, Yule, & Dalgleigh, 1999). Anxious individuals also show an overestimated perception of danger (Beck & Clark, 1997). This, in turn, inflates their appraisal of risk, increasing the possibility of an unpleasant outcome in their mind, therefore guiding their judgement (Stober, 1997). In addition anxious individuals underestimate their own coping abilities and resources.

These causal relationships are robust in adults and there has been increasing interest in evaluating their applicability to children and adolescents. A number of studies have demonstrated attentional biases and interpretation biases in anxious children (e.g. Barrett, Rapee, Dadds, & Ryan, 1996; Hadwin et al., 1997; Muris, Merckelbach, & Damsma, 2000; Taghavi et al., 1999). For example, a study by Taghavi et al. (1999) compared the interpretations of clinically anxious and non-clinical children aged 9 to 16 years. Children had to construct a sentence using ambiguous homographs, which had a threatening and a

neutral meaning, presented to children on cards. As predicted, clinically anxious children showed a significantly increased tendency to construct sentences using the threatening interpretation than non-clinical children. Similarly, Muris, Merckelbach, Schepers and Meesters (2003) found that when asked to interpret ambiguous, ambiguous and anxiety response, and unthreatening stories, Dutch children aged 8 to 13 years with high levels of anxiety symptoms were accompanied by enhanced threat perception in response to external threat cues, including high ratings of threat, a higher frequency of threatening interpretations, and an early detection of threat.

In a review of the research, Vasa and Pine (2004) concluded that the majority of findings support a strong link between information processing abnormalities in anxious children. They also conclude that anxious children have been found to; disproportionately favour more threatening interpretations of ambiguous situations, to display a bias toward threatening stimulus materials, and have a preference for a more maladaptive coping response.

1.3.4 Behavioural Models

Behavioural models suggest that all human and animal behaviour is learned. Operant conditioning is a process by which we learn through reinforcement and punishment, where people play an active role in obtaining rewards or avoiding punishments for themselves (Skinner, 1953). Operant conditioning has been said to be one of the major mechanisms through which various risk and protective factors impact on the development and maintenance of childhood anxiety disorders (Ollendick, Vasey & King, 2001). Traditional conditioning theorists (Mowrer, 1939; Pavlov, 1927; Skinner, 1953) state that fears are conditioned when a neutral stimulus becomes associated with anxiety, and are then maintained through operant conditioning, such as positive or negative reinforcement. For example, when neutral stimuli are associated with a fear or negative state, they become fear conditioned stimuli (CS). It is proposed that the strength of the fear is determined by the

amount of repetitions between the fear experience and the stimuli, and by the intensity of the fear experienced when associated with the stimuli. Behaviours that successfully reduce the fear, such as avoidance, are negatively reinforced and increase in strength. This theory has been supported by a number of animal studies, where researchers were able to generate fear in animals by pairing neutral and aversive stimuli, such as an electric shock (for reviews see Broadhurst, 1972; Wolpe, 1968). The most famous experiment of its kind was developed by Watson and Rayner (1920) known as the “Little Albert” experiment. “Little Albert” acquired a fear of a rat, following a series of trials where Albert experienced the pairing of a loud noise (UCS) every time the rat approached him or he touched the rat. However, attempts to replicate the “Little Albert” study by conditioning fear in animals and humans in laboratory settings have largely been unsuccessful (Bregman, 1934; English, 1929).

Traditional conditioning theory has been criticised for being unable to account for the onset and course of anxiety disorders (Ollendick et al., 2001), and that they can only be acquired by direct processes. Such criticisms led Rachman (1977) to propose that three key pathways were linked to fear acquisition; traumatic conditioning, vicarious or observational learning and negative information. Rachman (1977) stated that any of the three pathways to fear, either alone or in combination, can lead to fear acquisition. In particular, Rachman (1977) emphasized the importance of indirect, vicarious acquisition of fears through observational learning, such as modelling. For example, children will learn to associate a situation with anxiety through observing their parents’ responses, but will also learn to use avoidance to cope with anxiety by observing that their parents’ avoidant behaviour is being reinforced by reductions in anxiety. Mineka and Zinbarg (1995) reviewed the experimental data with humans and concluded that there was only anecdotal evidence that strong and persistent fear can develop through vicarious conditioning. They concluded that much stronger empirical evidence has been found in animal research. For example, Mineka and

colleagues demonstrated that Rhesus monkeys reared in laboratories could be conditioned to develop a fear of snakes through observing fear responses in wild-reared monkey's to real, toy and model snakes (e.g., Mineka, Davidson, Cook, & Keir, 1984).

In recent years, research has concentrated on investigating the influence of the family on children's anxiety, particularly related to the effect of modelling and parenting styles on children's anxiety. Family influences on childhood anxiety will now be reviewed in detail.

1.4 Family Influences on Childhood Anxiety

Evidence from family studies suggest that the family environment plays an important role in the development and maintenance of anxiety disorders (Hudson & Rapee, 2004). In support of this, behavioural genetic studies have suggested that shared environment accounts for a significant amount of the variance in childhood anxiety symptoms and disorders (Gregory & Eley, 2007). A number of family variables are said to be important in the development of anxiety disorders in children including; parental anxiety, parental modelling of anxious behaviour, parental control, and parental rearing styles (Bögels & Brechman-Toussaint, 2006). Cobham, Dadds and Spence (1999) summarised a number of ways in which parents of anxious children may be involved in the development and maintenance of anxiety in children, these include; the reinforcement of anxious and avoidant responses, an absence of reinforcement of positive, brave and non-avoidant responses, modelling of an attentional bias to threat, reinforcement of attentional bias to threat, expectations of anxious and avoidant responses, and general restrictive and inconsistent parenting that might result in children developing low competence and a general bias to threat.

The following section focuses on parental influences on the development and maintenance of anxiety in greater detail.

1.4.1 Parental Anxiety and Modelling of Anxious Behaviour

Children are at more risk of developing an anxiety disorder if they have an anxious parent. Studies have consistently found children of parents with anxiety disorders to have higher rates of anxiety disorders themselves (Beidel & Turner, 1997; Biederman et al., 2006; Biederman, Rosenbaum, Bolduc, Faraone, & Hirshfeld 1991; Burstein, Ginsburg, & Tein, 2010; Merikangas, Dierker, & Szatmari, 1998; Turner, Beidel & Costello, 1987). One of the earliest studies by Turner et al. (1987) investigated familial factors in the offspring of parents with anxiety disorders by directly assessing the children. In a sample of 59 children aged between 7 and 12 years, results showed that children of parents with an anxiety disorder were seven times more likely to meet criteria for an anxiety disorder than children of non-clinical parents. Beidel and Turner (1997) examined 129 children of parents with an anxiety disorder, major depression, mixed anxiety and depression, and non-clinical controls. They found that children of parents with an anxiety disorder were five times more likely to have an anxiety disorder than children of parents with other clinical disorders.

Further support was found by McClure, Brennan, Hammen and Le Brocque (2001), who carried out structured clinical interviews, and administered parent report and child report questionnaires to assess relationships between parent and child anxiety disorders in 816 children aged 15 years. They found that maternal anxiety disorder significantly predicted the presence of anxiety disorders in children. Similarly, Burstein et al. (2010) found that parent anxiety symptoms were significantly related to child anxiety symptoms in 6 to 14 year olds, supporting previous research.

One study investigated whether parent anxiety and fearfulness was associated with their children's anxiety and fearfulness (Muris, Steerneman, Merckelbach, & Meesters, 1996). The sample consisted of 40 children aged 9 to 12 years who had been referred to an outpatient treatment centre. Children and parents completed anxiety and fear questionnaires.

Children's trait anxiety was positively associated with trait anxiety in mothers and fathers, children's fearfulness being only related to fearfulness in their mother.

The increased risk of developing an anxiety disorder if your parent is anxious appears to have both genetic and environmental factors (Gregory & Eley, 2007). Genetic factors are estimated to account for 30-40% (Hettema et al., 2001) of the variance, with environmental factors accounting for the remaining variance.

Parental modelling of anxious behaviour also plays an important role in anxiety in children. Ginsburg and Schlossberg (2002) suggest that high levels of anxiety in the parent are likely to interfere with the development of adaptive coping skills in parents, and might lead to specific parenting behaviours that are anxiety enhancing in the child. In turn, these parental behaviours are hypothesized to increase their child's vulnerability to developing an anxiety disorder. Ollendick and King (1991) tested Rachman's (1977) three pathways model in a retrospective self report study with adults. Participants attributed 56% of the onset of their fears to modelling, and only 36% to direct conditioning.

In a more recent observational study, Gerull and Rapee (2002) found that toddlers showed greater fear expressions and avoidance of novel fearful stimuli (rubber snake and spider) following the pairing of negative reactions toward the stimuli from their mothers. In a later similar study, Dubi, Rapee, Emerton and Schniering (2008) assessed maternal modelling of the acquisition of fear and avoidance towards both fear-relevant and fear-irrelevant novel stimuli. Their results demonstrated that toddlers showed increased fear to both fear-relevant and fear-irrelevant stimuli following the pairing of fearful reactions from mothers towards those stimuli, when compared to positive reactions. Modelling of fear reactions were found even in children that did not have a shy or anxious temperament. In another study, children aged 8 to 12 years whose parents modelled a more anxious response to a child's future

spelling test showed higher levels of anxiety, more desire to avoid the test, and generally more anxious cognitions (Burstein & Ginsburg, 2010).

Children's interpretation biases and anxious/avoidant behaviour have been found to be modelled and enhanced by family discussion in a series of studies using hypothetical ambiguous scenarios developed by Barrett et al. (1996). In the first of these studies, Barrett et al. (1996) compared three groups of children; clinically anxious children aged 7 to 14 years ($n = 152$), children with oppositional behaviour ($n = 27$) and non-clinical children ($n = 26$). Children's interpretations of, and action plans to a number of ambiguous situations were assessed before and after a family discussion. They found that both anxious and oppositional children were more likely to interpret the ambiguous scenarios as threatening. Before the family discussion, anxious children chose significantly more avoidant solutions and the oppositional children chose significantly more aggressive solutions than the non-clinical group. After the family discussion anxious children chose even more avoidant solutions and oppositional children chose even more aggressive solutions. Using the same sample of children, Dadds, Barrett, Rapee, and Ryan (1996) examined specific sequences of communications exchanged between parents and children. Parents of anxious children were more likely to reciprocate avoidance, whereas parents of non-clinical children were more likely to agree and listen to their children's pro-social plans, further supporting their previous findings.

Using a similar paradigm to investigate cognitive biases associated with trait anxiety in children, Chorpita, Albano and Barlow (1996) asked 12 children aged 9 to 13 years (four clinically anxious) to respond to ambiguous situations and to interpret and give action plans before and after a family discussion. They found a positive correlation between trait anxiety scores and anxious responses. Parent discussions were related to changes in children's anxious responses, however this was not significant. These results tentatively support the

notion that parents might play a role in influencing the degree of anxious children's cognitive biases, however due to some insignificant findings and the small sample size, this study lacks sufficient power to make convincing conclusions.

Although there is support for the influence of family discussions on the enhancement of children's anxiety, avoidant behaviour and threat interpretation bias, a number of studies have also found limited support for this association. For example, Shortt, Barrett, Dadds and Fox (2001) recruited three groups of children aged 6 to 14 years; anxious children ($n = 101$), non clinical children ($n = 23$), children with externalising disorders ($n = 23$) and their parents. Anxious children and the externalising children were more likely to interpret the situation as threatening than non-clinical children, and anxious children gave more avoidant responses. They also found that for anxious children, the mother's symptoms of depression, anxiety and stress were related to children's avoidance. However, anxious children's responses did not become more avoidant after the discussion with their families as was expected. The authors suggested that the context in which families were recruited (they were all seeking psychological treatment) might have led to anxious families trying to promote themselves as 'normal' families, therefore minimising their child's difficulties during the assessment process. More recently, Bogels, Dongel and Muris (2003) found that parents' self-reported fear and interpretation bias was associated with children's interpretation bias before a family discussion in a sample of 25 children aged 8 to 17 years. However they found no evidence that parents' maintained or enhanced interpretation bias in their children. Contrary to expectations, they found that irrespective of parental interpretation bias and fear, children interpreted the ambiguous stories as less negative after the discussion.

There are a number of limitations of using the family discussion paradigm. Shortt et al. (2001) suggested that the experience of responding more than once to these situations causes the change in response, rather than the influence of the family discussion. In addition

children's responses are self-reported and based on hypothetical scenarios, which limits ecological validity.

Other researchers have attempted to improve methodological procedures. For example, Cobham et al. (1999) utilised hypothetical ambiguous situations by replacing them with a real-life, anxiety provoking speech task after a family discussion in a sample of 73 children aged between 7 and 14 years. They found no differences between anxious, clinical control and non-clinical control groups in children's anxiety or skill level before or after the family discussion. Compared to mothers in the child anxiety group only, anxious mothers of anxious children expected their children to be more anxious and choose more avoidant responses. Furthermore, the family discussion did not change anxious children's expectations about their future performance as was expected.

Studies have frequently found that anxious children and their parents demonstrate biased interpretations. However they had been unable to establish whether parents and anxious children share a common style of threat interpretation, or whether parents are able to accurately reflect their child's likely interpretation style. Creswell, Schniering and Rapee (2006) aimed to investigate whether anxious children and their mothers shared an interpretation bias further, by using adapted adult versions of the ambiguous situations to assess mother's interpretations. Clinically anxious ($n = 27$) and non-clinical ($n = 27$) children aged between 7 and 15 years and their mothers completed self-report measures of anxiety and indicated their most likely interpretation of ambiguous scenarios. Results replicated previous studies, suggesting that clinically anxious children interpret ambiguous situations as more threatening than non-anxious children. Results showed that mothers of anxious children also interpreted a high level of threat, and that mothers' and children's' threat interpretations were significantly correlated, this correlation being greater than the correlation between mother

and child self-report anxiety symptoms. This suggests that mothers and anxious children share a common style of threat interpretation.

Gifford, Reynolds, Bell and Wilson (2008) extended this study further by comparing interpretation biases of non-clinical controls ($n = 23$), children with anxiety disorders ($n = 18$) and children with externalising disorders ($n = 15$) and their mothers, using an ambiguous stimuli task developed by Hadwin et al. (1997) with children aged between 7 and 12 years. Mothers of anxious children had significantly more anxious symptoms than mothers of non-clinical children, and maternal anxiety was significantly correlated with child anxiety. As expected, anxious children also had higher threat interpretation scores than the non-clinical group, yet mothers of anxious children did not make more threat interpretations than non-clinical mothers. Anxious children did not significantly differ from children with externalising disorders, suggesting that a tendency to interpret ambiguous situations as threatening may be a process shared by children with other disorders.

Overall the evidence about the effect of parents influence on children's interpretation bias is mixed. There appears to be some evidence to suggest that anxious children's threat interpretation bias can be enhanced through family discussions. The research offers tentative support for the role of parental cognitions and behaviour as an important influence in an anxious child's environment. Hudson and Rapee (2004) have included parental cognitions in their model of the development and maintenance of childhood generalised anxiety. Kortlander, Kendall and Panichelli-Mindel (1997) suggest that parental cognitions and beliefs about their anxious child's vulnerability and their lack of ability to cope in situations, encourages parents to become over protective, overly intrusive and exhibit anxious behaviour towards their child. The role of parental styles in childhood anxiety will now be discussed.

1.4.2 The Influence of Parental Rearing Styles on Child Anxiety

The categorisation of parenting constructs and behaviours in the literature has been complex and somewhat inconsistent to date, and terms are often used interchangeably. Research on parenting styles has focused on two main dimensions: acceptance and warmth as compared to criticism and rejection, and controlling, overinvolved, and intrusive parenting compared with autonomy granting parenting (Rapee, 1997). In a review, Rapee (1997) concluded that controlling or overinvolved parenting is consistently associated with child anxiety, whereas parental rejection is strongly associated with depression in children and adolescents. A controlling parenting style has been described as parental behaviors aimed at guiding the child during daily activities (Brakel, Muris, Bogels & Thomassen, 2006). These parental behaviors often have the effect of directing the child and reducing the development of autonomy (Rapee, 1997). More specifically, an overinvolved parental behaviour is that which supports a child's restricted exposure to his or her environment and limits their opportunity for personal autonomy, whereby the child is not allowed to interact with his or her environment alone (Hudson & Rapee, 2004).

Two recent meta-analyses, which included 23 and 47 studies reported medium to large effect sizes between parental control during parent-child interactions and child anxiety (McLoed, Wood, & Weisz, 2007; Van der Bruggen, Stams & Bögels, 2008; Wood et al., 2003). Due to the variety of terms and constructs that have been considered in previous research, in their meta-analysis, McLoed, Wood and Weisz (2007) divided parental control into two subdimensions: a) overinvolvement, defined as parental interference with children's age normative autonomy and emotional independence, boundary problems, excessive restrictiveness, and encouragement of excessive dependence on parents, and b) autonomy-granting, defined as parental encouragement of children's opinions and choices, and

acknowledgement of children's independent perspectives on issues. Parental control being marked by over involvement and low autonomy-granting parenting behaviours.

Controlling and over involved parenting behaviours have been suggested to lead to a child having limited interaction with their environment (Rapee, 1997). Following this model, excessive protection and involvement from a parent may lead children to think that the world is a dangerous place. This might increase a child's perception of threat, and reduce opportunities to learn otherwise. Everyday situations may then appear threatening and produce high levels of unnecessary anxiety for the child. Over-control or overinvolvement may also communicate a message that a child is incapable of managing challenging situations effectively, therefore increasing feelings of anxiety and insecurity (Hudson & Rapee, 2001). However, the precise relationship between a controlling and over involved parent-rearing style and child anxiety has not been well established. Some theories have emphasised the transactional and cyclical nature of this relationship. For example, Hudson and Rapee (2004) suggest overinvolved parenting might be provoked by the child's anxious behaviour in an attempt by the parent to reduce their child's distress in a given situation. As such children's anxiety will be reduced in the short-term. However, repeated experiences of overinvolvement might maintain the child's anxiety in the long-term, as the child will be denied sufficient opportunities to overcome their anxiety and develop adaptive coping strategies.

Researchers have also outlined the development of anxiety with respect to psychological variables related to control. Chorpita and Barlow (1998) suggest that "early experiences with a perceived lack of control may foster a cognitive style characterised by an increased probability of interpreting or processing subsequent events as out of one's control, which may represent a psychological vulnerability for anxiety" (p. 3). Chorpita, Brown and Barlow (1998) have proposed a theoretical model explaining this relationship in more detail, in relation to perceived control. They suggest that the influences of parental control on

negative affect are mediated by children's perceptions of control. A controlling parental style is said to reduce a child's perceptions of mastery over their environment. This encourages a child to perceive events as out of their personal control, therefore fostering a sense of low perceived control, which will in turn lead to anxiety and negative affect (see Figure 1).

Furthermore, they suggest that experiencing diminished control of events during childhood may result in stored memories or 'regularities' that may result in the person predicting negative outcomes of events in the future. Due to limited exposure to novel situations, controlling parental styles are therefore likely to limit the development of coping strategies and a sense of control in the child.

