Cognitive Behavioural Therapy Skills in Children: The Role of Executive Function, Empathy and Theory of Mind.

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ABSTRACT

Background and Research Aims

Cognitive behaviour therapy (CBT) has become an increasingly popular front-line treatment in Child and Adolescent Mental Health Services (Benjamin et al., 2011) and treatment efficacy with children has received significant empirical attention (Graham & Reynolds, 2013). The adaptation of CBT for children has led to the development of tasks intended to assess core CBT skills (such as distinguishing between and linking thoughts, feelings and behaviours, Quakley, 2002). The aim of this study is to explore the relationship between three developmental modalities (executive functioning, empathy and theory of mind) and performance on tasks assessing CBT skill. The developmental modalities were hypothesised to be related to both the demands placed on children by the CBT skills tasks, and to children's ability to engage in CBT.

Method

A quasi-experimental correlational design was employed. Eighty-eight normally developing children between five and eight years old were assessed. Individual assessment with each child included three measures of CBT skill (Quakley, 2002), the Tower of London assessment (Shallice, 1982), age appropriate first and second order theory of mind tasks (Liddle and Nettle, 2006) and a brief measure of IQ (Wechsler, 1999; 2003). In addition one parent of each child was asked to provide parent-report data on their child. This included measures assessing empathy, executive functioning and their child's overall strengths and weaknesses.

Results

Initial exploration of potential confounding variables identified significant effects of age and general intelligence on performance on the both CBT skills tasks and measures of executive functioning, empathy and theory of mind. Through investigation of the research hypotheses, small but significant findings were identified between superior performance on the CBT skills tasks and higher child assessed executive functioning and theory of mind ability. However these results were not maintained when age and IQ were controlled for. No significant relationships were identified between performance of the CBT skills tasks and parent-rated executive functioning or empathy.

Conclusions

The results of this study suggest that children's ability to demonstrate CBT skill is not related to executive functioning, empathy or theory of mind, however CBT skill was significantly influenced by children's age and IQ. A number of methodological considerations are discussed that suggest that these findings should be interpreted cautiously. Future research should seek to address identified methodological limitations and investigate the validity of the CBT skills tasks employed.

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Chapter One

INTRODUCTION

1.1 Overview

This chapter begins with an overview of psychopathology in childhood and the development and adaptation of cognitive behaviour therapy (CBT) for children. Consideration is given to the skills and abilities children are required to develop to successfully engage in CBT. This is discussed alongside a structured review of the literature that examines tasks that assess the development of 'CBT skill'. Following this attention is turned to the potential role that executive function, theory of mind (ToM) and empathy might play in the assessment of CBT skill and in children's engagement in CBT based interventions. The chapter concludes by outlining the aims of this study along with the research questions and hypotheses investigated.

1.2 Childhood Psychopathology

Common psychological disorders in childhood include anxiety disorders, depression, attention deficit hyperactive disorder (ADHD), oppositional defiant disorder (ODD), conduct disorder, and eating disorders (Carr, 2006, p96). Research examining childhood psychopathology has increased exponentially over recent decades (Mash & Barkley, 2003). There is now a more advanced recognition that problems in childhood and adolescence often have lifelong individual and societal implications, and that a better understanding of these disorders guides more effective early intervention, prevention and treatment (Target & Fonagy, 1996).

1.2.1 Epidemiology and Prevalence

The last national survey of the mental health of children and adolescents in the United Kingdom (Office of National Statistics; Meltzer, Gatwood, Goodman & Ford, 1999) is now fourteen years old. However, this was an extensive study and Meltzer et al. surveyed children aged five to 15 years in 12,529 households using the ICD-10 classification of mental and behavioural disorder. The results detailed that 10% of children between the ages of five and 15 years met diagnostic criteria for a mental disorder, five percent reached criteria for conduct disorder, four percent for emotional disorders and one percent for ADHD. Autistic spectrum conditions (ASC) and eating disorders were less common at half a percent. Prevalence rates were higher in boys than girls and increased prevalence was found in families from lower socio-economic status. This figure is similar to that reported in other population based studies that have been carried out in the UK (Richman, Stevenson & Graham, 1975; Rutter, Tizard & Whitmore, 1970), although the data are significantly outdated.