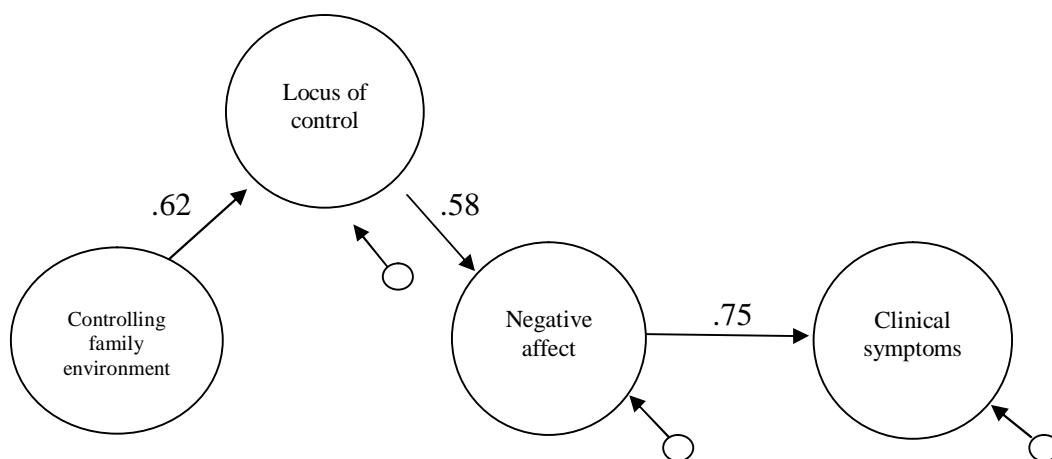


Figure 1. Chorpita, Barlow and Brown's model. The link between family environment, locus of control, negative affect, and clinical symptoms.

1.4.3 Evidence Examining Overinvolved Parental Styles and Child Anxiety

1.4.3.1 Literature search. Literature searches were carried out using Amed, Embase, Medline and PsychInfo databases. The key search items of anxiety and anx* were combined with the terms child*, adolescen* parent*, family, mother*, maternal, father*, paternal, control*, involve*, intrusive* in a number of systematic searches. Additional literature was obtained through references in relevant articles and books. No date restrictions were added.

Four main research designs were identified in the literature; retrospective and questionnaire, observational, longitudinal and experimental manipulation designs.

The evidence reviewed has been grouped according to their research design; retrospective/questionnaire design, observational design, longitudinal design and experimental design. Within those categories studies are grouped by sample type (clinical and non-clinical) and will then be presented in chronological order. Definitions or specific examples of the different parenting constructs will be given where possible.

1.4.3.2 Retrospective and questionnaire designs. Early studies investigating parental rearing styles have relied on using retrospective questionnaires with adults to assess their parent's behaviours. Rapee (1997) reviewed this earlier work and reported that although many of the studies were methodologically limited, clinically anxious subjects consistently perceived their parents to have been more controlling and more rejecting than non-clinical subjects. However, retrospective studies can be problematic due to possible reporting bias, including a mood dependent memory bias that could be present in anxious adults (Lewinsohn & Rosenbaum, 1987). Due to these limitations, retrospective questionnaire studies have been excluded from some recent meta-analyses (Wood et al., 2003), and as the majority of these studies were carried out between 1970 and 1995, these studies will not be discussed within this review.

To overcome these limitations, many studies have used questionnaire designs to examine the relationship between perceived parenting and anxiety in children, by interviewing children directly. Muris and Merckelbach (1998) examined the relationship between perceptions of parental rearing behaviours and anxiety symptoms in 45 non clinical children aged 8 to 12 years. Children completed the modified version of the EMBU for children (EMBU-C; Castro, Toro, Van der Ende, & Arrindell, 1993), a self-report measure of perceptions of parental rearing practices i.e. overprotection, rejection and emotional warmth,

and the Screen of child anxiety related emotional disorders (SCARED; Birmaher et al. 1997), an index of DSM defined anxiety disorder symptoms. They found positive relationships between anxious rearing behaviours (e.g. your parents are scared when you do something on your own), parental control (e.g. your parent's want you to reveal your secrets to them), and anxiety symptoms in children. Authors report sufficient internal consistency for both measures, yet the method and results sections were brief, and effect sizes were not reported.

In a similar study, Gruner, Muris and Merckelbach (1999) examined this relationship on a larger sample of 117 children aged between 9 and 12 years. Children completed the modified version of the EMBU for children (EMBU-C; Castro et al., 1993), and the Child's Anxiety Scale (CAS; Spence, 1997) which measures DSM-IV defined anxiety disorder symptoms. Their results also support this relationship, as they found significant and positive associations between parental control, parental rejection, and anxiety symptoms. Although, a strength of this study is its larger sample size, the results should be interpreted with some caution, as the internal consistency of some of the CAS subscales were not found to be sufficient, with Cronbach's alpha coefficients of less than .6. Although a positive association was found, the effect size for parental control and child anxiety was small.

McClure et al. (2001) used similar methodologies to examine parenting perceptions and child anxiety in a high risk sample of 815 fifteen year olds, and found that maternal psychological control (e.g. "tells me of all the things she has done for me", "is always telling me how I should behave") predicted child anxiety, therefore supporting previous research. Detailed accounts of the methodology and analyses were included, and authors report acceptable levels of internal consistency for the self-report measure, and good inter-rater reliability for the SCID. The authors also highlight the limitations, including the possibility that anxious children tend to interpret and recall information in a negative light, and therefore, their responses may be subject to bias. This study is strengthened by the use of the SCID to

assess child anxiety, rather than relying on self-report measures, which can be unreliable and subject to bias.

Expanding on previous research the relationship between child anxiety, parental anxiety and perceived parental rearing practices was explored within a sample of 72 non-clinical children aged 9 to 12 years (Bogels & van Melick, 2004). Dimensions of parental rearing practices were measured by the child report, parent report and partner report on the Mother-Father-Peer Inventory (MFP; Epstein, 1983). Parent and child anxiety were measured by the parent and child versions of the SCARED (Birmaher et al., 1997). The dimension of autonomy encouragement vs overprotection on the MFP indicated “the degree to which the parent accepted and encouraged the child’s independence, self-reliance, and the development of social and other skills, versus the degree to which they overprotected the child, worried about the child’s health and safety and failed to help the child function independently”. They found that the relationship between the combined paternal and maternal autonomy encouragement versus overprotection, and anxiety in children explained 17% of the variance in child anxiety. The use of aggregate scores in this study from multiple informants was found to enhance the internal consistencies of measures. They also found that maternal autonomy versus overprotection was predominantly related to maternal anxiety, and that mothers tended to give a more positive impression of their own rearing behaviour compared to partners and children’s report of mothers rearing. This finding implies that in studies that have used mothers self-report of their child rearing, systematic errors could occur, whereby an unrealistically positive impression of mother’s child rearing could be given. Although the MFP (Epstein, 1983) and the SCARED (parent version) reports adequate reliability, the items on the MFP had to be reformulated into child, parent and partner report of parental rearing practices, as this measure in its original form assesses adult retrospective

report of past parental rearing. Similarly, the SCARED was modified into an adult version to measure parent anxiety for the purpose of the study.

In the first study to examine whether reciprocal associations existed between temperament, attachment, rearing style and anxiety symptoms, Brakel, Muris, Bögels and Thomassen (2006) recruited a large sample of 644 non-clinical children aged 11 to 15 years. Children completed questionnaires measuring behavioural inhibition, attachment, parental rearing behaviour, and anxiety symptoms. Behavioural inhibition, insecure attachment and controlling (e.g. when you come home you have to tell your parents what you have been doing) and anxious parent rearing were positively associated with higher anxiety symptoms. This study relied solely on adolescent responses and did not include parent versions of questionnaires, which could have provided important cross-validation information. Although this is a limitation of many questionnaire designs, it is an important one, as anxious children can experience cognitive distortions which might influence perceptions of their parents' behaviour as being overly threatening or negative. The large sample size is a clear strength of this study, with the power to be able to detect small effect sizes. Authors recommend the use of parental measures for cross-validation purposes, and assessing a wider range of risk factors, including parental anxiety.

Contrary to previous findings, Brown and Whiteside (2008) used the EMBU-C (Castro et al., 1993) to measure perceived parental rearing behaviours in a sample of 64 clinically anxious children and adolescents aged 7 to 18 years. Parental rejection was positively related to child worry, and although a trend emerged between overprotection and child anxiety, this was not significant. These unexpected findings suggest that parental rejection may play a more salient role in the development of anxiety disorders than overprotection or control. Worry was measured by the The Penn-State Worry Questionnaire

for Children (PSWQ-C; Chorpita, Tracey, Brown, Collica, & Barlow, 1997), yet the reliability of this measure was not reported.

In a more comprehensive study, Gastel, Legerstee and Ferdinand (2009) explored the role of perceived parenting style in the familial aggregation of anxiety disorders in a sample of 133 children aged 8 to 12 years diagnosed with an anxiety disorder. Anxiety disorders were diagnosed through the Anxiety Disorders Interview Schedule (ADIS; Silverman & Albano, 1996), which is a reliable semi-structured interview. Similar to previous studies, parenting style was assessed through the modified version of the EMBU for children (EMBU-C; Castro et al., 1993). A small negative association was found between maternal and paternal overprotection and child anxiety. Thus, these results were contrary to theoretical approaches such as Rapee (1997) and Chorpita et al. (1998), as child anxiety diagnoses were associated with a less overprotective parenting style, when compared to a control group. The authors however state that it is possible that a perceived parenting style may not be congruent with an objective parenting style, and suggest observational measures of parenting styles are important to examine these contrary findings further.

A recent study expanded on previous research by collecting data on perceived parenting from both parent and child in a clinical sample of 36 children aged 6 to 18 years. Lindhout et al. (2009) administered the EMBU-C (Castro et al., 1993) to measure child report of perceived parenting, and the Child Rearing Practices Report (CRPR; Block, 1965) to measure parental report of parenting behaviours in families with clinically anxious children, their siblings and controls. Contrary to previous findings, the child report demonstrated no differences between anxious children and controls on perceived overprotection. However, from the parent report, parents of anxious children showed more negative affect and were less inclined to encourage independence than control parents. Yet, no differences were found between anxious children and their siblings on measures of overprotection. A strength of this

study is the inclusion of both non-referred siblings and a control group to compare with anxious children in an attempt to distinguish shared, from non-shared parental experience, however, it also has a number of limitations. Firstly, the authors note that the relatively small sample size may have obscured possible differences between groups. Secondly, the study might be limited by the inclusion of some children with co-morbid depression, which may have limited the specificity of the findings to anxiety disorders only.

Overall, studies have reported mixed findings, and such cross sectional, self-report studies have significant methodological problems including common method variance, the influence of negative affectivity, reporter bias and the impossibility of demonstrating any causal relationships. In a recent review of the literature, McLoed, Wood and Weisz (2007) also found that questionnaire measures of parenting were found to underestimate the magnitude of the association between parenting and childhood anxiety compared to observational measures.

1.4.3.3 Observational designs. Due to the limitations of retrospective and questionnaire designs, the majority of recent studies investigating familial factors and parenting styles in childhood anxiety have used observational methods. Observational studies overcome some of the methodological problems associated with common method variance and negative affectivity. This methodology offers an independent measure of behaviour, rather than accessing participant's perceptions of behaviours. However, it is important to consider the inability of such studies to establish the direction of effects whilst interpreting these findings. Studies have been categorised into those that use non-clinical samples, and those that use clinical samples.

1.4.3.3.1 Non-clinical samples. Some of the research investigating parenting styles and child anxiety has been carried out with non-clinical samples. A general limitation of using non-clinical samples, which is important to consider whilst interpreting these findings,

relates to the difficulty in generalising these results to clinical settings. Mills and Rubin (1998) assessed maternal behavioural control whilst observing 459 mothers interacting with their children in a variety of tasks over a 35 minute period. Children between 5 and 9 years old were rated by their class teachers on the Teacher-Rating Scale (Hightower et al. 1986) which measures externalising and internalising difficulties. Children were then grouped into those that were aggressive-externalising, withdrawn-internalising, or socially average. As expected, compared to mothers of average children and aggressive children, mothers of withdrawn children appeared to be more behaviourally and psychologically controlling. Control was defined as pressure from the mothers to comply i.e imperative compliance commands, criticism directed at the child's behaviour, punishment or threat of punishment etc. Compared to mothers of average children both mothers of aggressive and withdrawn children were less responsive to their child. Although this study has a large sample size, it also has a number of limitations, including low frequencies of behavioural control, and only 5% of the sample met criteria for withdrawn/internalising. A further limitation is the lack of parental report of child behaviour, which would have enhanced the findings of this study.

Another study explored the influence of mother's behaviour during free play. Rubin, Cheah and Fox (2001) observed 188 four year old children and their mothers and found that children's shy, socially reticent behaviour was predicted by the extent to which mothers were 'over-solicitous' (excessively attentive) during free-play. The authors suggested that this type of overprotective parenting style prevents children from developing their own self-initiated coping techniques. The strengths of this study include its large sample size and the use of four independent observers to rate the play observation, with good inter-rater reliability reported. A possible limitation of the design is the observation of children and mothers in an unfamiliar laboratory setting, which reduces the ecological validity of its findings. The study could have been strengthened by observing children and mothers in a more natural setting.

In another study, mothers and children were observed engaging in a challenging etch-a-sketch task in order to investigate parenting behaviours and child outcome among anxious mothers ($n = 25$) and non-anxious mothers ($n = 25$) and their children (Ginsburg, Grover, & Ialongo, 2004). The observations were made at age 6 years and at a 6-year follow-up. Measures of externalising symptoms were also collected at each time point by blind observers. There were no between group differences between parenting behaviours at the first observation. However, six years later, higher levels of criticism, and lower levels of autonomy granting behaviours (e.g. supports, encourages, accepts child's opinions/ideas) from parents were significantly related to higher anxiety symptoms in children of anxious parents. Inclusion of a 6-year follow up is a strength of this study, however it might be difficult to generalise these findings to clinical samples, of higher income and with different ethnic backgrounds, as the sample consisted of non-clinical children from predominantly African American, low income families. The sample size was also small, therefore it may have had reduced power to be able to detect group differences.

Perez-Olivia, Stevenson and Hadwin (2008) explored attentional mechanisms via which maternal over involvement could contribute to child separation anxiety symptoms in a sample of 129 non-referred children aged 6 to 14 years and their mothers. They assessed this through; a visual search task, parent and child rated reports of child anxiety, and the Five Minute Speech Task (FMSS; Mangana et al., 1986) which was used to assess maternal over involvement. The FMSS assessed emotional over involvement (EOI) which included self-sacrificing/over-protective behaviours, emotional display (crying during the interview), excessive detail given about their offsprings past or expressing strong feelings of love or giving more than five positive comments. They found that maternal over involvement enhanced a child's separation anxiety via an attentional bias to angry faces. Authors concluded that over involvement in mothers and symptoms of child anxiety might be

mediated by vigilance for threat. This supports Rapee's (2001) model which suggests that over involvement increases a child's perception of threat, which contributes to child anxiety.

In a recent study, van der Bruggen, Bögels, and van Zeilst (2010) investigated the influences of parental controlling behaviour by examining the specific role of parent and child trait anxiety on controlling behaviour. They recruited 37 children between the ages of 8 and 11 years, and their mothers and fathers. The dyads were observed whilst the child completed two difficult tangram puzzles, each puzzle with a different parent present. In results opposite to those expected, they found that higher mother and father trait anxiety was associated with lower levels of parental control during the tasks (e.g. lower levels of unsolicited, intrusive help). A significant stronger effect was found between child trait anxiety and parental control for boys than girls, and as expected more child withdrawal during the parent-child interaction was related to more parental control. The authors report that such results might suggest that in novel and challenging situations, high trait anxious parents might become either more controlling to avoid such situations, or more withdrawn to avoid their anxious feelings or distress. Unfortunately this study did not report effect sizes, as the small sample size meant that the study lacked sufficient power. The authors also reported the limits in generalising the findings from non-clinical families to those families with clinically anxious children, and due to the correlational design of the study, causality can not be inferred.

1.4.3.3.2 Clinical samples. The majority of observational studies have utilised clinical samples of anxious children. Dumas, Serketich and LaFreniere (1995) compared mother-child and child-mother exchanges in socially competent ($n = 42$), aggressive ($n = 42$) and anxious children ($n = 42$) aged between 2 and 6 years during a game which consisted of planning an efficient route through a grocery store. The study focused on mother-to-child and child-to-mother control exchanges i.e. attempts to control each others behaviour during

the game. Control consisted of clearly stated commands, requests or instructions during the game. Interactions between anxious children and their mothers were generally aversive: mothers attempted to control their children in a coercive and unresponsive manner, and children tried to manage this by being resistant and coercive. In comparison, socially competent children and their mothers shared a more positive interaction. Interactions between aggressive children and their mothers were relatively positive, but children made regular use of coercive control and mothers responded indiscriminately and failed to oppose more extreme forms of coercion. This suggests that children actively influence and are influenced by their relationship with their mothers. The authors give a detailed summary of the methods and results, and make good use of tables and figures to summarise the data, making it more accessible to the reader. However, it is unclear whether such a brief laboratory based task reflects real-life mother-child interactions, and the authors suggest that such findings should be interpreted with caution, as the methods used may lack ecological validity.

Siqueland, Kendall and Steinberg (1996) compared differences between families of anxious ($n = 17$) and non-anxious ($n = 27$) children aged between 9 and 12 on self-report measures of parenting and observed family interactions in a discussion task. Parental autonomy granting was defined as the degree to which the parent constrains or encourages the child's individuality through the use of inductive disciplinary techniques. Psychological control included guilt induction, love withdrawal and power assertion. Parents of anxious children were significantly less granting of autonomy than control parents, no differences were found in the level of warmth. Interestingly, parents of anxious children did not rate themselves differently from parents of controls, which highlights the potential bias when using self-report measures of perceived parenting. Anxious children also rated their parents as 'less accepting' than control children. Although an advantage of the study is the rating of

parental behaviours by trained graduates who were blind to the families group membership, with high inter-rater reliabilities reported, the scale used a 3-point likert scale, which the authors report may have simplified the complexities of the parent-child interactions.

In the first of two studies by Hudson and Rapee (2001), mother-child interactions were observed while the child completed two difficult cognitive tasks. The sample consisted of 43 clinically anxious children, 20 oppositional defiant children and 32 non-clinical children aged between 7 and 15 years. The aim of this study was to examine mother's involvement (control) and general negativity (rejection) during the interaction. An observational coding system was used to measure levels of involvement and negativity. Higher scores on the involvement factor (e.g general help, unsolicited help etc) indicated over-involvement and intrusiveness. This coding system will also be used in the present study. Mothers of anxious children were more involved and more intrusive than mothers of non-clinical children. Mothers of anxious children were also more negative during interactions with their child than the mothers of non-clinical children. They also found that mothers of oppositional children were more involved than mothers in the control group, which might suggest that a controlling, overinvolved parental style may be common to child psychopathology in general, and not only child anxiety. These findings are indicative of a link between overinvolved parenting and child anxiety, and due to the wide age range used and the lack of differences across age groups between anxious and non-anxious children, this research suggests that the influence of over-involvement in the parenting of anxious children may be important from infancy to adolescence. The authors provide a detailed account of the coding methods used for measuring parental behaviour, however although inter-rater reliability for involvement was high (.90), this was not the case for negativity (.50).

Another study has found evidence for an association between an overinvolved parenting style and child anxiety, however in this study the relationship was not specific to

the anxiety disordered child (Hudson & Rapee, 2002). The authors aimed to replicate and expand on their previous findings by comparing parent-child interactions across two siblings in both clinically anxious ($n = 37$) and non-clinical ($n = 20$) families. The same coding system was used to assess levels of involvement and negativity in mothers as in the previous study and in the present study (Hudson & Rapee, 2001). Contrary to predictions, they found mothers of anxious children were more involved and intrusive with both the anxious child and their sibling, than mothers of non-anxious children. This suggests maternal overinvolvement may not occur purely in response to child anxiety. The conclusions that can be drawn from this study are limited, as 30% of the siblings of anxious children also experienced sub clinical levels of anxiety, therefore mothers may have responded with overinvolvement during the tasks due to a shared anxious temperament between the siblings. They also suggest that over involvement may not be a response to the child's anxiety or temperament, but rather a stable parenting style. Due to the unequal group sizes between clinical and control groups, it is unclear whether the data met the assumptions of normality, as such violations can affect the power of F in quite unpredictable ways (Wilcox, 2005). This information has not been provided, and it is possible that F is biased (Field, 2009), therefore these results should be interpreted with caution.