Using a longitudinal approach Costello et al. (2003) assessed 1420 nine to 13 year olds from entry to the study to their 16th birthday for psychiatric disorders as classified by the DSM-IV (American Psychiatric Association; APA, 2000). The authors reported the prevalence of a psychiatric disorder of at least three months in duration was 13.7%. Additionally, in a systematic review of the literature Costello and Angold (1995) reported that 40- 60% of a combined sample of 8000 children who met diagnostic criteria for a psychological disorder at one time point still met the criteria for diagnosis between two to five years later. Furthermore, psychopathology in childhood is associated with poor mental health across the life span (see for example, Roza, Hofstra, van der Ende & Verhulst, 2003; Ferguson, Horwood & Ridder, 2005).

It is also important to recognise the significance of co-morbidity of psychological disorders in childhood. For example, there is significant overlap between emotional and behavioural difficulties in childhood (Egger & Angold, 2006) and between anxiety and depression (Compass & Oppendisano, 2000). Additionally, co-morbidity between general medical disorders, developmental disorders and childhood psychopathology is widely acknowledged. For example, co-morbid psychiatric conditions in children with ASC are common (Siminoff et al., 2008; White, Osborne, Ollendick & Scahill, 2009) and Max et al. (1997) reported that 76% of a population of children who experienced a traumatic brain injury went on to develop a novel psychiatric disorder post injury. Dasarathi, Grace, Kelly and Forsyth (2011) report significantly increased contact with UK Child and Adolescent Mental Health Services (CAMHS) for children who suffer a paediatric traumatic brain injury compared to normally developing children.

It is beyond the scope of this thesis to provide an in depth discussion of the precipitating and risk factors for childhood psychopathology (see Carr, 2006, p 44; Mash & Barkley, 2003, p 17). However, a dynamic interaction between genetics (nature) the environment in which a child is brought up (nurture), alongside a range of individual and parental characteristics and life events are all proposed to play a significant role in the healthy or otherwise development of a child (see Rutter, 2002 for review).

Despite the brief review presented here it is clear that the prevalence of childhood psychopathology is significant. Furthermore childhood psychopathology and has long term implications for the wellbeing of children and young people (Target & Fonagy, 1996; Woodward & Ferguson, 2004). Over recent years the mental health of young people has been recognised internationally as an area of global neglect (Remschmidt, Nurcombe, Belfer, Sartorious & Okasha, 2007), and a significant public health challenge which has implications for practice and policy within national health services (NHS;

Patel, Fisher, Hetrick & McGorry, 2007). As a profession clinical psychology is well placed to make important evidence-based contributions to understanding the processes involved in the development and maintenance of childhood psychopathology, and the development of effective evidence-based interventions.

1.3 Cognitive Behaviour Therapy

The previous section highlights the significance of childhood psychopathology and the current need for effective intervention. This thesis focuses on the development of children's ability to engage in tasks used to assess Cognitive Behaviour Therapy (CBT) skills. Prior to turning attention to these tasks the development, adaptation and efficacy of CBT as a treatment for psychopathology in children and young people will be discussed. This subsection begins with a brief outline of the development of CBT from initial theory to intervention, including current research demonstrating efficacy with adult populations. This is followed by a discussion of the theoretical and clinical adaptations necessary to apply CBT with children and young people, and a review of the evidence that demonstrates the efficacy of this approach.

1.3.1 Development of CBT: From Theory to Intervention

With the development of the cognitive model and the notion of irrational thinking Aaron T Beck (1967; 1976) and Albert Ellis (1975) are largely accredited as the forefathers of CBT. In developing cognitive theory Beck proposed that systematic biases in information processing meant that depressed individuals held a negative viewpoint towards the world, themselves and their future (otherwise known as the cognitive triad). Beck proposed that the negative information processing biases were guided by internal bodies of knowledge known as a schema. These were likened to stable cognitive

structures that develop through our early experience (Clark, Beck & Brown, 1989), and that help us make sense of information we perceive and encode.