Moore, Whaley and Sigman (2004) examined the relationship between mother and child anxiety disorders by observing parent-child interactions in conversational tasks. The sample consisted of 68 mother-child pairs, with children aged between 7 and 15 years. There were 29 mother-child dyads where both had anxiety disorders, 8 dyads where mothers only had anxiety disorders, 15 dyads where only the child had an anxiety disorder, and 16 dyads in which neither mother nor child were anxious. This study specifically measured mother's warmth and granting of autonomy (e.g. encouraged the child to think independently) during the conversational tasks. Mothers of anxious children, regardless of their own anxiety were

significantly less warm and granted less autonomy to their children during the tasks. This is contrary to the hypothesis that parental anxiety drives overprotective parenting which in turn causes child anxiety. Rather, these findings suggest that anxiety in children might shape their parents to display more overprotective behaviour, as suggested by Manassis and Bradley (1994). Ultimately, the conclusions that can be drawn from this study are limited, due to the small numbers in some of the groups.

Barrett, Fox and Farrell (2005) compared the behaviour of anxious children ($n = 33$), their non-anxious siblings, and non-clinical ($n = 14$) children aged 7 to 14 years and their parents during two discussion tasks related to anxiety-provoking or challenging situations. Parents' behaviours were coded for control, warmth, reward of coping behaviour and task involvement. Detailed accounts of the analyses used were reported. Parents of anxious children were more controlling (i.e. control through disregard of other's opinions or dictating other's actions), fathers showed less warmth and mothers rewarded children's coping behaviours less than parents of non-clinical children. Parents of anxious children also showed more control towards their non-symptomatic child than mothers of non-clinical children. They found that mothers of anxious children's level of control were consistently high with both anxious and non-symptomatic child. This further supports Hudson and Rapee's (2002) findings, that maternal control might interact with children's behaviour or other characteristics to create anxiety. However, due to the cross-sectional design, this research does not permit speculation on the direction of causality. The unequal group sizes, based on the small non-clinical sample, also created problems during the MANOVA analyses used due to unequal cell sizes, therefore the results should be interpreted carefully.

Hudson, Comer and Kendall (2008) examined the role of children's emotions and parent anxiety during parent-child interactions of anxiety disordered children ($n = 55$) and non-anxious children ($n = 29$) aged 7 to 13 years. The families were observed discussing

three recent and real situations in which the child had experienced anxiety, anger and happiness. There were differences in parental behaviour between anxious and non-anxious children. Mothers of anxious children displayed greater intrusive involvement (e.g. taking over the task and ignoring the child's autonomy) than mothers of non-anxious children in those situations in which the child was experiencing negative affect. They also found that anxious mothers were more intrusive in situations involving anxiety and anger compared to positive situations. This study suggests that the relationship between parenting and anxiety may not be uni-directional as previously thought, but rather the specific emotion that children display and mothers' own anxiety might influence the amount of involvement mothers give. Children's negative affect might prompt a mother to intrude in the child's activity, rather than maternal intrusiveness causing child anxiety. The use of structured clinical interviews to assess parental anxiety and the inclusion of fathers are strengths of this study. Authors have also attempted to enhance the relevancy of the task by using real-life situations for the families to discuss, which could enhance the ecological validity. However, authors recognise the need to replicate these findings with standardised situations.

Gar and Hudson (2008) examined the association between parenting styles and mother and child anxiety. Maternal involvement and negativity was evaluated during a speech preparation task ($n = 135$) and a Five Minute Speech Sample (FMSS) from mothers ($n = 155$) of anxious children aged 4 to 17. Using the same coding system as Hudson and Rapee (2001; 2002) results from the speech task demonstrated that mothers of anxious children were more overinvolved than mothers of non-anxious children, regardless of maternal anxiety status. Similarly, results from the FMSS showed that mothers of anxious children were more overprotective, non-objective and self-sacrificing than mothers of non-anxious children, irrespective of their own anxiety. This study supports the findings of Moore et al. (2004) suggesting that maternal anxiety may not be associated with increased

overinvolvement. Although the direction of effects cannot be established in this study, the authors suggest an alternative interpretation of the findings, similar to Hudson et al. (2008), in asserting that parenting might be influenced by the behaviour of an anxious child. They suggest research using longitudinal and experimental designs would be helpful to elucidate the reciprocal influences.

In a further study, Hudson, Doyle and Gar (2009) set out to investigate the relationship between maternal overinvolvement and child anxiety using the same coding system as Hudson and Rapee (2001). Mothers of children with anxiety disorders ($n = 45$) and mothers of non-clinical children ($n = 46$) aged 7 to 14 years were observed interacting during a speech preparation task with a child from the same diagnostic group as their child (anxious or non-clinical) and with a child from a different diagnostic group. During interactions with children who were not their own, mothers were found to be significantly more involved with anxious children than non-clinical children. This study therefore supports a reciprocal model of anxiety development, whereby children's anxious behaviour partially influences maternal overinvolvement (e.g. Hudson & Rapee, 2004). The unique research design enabled researchers to examine maternal and child influences on the maternal behaviours associated with child anxiety, suggesting that children's behaviour effectively impacts subsequent maternal behaviours.

Finally, in the most recent observational study, Eley, Napolitano, Lau and Gregory (2010) aimed to investigate whether childhood anxiety evokes maternal control for the first time through a genetically informed study. Mothers and 265 eight year old twins were asked to complete an etch-a-sketch task. Maternal control was assessed during the task in terms of whether the mother displayed 'extreme control', defined as breaking the rule and touching the child's dial. Child anxiety was rated using the Screen for Child Anxiety Related Emotional Disorders (Birmaher et al. 1997). This scale has excellent psychometric properties, and the

internal consistency in this study was high (.88). Children whose mothers demonstrated 'extreme control' in the interaction reported higher levels of anxiety than those who did not experience 'extreme control'. This finding is in line with previous research. In addition, the association between maternal control and child-rated anxiety was found to be largely explained by shared genetic effects. These findings are indicative of a bi-directional model, with child anxiety eliciting maternal control, and maternal control influencing anxiety. The authors conclude that their results suggest maternal control may be more important in the maintenance, rather than the onset of child anxiety, which is likely to have important implications for treatment. However, their findings are limited due to child anxiety ratings coming solely from self-report ratings, with no parental or observational measure for cross-validation. Description of the coding system for maternal control is also limited, the details being restricted to the rating of mothers as displaying 'extreme control' if they broke the rule and touched the dials. This seems a rather simplistic measurement of maternal control, and may therefore be insensitive to the complexities of this parenting construct.

Observational studies have been valuable in showing basic relationships between parenting and child anxiety. However, many of these studies have been laboratory based which often lack ecological validity. Studies have typically used cross-sectional designs which do not allow us to establish the direction of effects, therefore limiting their clinical application. Furthermore, in a review of the literature examining the association between parenting and childhood anxiety, McCloed (2007) reported that although an established relationship between parenting and childhood anxiety was found (with autonomy-granting parenting dimensions accounting for a significantly stronger association with childhood anxiety), the direction of this relationship has not been clarified. They conclude that in order to establish the causal influence of parental control and child anxiety, improved methodological designs are required. They suggest that the next generation of research in

this area employ experimental or longitudinal designs to attempt to clarify the direction of effects.

1.4.3.4 Longitudinal designs. A small number of studies have attempted to investigate the direction of effects, implementing longitudinal designs, and utilising non-clinical samples. These studies have the advantage that antecedent behaviours can be observed. Although such methods cannot be used to infer causality, they do give stronger evidence of causal processes than cross sectional observational designs.

Rubin, Nelson, Hastings and Asendorpf (1999) investigated the longitudinal relationships between children's social wariness/inhibition and parent's beliefs about how to best socialise their child. Questionnaire data was obtained on child temperament and parenting practices from 60 two-year olds. The same data was collected 2 years later, alongside observational data of inhibited behaviour. They found that parental perceptions of child shyness were stable over time, and that parental perception of shyness at age 2 years predicted a lack of encouragement of independence at age 4 years. However, contrary to expectations, parents expressed lack of encouragement of independence at age 2 years did not predict child shyness at age 4 years. Contrary to these findings, Rubin, Burgess and Hastings, (2002) examined the effects of behavioural inhibition and parenting style on subsequent social and behavioural problems with 108 toddlers at time one, with a follow-up of 88 children aged 4 years. Mothers of inhibited children, who were intrusive or made negative comments about their child when they were toddlers, were more likely to have children who were socially reticent at age 4 years, compared to mothers with inhibited children who did not. Intrusive behaviour was defined by mother's interruption of the child's independent or social behaviour with the apparent goal of assisting the child, despite a lack of evidence that the child was experiencing difficulty, distress or was requesting maternal involvement. The authors concluded that maternal behaviours moderated the relation between toddler's

inhibition and preschooler's social reticence. This research has particular implications for preventative measures, as for those children with behaviourally inhibited temperaments as toddlers, it might be possible to reduce the likelihood of developing further anxiety problems by adapting parenting styles, which Rubin, Burgess et al. (2002) have found to moderate this effect.

In the most recent study, Muris, Brakel, Arntz and Schouten (2011) examined the additive and interactive effects of behavioural inhibition and a wide range of other vulnerability factors in the development of anxiety disorders, including parental rearing. A sample of 251 children aged 5 to 8 years were assessed at three time points, each a year apart. The modified EMBU was used to assess parental rearing behaviours, and the SCARED was used to assess trait anxiety. No significant relationships were found between maternal overprotection and child trait anxiety at any of the time points. However, anxious rearing at time one was positively associated with child trait anxiety three years later. This study does not support a relationship between maternal overinvolvement and child anxiety. However, as the study did not assess anxiety disorders or other forms of psychopathology (i.e. depression) these results should be considered with caution, and these findings may not be representative of clinical populations.

To conclude, the few longitudinal studies that exist have shown mixed results, and have failed to offer clearer conclusions as to the causal influence of parental control/intrusiveness and childhood anxiety.

1.4.3.5 Experimental manipulation studies. Experimental studies provide the strongest test of causality. Only two studies have experimentally manipulated parental control and examined the impact on children's behaviours, both using non-clinical samples. De Wilde and Rapee (2008) was the first study to employ an experimental design to examine the influence of maternal control on children's state anxiety when faced with a social threat.

They recruited 26 children aged 7 to 13 years and their mothers. Mothers were randomly allocated to conditions where they were asked to be overly controlling or minimally controlling during the preparation of a practice speech task that their child was required to undertake. Maternal control was coded by Hudson and Rapee's (2001) coding system. Children whose mothers had been controlling during the practice speech showed greater anxiety than children whose mothers were minimally controlling. However, this study is limited by a small sample size, with only 14 pairs in the high control condition and 12 pairs in the low control condition, therefore it has limited power to detect differences.

Thirwall and Creswell (2010) aimed to build on De Wilde and Rapee's (2008) study by using a Latin-square, repeated measures experimental design to investigate the specific influence of controlling parental behaviours on children's affect, cognition and behaviour. Their non-clinical sample consisted of 24 children aged 4 and 5 years old and their mothers. Mothers were shown a training video of how to engage in controlling and autonomy-granting behaviours in interaction with their child whilst they prepared for a speech. Mothers were randomly allocated to either engage in controlling behaviours or autonomy granting behaviours first, and vice versa. Children's anxiety was assessed by observations and self-ratings. When mothers engaged in more controlling behaviours (e.g. offering frequent guidance and assistance throughout the task, being more involved than appeared necessary etc), children made more negative predictions about their performance before delivering the speech and reported feeling less happy about the task. This was moderated by child trait anxiety. The authors also found that children with higher trait anxiety demonstrated a significant increase in observed anxiety in the controlling condition than low trait anxious children. A possible limitation of this study, is the use of a parental behaviour coding scale developed specifically for this study, therefore as this coding system has not been used or

validated previously, it is unclear how valid or reliable this scale is in measuring the construct of parental control.

Both experimental studies have therefore provided support for the hypothesis that controlling parenting leads to increased anxiety in children, particularly in those children who have higher levels of trait anxiety. However, as with other studies with similar designs, small sample sizes were utilised, these studies therefore had low power to detect differences between groups.

One of the difficulties in reviewing and comparing the previous literature on parenting and childhood anxiety is the way in which the constructs have been measured. McLoed, Wood and Weisz (2007) state that inconsistent findings in such research can often be attributed to variations in measurement. Similarly, the way in which constructs have been interpreted and defined may also be a source of inconsistency. Terms such as controlling, intrusive, over involved, overprotective and autonomy-granting have been used inconsistently and interchangeably throughout previous literature, making it difficult to decipher whether studies are measuring the same construct and are therefore directly comparable. It is possible that this is due to a lack of specificity within theoretical models of parental control and childhood anxiety (Wood, 2006). As a result of the lack of specificity and direction as to what defines a controlling parental style, it seems that parental control has been interpreted as an overarching construct. In order to directly examine this construct, it seems that researchers have tested sub-dimensions or more specific behaviours within the broader concept of parental control. In a recent meta-analysis, the different subtypes of parental controlling (autonomy granting and over involvement) and rejecting (warmth, withdrawal and assertiveness) behaviour explained different amounts of variance in anxiety symptoms, ranging from 1 to 18%. (McLoed, Wood & Weisz, 2007). Due to the inconsistent findings in previous research, it seems that theoretical models of parenting and childhood anxiety will

need to be more specific in defining which parenting behaviours are more strongly related to childhood anxiety in order to further test these models.

Like many of the observational studies to date (e.g. Gar & Hudson, 2008; Hudson & Rapee, 2001; van der Bruggen et al., 2010) the current study will be examining whether the parenting construct of ‘over involvement’ is related to childhood anxiety. Over involvement in this study is construed as; excessive involvement and a lack of autonomy granting behaviour, where parents take over, assist and guide their child excessively, and ignore their independence, even when their child may not need or have requested their excessive involvement.

1.4.4 Evidence examining an association between perceived control, overinvolvement, and child anxiety

Having reviewed the literature examining the relationship between overinvolved parental styles and child anxiety, this section reviews the limited literature examining the relationship between perceived control, overinvolved parenting styles and child anxiety. Firstly, there is evidence to support an association between the construct of control and anxiety. Rapee, Craske, Brown and Barlow (1996) found that anxious adults scored significantly lower on the Anxiety Control Questionnaire (ACQ; Rapee, Craske, et al., 1996) than control subjects. Anxious adults had lower perceptions of control over external threats and lower internal emotional reactions than non-clinical adults. In two similar studies investigating associations between control and anxiety in children, both Nunn (1988) and St-Yves, Dompierre, Freeston, Jacques, and Malo (1989) found significant positive relationships between an external locus of control on the Nowicki and Strickland (1973) locus of control (NSLOC) scale and higher levels of trait anxiety as measured on the Stait-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973). In a more recent study, Weems, Silverman, Rapee, and Pina (2003) investigated the role of control beliefs in childhood

anxiety disorders in 117 children and adolescents aged 9 to 17 (86 = anxiety disordered, 36 = control). They found that perceived control over anxiety related events was significantly positively correlated with self-reported anxiety levels. Those with anxiety disorders reported significantly lower perceived control about anxiety related events than the control group.

However, studies examining Chorpita, Brown and Barlow's (1998) model, and the relationship between a controlling parental style, perceived control and anxiety in children are limited to three studies. Firstly Chorpita, Brown and Barlow (1998) tested their model using a mixed sample of 93 clinical and non-clinical children aged between 6 and 15 years and their families. The model hypothesised that perceived control would act as a mediator of family environment and child anxiety. Anxiety disorders were diagnosed via the ADIS-IV C/P, which is a revision of the Anxiety Disorders Interview Schedule for Children (ADIS; Silverman & Nelles, 1988), reported to have satisfactory reliability. Perceived control was measured by the Nowicki and Strickland (1973) locus of control (NSLOC) scale, and parental control was assessed by the Family Environment Scale (FES; Moos, 1974) as completed by both parent and child. The findings of this study supported the hypothesis, as controlling parental rearing behaviours were associated with low perceived control, which resulted in higher levels of negative affect. Thus a diminished sense of control over events may lead to vulnerability for developing an anxiety disorder in childhood. Their results suggest that there is an association between children who live in a family environment where they experience a limited opportunity for personal control, and anxiety and negative affect. This study is strengthened by the use of a clinical sample, and the assessment of parental control by both parent and child. However, the NSLOC scale has been criticised for its poor reliability (Haplin & Ottinger, 1983). The authors state that its constructs may be somewhat theoretically simplified, and future studies would benefit from using more sophisticated measures of perceived control.

In a more recent study, Muris, Meesters, Schouten and Hoge (2004) examined the effects of perceived control on the relationship between perceived parental rearing behaviours and symptoms of anxiety and depression in a sample of 167 non-clinical adolescents aged 12 to 14 years. Perceived parental rearing behaviour was assessed by the commonly used EMBU (Castro et al., 1993), and perceived control was assessed by the Perceived Control Scale (PCS; Weisz, Southam-Gerow, & Sweeney, 1998). The authors stated that this measure had good internal consistency and test-retest reliability, which is therefore superior to the NSLOC scale used in Chorpita, Barlow and Brown's (1998) study. Child anxiety and depression was assessed by the shortened version of the Revised Child Anxiety and Depression Scale (RCADS; Chorpita, Yim, Moffit, Umemoto, & Francis, 2000), all of which report at least acceptable internal reliability. The results did not support the Chorpita, Barlow and Brown's (1998) mediational model. Whilst associations were found between higher levels of overprotection and higher levels of anxiety, which at the same time were related to lower levels of perceived control, they found no evidence of the mediational effects of perceived control on the link between overprotection or other perceived parenting behaviours and child anxiety.

In the most recent study found, Ballash, Pemble, Usui, Buckley and Woodruff-Borden (2006), conducted a similar study investigating whether control acts as a mediator or a moderator between perceived family environment and anxiety with a sample of 362 undergraduate students aged 18 to 25 years. Students completed the family assessment device (FAD; Epstein, Baldwin, & Bishop, 1983), the anxiety control questionnaire (ACQ; Rapee, Craske, Brown, & Barlow, 1996), and the Beck anxiety inventory (BAI; Beck & Steer, 1990). No moderating effects were found. A mediational relationship was found whereby perceived affective involvement and behavioural control by parents predicted a sense of a lack of control, which then leads to anxiety. These results somewhat support Chorpita, Brown

and Barlow's (1998) mediational model, however Chorpita, Brown and Barlow (1998) proposed that control acts as a mediator until late childhood, when increased cognitive development enables control to act as more of a moderating variable, which was not found in this study. In this study, it appears that perceptions of control still appear to be directly influenced by familial control and over involvement in early adulthood.

1.5 Summary of findings

In conclusion, the majority of studies reviewed have supported a link between an overinvolved or controlling parental style and childhood anxiety. Three of the reviewed studies reported results that were contrary to the majority of findings and did not support an association between increased parental control or overinvolvement and child anxiety (Gastel et al., 2009; Muris, Brakel, et al., 2011; Rubin, Nelson, et al., 2002). Very little research has investigated the association between perceived control, a controlling or overinvolved parental style and child anxiety, and results of these studies have been mixed.

Two studies have aimed to examine this relationship further. Parental rearing styles were studied in families with an anxious child and non-anxious sibling (Barrett, Fox, et al., 2005; Hudson & Rapee, 2002), to investigate whether this relationship is specific to the anxious child. Both studies reported mothers to be more intrusive and overly involved with both the anxious child and their non-anxious sibling, compared to non-clinical mothers, suggesting that overinvolvement does not occur purely in response to child anxiety, but might interact with other characteristics in the child to create anxiety. Contrary to this, two studies suggested that children's anxious behaviour might prompt mothers to become more controlling or overly involved (Hudson, Comer, et al., 2008; Hudson, Doyle, et al., 2009). This has been partially supported by two studies which found mothers of anxious children were significantly more involved than mothers of non-anxious children, regardless of their own anxiety (Hudson & Gar, 2008; Moore et al., 2004). These studies suggest that maternal

anxiety is not associated with increased overinvolvement, but rather that parenting might be influenced by the behaviour of an anxious child.