Beck's Cognitive theory (1967) posits that negative early experience gives rise to the development of dysfunctional schemata which are extreme and inflexible by nature. It is proposed that in a depressed individual these dysfunctional schemata influence cognition so that information is interpreted to fit with the individual's negative view of themselves, the world around them and their future (Beck, 1991; Ingram, Miranda & Segal, 1998). Biases in information processing as a result of dysfunctional schema are thought to distort cognition and are often referred to as negative automatic thoughts (NATS), which are proposed to precede, precipitate and maintain depressed mood. Alongside the cognitive triad and the bias in information processing, a further defining feature of the cognitive model is the interlinked relationship between our environment and our cognitions, emotions and behaviours that come together to form a perpetuating cycle.

As research advanced, cognitive theory was used to develop a therapeutic approach known as cognitive therapy (CT). The approach is described as a structured, short term, psychotherapy orientated in the present with the aim being to modify biased thinking and its negative impact on emotion and behaviour (Beck, 1991). CT initially focused on depressed patients, and over time principles of behaviour therapy were also included in the treatment. For example, the use of behavioural activation (Kanter, Bowe, Baruch & Busch, 2011) or the consideration of operant conditioning principles (Skinner, 1938) to understand the perpetuating cycles of depression or anxiety. Through the reincorporation of behavioural ideas once popular in the 1950's and 1960's CT further developed into CBT (Leahey, 2000).

1.3.2 The Application and Efficacy of CBT for Adults

Over ensuing decades CBT has not only been applied in the treatment of depression, but has been adapted for a wide range of disorders. There are currently many theoretical models and specific treatment protocols in use. For example there are specific models and intervention for PTSD (Ehlers & Clarke, 2000), GAD (Wells, 1995), OCD (Salkovskis, 1985), bulimia nervosa (Cooper, Wells & Todd, 2004), chronic pain (Sharp, 2001), positive symptoms of psychosis (Garety, Kuipers, Fowler, Freeman & Bebbington, 2001) and more beyond. The approach has also been adapted for use with a wide range of specific populations, for example, with older adults (Laidlaw, Thompson, Gallagher-Thompson & Dick-Siskin, 2003), individuals with learning disability (Kroese, Dagnan & Loumidis, 1997) and children and young people (Graham, 2005; Kendall, 1990; Kendall & Hedkte, 2006; Stallard, 2002a). Additionally, the therapy is not only practised individually, but has been adapted for groups (Bieling, McCabe & Antony, 2009), and delivered in computerised and telephone format (Marks et al., 2003; Proudfoot et al., 2004; Taylor et al., 2003).

From its infancy researchers within the CBT field have attempted to demonstrate treatment effectiveness through empirical research (Beck, 1995) and the evidence base accrued is greater than that of other psychotherapies (Dobson, 2001; Hollon & Beck, 1994). In a review of the empirical status of the application of CBT with adults, Butler, Chapman, Forman and Beck (2006) combined 16 meta-analyses that examined the efficacy of CBT compared to other psychological and pharmacological treatments. The authors concluded that CBT is highly effective for a range of disorders. The considerable empirical support for the approach has led to CBT being recommended by the National Institute of Health and Clinical Excellence (NICE), an agency which guides best practice in the UK. For example, CBT is recommended as treatment for mild to moderate

depression, PTSD, panic, agoraphobia and GAD, OCD and bulimia nervosa and binge eating (NICE: 2004, 2005a, 2005b, 2007 & 2009)