The studies outlined above may have produced inconsistent findings due to a number of methodological limitations which are described below.

1.6 Summary of methodological limitations

Inconsistencies in the methodologies used and the way in which constructs have been interpreted and defined are likely to have contributed to the variations in the findings reported. An important limitation is the homogeneity of the samples, as the majority of participants were Caucasian. Due to small numbers in other ethnic groups, studies were unable to examine parenting differences between ethnic groups, therefore it is unclear whether these findings can be applied to children from different cultures.

A number of the studies rely solely on self-report, questionnaire data to measure both parenting and child anxiety, and the validity of such methods have been questioned. There is an increased likelihood of common method variance, the influence of anxiety and negative affect on subject's responses, reporter bias and the impossibility of demonstrating any causal relationships.

Although observational data has provided stronger evidence for a relationship between parental control/overinvolvement and child anxiety, it is difficult to determine whether the findings from studies using laboratory based tasks reflect the natural behaviour of participants or the natural interactions between children and parents (Gardner, 2000). Gardner (2000) reviewed observational evidence for their utility and validity and concluded that we need to be particularly cautious when deciding whether observations carried out in artificial settings can tell us about interactions under more natural conditions, as the results are somewhat conflicting. A number of the observational studies are also limited by small sample sizes, which reduce their power to be able to detect differences between groups.

The vast majority of studies have employed correlational or cross-sectional designs to establish relationships between controlling or overly involved parenting and child anxiety, therefore whether parental control or overinvolvement plays a causal role in the development of child anxiety, cannot be implied. Few longitudinal and experimental manipulation studies have been conducted to help clarify the direction of effects. Findings from the longitudinal studies have been mixed, and although two experimental manipulation studies have found support for the hypothesis that controlling parenting leads to increased anxiety in children, both are limited by small sample sizes.

1.7 Rationale and Aims of the Study

Research has consistently found parental overinvolvement to be associated with childhood anxiety disorders (e.g. Wood et al., 2003). Given the potential influence of overinvolved parental styles on children's anxiety, emphasised in theoretical models of childhood anxiety (Rapee, 2001; Chorpita & Barlow, 1998; Chorpita, Brown, & Barlow, 1998) it is surprising that relatively few studies have attempted to establish the causal relationship in more detail. Gaining a greater understanding of the causal influence could lead to possible interventions that could attempt to tackle such influences. It could also lead to the development of preventative parenting interventions. The causal role of an overly involved parental style certainly warrants further investigation using experimental manipulation studies to establish the direction of the relationship in more detail. As studies examining the influence of children's perceived control in this relationship are also limited, this too warrants further investigation.

The proposed study will therefore be testing Chorpita, Brown and Barlow's (1998) model, by manipulating maternal involvement and observing its effect on child behaviour and affect, and levels of perceived control, using a non-clinical sample of children aged 8 to 11. This relationship will be explored using an experimental task based on Hudson and Rapee's

(2002) study. This study will use a repeated measures design, whereby each child experiences their mother in both high and low involvement conditions. This study has two aims; firstly, to investigate whether maternal overinvolvement leads to an increase in child anxiety, and secondly, to investigate whether perceived control acts as a mediator between maternal overinvolvement and child anxiety.

1.8 Research Hypotheses

1.8.1 Hypothesis One

Children will report higher levels of anxiety during the high maternal involvement condition than the low maternal involvement condition.

1.8.2 Hypothesis Two

Children will display more observable avoidant behaviours during the high maternal involvement condition than the low involvement condition.

1.8.3 Hypothesis Three

Children will report lower levels of perceived control over their performance during the high maternal involvement condition than the low involvement condition and perceived control will act as a mediator between parental overinvolvement and child anxiety.

Chapter 2

Method

2.1 Chapter Overview

This chapter will provide a description of the methods used in this study. It begins by describing the design of the study, with details given about the participants, the experimental task, measures and recruitment methods. Ethical considerations will then be discussed in detail. The measures used are then discussed, including their psychometric properties. Finally, the procedure is presented.

2.2 Design

This study used a within participants, repeated-measures experimental design. The independent variable was 'parental involvement', with two levels of experimental manipulation: high parental involvement (condition one) and low parental involvement (condition two). High involvement equates to overinvolved parental behaviour, whereby the child is granted very little autonomy to complete the task him/herself and rather takes over the task, whereas low involvement equates to an autonomy-granting style whereby the child is left to work on the puzzles alone, with encouragement, but no direct involvement. Dependent variables were; scores on self-report measures of anxiety and perceived control, and observed avoidant behaviour. To control for order effects, condition one and condition two were counter-balanced. Half of the sample completed condition one followed by condition two, and half completed condition two followed by condition one. Basic demographic information was collected at the time of gaining consent. Self-report anxiety measured on a likert scale was collected at baseline before the experimental manipulation. Likert scales measuring anxiety and perceived control were completed after both conditions. Questionnaire measures of child and maternal anxiety were collected following completion of the experiment.

2.3 Participants

Participants were 39 school children aged between 8 and 11 years, recruited from primary schools in Cardiff and their mothers. This age group was selected as research suggests that the median age of onset for anxiety disorders is nine years old (Kessler et al., 2005). Previous research has found significantly stronger associations between maternal anxiety and child anxiety, than between paternal anxiety and child anxiety (Cooper, Fearn, Willetts, Seabrook & Parkinson, 2006) suggesting that mother-child and father-child relationships differ in some way. Different attitudes, roles and behaviours in fathers than in mothers have also been said to either promote child anxiety or protect a child against anxiety, therefore mothers and fathers might influence a child's anxiety in different ways (Bogels & Phares, 2008). Bogels and Phares (2008) state that specific models concerning the different role of fathers compared to mothers in the aetiology of child anxiety are needed, before we are able to test fathers influence further. Although the role of a father should not be ignored, the influence of maternal overinvolvement and paternal overinvolvement need to be investigated separately. For the purpose of this study, we investigated the effect of maternal overinvolvement.

2.3.1 Inclusion and Exclusion Criteria

Children included in the study were aged between 8 and 11 years old. Exclusion criteria included those who were unable to communicate in English and those who had recognised special educational needs that may have affected their ability to perform the tasks (assessed by children's teachers), as this could have affected their ability to complete the task and questionnaire.

2.3.2 Sample Size

Two reviews reported medium to large effect sizes between parental control during parent-child interactions and child anxiety (McLoed et al., 2007; Van der Bruggen et al.,

2008). Therefore, to detect a minimum of medium effect sizes, statistical power analysis using G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007) showed that based on the statistical methodologies being used, to obtain a medium effect size of .5, a power of .80, with an alpha level of .05, a sample of 34 mother-child dyads would be required. The study received 39 responses from schools, therefore 39 mother-child dyads were recruited in total.

2.3.3 Recruitment of Participants

Participants were recruited from three primary schools in Cardiff. Initial contact was made to head teachers by email (Appendix A), all of whom agreed to take part. Information packs explaining the project and inviting pupils to take part in the study were given to children to take home to parents from year groups four, five and six. Information packs included a covering letter from the head teacher, a parent (Appendix B) and child (Appendix C) information sheet, a contact sheet (Appendix D) and a parent consent form (Appendix E) to be returned to the school in the envelope enclosed. Child assent (Appendix F) was gained at the start of the research visit. Schools and parents were informed that for every child that took part, a £3 book voucher would be given to the school.

For each participating primary school, 180 information packs were sent out to parents, an overall total of 540 information packs, as each year group contained 60 children in all three schools. Forty information packs were returned in total, 14 (7.7%) from school A, 13 (7.2%) from school B and 12 (6.6%) from school C. The overall response rate was 7.4%. All returned contact sheets were collected from teachers. None of the children that responded were identified as having special education needs that might have affected their ability to perform the tasks, and all spoke English fluently. Families were contacted to discuss the study further and to arrange appointments at their home. All mothers contacted were happy to take part and gave written consent to be in the study. Basic demographic details of participants can be found in section 3.2.

2.4 Experimental Manipulation Task

The experimental task used in this study was developed from a similar task used by Hudson and Rapee (2001), and involves children being asked to complete as many complex tangram puzzles as they can within five minutes. The tangram puzzle involved combining small shapes to form larger shapes outlined on a set of four pictures (for an example see Appendix G). The tasks were video-recorded for subsequent coding and were rated by an independent researcher to assess inter-rater reliability. The order in which children completed each condition was counter-balanced and no significant order effects were found. Children were given slightly different instructions before each set of puzzles. Before starting the first set of puzzles children were told:

I am going to ask you to complete a number of puzzle games, and what I am interested in is seeing how well you can complete the puzzles. I would like you to put these small shapes together in the green box to make the big shapes in the picture, a bit like a jigsaw. All of the small shapes have to fit in the box somehow. I'm going to give you 5 minutes on the clock to see how many of these puzzles you can complete, so I'd like you to work as quickly as you can.

A clock was positioned near the child and their mother so that they could monitor the remaining time. Their mother was present whilst the child was given the instructions and was asked to sit on the right hand side of their child whilst completing the task.

Prior to the second set of puzzles children were told:

This time, I am going to give you a different set of puzzles and I'm interested in seeing how well you can complete these puzzles. I'm going to give you another 5 minutes on the clock to see how many of the new puzzles you can complete correctly. Just like the last time, I'd like you to work as quickly as you can.

Prior to undertaking both conditions, mothers were given instructions on how to behave during the task. Due to time restraints, instructions were chosen, rather than a training video. Instructions were given in another room away from their child so that the child could not hear the instructions. Children were told that the researcher was going to ask their mothers a couple of questions in the kitchen/hallway before starting the puzzles. Children were given the task of getting the puzzle pieces out of the bag. Before the first experiment mothers were told:

I will be asking your child to complete two sets of puzzles. They will be given 5 minutes to complete as many puzzles as they can. They will be told that we are interested in seeing how well they can complete the puzzles. What I'm really interested in is how much your level of involvement affects your child's performance. I'm going to ask you to behave quite differently for each set of puzzles in how much you get involved with your child.

Depending on the counter-balancing of conditions, mothers were given instructions for the relevant condition. Before condition one, mothers were instructed:

In this set, I would like you to be highly involved in helping your child complete the puzzles, even if this is not how you might usually be. Here are the answers to the puzzles so that you can offer frequent guidance and assistance, but please don't let your child know that you have the answers, and please don't show them the answers. Please instruct and direct them throughout the task, even if they do not ask for help.

Before the second condition, mothers were taken into another room and given the following instructions away from the presence of their child:

In this part of the experiment we want to see how well they can do on their own. It is important that your level of involvement with helping your child is very low, and that they complete the puzzles on their own, even though you have the answers in front of

you. If they ask for help, please acknowledge their request, and encourage them to try on their own, therefore keeping your involvement to a minimal. Please encourage and support them, but without being overly involved.

2.5 Ethical Considerations

Before conducting the study, ethical approval was obtained from The Faculty of Health Ethics Committee, at the University of East Anglia (UEA; see Appendix H for correspondence). Guidance and recommendations from the British Psychological Society (BPS, 2010) and Medical Research Council (MRC) on conducting research was followed.

2.5.1 Informed Consent

Research information packs were sent home with children from school. Mothers were provided with information sheets describing the nature of the study, a consent form and a contact sheet. Children were also given age-appropriate information sheets. Researcher contact information was provided on the information sheets. Mothers were encouraged to discuss the study with their child. Child assent was obtained during the research visit prior to starting the experimental tasks. Children were only able to take part with both written consent from their mother and a completed assent form. Mother and child were told that they could withdraw from the study at any point, without having to give a reason. All children completed the assent form.

2.5.2 Deception

It was necessary to withhold some information about the true aims of the study to maintain the validity of the research, in keeping with BPS (2010) ethical guidance. If children and parents had been informed of the true aims, their behaviour during the task might have been unduly influenced.

Head teachers and parents were told that we were investigating the influence of parental involvement on children's learning potential and task performance, rather than the

effect of over involved parental behaviour on children's anxiety levels and avoidant behaviour during the tasks. Following completion of the tasks, participants were fully debriefed as to the true purpose of the study, and children were told that their mother was asked to act in different ways whilst they were completing the tasks. British Psychological Society research ethics guidelines (BPS, 2010), were strictly followed throughout the study.

2.5.3 Confidentiality and Anonymity

Data were managed in accordance with the Data Protection Act (1998) and UEA guidelines on Good Practice in Research. Participants were informed that data were only collected for the purpose of the study and that their identity would not be revealed in any way. All raw data, including written records, questionnaires, and video-recordings were coded anonymously and stored in a locked cupboard. Records kept on a computer were again stored securely, and were only accessed by a secure password. Data will be securely stored for a maximum of 5 years and will then be destroyed.

2.5.4 Managing Distress

The researcher aimed to minimise the risk of distress throughout the experimental task. If the researcher had become concerned about the well being of a participant, the study would have been stopped immediately and the distress managed appropriately. This did not happen on any occasion. Questionnaire scores were calculated during the visit and if scores on any of the questionnaires indicated that the child was experiencing psychological difficulties, concerns were discussed further with the mother and child. Mothers were advised to contact the child's general practitioner if it was felt that anxiety was interfering with their daily life. Seven children scored above the mean clinical cut-off score of 42.48 reported by Spence (1998). The researcher's contact details were given in case of any concerns following the visit.

2.6 Measures

2.6.1 Self-report Questionnaires

2.6.1.1 The Spence children's anxiety scale (SCAS; Spence, 1998). The SCAS (see Appendix I) is a 45-item standardised self-report questionnaire used to measure symptoms of anxiety in children aged 8 to 12 years old. For the purpose of this study the SCAS was used to investigate associations between self-reported child anxiety levels and specific anxiety levels measured during the experimental tasks. It has six subscales; panic/agoraphobia, social anxiety, separation anxiety, obsessions/compulsions, generalised anxiety and fear of physical injury. Children are asked to indicate the frequency with which each item occurs on a 4-point scale ranging from 0 (never) to 3 (always). This measure has high internal consistency with a Pearson correlation coefficient of between .90 and .94 (Spence, 1998; Muris, Schmidt & Merckelbach, 2000). The internal consistency of the subscales was also acceptable with correlation coefficients of .82 (panic/agoraphobia); .70 (separation); .70 (social phobia); .60 (physical injury fear); .73 (obsessive-compulsive) and .73 (generalised anxiety). Test-retest reliability after 6 months was reported to be $r = .60$ for the total score (Spence, 1998). Convergent validity was examined against the revised children's manifest anxiety scale (RCMAS, Reynolds & Richmond, 1978) with a reported Pearson correlation of $r = .71$.

2.6.1.2 The Beck anxiety inventory (BAI; Beck, Epstein, Brown & Steer (1988); Beck & Steer, 1990). The BAI is a 21-item self-report measure of anxiety symptoms experienced during the previous week. The BAI has high internal consistency of $r = .92$ (Beck et al., 1988) and a good test-retest reliability of $r = .75$ (Beck et al., 1988). For the purpose of this study, the BAI will be used to explore associations between maternal anxiety and maternal overinvolvement to establish whether maternal anxiety influenced levels of involvement, despite the manipulation.

2.6.2 Coding systems

2.6.2.1 Parental involvement and negativity (Hudson, Rapee, Jacobs, & Vrieze, 2001). Maternal involvement and negativity were rated on a global rating scale developed by Hudson et al. (2001). Mother-child interactions were rated on five global scales of involvement: (a) general degree of involvement (intrusiveness); (b) general degree of unsolicited help; (c) touching of the tangram pieces; (d) mother's position or posture; and (e) mother's focus towards the child (autonomy granting) or towards the task (control).

Mother-child interactions were also rated on four global scales of negativity: (a) general mood; (b) mother's affect; (c) mother's tension; and (d) mother's response to the child (encouraging or critical). Each of these scales consisted of a 9-point scale ranging from 0 (low) to 8 (high) with 4 representing a neutral point on the scale. Participants' total scores were averaged to determine the degree of involvement and negativity.

2.6.2.2 Children's avoidant behaviour (van der Bruggen, 2010). To measure children's avoidant behaviour during each experimental condition, child dependent verbal, non-verbal and withdrawn behaviour were coded for each mother-child interaction using a coding system developed by van der Bruggen (2010). Child dependent behaviours were rated on a verbal (e.g. asks mother for help or reassurance) and non-verbal scale (e.g. looks up to parent for help or reassurance). Withdrawn behaviours were rated as withdrawn behaviour towards the puzzle (e.g. complains that the puzzles are not fun or sits back away from the puzzle). Each scale ranged from 0 (no presence of the behaviour) to 6 (behaviour present often). A total score of avoidant behaviour was calculated for each child by combining the dependent verbal, non-verbal and withdrawn behaviours

2.6.3 Likert scales

2.6.3.1 Self-report anxiety scale. Although this study was primarily interested in children's level of anxiety overall, we were unsure whether all children would understand the

complex concept of ‘anxiety’, whereas the term ‘worry’ is a more commonly used everyday term used and understood by children at home and at school. ‘Worry’ has also been defined as the cognitive component of anxiety (e.g. Vasey, 1993; Vasey & Daleiden, 1994), therefore it was deemed relevant to ask children how worried they felt, alongside how anxious they felt, in order to cover both physiological and cognitive components of anxiety. This measure has been named the ‘self-report anxiety scale’ in this study. Children were asked to rate how anxious or worried they felt before completing the first experimental condition. After each condition children were also asked to rate how worried or anxious they felt whilst they were completing the puzzles. This was rated using a ‘worry thermometer’, in order to help children understand the meaning of rating their anxiety and worry through a visual aid. The scale (see Appendix J) ranged from 0 (very relaxed) to 10 (extremely anxious or worried). The worry thermometer in this study is an adapted version of the originally validated ‘anxiety thermometer’ (Houtman & Bakker, 1989). The original ‘anxiety thermometer’ was validated with adults, therefore the measure was adapted to make sense to young children and to look more attractive. The original scale was found to have acceptable internal reliability with Pearson correlation coefficients ranging from .63 to .78, with test-retest reliability coefficients of .70.

2.6.3.2 Self-report perceived control scale. Following the completion of each condition, children were asked to rate the level of perceived control they felt they had over completing the puzzles. A 5-point likert scale was developed for this study ranging from 0 (I felt I had no control over completing the puzzles) to 4 (I felt I had total control over completing the puzzles). This was rated using a ‘control thermometer’ (see Appendix K) in the same style as the ‘worry thermometer’ to help children understand the meaning of rating their control through a visual aid. Based on the pilot study, it was decided that an example

should be given to each child to help them understand what ‘control’ meant. Each child was given the example of learning to ride a bike;

When children first learn to ride their bike they often have stabilisers and some help from a grownup to make sure they don’t fall off, so the child has some control over riding the bike, and the stabilisers and the grownup helping the child has some control over the bike. However, when that child is older and can ride the bike on his/her own, they are the main person in control of riding the bike.

2.6.4 Inter-Rater Reliability

In order to reduce potential experimenter bias, a researcher completing a PHD at the University of Cambridge was trained in both behavioural coding methods by the main researcher to assess inter-rater reliability. Three video-recordings were chosen at random to use for training purposes. The three randomly selected video-recordings were then coded by both researchers, working through each section of the coding manuals. Each behavioural observation (from the coding manuals) was recorded, compared, and discussed throughout this process. Data from a further 19 participants (50%) were then randomly selected and rated by the independent researcher, who was blind to the experimental condition, and who was given minimal background information about the study. Intra class correlations were used to measure inter-rater reliability (see Table 1) for each separate item that made up the total scores on measures of maternal involvement and negativity, and children’s observed avoidant behaviour. Only one reliability coefficient was below .8 indicating overall good inter-rater reliability (Field, 2009).