Despite the substantial evidence base the efficacy of CBT is not without debate. Parker, Roy and Eyers (2003) and Lynch, Laws and McKenna (2010) suggest that effectiveness of the therapy for depression has been overstated in the literature. Furthermore longstanding difficulties are identified with measuring and comparing the outcomes of different types of psychotherapy. For example, when different types of therapy are compared they often produce equivalent outcomes (Luborsky, Singer & Luborsky, 1975), an issue which has been termed the 'Dodo bird verdict' (Rosenzweig, 1936). This term was taken from Alice in Wonderland (Carroll, 1865, Chapter 3), where after a race where the outcome wasn't effectively measured the Dodo bird proclaims that "everybody has won and all must have prizes". Luborsky et al. (2002) examined 17 meta-analyses of comparisons of different forms of active psychotherapy (including CBT) and found non-significant effect sizes for treatment type, which reduced further when the effects of therapeutic alliance were removed. Additionally, research highlights how the important contribution of common processes of therapy (for example therapeutic alliance and therapist-client relationship) are often significantly overlooked when examining the evidence in support for a particular therapeutic approach (Baldwin, Wampold, & Imel, 2007; Klien et al., 2003; Messer & Wampold, 2002; Martin, Caske & Davis, 2000).

1.4 Interim summary

In summary, CBT as practised today has been largely influenced by Beck's cognitive theory and subsequent work with depressed patients. The therapy has diversified from its original intention as a treatment for depression, to a recommended

treatment for wide range of mental health disorders in the UK. Furthermore, CBT is currently delivered to a diverse range of populations in a variety of formats. The therapy has strong empirical support, although its evidence-base is not without criticism. This thesis focuses on the use of CBT with children. This section has been intended as a brief introduction to CBT and the origins of this approach. The following section will discuss the use of CBT with children and young people.

1.5 CBT for Children

Benjamin et al. (2011) explain how the emerging success of CT for adults in the 1970's had a significant impact on psychological therapy for children, with the adaptation and application of the therapy developing simultaneously over ensuing decades. Given the effectiveness of this form of therapeutic intervention with adults, and the goal directed and time limited nature of the therapy, Grave and Blisset (2004) suggest that CBT is an attractive approach to clinicians working with children and adolescents within the context of the modern NHS. Additionally, intervention with children that takes place as they simultaneously develop their view of themselves, others and the world is promising, as with this is the potential to prevent or discourage the development of dysfunctional schema (Reinecke & Clark, 2003). Other popular aspects of the use of CBT with children include the emphasis on teaching adaptive coping skills and increasing self efficacy (Kendall & Panichelli-Mindell, 1995) both of which are hypothesised to contribute to increased long term well being and resilience.

The following section will discuss the theoretical basis of CBT with children and young people. Consideration will be given to the link between cognition and psychopathology in this population. This will be followed by an evaluation of the adaptation and efficacy of CBT for this population.

1.5.1 Cognition and Psychopathology in Childhood

The application of CBT with children and young people assumes that childhood psychopathology is associated with distorted cognitive processes, which are different to the cognitions of healthy children (Spence, 1994). Based on this premise it is important to understand how abnormal cognitive processing is associated with childhood psychopathology, and whether this is also associated with changes in affect and behaviour (Spence, 1994; Stallard, 2002).

Research investigating information processing in children has explored this. For example, negative attributions and self cognitions, and selective attention for negative information (along with difficulties processing positive information) were associated with children experiencing depressive symptomatology (Kendall, Stark, Rehm & Carter, 1990; Whitman & Leitenberg, 1990). A bias towards fear has been identified in children experiencing symptoms of anxiety (Vasey & McCloud, 2001), with anxious children more likely to perceive ambiguous events in a more threatening way compared with healthy children (Chorpita, Albano & Barlow, 1996; Kendall & Panichelli-Mindell, 1995). Furthermore, anxious children often present in clinic with distressing thoughts about feared situations (Comer, Kendal, Franklin, Hudson & Pimental, 2004) and research has identified similar cognitive maintaining processes involved in adult and adolescent worry (Gosselin et al., 2007). However, there are some inconsistencies with regards to findings on information processing biases in anxiety (Waters, Henry, Mogg, Bradley & Pine, 2010), and it is also important to consider that it is not possible to infer causality from these associations (Harrington, Wood & Verduyn, 1998).