2.7 Procedure

2.7.1 Pilot Study

The experimental task itself has been used in previous research. However the manipulation of maternal involvement was more novel, and therefore a small pilot study was

conducted to determine whether the methods being used to manipulate maternal involvement were successful. Four children aged 8 to 11 years and their mothers were included in the

Table 1

Intra-class correlation coefficients for involvement, negativity and child avoidance.

Variable	Condition	
	High Involvement P	Low Involvement P
Maternal involvement		
General degree of involvement	.86	.96
Unsolicited help	.82	.97
Touching of tangram pieces	.87	.97
Position/posture	.87	.95
Focus	.92	.81
Maternal negativity		
General mood	.77	.85
Affect	.90	.94
Tension	.86	.85
Response to child	.82	.86
Child avoidance		
Dependent verbal	.89	.90
Dependent non-verbal	.88	.97
Withdrawn towards puzzle	.87	- *

* Intra-class correlations could not be performed on this variable, as both raters scored zero for all items.

pilot study. During the pilot study the manipulation of involvement was successful. However, mothers suggested that it would have been helpful to inform them prior to the first condition that they would be asked to behave quite differently in each experiment, so that they were aware that they had to vary their level of involvement between conditions. This information was added to the instructions. Prior matching of tangram puzzle sets based on their difficulty

appeared successful, as children reported each puzzle set to be of similar difficulty. This was also apparent based on the amount of puzzles children were able to complete within the time limit. Children found the ‘worry thermometer’ easy to comprehend, but did need some help with understanding the ‘control thermometer’. However, once a real-life example was given to each child, they seemed confident that they understood what control meant. An example was therefore given to each child during the main study. Children did not report finding the SCAS difficult or time consuming to complete, taking less than 15 minutes for each child.

2.7.2 Main Study

After consent forms were returned to schools, the researcher contacted the mother on the provided telephone number to discuss the study further, answer any questions and arrange an appointment to visit the family at their home.

Before each research visit, the order in which conditions were to be performed and the order of puzzle sets used in each condition was randomly counter-balanced to reduce potential order effects. This was achieved by an independent researcher labelling 40 individual pieces of card, with 20 labelled as ‘1’ and 20 labelled as ‘2’. A card was then chosen from an envelope at random, and the number chosen represented the condition that was conducted first. The same process was used for the counter-balancing of the puzzle sets with each set labelled ‘A’ and ‘B’. At the start of the visit, for those children who had not read the child information sheet, the researcher read through this with the child and then gained informed assent.

The next stage of the process involved the experimental manipulation. Firstly, children were asked to take all of the puzzle pieces and box out of the bag and lay them on the table whilst the researcher asked their mother a question in another room. Mothers were then given the first set of instructions depending on which condition they were performing first, as detailed in section 2.4. Once the instructions had been given, both mother and

researcher went back into the room with the child. Mothers and children sat at a table with the mother on the child's right hand side. Children were asked to rate their current level of anxiety and then given the instructions to complete the tangram puzzles. Dyads were video-recorded during the task. A digital timer was placed in front of the child and was set to 5 minutes. The researcher was not in the child's direct view.

After 5 minutes the experimenter asked the child to stop what they were doing. They were then asked to rate their anxiety and perceived control on the worry and control thermometers. Mothers were then taken into another room and given the second set of instructions. The researcher told the child that they were going to ask their mother a question in another room, before returning to start the second set of puzzles. The second set of instructions was then given to the child before starting the new set of puzzles. Another 5 minutes was set on the timer. At the end of the task, children were again asked to rate their anxiety and perceived control on the worry and control thermometers.

Following completion of both experimental conditions, children and mothers were asked to complete the questionnaires (SCAS & BAI) before children were debriefed (see Appendix L) and both mothers and children were offered the opportunity to have any questions answered. The total time taken to complete all aspects of the research visit ranged between 40 to 60 minutes. The child's school received a £3 gift voucher for each child that took part.

CHAPTER THREE

3. Results

3.1 Chapter Overview

This chapter begins with an overview of the demographic data, including participants' age, gender and ethnic origin. Treatment of the raw data is described, including the screening of data for errors and missing values. Internal consistencies for the measures are then presented (Table 2). Following this, descriptive data are presented for all measures and variables (Table 3 & Table 4), including details of the distribution of the data and whether the data met the assumptions for using parametric tests. All dependent variables were found to be normally distributed.

Each research hypothesis was then examined. A manipulation check was carried out to assess whether the experimental manipulation was successful. Means from the high involvement and low involvement conditions were compared on self-report levels of anxiety and perceived control and behavioural measures of child avoidance. For each hypothesis, results from the main analysis are presented, followed by exploratory correlational analyses (Table 5) to examine whether relationships occurred between baseline measures of anxiety symptoms and self-report anxiety, observed child avoidance and perceived control during the tasks. The chapter concludes with a summary of the results, which leads into the discussion.

3.2 Demographics

The demographic characteristics of the sample were explored. Females made up 66.6% of the sample, with 33.3% of the sample being males. The mean age was 9.3 years ($SD = 1.02$), with a range of 8 to 11 years. Twenty one mothers (53.8%) described their ethnicity as White British, 13 (33.3%) as Asian or British Asian, and the remaining five (12.8%) were Israeli, Iraqi and German ethnic origin.

3.3 Data Analysis Strategy

The data were entered into an SPSS spreadsheet and screened for errors and missing data. Any unusual data were checked against original questionnaire or data coding sheets and amended where appropriate. No missing data were found.

Initial correlations were run to identify any associations between variables that would indicate the use of a MANOVA. Variables were not correlated (see Table 8), therefore main effects between conditions were analysed using paired samples t-tests, as a MANOVA can be considered redundant when dependent variables are uncorrelated (Tabachnick & Fidell, 2007). A Bonferonni correction was applied to each test to reduce the chance of making Type 1 errors (Field, 2009). Prior to considering a mediational model, correlations were investigated to establish whether the predictor variable (parental involvement) was associated with the outcome variable (child anxiety). As the variables were not associated in the anticipated direction as hypothesised, there was no effect to mediate and further testing was not necessary.

3.4 Internal Consistency of the Questionnaires and Rating Scales

The internal consistency of the questionnaire used in the study was tested. Pallant (2007) recommends that a Cronbach Alpha (α) score of above .70 is indicative of acceptable reliability, an alpha score of .80 and above being preferable. The alpha score for the total score on the SCAS indicated very good internal consistency (.88), comparable to Spence (1998) (see Table 2). Low internal consistency was obtained for all subscales except the Social Phobia subscale. The individual subscales were not used in the analyses, and only the total score was used.

Internal reliability for maternal involvement and negativity was good across both conditions (Table 2). The reliability of the child behavioural measures was unable to be

assessed, as the data violated the assumptions of the reliability model. This was due to a negative average covariance among items caused by a large amount of scores being zero.

Table 2

Cronbach's Alpha's for Rating Scales

Rating scale	A
BAI	.88
SCAS total score	.88
SCAS Separation subscale	.66
SCAS Social phobia subscale	.76
SCAS Obsessive compulsive subscale	.44
SCAS Panic / Agoraphobia subscale	.67
SCAS Physical injury subscale	.58
SCAS Generalised anxiety subscale	.62
Maternal involvement condition one	.79
Maternal involvement condition two	.82
Maternal negativity condition one	.78
Maternal negativity condition two	.83

Note. Condition one = high involvement, condition two = low involvement.

3.5 Descriptive Analysis

This section presents descriptive data for each measure used in the main analyses (see Tables 3 & 4). To assess normality of the data, histograms and P-P plots were inspected to identify the spread of the data visually. Levels of skewness and kurtosis were also calculated for each variable by converting these values into z scores. Any values greater than 2.58 or less than -2.58 indicated significant levels of kurtosis and skewness in the distribution at

Table 3

Descriptive Data for Dependent Variables

Variables		Experimental Manipulation									
		High Involvement					Low Involvement				
		Mean	SD	Ranges	Skew	Kurtosis	Mean	SD	Ranges	Skew	Kurtosis
Maternal											
	Involvement	6.89	.58	6 - 8	-.05	-1.14	2.62	1.37	1 - 6	.84	-.30
	Negativity	3.05	.91	2 - 5	.32	-.25	2.83	.92	1 - 5	-.05	.52
Child											
	Observable avoidant behaviour	1.42	1.32	0 - 5	.76	.08	3.11	3.23	0 - 11	.88	-.14
	Self report anxiety	2.29	2.16	0 - 8	.93	.03	3.32	2.63	0 - 8	.26	-1.35
	Self report perceived control	2.16	1.32	0 - 4	-.47	.38	2.97	.91	1 - 5	-.17	-.24

Table 4

Descriptive Data for Baseline Measures of Mother and Child Anxiety

Baseline measures	Mean	SD	Ranges	N. above clinical cut off *	Skew	Kurtosis
Pre-task self-report anxiety	1.66	1.16	0 - 4	n/a	.40	-.16
SCAS total score	31.2	13.47	7 - 64	7	.28	-.36
BAI total score	9.34	7.75	0 - 28	8	.87	-.09

Note. * The number of participants that scored above the clinical cut off score.

the .01 level (Field, 2000; 2009). One case was removed due to displaying significant outliers on a number of variables, which affected the skew of the data. One significant outlier was changed within the total BAI scores, by changing the score to be one unit above the next highest score (Field, 2009). Descriptive data for maternal involvement and negativity, child avoidant behaviour, child self-report anxiety, child perceived control, and baseline measures of child and maternal anxiety are presented in Tables 3 and 4. All data were found to be normally distributed.

3.5.1 Spence Children's Anxiety Scale (SCAS; Spence, 1998)

Descriptive data for the SCAS total score are presented in Table 4. The mean score on the SCAS of 31.2 was below the mean clinical cut-off score of 42.48 reported by Spence (1998), reflecting a non-clinical sample. Although seven children scored above this cut-off score, 82% of scores were below the clinical cut-off. Data from all children were included in the following results.

3.5.2 Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer (1988); Beck & Steer, 1990)

Descriptive data for the total BAI scores are presented in Table 4. According to normalised data (Beck & Steer, 1990) mother's mean score on the BAI represents a

mildly anxious (8 - 15) sample of mother's, with six mothers scoring within the moderately anxious range (16 - 25), and two mothers scoring within the severely anxious range (26 - 63). Data from all mothers were included in the following results.

3.6 Preliminary Analyses

3.6.1 Age

Pearson correlation coefficients were undertaken to determine any associations between age (in months) and the dependent variables across conditions (see Table 5). There was a positive correlation between age and levels of perceived control in the high involvement condition, $r = .36$, $p = .02$, with higher levels of perceived control as children's age increased. No other associations were found.

Table 5

Associations Between Age and Dependent Variables

Variables	Age	
	<i>R</i>	<i>P</i>
Pre-anxiety	-.20	.47
Avoidance		
High	-.14	.38
Low	-.02	.89
Self-report anxiety		
High	-.07	.64
Low	-.10	.51
Control		
High	.36	.02*
Low	-.09	.57
SCAS	-.14	.38

Note. High = high maternal involvement, Low = low maternal involvement

* $p < .05$ two tailed

3.6.2 Gender

Independent samples t-tests were used to investigate differences in mean scores between males and females on all dependent variables across conditions. No significant differences between males and females were found (see Table 6).

Table 6

Independent t-tests for Gender Differences

Variables	Males (n = 12)		Females (n = 26)		<i>T</i>	<i>P</i>
	M	SD	M	SD		
Pre-anxiety	1.67	1.37	1.65	1.09	.03	.97
Avoidance						
High	1.17	1.26	1.54	1.36	-.79	.43
Low	2.50	2.90	3.38	3.39	-.77	.44
Self-report anxiety						
High	2.92	2.77	2.00	1.81	1.22	.23
Low	3.17	2.69	3.38	2.65	-.23	.81
Control						
High	2.17	1.11	2.15	1.04	.03	.97
Low	3.08	0.90	2.92	0.93	.49	.62
SCAS	29.17	14.69	32.23	13.06	-.64	.52

Note. n = number of participants in each gender.

3.6.3 Ethnicity

Differences between ethnic groups were tested using one-way analysis of variance (ANOVA) on all of the dependent variables. There were no significant between group differences found (See Table 7).

Table 7

Analysis of Variance for Ethnicity Differences

Variables	White British (n = 21)		Asian or Asian British (n = 12)		Other (n = 5)		<i>F</i>	<i>p</i>
	M	SD	M	SD	M	SD		
Pre-anxiety	1.62	1.16	1.33	0.77	2.60	1.67	2.23	.12
Avoidance								
High	1.29	1.48	1.67	1.23	1.40	0.89	.30	.74
Low	3.19	3.40	2.42	3.20	4.40	2.70	.66	.52
Self-report anxiety								
High	2.86	2.28	1.58	1.92	1.60	1.81	1.66	.20
Low	3.29	2.51	3.50	2.78	3.00	3.31	.06	.93
Control								
High	2.14	1.10	2.25	0.96	2.00	1.22	.09	.90
Low	3.00	0.94	3.08	0.90	2.60	0.89	.49	.61
SCAS	30.00	13.58	35.08	13.82	27.40	12.68	.77	.47

3.6.4 Manipulation Check

Observations of maternal behaviour in each experimental condition were compared using a paired samples t-test which indicated that mean scores of maternal involvement were significantly higher during the high involvement condition ($M = 6.89$, $SD = 0.58$) compared to mean scores of involvement during the low involvement condition ($M = 2.62$, $SD = 1.37$), $t(37) = 17.15$, $p = .000$, $r = .88$, $CI [3.76, 4.77]$. A large effect size was indicated, $r = .94$. Thus the experimental manipulation was successful. No differences were found in maternal negativity between the high involvement or low involvement conditions $t(37) = 1.39$, $p = .17$.

Pearson correlations were conducted to assess whether there was any relationship between mothers BAI score and their level of negativity or involvement in both conditions. There was no correlation between mothers' BAI scores and their level of negativity in the high involvement condition, $r = .04$, $p = .77$, or the low involvement condition, $r = -.05$, $p = .76$, or between mothers BAI scores and their

Pearson correlations were conducted to assess whether there was any relationship between mothers BAI score and their level of negativity or involvement in both conditions. There was no correlation between mothers' BAI scores and their level of negativity in the high involvement condition, $r = .04$, $p = .77$, or the low involvement condition, $r = -.05$, $p = .76$, or between mothers BAI scores and their level of involvement in the high involvement condition, $r = .03$, $p = .84$, or the low involvement condition, $r = -.21$, $p = .20$. To assess whether there were any significant order effects, independent sample t-tests were performed on all dependent variables, to compare the scores for those children receiving the high involvement condition first with those children receiving the low involvement condition. No significant order

effects were found on any of the variables, as all significance p values were greater than .05.

3.7 Main Results

Descriptive data for ratings of self-report anxiety, avoidant behaviour and perceived control are presented in Table 3. Differences between the high and low involvement conditions on each of these variables are represented in Figure 2.

3.7.1 Hypothesis One (Self-report Anxiety)

It was hypothesised that children would report higher levels of anxiety during the high involvement condition when compared to levels of anxiety during the low involvement condition. Mean scores of self-report anxiety between the high and low involvement conditions were compared using a paired samples t-test. There was a trend towards significance between conditions $t(37) = -2.42, p = .02, r = .13, CI [.16,$

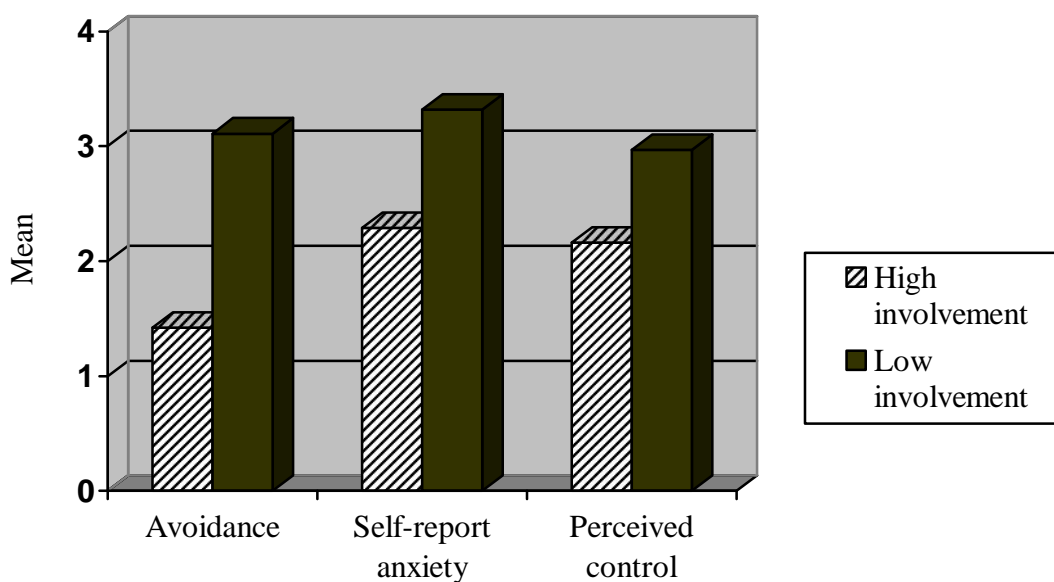


Figure 2. Mean scores on the dependent variables between the high and low involvement conditions.

1.88]. Contrary to the hypothesis, mean scores showed that children's self-reported anxiety levels during the low involvement condition ($M = 3.32$, $SD = 2.63$) were higher than self-reported anxiety levels during the high involvement condition ($M = 2.29$, $SD = 2.16$), however this did not reach the significant level required when applying a Bonferroni correction, where p was required to be less than .017.

3.7.1 Hypothesis Two (Observed Avoidant Behaviour)

It was hypothesised that children would show higher levels of avoidant behaviour during the high involvement condition than the low involvement condition. Mean scores of avoidant behaviour were compared using a paired samples t-test. There was a significant difference between the conditions, $t(37) = -3.45$, $p = .001$, $r = .24$, $CI [.69, 2.67]$. The mean scores showed that children were more avoidant in the low involvement condition ($M = 3.11$, $SD = 3.23$) than in the high involvement condition ($M = 1.42$, $SD = 1.32$). A moderate effect size of $r = .49$ was indicated.

3.7.3 Hypothesis Three (Perceived control)

It was hypothesised that children would report lower levels of perceived control in the high involvement condition compared to the low involvement condition. Mean scores of perceived control between the high and low involvement conditions were compared using a paired samples t-test. This showed that there was a significant difference between levels of control between both experimental conditions $t(37) = -3.95$, $p = .000$, $r = .29$, $CI [-.398, -1.233]$. Consistent with the hypothesis, children reported significantly lower levels of perceived control in the high involvement condition ($M=2.16$, $SD=1.05$) compared to the low involvement condition ($M = 2.97$, $SD = .91$). It was also hypothesised that lower levels of control would be associated with higher levels of self-report anxiety and observed avoidant behaviour. This was not supported as there were no significant associations found between perceived

control and self-report anxiety in the high involvement condition, $r = -.12$, $p = .44$, or the low involvement condition, $r = .06$, $p = .70$, or between perceived control and avoidant behaviour in the high involvement condition, $r = .02$, $p = .86$, or the low involvement condition $r = -.10$, $p = .51$.

3.8 Exploratory Correlational Analyses

Exploratory correlation analyses were undertaken to examine relationships between variables. The relationships between baseline measures of anxiety, (both on the SCAS and pre-task self-report ratings) and levels of self-report anxiety, avoidant behaviour and perceived control during each condition were of particular interest. Pearson's correlation coefficient was used on all data (see Table 8).

3.8.1 Baseline anxiety symptoms (SCAS)

Children's anxiety symptoms were positively correlated with self-report anxiety ratings prior to starting the tasks, $r = .36$, $p = .02$. Children's anxiety symptoms were not significantly correlated with children's avoidant behaviour in the high involvement condition, $r = .31$, $p = .064$, but were significantly correlated with avoidant behaviour in the low involvement condition, $r = .33$, $p = .03$. There was a positive correlation between children's anxiety symptoms and self-reported anxiety levels during the low involvement condition, $r = .44$, $p = .005$, but no significant correlation between children's anxiety symptoms and self-reported anxiety levels during the high involvement condition, $r = .08$, $p = .61$. Children's anxiety symptoms were not associated with perceived control in either the high involvement condition, $r = .01$, $p = .94$, or the low involvement condition, $r = .12$, $p = .45$.

3.8.2 Baseline pre-task self-report anxiety

There was no significant correlation between self-report anxiety ratings before starting the tasks and avoidant behaviour during the high involvement condition, r

Table 8

Correlations Between Dependent Variables

Variable	Pre-anxiety	Avoidance		Self-report anxiety		Control		SCAS
		High	Low	High	Low	High	Low	
Pre-anxiety	-	.16	.19	.27	.51**	-.06	.01	.36*
Avoidance								
	High	-	.37*	-.01	.27	.02	.03	.31
	Low		-	-.02	.27	-.03	-.10	.33*
Self-report anxiety								
	High			-	.41**	-.12	-.20	.08
	Low				-	-.18	-.06	.44**
Control								
	High					-	.17	-.01
	Low						-	.12
SCAS								-

Note. High = high maternal involvement, Low = low maternal involvement

* $p < .05$ two tailed ** $p < .01$ two tailed

= .16, $p = .32$, or the low involvement condition, $r = .19$, $p = .23$. Children's self-report anxiety levels prior to starting the task were positively correlated with their self-report anxiety following the low involvement condition, $r = .51$, $p = .001$, with higher levels of pre-task self-reported anxiety associated with higher levels of self-reported anxiety during the low involvement condition. There was no significant correlation between levels of pre-task self-report anxiety and levels of self-report anxiety during the high involvement condition, $r = .27$, $p = .09$.

3.9 Summary of Results

Results suggest that overall, the hypotheses have not been supported. The experimental manipulation was successful in inducing high and low levels of involvement in mothers; however results were contrary to what was expected. Children were observed to show more avoidant behaviour and reported higher levels of anxiety in the low involvement condition, not the high involvement condition as hypothesised. Children did report lower levels of perceived control in the high involvement group as hypothesised, however this was not associated with self-report or behavioural ratings of anxiety or avoidance. These results are discussed and explained in more detail in the next chapter.

CHAPTER FOUR

4. Discussion

4.1 Chapter Overview

The discussion begins with a summary of the findings (section 4.2) and an evaluation of the findings in relation to the research hypotheses and previous research in the field (section 4.3). A thorough critique of the methodologies used is then presented (section 4.4). Theoretical and clinical implications are then discussed in relation to Chorpita, Barlow and Brown's (1998) model and alternate models discussed in the introduction (section 4.5). Directions for future research are then suggested (section 4.6) before an overall summary of the conclusions from this investigation are presented (section 4.7).

4.2 Summary of Results

The experimental manipulation in this study was successful in creating significantly different levels of involvement in mothers whilst their child completed the tangram puzzles. Mothers were significantly more involved during the high involvement condition than during the low involvement condition. In the low involvement condition, a trend towards significantly higher levels of self-report anxiety was found. Children were found to show significantly higher levels of avoidant behaviour in the low involvement condition compared to the high involvement condition.. Levels of perceived control were significantly lower in the high involvement condition. Although children's levels of self-report anxiety and avoidant behaviour were higher in the low involvement condition, and perceived control was lower in the high involvement condition, correlations between these three measures were non-significant.

In the low involvement condition, levels of anxiety symptoms were positively correlated with levels of avoidant behaviour and self-report anxiety. However, this relationship was not found in the high involvement condition.

Baseline measures of self-report anxiety were not associated with avoidant behaviour during the high involvement or low involvement conditions. However, higher baseline self-report anxiety levels were significantly correlated with higher self-report anxiety levels in the low involvement condition. No associations were found between base-line self-report anxiety and self-report anxiety during the high involvement condition. No associations were found between perceived control and the remaining dependent variables.

4.3 Evaluation of Findings

This section provides an evaluation of the findings in relation to the hypotheses, whilst comparing the findings to previous research where possible.

4.3.1 Hypothesis One and Two: Children will report higher levels of self-report anxiety and will display more observable avoidant behaviour during the high maternal involvement condition than the low involvement condition.

Contrary to expectations, children showed a trend towards higher levels of anxiety and more avoidant behaviour in the low involvement condition compared to the high involvement condition. The hypotheses were therefore not supported, as the opposite effect was found.

These findings can only be directly compared to two previous experimental manipulation studies, and the results are contrary to both studies. Thirwall and Creswell (2010) administered a speech task to children and found a trend towards more observed child anxiety in the high involvement condition. They also found that children predicted they would do less well prior to the speech task, felt significantly

less happy and more scared about the task when their mothers were more controlling during the speech preparation. Similarly, de Wilde and Rapee (2008) reported that children showed greater levels of situational anxiety during a speech task when mothers had been overly controlling in the practice task.

The majority of observational studies that have found associations between higher levels of parental control or involvement and child anxiety in non-clinical samples (e.g. Rubin et al., 2001; van der Bruggen et al., 2010) and in clinical samples, (e.g. Barrett et al., 2005; Hudson & Rapee, 2001; Moore et al., 2004). It is difficult to directly compare the findings from the current study to these studies, as most have measured parental involvement whilst parents interact with their child, and have utilised questionnaire measures of child anxiety or clinical diagnoses to look for associations between parental overinvolvement and child anxiety, rather than directly measuring child anxiety or anxious behaviour during the observation. Therefore, it is unclear what effects higher levels of involvement might have directly had on children during these observational tasks.

A number of studies have not found support for the association between parental control and increased child anxiety (Lindhout et al. 2009; Muris et al., 2011; Rubin et al., 1999). Only one study has reported opposite findings; that child anxiety disorders were associated with a less overprotective parenting style compared to control groups (Gastel et al., 2009). Although the findings in this study are somewhat different to those reported by Gastel et al. (2009) due to the different methodologies utilised, both studies have found limited support for the hypothesis that parental overinvolvement causes child anxiety.

It is possible that the design of this study might explain the contrary findings. For example, in the experimental manipulation studies (de Wilde & Rapee, 2008;

Thirwall & Creswell, 2010) maternal overinvolvement was manipulated during a practice speech task. Subsequently child anxiety was rated and observed during the delivery of the speech task with the child alone. Whereas in the present study, the effect of mother's involvement was examined during the task itself. Therefore in the high involvement condition, an increase in mother's presence, help and involvement during the task may in itself have acted as a means of reducing child anxiety and it may not be surprising that children were more anxious and therefore more avoidant when left to complete the difficult tasks alone. Children were also told that the researchers wanted to see how well they could complete the puzzles, so there was an element of evaluative pressure. During the high involvement condition, they were likely to complete more of the puzzles with their mother helping them. Therefore, compared to the low involvement condition, this is likely to have led to increased confidence in children, as their performance was improved because of their mothers' overinvolvement. Children may have also felt a shared responsibility with their mother towards completing the puzzles in the high involvement condition, making it less anxiety provoking.

It also seems possible that this experiment may not have created the necessary affect required to investigate the impact of maternal overinvolvement on children's anxiety. Overall, the levels of self-report anxiety and behavioural avoidance were fairly low, and therefore it seems that children did not find the task particularly stressful or anxiety provoking as predicted. Previous researchers have suggested that what might be most important is the situation in which the overinvolved parenting occurs that might cause anxiety in children (de Wilde & Rapee, 2008). In particular, overinvolved or controlling parenting behaviour that protects the child in threatening or anxiety provoking situations is said to be more specifically related to child anxiety

(de Wilde & Rapee, 2008). This experiment may therefore not have created an adequately anxiety provoking or threatening situation whereby the construct of overinvolvement and its effect on children's anxiety could be investigated.

In the present study, positive relationships were found between anxiety symptoms on the SCAS, and self-report anxiety levels and avoidant behaviour during the low involvement condition. Those children who reported higher levels of anxiety symptoms also reported higher anxiety levels and were observed to be more avoidant during the low involvement condition. Lau, Eley and Stevenson (2006) also found that trait anxious children behave more anxiously during challenging situations. Thus, children who reported higher anxiety levels based on self-report measures might have found increased comfort in their mothers being overly involved. Trait anxious children have been found to display their anxiety through external behaviours, such as dependence on their parents for help or withdrawing from the situation (Barlow, 2002). Therefore, it is possible that ordinarily, children that displayed higher levels of anxiety and avoidance in the low involvement condition might have been used to their mother's responding to their avoidant or withdrawn behaviour by intervening, whereas in this study, mother's were advised specifically not to intervene. Children with higher self-reported anxiety symptoms may therefore have been surprised by their mother's lack of involvement, further increasing their anxiety. Due to the lack of data regarding mother's typical style of parenting, we were unable to examine any associations between natural parenting and child anxiety in this study.

Future research could investigate this further, using an experimental manipulation to establish whether increased child anxiety causes increased parental involvement.

4.3.2 Hypothesis Three: Children will report lower levels of perceived control over their performance during the high maternal involvement condition than the low involvement condition and perceived control will act as a mediator between parental involvement and child anxiety.

Due to the main unexpected findings in this study, it was not possible to test a mediational model, therefore support for this hypothesis was not found. Although as expected, children reported significantly lower levels of perceived control in the high involvement condition than in the low involvement condition, perceived control was not related to increased levels of anxiety or avoidant behaviour in the high involvement condition as expected. Based on the contrary results in hypotheses one and two, the possibility of detecting the expected mediational relationship between perceived control, maternal overinvolvement and child anxiety was not possible.

This was the first study to measure perceived control using an observational experimental manipulation. Previous studies that have examined the relationship between parenting, perceived control and child anxiety have utilised questionnaire designs. Therefore it is difficult to directly compare these findings with other studies. Despite this, the findings do not support previous research that found associations between overinvolvement, child anxiety, and perceived control (Muris et al., 2004) and those that found a mediational relationship whereby perceived involvement and behavioural control by parents predicted a sense of a lack of control, which then lead to anxiety (Chorpita, Brown, & Barlow, 1998; Ballash et al., 2006). Although children reported lower levels of perceived control in the high involvement condition, supporting part of the hypothesis, little can be inferred from this, due to children showing lower levels of avoidant behaviour and there being a trend towards significantly lower levels of self-report anxiety in the high involvement condition.

4.4 Methodological Critique

This section addresses the strengths and weaknesses of the study. Limitations are described in relation to their potential impact on the study.

4.4.1 Design

This study used a repeated-measures experimental design. An advantage of experimental designs, as an alternative to correlational designs, is their ability to demonstrate causality. Therefore this study allowed the direct impact of different levels of maternal involvement on child anxiety to be assessed. Repeated-measures designs have two main advantages which can make it a more powerful design to use. Firstly, this design removes the possibility of between participant differences, which can result in large amounts of variability in the data. Secondly, they also require fewer participants, and are therefore more convenient and efficient. However, a disadvantage of using a repeated measures design is the possibility of order effects or carry over effects which might arise from testing the participants twice. However, by counterbalancing the order in which children received each condition, potential order effects or carry over effects were equally distributed across the conditions. Furthermore, no significant order effects were found on any of the variables.

4.4.2 Sample

An advantage of this study is its relatively heterogeneous sample, compared with the majority of homogenous samples found in previous studies. In this study, 33.3% of the sample described their ethnicity as Asian or British Asian. Therefore it is possible that the findings of this study can be generalised to families from both White British and Asian cultures living in the UK. However, as parental involvement was manipulated and did not reflect natural parenting styles, this study does not inform us of ethnic differences in parenting, and therefore limits the generalisability

of the findings to the effect of the manipulated parenting behaviours on children's behaviour and anxiety only.

The use of a non-clinical sample was an intentional aspect of the experimental design. De Wilde and Rapee (2008) reported in a similar study, that because parents of clinically anxious children are more involved or controlling than parents of non-clinical children, it is likely that there would be limitations to the extent to which maternal involvement could be increased in a clinical population. However, it is also recognised that using non-clinical samples limits the extent to which the findings can be generalised to clinical populations. This is because different relationships between parental involvement and anxiety may exist in clinical populations.

The age range was quite limited in this study, as children were aged between 8 and 11 years. In order to investigate whether there are developmental factors involved in the relationship between parental involvement and child anxiety, future research would benefit from using a wider age range.

The sole use of mothers in this study also limits the generalisability of this data to relationships between paternal overinvolvement and child anxiety. Bogels and Phares (2008) reviewed the literature and concluded that overall father's have been neglected in research on the etiology, prevention and treatment of anxiety disorders in children. The impact of paternal overinvolvement needs further investigating, as it has been found that both mothers and fathers form a dynamic system in which they influence the child, and that fathers play an important role in child anxiety which should not be neglected (Bogels & Phares, 2008).

4.4.3 Statistical Power

Power calculations were used to determine the number of mother-child dyads needed to detect significant differences between conditions. The present study based

the effect size for calculating power on two reviews (McLoed et al., 2007; Van der Bruggen et al., 2008) who reported medium to large effect sizes between parental control during parent-child interactions and child anxiety. A minimum of 34 mother-child dyads were required to detect medium effect sizes. Although the findings were in the opposite direction to the proposed hypotheses and previous research, a medium effect size was reported in this study, therefore with a sample size of 38 following the removal of one subject in the analysis phase, the study had adequate power to statistically detect this effect.

4.4.4 Blinding

A limitation of this study is the lack of blinding in both the experimental process and in the coding of variables. Due to time restraints and limited resources, it was not possible to recruit a second researcher to attend the research visits or to independently rate maternal and child behaviour, therefore increasing the potential of producing biased results. However, in order to reduce this potential bias, random selections of 50% of the video recordings were coded by a second researcher who was blind to the order of condition. Furthermore inter-rater reliability was high for all variables.

4.4.5 Experimental Task

The standardised task used in this study was the tangram puzzle (Hudson & Rapee, 2001). This task was also used in a recent study by van der Bruggen et al. (2010), who used the tangram puzzle to measure both parental control and child anxiety. Due to the difficulty of the puzzles, the task was designed to facilitate stress in children and parents. Although differences in avoidant behaviour and self-report anxiety in the high involvement and low involvement conditions were found, overall the levels of avoidant behaviour and self-report anxiety were still relatively low.

Therefore, it is possible that this experiment lacks ecological validity as the task did not illicit the necessary affect required to assess the affect of maternal over involvement on children's anxiety levels. It is also possible that the sample was not representative of the general population, as due to the relatively low response rate, the study might have been subject to volunteer bias. For example, due to the element of deception involved in this study, whereby families were told that we were interested in looking at children's learning, it is possible that mothers felt sure that their children would manage such tasks, suggesting that this sample of children may have been quite confident in such tasks. The voluntary nature of this research might have therefore increased the risk of a self-section bias. Those mothers who felt their child would struggle or become anxious in the experiments may have been less likely to volunteer.

4.4.6 Experimental Manipulation

The experimental manipulation in this study was successful in significantly increasing mother's involvement in the high involvement condition. Due to the very high levels of involvement observed, it seems that the manipulation was successful in eliciting overinvolvement during the task, as mothers were observed to take over the task, and offer frequent guidance and assistance at times when it was not necessary or when children did no ask for help. Although experimental manipulations allow us to establish causality, such manipulations are also likely to lack ecological validity.

Although overinvolvement was observed, mother's reactions to the instructions in this experiment appeared to be excessive, and although this meant a highly significant difference between conditions, the levels of involvement shown may have been unnatural and therefore the findings may be difficult to generalise. Interestingly, although mothers were asked to be highly involved with helping their child by offering frequent guidance and assistance, the majority of mothers interpreted this by

being physically intrusive in helping their child by touching and fitting the puzzle pieces for them. Due to excessive help throughout, it is therefore not surprising that children were less anxious in the high involvement condition, as children were more likely to succeed in completing some of the puzzles within the time limit. In contrast, in the low involvement condition, although mother's were told to; acknowledge their child's request for help, encourage them to try on their own, and to encourage and support them, without being overly involved, mother's appeared to interpret this as being completely uninvolved, as most sat back and were silent throughout the task. Therefore children may have felt more pressure to perform during the low involvement condition, leading to increased anxiety. Such extreme levels of involvement may not be reflective of typical or more natural levels of involvement in either clinical or non-clinical parents. Although verbal instructions were given to mothers, these were only read aloud to them once before each condition, therefore it may have been difficult for mothers to take in all of the information, and they may have only retained part of the instructions. If mothers do not typically behave in such a way with their child, they might have found it difficult to put on an act for the purpose of the task. It may have been easier for mothers to give excessive levels of physical involvement during the task, whereas in a more natural setting, overinvolvement is likely to involve both verbal and physical overinvolvement. Therefore the overinvolvement elicited in this task might not have truly represented the construct this study was aiming to test, therefore lacking ecological validity. Future studies might aim to train parents to behave in a more naturally overly involved manner, such as using a training video (Thirwall & Creswell, 2010).

4.4.7 Measures

Reliable and valid questionnaires were used to measure child anxiety

symptoms (SCAS) and maternal anxiety (BAI). These questionnaires had good internal consistency in this sample. Ratings of maternal involvement and negativity using a global rating scale developed by Hudson et al. (2001) were also found to have good internal consistency, and good inter-rater reliability.

The reliability and validity of the self-report likert scales measuring anxiety and perceived control is less clear. The original version of the ‘anxiety thermometer’ (Houtman & Bakker, 1989) was validated with a group of adults, therefore it is unclear how reliable this measure is in assessing anxiety in children. The ‘worry thermometer’ was easy to use and was easily understood by children. Ratings on the anxiety thermometer prior to starting the experiments also correlated with children’s total score on the SCAS, with higher anxiety symptoms on the SCAS being associated with higher self-report anxiety prior to starting the task, indicating that both were measuring similar constructs, therefore giving some indication of the validity of the task.

The perceived control thermometer developed for this study appeared more difficult to understand. Although children were given a real-life example following the pilot study, it was unclear whether some children still found this a difficult concept to understand. It is therefore possible that the concept of ‘control’ may have been too abstract for this age group. For this reason, and as the validity and reliability of the scale has not been formally evaluated, results using this measure should be interpreted with caution.

The inclusion of a measure of child avoidant behaviours, and self-report anxiety levels was a strength of this study. Avoidant behaviours were coded for each mother-child interaction using a coding system developed by van der Bruggen (2010). Although the inter-rater reliabilities for this scale were good, it is less clear how valid

or reliable this measure is. This could not be assessed as the data violated the assumptions of the reliability model, due to large amounts of scores being zero. One explanation for this is that children were relatively confident throughout the task. Another explanation is that the coding system was not able to capture more subtle aspects of anxiety that might have been evident, as it relied on clear behavioural expressions of avoidance. For example, the coding system did not code behaviours such as facial expressions or more subtle body movements or verbal expressions of anxiety, such as sighing or 'huffing', which may also have been indicative of anxiety in the child. The nature of the manipulation of maternal involvement also meant that children in the high involvement condition were given more help than in the low involvement condition, and asking for help and reassurance was one of the main verbal behaviours coded in this scale. It is therefore unsurprising that children were observed displaying less avoidant behaviour in the high involvement condition, as they did not have to ask for help or reassurance, as it was automatically given to them by their mothers through the manipulation. It is also possible that behavioural avoidance in this task, did not necessarily equate to the type of avoidance present in anxiety disorders. In this study, as previously discussed, low levels of anxiety were reported, therefore it is possible that the avoidance and withdrawal during this task was related to a different type of emotion, such as boredom or frustration. This would be in contrast to the avoidance of situations or tasks that someone with an anxiety disorder might find difficult, avoidance in this context being a strategy for reducing or avoiding feelings of anxiety. Despite this consideration, increased avoidant behaviour was still associated with higher levels of self-reported anxiety, and although it was not in the expected condition, it is possible that children were showing more avoidant behaviour because they were feeling slightly anxious about completing the tasks. It

would have been useful to have asked children to rate a number of different emotions, such as boredom or frustration to clarify the specific emotion experienced.

In this study, data on mother's typical style of parenting and levels of overinvolvement were not obtained. Similarly, we did not include an observation of mother's natural response styles during the task. These are potential limitations of the study, as it is possible that children's behaviour and responses during the experiment may have been influenced by mother's behaving in a different or similar way than they usually would. In future research, it would be beneficial to collect this data in order to examine such influences.

4.5 Theoretical and Clinical Implications of the Study

4.5.1 Theoretical Implications

A number of theoretical models have argued for the importance of parental overinvolvement in the development of child anxiety (Chorpita & Barlow, 1998; Chorpita, Brown, & Barlow, 1998; Hudson & Rapee, 2004; Manassis & Bradley, 1994; Rapee, 1997). Past studies have consistently demonstrated an association between overinvolved parenting and child anxiety, particularly in clinical samples (e.g. McLoed et al., 2007; Van der Bruggen et al., 2008; Wood et al., 2003). However due to the cross-sectional, correlational nature of these studies, causality and the direction of effects remains less clear. This study enabled us to explore the direction of this relationship in more detail, yet the findings in this study were contrary to previous experimental research (de Wilde & Rapee, 2008; Thirwall & Creswell, 2010). This study found that maternal overinvolvement did not induce anxiety or avoidant behaviour, but rather children were more avoidant and there was a trend towards higher levels of self-report anxiety in the low involvement condition. Therefore, this study offers limited or no support for Chorpita, Brown and Barlow's (1998) model of

the mediating role of perceived control in the relationship between parental overinvolvement and child anxiety. Although perceived control was found to be significantly lower in the high involvement condition, this did not relate to increased avoidant behaviour, or increased anxiety levels. The model clearly proposes an association between overinvolvement and child anxiety, therefore we were unable to fully test this model due to the contrary effects of overinvolvement on child anxiety in this study.

Despite potential limitations of the methodology as discussed in section 4.4, if these differences are valid, then this study raises some interesting questions about the relationship between parental overinvolvement and child anxiety. The finding that avoidant behaviour was significantly higher in the low involvement condition and that there was a trend towards significantly higher anxiety levels during the low involvement condition suggests that rather than an overinvolved parenting style causing anxiety in children, in some instances, maternal overinvolvement may either prevent or lead to reductions in child anxiety.

These findings indicate that the relationship between parental overinvolvement and child anxiety is more complex than could be examined in this study. Many theorists have emphasized the transactional and cyclical nature of the occurrence of over-involved parenting in parent-child interactions. Hudson and Rapee (2004) proposed an etiological model of anxiety, suggesting that parents of children with anxious temperaments are more likely to become overinvolved with their child in an attempt to prevent or at least reduce the child's distress.

Some support for an overinvolved parental style reducing or preventing children's anxiety can be found in the present study. Hudson and Rapee (2004) state that this type of overinvolved, maladaptive pattern of parenting may inadvertently

reinforce the child's vulnerability to anxiety by "increasing the child's perception of threat, reducing the child's perceived control over threat, and ultimately increasing the child's avoidance of threat" (p. 67). Therefore, this model proposes that parental overinvolvement is likely to prevent anxiety or at least reduce it in the short-term, particularly for those children who have an anxious temperament. In the current study, the levels of involvement shown were manipulated, so for that reason mothers were not given the opportunity to respond to their child naturally. We were therefore unable to ascertain whether those children who expressed more avoidant behaviour and reported higher levels of anxiety in the low involvement condition would have ordinarily gained more involvement from their mothers in response to their anxiety. Based on Hudson and Rapee's (2004) model, we can speculate that if left to interact naturally, for those children who displayed more anxious and avoidant behaviour, mothers may have become more involved in an attempt to reduce their child's anxiety.

Previous research has provided some support for Hudson and Rapee's (2004) reciprocal etiological model of anxiety, which suggests that parental overinvolvement may be elicited by children's anxious behaviour, which then inadvertently reinforces children's anxiety and avoidance (Hudson et al., 2008; Hudson et al., 2009).

Although this study found that overinvolvement did not increase children's levels of avoidant behaviour or anxiety, this study was only able to test one side of the theoretical model. In this context, mother's involvement appeared to benefit children, but if this was a repeated pattern of parental behaviour in a child's life, then it is possible that in situations where mother's are not available to protect the child from feelings of anxiety and distress, children might develop limited coping strategies, increased perceptions of threat, reduced perceived control over the situations, and

increased anxiety levels (Hudson & Rapee, 2004). However, this can only be speculated and future research will be needed to explore this model.

Some have suggested that anxiety in parents or an inability to tolerate their child's distress causes them to become overinvolved. Research involving the influence of anxious parents has been inconclusive. Some have found support for the notion that anxious mothers are more involved than non-anxious mothers (Ginsburg et al., 2004) and some have found that mothers of anxious children were more involved regardless of their own anxiety status (Gar & Hudson, 2008; Moore et al., 2004). Although the results are mixed, it is possible that some parents are unable to tolerate their children's anxiety and distress and therefore cope with their own feelings of discomfort by becoming more involved, therefore reducing discomfort in both parent and child. However, in a recent review, Murray, Cooper, Creswell, Schofield and Sack (2007) concluded that the support for the contention that parental anxiety is related to increased parental control is limited. Similarly, other researchers suggest that parental beliefs about their anxious child's vulnerability and their lack of ability to cope, encourages parents to become overly protective or involved in interactions with their child (Kortlander et al., 1997).

The results from this study and the inconsistencies found in previous literature suggest that there may be some difficulties in the way in which parenting constructs are being defined and measured in this area of research. This seems to relate to the way in which both models of parenting and child anxiety, and individual studies have interpreted the parenting constructs. As discussed in section 1.4.3.5, terms have been used inconsistently and interchangeably throughout the literature (e.g. controlling, overinvolved, over-protective, intrusive etc). Within the theoretical models of parenting and childhood anxiety that have driven such research, multiple terms are

used, and there does not appear to be general consensus as to what specific behaviours represent a parent who is controlling or overinvolved. This may be because this construct is far more complicated than a simple set of behaviours, and that future research is needed to clarify the multiple influences that are implicated in the relationship between maternal overinvolvement and child anxiety. Similarly, overinvolvement in one context or with one child might not equate to the same level of overinvolvement in another context or with another child. Unless models of parenting and childhood anxiety are revised and made more specific, similar methodological limitations and conceptual difficulties will exist, and inconsistencies between studies are likely to remain.

4.5.2 Clinical Implications

The reported findings provide limited support for Chorpita, Brown and Barlow's (1998) mediational model, and are contrary to uni-directional theoretical models (Rapee, 1997; Chorpita & Barlow, 1998; Chorpita, Brown, & Barlow, 1998) of childhood anxiety, that suggest parental overinvolvement induces child anxiety. Therefore, as this is the first experimental study to report the finding that children were less anxious when mothers were overly involved, clinical implications are limited until further research is carried out to replicate these findings.

Despite this, some provisional implications can be offered. In light of the finding that parental overinvolvement resulted in lower levels of anxiety compared to low maternal involvement, this study offers preliminary insight into understanding why this pattern of parenting style has been consistently associated with parenting of anxious children. Children who have temperaments which lead them to display anxious and avoidant behaviours (Barlow, 2002) might encourage their parents to become overly involved with them. It is natural for parents to want to protect their

child from harm and distress, therefore it is understandable why parents might continue to parent their child in an overly involved manner, if such parenting behaviours lead to a reduction in distress, as suggested in this study. Although future research is needed to replicate these findings and further inform theories, such insight into the systemic factors involved in potentially maintaining child anxiety, will be important when developing individualised formulations and treatment plans when working with families of anxious children. In particular, educating and helping parents to understand that, although it might seem like their overinvolvement benefits their child in the short-term (due to immediate reductions in their child's anxiety levels), in the long-term, this might communicate a message to their child that they are unable to cope without this involvement. This might lead to increased dependency on parents to cope with difficult situations, and as a result, children may not develop their own adaptive coping strategies.

Collaborative interventions with parents who engage in such parenting patterns, might involve helping them to develop parenting strategies that encourage children to develop adaptive coping strategies in situations that cause them anxiety or distress, rather than engaging in avoidant and dependent behaviours, which in turn, might maintain their anxiety levels.

4.6 Future Research

Whilst the findings do not support the theory that parental overinvolvement causes child anxiety, or that perceived control mediates this relationship, extension and improvement of this work is necessary before conclusions can be drawn. In particular, extension of similar work with clinical populations would be beneficial, due to the difficulty in generalising the findings of non-clinical samples.

Future studies could be improved by utilising a task that is more challenging and anxiety provoking. A design which does not entail parents being present during the task itself might be beneficial. For example, maternal involvement could be manipulated during a discussion or practice task prior to the main task, in order to assess the effect of parental overinvolvement when parents are not present. This might then relate to the effect that parental overinvolvement at home might have on children's anxiety in situations such as school. Extension of this work with more naturalistic settings would also be beneficial to improve the ecological validity. Although this study was strengthened by its diverse sample, due to the nature of this study, we were unable to examine differences in natural parenting styles with this sample. Future studies would therefore benefit from examining cultural factors that might influence parenting. The age range used in this study was fairly narrow, therefore future research would also benefit from using a wider age range to examine whether developmental factors moderate the influence of parental involvement. Future research could also employ alternative methodology to overcome the limitations of the current study as outlined in section 4.4.

The complex relationship between overinvolved parenting and child anxiety needs further exploration before firmer conclusions can be made. Having discussed the theoretical implications in section 4.5, further work is clearly needed to disentangle the conceptual issues within theoretical models of parenting and child anxiety, allowing researchers to be more focused in their theoretical aims and allowing the direction of effects to be investigated more thoroughly. Few studies have conducted experimental manipulations, and so far, they have only examined one direction, and based on the findings in this study, the results have been mixed. This study has highlighted the difficulties and complications when conducting

experimental manipulation studies in this particular area. Once the conceptual issues have been rectified and models have been revised and expanded, future research can replicate this study, with a design that overcomes the methodological limitations discussed in section 4.4. Future research should also examine the opposite direction of the effect, that is, whether child anxiety provokes or causes parental overinvolvement. Future research should aim to further investigate the possible reciprocal nature of the relationship between overinvolved parenting and child anxiety as proposed by more recent models (Hudson & Rapee, 2004), before such models can be confidently used to inform clinical practice and improve the effectiveness of the treatment of child anxiety disorders.

4.7 Final Summary and Conclusions

Anxiety disorders in childhood are common, and it is well recognised that anxiety can cause substantial social and academic impairments. Treatment currently focuses on CBT, and although recent research has examined on the effectiveness of family-based treatment, the outcomes do not appear to be superior to CBT only, and a significant proportion of individuals do not benefit from treatment at all (Waters et al., 2009). To improve the effectiveness of treatment, research has concentrated on developing and improving theories of the influence of families on child anxiety. In particular, there has been a focus on the influence of parenting styles. Many theorists have proposed a link between overinvolved and controlling parental styles and child anxiety (e.g. Chorpita & Barlow, 1998; Chorpita, Brown, & Barlow, 1998; Hudson & Rapee, 2004; Rapee, 1997), and much of the research has supported this association. Chorpita, Brown and Barlow (1998) also proposed a model whereby perceived control in children mediates the relationship between an overinvolved parental style and child anxiety. Very few studies have examined the direction of effects (de Wilde

& Rapee, 2008; Thirwall & Crewswell, 2010), therefore this study aimed to experimentally manipulate maternal involvement using a repeated-measures design. In this design, children experienced their mothers in both the high and low involvement conditions whilst they completed difficult tangram puzzles. The impact that the mother's level of involvement had on children was measured by self-report anxiety, perceived control ratings, and observational ratings of avoidant behaviour. The results failed to support uni-directional models that suggest parental overinvolvement induces child anxiety, as children were found to be more avoidant in the low involvement condition. There was also a trend towards higher levels of anxiety in the low involvement condition. The mediational role of perceived control was unable to be tested, therefore future research is needed to explore Chorpita, Barlow and Brown's (1998) model further.

Finally, several areas for future research have been proposed, including a replication of this study using more robust methodology. Future research investigating causality will be important, in particular, researchers should look to develop methods whereby reciprocal models can be investigated. Developing a more coherent theoretical basis is crucial to inform preventative and treatment approaches, and improve outcome for children with anxiety disorders.

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Appendix A

School of Medicine. Health Policy and Practice.**Kate Greening**

Elizabeth Fry Building

Norwich, NR4 7TJ

K.Greening@uea.ac.uk

Dear Head Teacher

I am writing to ask for your help in a research project that I am undertaking. I am a trainee clinical psychologist on the Doctoral Programme in Clinical Psychology at the University of East Anglia. As part of the programme, I am required to undertake a research project for my thesis, which may result in a publication. I am writing to ask whether you would allow me to recruit some of the children in your school in my research.

What is the research about?

I am interested in looking at the influence of different levels of maternal involvement on children's learning potential and task performance. Very little experimental research has been conducted on the effect that mothers involvement, therefore this research will increase our understanding of the influences on children's learning.

What would it involve for families?

I need to recruit as many children as possible, which is why this research is being run in a number of different schools across the UK.

If you decide that you would like your school to take part, information sheets and consent forms would be sent home to children in your school aged between 8 to 11. Mothers who are happy to take part in the study will complete an enclosed consent form and contact sheet, and return it to the school. I will then call these mothers to arrange a convenient time to visit them and their child at their home. I will give the children information about the study so they can decide whether they want to take part. If there are happy to take part I will be asking the children to complete some puzzles. There will be two sets of puzzles, each lasting 10 minutes. Their mother will be next to their child whilst they complete the puzzles, and will be given instructions about how much to get involved during the tasks. They will be video-recorded during the tasks, and will also be asked some questions about how they found the tasks. They will also be asked to fill out some questionnaires about how they are feeling.

Confidentiality and Consent

Data management will follow the Data Protection Act. I work to these strict guidelines regarding protecting the confidentiality of people who take part in research.

All records which relate to the research project will be identified only by unique ID numbers and kept in a locked cupboard at the University of East Anglia. Records kept on a computer will again be stored securely, and can only be accessed by a secure password. I will not keep any identifiable information about your school or the children and their mothers. After the study is complete, the video tapes will then be destroyed.

Time

The interview will be at families homes at a time convenient to them, and should take no longer than 45 minutes.

What are the potential benefits?

This is an opportunity to get involved in research that could contribute to our understanding of the influence of maternal involvement on children's learning potential. Your school will receive a £3 book token for every child that participates as a token of our appreciation. I will also be happy to send your school the results once they have been collected.

Who has reviewed the study?

The Faculty of Health ethics committee at the University of East Anglia has reviewed and approved the project.

Who can I contact if I'm interested in this study, want to know more or if I have any queries?

If you have any queries about the study you can contact me at k.greening@uea.ac.uk.

Who can I contact to if I have any concerns about the study?

If have any concerns about the study please contact my supervisor, Professor Shirley Reynolds at s.reynolds@uea.ac.uk.

What next?

If you are interested in allowing me to recruit children from your school, or you have any questions about the research, please get in touch via the above contact details. I will also follow up this letter with a telephone call within the next two weeks, and will be able to answer any questions you have then.

Thank you for taking the time to read this information.

Yours sincerely,

Kate Greening
Trainee Clinical Psychologist



Appendix B

School of Medicine. Health Policy and Practice.

Kate Greening

Elizabeth Fry Building

Norwich, NR4 7TJ

K.Greening@uea.ac.uk

Parent Information Sheet

I would like to invite you and your child to take part in a research study. Before you decide, you need to know why the research is being done and what the study will involve.

Please take time to read this information carefully to help you decide whether or not to take part. Please contact me on the email given below if there is anything that is not clear or if you would like more information. Thank you for reading this.

What is this project about?

I am interested in looking at influences on children's learning, including the effect of maternal involvement.

Why have I been chosen to take part?

Your child's school has agreed to help us with our research, and has allowed us to contact mothers whose children are aged 8 to 11 years (in years 4, 5, and 6).

What does the research involve?

If you would like to get involved in this study, I would like to visit you and your child at home at a time that is convenient for you both. I would ask your child to complete some puzzles. There will be two sets of puzzles, each lasting 5 minutes. You would be next to your child whilst they complete the puzzles, and I will give you instructions about how much to get involved during the puzzle tasks. I would video-record you both. You and your child would also be asked to fill out a questionnaire each.

If you are happy for me to contact you further please complete the contact form provided with this information sheet and return it to your child's school. If you would like to find out more about the study and what it involves, please contact me on the address / email address at the top of this letter.

Once I have received your contact details, I will get in touch to arrange a time to visit you at home. I would be more than happy to answer any questions that you have at this time. The interview at your home should take no longer than 45 minutes.

Are there any side effects?

Some children may worry slightly about getting the puzzles right, but usually children find them fun. The puzzles have been specifically designed for children aged 8 and above.

What are the potential benefits?

This is an opportunity to get involved in research that could contribute to our understanding of the influence of parental involvement on children's learning potential. There are no direct benefits to you, however your child's school will receive a £3 book token for each child that takes part in the study.

Will my right to confidentiality be respected?

I work to strict guidelines regarding protecting the confidentiality of people who take part in research. Your name will not be kept on any records. All records which relate to the research project will be identified only by unique ID numbers and kept in a locked cupboard. Records kept on a computer will again be stored securely, and can only be accessed by a secure password. After the study is complete, all data will be securely stored in a locked cupboard at the University of East Anglia for a maximum of five years and will then be destroyed. We will not keep any information about you or your child that could identify you to someone else.

About myself

I am a trainee Clinical Psychologist studying at the University of East Anglia, in the final year of my training. I have experience in working with young children, and have a special interest in child psychology.

Who has reviewed the study?

The Faculty of Health ethics committee at the University of East Anglia has reviewed and approved the project.

Who can I contact if I want to know more or if I have any queries?

If you have any queries about the study you can contact me at k.greening@uea.ac.uk

Who can I contact to if I have any concerns about the study?

If have any concerns about the study please contact my supervisor, Professor Shirley Reynolds at s.reynolds@uea.ac.uk

Do I have to take part?

No, you do not have to take part in the research. You are free to participate and may withdraw from the study at any time without giving a reason.

If you would like to take part, please complete and sign the enclosed contact form and return it to your child's school within two weeks. I will then contact you to arrange a time to come and visit.

Many thanks for your time, it is very much appreciated.

Kate Greening

Trainee Clinical Psychologist

(Supervised by Professor Shirley Reynolds, Professor of Clinical Psychology)



Appendix C

School of Medicine. Health Policy and Practice.

Kate Greening

Elizabeth Fry Building

Norwich, NR4 7TJ

K.Greening@uea.ac.uk

Information for Children

Hello! I am doing a project and would like to invite you and your mum to take part.

Before you decide we would like you to read the following information (or ask someone to read it to you). You can ask us as many questions as you like before you decide.

What is it all about?

We are interested in finding out how children learn and how we can help children to get the most out of learning. We are asking children of your age to help us try and find this out.

What would I have to do?

If you and your mum agree to take part in the study, I would like to come and visit you at your home. I will tell you a bit about the study before, but will tell you all the details at the end of the visit.

If you and your mum want to take part I will ask you to sign a form agreeing that you are both happy to be in my study. If you don't want to take part, that's ok too.

When I come to see you, I will ask you to fill in a questionnaire, which asks you questions about lots of different things like worries and fears.

During the visit, I will also ask you to try and work out some puzzles. Your mum will be there next to you while you complete the puzzle games. There will be two sets of puzzles, and you will have 5 minutes to complete each set. Most children usually find these puzzles fun to do. Before and after each set of puzzles I will ask you a couple of questions about how you felt while you were completing the puzzles.

Who will know what I said or did?

Only two people will see how you got on with the puzzles and your answers in the questionnaire. That is me, and another researcher that I work with who is helping me with the study. If you tell me something that is worrying you then I might share it with your parents, but I will talk about it with you too.

Who am I?

I am studying at the University of East Anglia. I plan to use the information I collect from all the children and their parents to write a long essay. It will help me become a Doctor in Clinical Psychology.

When I get stuck with my work I am helped by people at my University. I get help from Professor Shirley Reynolds (Professor of Clinical Psychology).

I have got special permission to do my study from the University of East Anglia Faculty of Health Research Ethics Committee. They make sure that I do not hurt or upset anyone when I do my study.

Do I have to take part?

You do not have to take part in the study if you do not want to and can change your mind and stop doing the puzzles at any time during the visit, without saying why.

If you would like to take part in the study please tell your mum. They can let me know by filling in a form. I will then arrange to come and see you and your mum at home.

Thanks for your help

Kate Greening
Trainee Clinical Psychologist
(Supervised by Professor Shirley Reynolds, Professor of Clinical Psychology)





Appendix D

School of Medicine. Health Policy and Practice.

Kate Greening
Elizabeth Fry Building
Norwich, NR4 7TJ
K.Greening@uea.ac.uk

Contact Form

If you would like to take part in the study, please fill in the details below and return to your child's school in the envelope provided as soon as possible. I will regularly collect these forms from the school and will contact you in the near future.

Name

Child's name.....

Child's age.....

Contact telephone number.....

Many thanks for your time and interest,

Kate Greening

Appendix E

Parent Consent Form

Name of Researcher: Kate Greening, Trainee Clinical Psychologist.

Study: Parental involvement and children's learning

Please read the following statements carefully. If you are in agreement with these statements, please put a tick and write your initials in each box, and complete the details at the bottom of the form. Please return to your child's school with the completed contact form in the envelope provided, within two weeks.

1. I have read and understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that participation is voluntary and that I can withdraw my consent at any time if I change my mind.
3. I agree that my child and I can be video-recorded whilst my child completes the puzzles.
4. I understand that all the information collected for this study will remain confidential.
5. I agree that my child can take part in the study.
6. I agree to take part in these studies.

Name of Child	Date of Birth	Name of School
Name of Parent	Date	Signature
Name of Researcher	Date	Signature

Appendix F

Assent Form for Children

Title of Study: How do children learn new things?

Please circle 'Yes' or 'No' for each of the following statements:

1. The reason for doing this research has been explained to me
and I have read the information sheet for children Yes / No

2. I am happy to take part in this research project Yes / No

3. I know that I can stop whenever I want to Yes / No

Name of child

Age

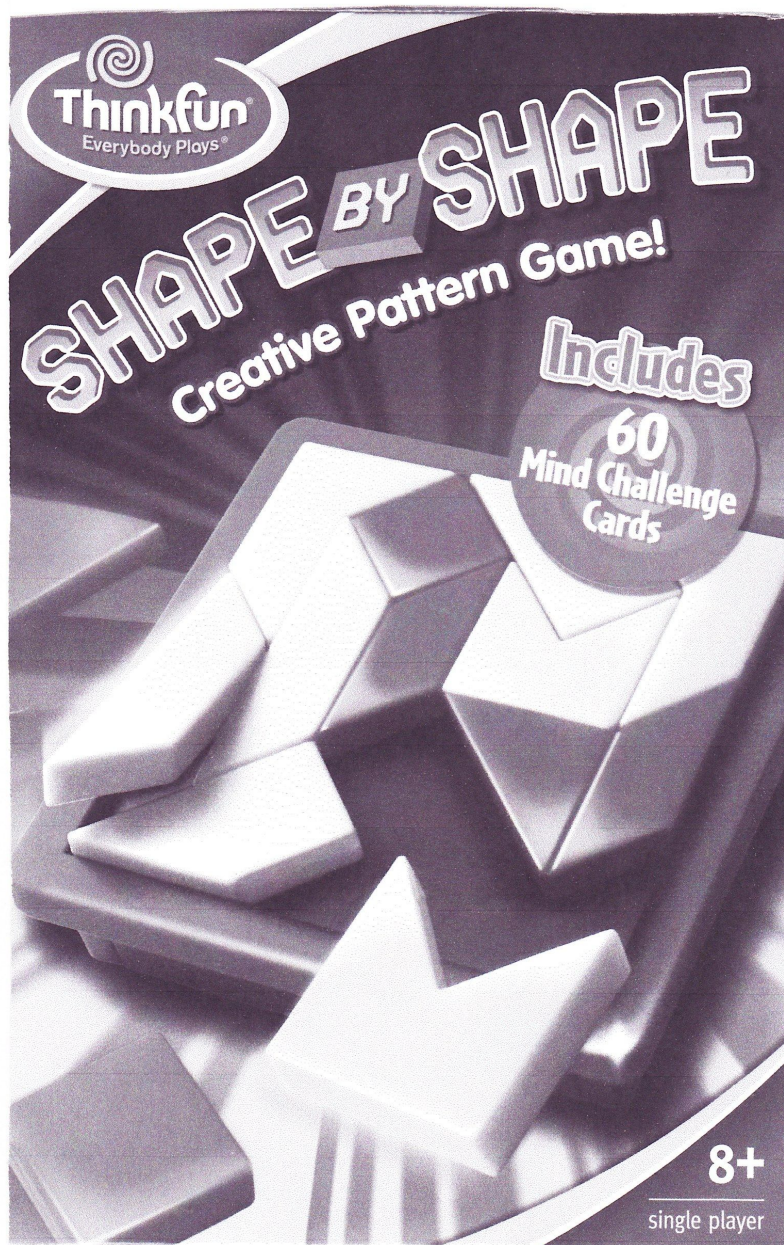
Child's signature

Parent's signature

Researcher's signature

Appendix G

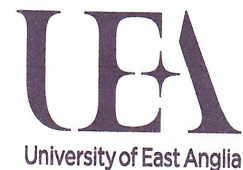
Picture of the tangram puzzle.



Appendix H

Ethical approval letter from the Faculty of Health Ethics Committee, UEA.

Faculty of Health Research Ethics Committee



Kate Greening
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8th October 2010

Dear Kate

**An experimental manipulation of parental behaviour on children's avoidant and anxious behaviours:
Reference 2009/10-076**

The amendments to your above proposal have now been considered by the Chair of the FOH Ethics Committee and we can now confirm that your proposal has been approved.

Please could you ensure that any amendments to either the protocol or documents submitted are notified to us in advance and also that any adverse events which occur during your project are reported to the committee. Please could you also arrange to send us a report once your project is completed.

The Chair would like to wish you good luck with your project.

Yours sincerely

A handwritten signature in black ink, appearing to be 'Maggie Rhodes', written over a white background.

Maggie Rhodes
Research Administrator

Appendix I

The Spence Children's Anxiety Scale (SCAS)

SPENCE CHILDREN'S ANXIETY SCALE

Your Name: Date: _____

PLEASE PUT A CIRCLE AROUND THE WORD THAT SHOWS HOW OFTEN EACH OF THESE THINGS HAPPEN TO YOU. THERE ARE NO RIGHT OR WRONG ANSWERS.

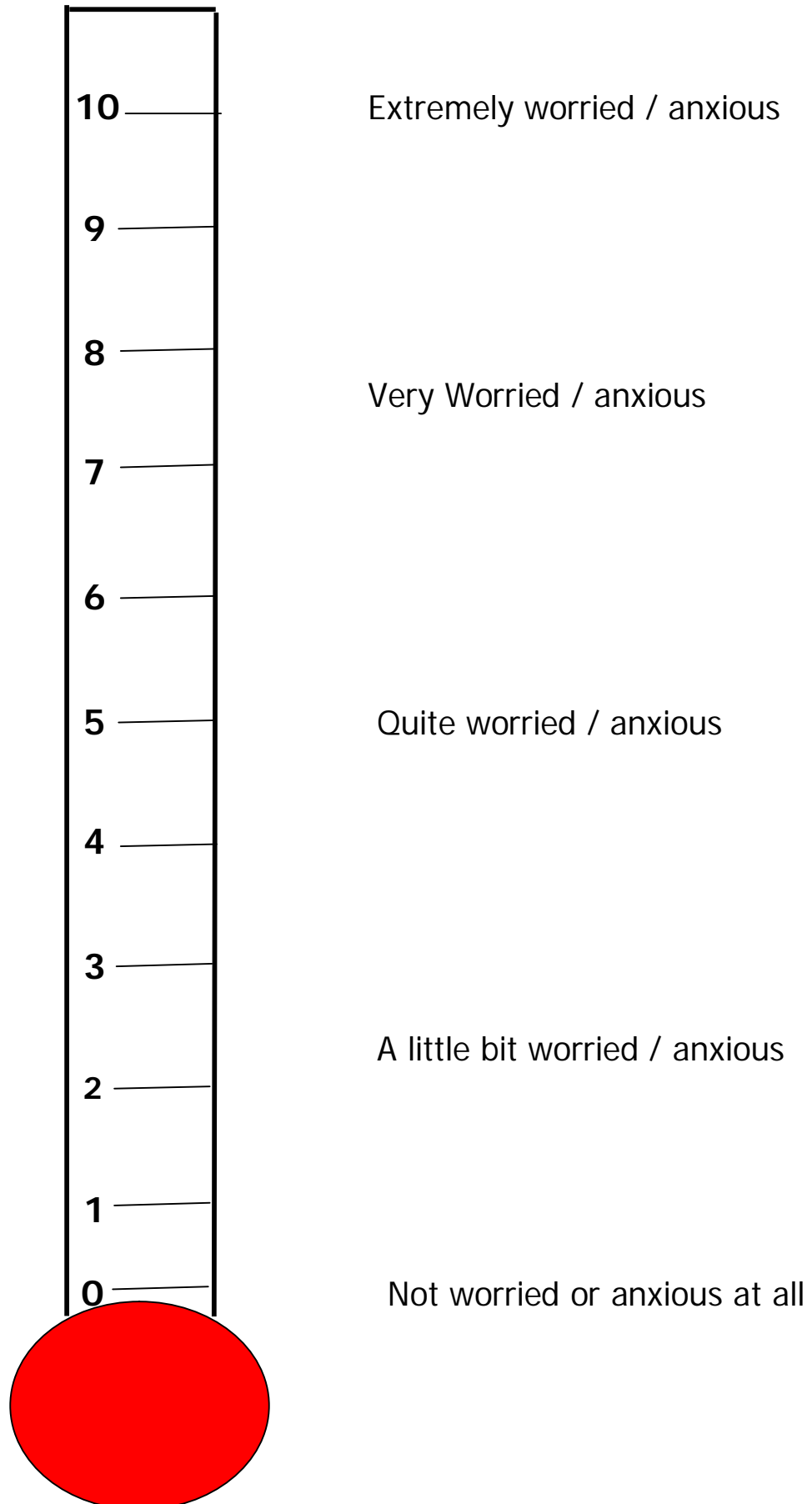
1. I worry about things.....	Never	Sometimes	Often	Always
2. I am scared of the dark.....	Never	Sometimes	Often	Always
3. When I have a problem, I get a funny feeling in my stomach.....	Never	Sometimes	Often	Always
4. I feel afraid.....	Never	Sometimes	Often	Always
5. I would feel afraid of being on my own at home.....	Never	Sometimes	Often	Always
6. I feel scared when I have to take a test.....	Never	Sometimes	Often	Always
7. I feel afraid if I have to use public toilets or bathrooms.....	Never	Sometimes	Often	Always
8. I worry about being away from my parents.....	Never	Sometimes	Often	Always
9. I feel afraid that I will make a fool of myself in front of people.....	Never	Sometimes	Often	Always
10. I worry that I will do badly at my school work.....	Never	Sometimes	Often	Always
11. I am popular amongst other kids my own age.....	Never	Sometimes	Often	Always
12. I worry that something awful will happen to someone in my family.....	Never	Sometimes	Often	Always
13. I suddenly feel as if I can't breathe when there is no reason for this.....	Never	Sometimes	Often	Always
14. I have to keep checking that I have done things right (like the switch is off, or the door is locked).....	Never	Sometimes	Often	Always
15. I feel scared if I have to sleep on my own.....	Never	Sometimes	Often	Always
16. I have trouble going to school in the mornings because I feel nervous or afraid.....	Never	Sometimes	Often	Always
17. I am good at sports.....	Never	Sometimes	Often	Always
18. I am scared of dogs.....	Never	Sometimes	Often	Always
19. I can't seem to get bad or silly thoughts out of my head.....	Never	Sometimes	Often	Always
20. When I have a problem, my heart beats really fast.....	Never	Sometimes	Often	Always
21. I suddenly start to tremble or shake when there is no reason for this...	Never	Sometimes	Often	Always
22. I worry that something bad will happen to me.....	Never	Sometimes	Often	Always
23. I am scared of going to the doctors or dentists.....	Never	Sometimes	Often	Always
24. When I have a problem, I feel shaky.....	Never	Sometimes	Often	Always
25. I am scared of being in high places or lifts (elevators).....	Never	Sometimes	Often	Always

26.	I am a good person.....	Never	Sometimes	Often	Always
27.	I have to think of special thoughts to stop bad things from happening (like numbers or words).....	Never	Sometimes	Often	Always
28.	I feel scared if I have to travel in the car, or on a Bus or a train.....	Never	Sometimes	Often	Always
29.	I worry what other people think of me.....	Never	Sometimes	Often	Always
30.	I am afraid of being in crowded places (like shopping centres, the movies, buses, busy playgrounds).....	Never	Sometimes	Often	Always
31.	I feel happy.....	Never	Sometimes	Often	Always
32.	All of a sudden I feel really scared for no reason at all.....	Never	Sometimes	Often	Always
33.	I am scared of insects or spiders.....	Never	Sometimes	Often	Always
34.	I suddenly become dizzy or faint when there is no reason for this.....	Never	Sometimes	Often	Always
35.	I feel afraid if I have to talk in front of my class.....	Never	Sometimes	Often	Always
36.	My heart suddenly starts to beat too quickly for no reason.....	Never	Sometimes	Often	Always
37.	I worry that I will suddenly get a scared feeling when there is nothing to be afraid of.....	Never	Sometimes	Often	Always
38.	I like myself.....	Never	Sometimes	Often	Always
39.	I am afraid of being in small closed places, like tunnels or small rooms.	Never	Sometimes	Often	Always
40.	I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order).....	Never	Sometimes	Often	Always
41.	I get bothered by bad or silly thoughts or pictures in my mind.....	Never	Sometimes	Often	Always
42.	I have to do some things in just the right way to stop bad things happening.....	Never	Sometimes	Often	Always
43.	I am proud of my school work.....	Never	Sometimes	Often	Always
44.	I would feel scared if I had to stay away from home overnight.....	Never	Sometimes	Often	Always
45.	Is there something else that you are really afraid of?.....	YES	NO		
	Please write down what it is _____				

	How often are you afraid of this thing?.....	Never	Sometimes	Often	Always

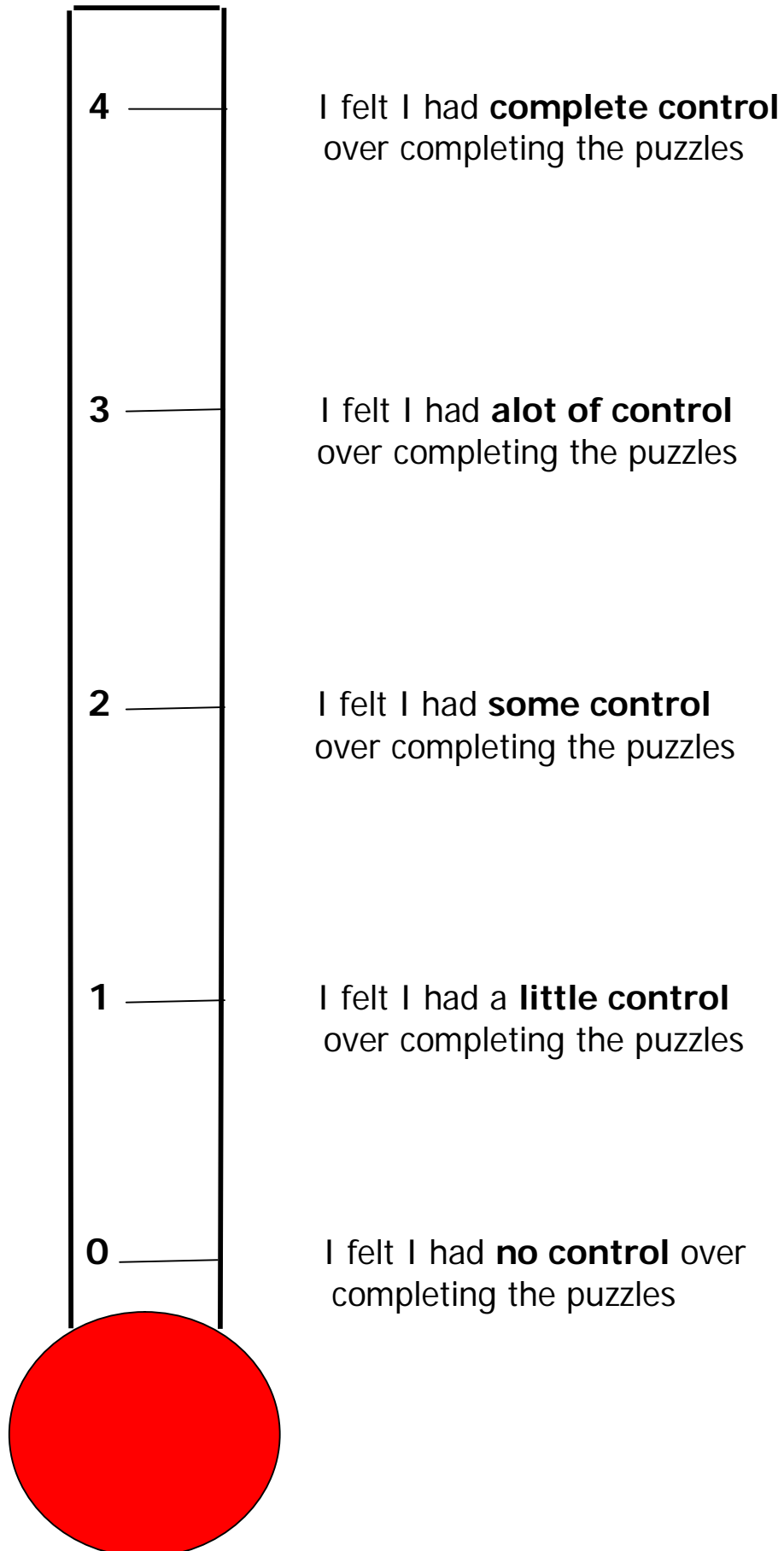
Appendix J

Worry Thermometer



Appendix K

Control Thermometer



Appendix L

Debrief information

Both mothers and children were present during the debrief:

‘Now that you have finished completing the puzzles, I can tell you what we were really interested in finding out from you. So at the start, I said that we wanted to see how well you could complete the puzzles. Well actually, we weren’t really so interested in that. What we really wanted to know was whether the amount of help and involvement your mum gave you during the puzzles made you feel or behave in an anxious or worried way. We asked your mum to give you lots and lots of help and involvement in one of the set of puzzles and very little help and involvement in the other set of puzzles. So now we are going to look at what you’ve told us from the worry and control thermometers, and how you acted in the videos, to see whether you were more anxious and gave up more easily when your mum helped you a lot compared to not at all. So we actually asked your mum to act in a certain way during the puzzles’. Does that make sense? Would you like to ask me any questions about it?