Distortions in cognitive/information processing have been identified in a number of externalising disorders. For example, problematic childhood aggression is associated

with limited problem solving skills (Perry, Perry & Rasmussen, 1986) and elevated hostile responses to ambiguous social situations (de Castro, Merk, Koops, Verman & Bosch, 2005). Difficulties processing complex information and solving problems have also been associated with ADHD (Iaboni, Douglas & Baker, 1995; Kendall, 1993; Tanock, Purvis & Schachar, 1993). However, it is important to consider that these impairments could also be related to executive functioning difficulties which are also commonly associated with the disorder (Hughes & Graham, 2002).

Despite some support for similarities in cognitive biases to those found in adult populations it is premature to assume that relationships between cognition in psychopathology in adulthood neatly apply to psychopathology in childhood. Stallard (2002a) discusses the need for further research to investigate the cognitive processes that underlie psychopathology in childhood. Taking anxiety as an example Laugesen, Dugas and Bukowski (2003) highlight that there has been limited research which investigates cognitive factors involved in the development and maintenance of childhood worry. Furthermore, given that children do not exist in isolation there are also likely to be many other factors that contribute to psychopathology, such as parental mental health (see for example Goodman & Gotlib, 1999), family stress (Garalda & Bailey, 1988), parenting style (Mcleod, Weisz & Wood, 2007) and socio-economic status (Gould, 2006) to name only a few potential contributory factors.

1.5.2 Adaptations and Application of CBT with Children

Despite on-going debate about the mechanistic and theoretical processes, there is a general consensus that CBT for children needs to take into account the child's developmental stage, and be imbedded within a wider developmental approach (Grave & Blisset 2004; Ollendick, Grills & King, 2001; Stallard, 2002a). Barrett (2000)

highlighted how children should not be treated as 'little adults' and proposed that models of CBT for specific disorders are not always appropriate for children across all developmental stages. In the application of CBT to children Kingery et al. (2006) discuss the need for flexibility, creativity and adaptations which are based upon individually assessed developmental level, and not only chronological age. Furthermore Stallard (2002a) highlights how models of CBT for this population must take in to account systemic factors relevant to the development and maintenance of psychopathology (rather than employing an egocentric approach that might be used with adults).

Despite the recognition that adult models of cognition and psychopathology are not wholly appropriate for children there have been initial attempts to downwardly apply adapted versions of these models (Mathews, Reynolds & Derisley, 2007; Meiser-Steadman, 2002; Stallard; 2002a). Reynolds, Wilson, Austin and Hooper (2012) discuss how unlike the disorder specific models of CBT used for adults, the treatment of childhood psychopathology is often more generalised. Reynolds et al. cite the use the Coping Cat workbook (Kendall, 1990; Kendall & Hedtke, 2006), a widely employed manualised programme for anxiety in children that employs generic anxiety treatment strategies for children presenting with a range of anxiety disorders. In their meta-analyses the authors report stronger treatment effects for CBT that targets specific disorders rather than more generalised treatment programmes.

As the field has advanced more child-centred, disorder specific models of CBT have emerged, for example for OCD (Derisley, Heyman, Robinson & Turner, 2008; March & Mulle, 1998) and specific phobia (Davis, Ollendick & Ost, 2009). These child specific models often more appropriately take account of wider systemic factors. For example, Rapee's (2001) model of GAD in children includes the impact of parental cognitions in formulation, and Cohen, Mannarino and Deblinger's (2006) model of

trauma focused CBT includes a parallel systemic intervention. Furthermore, the delivery of CBT with this population has been adapted to be more 'child friendly', with the use of simplified vocabulary, visual resources, social stories and metaphors all included to increase accessibility. The identified need to adapt intervention to suit children's abilities has led to the development of child-friendly treatment resources such as the previously discussed Coping Cat workbook (Kendall, 1990; Kendall & Hedkte, 2006) and the Think Good, Feel Good workbook (Stallard, 2002b).

1.5.3 Efficacy of CBT with Children

The adaptation of CBT for children has attracted substantial empirical attention. The research has been summarised by a number of meta-analyses. Reynolds et al. (2012) detailed an inclusive analysis of 55 studies investigating psychotherapy for childhood anxiety, and reported moderate treatment effect sizes, apart from in seven studies that did not include CBT, where non-significant effect sizes were reported. This largely concurs with other reviews of the literature investigating the use of CBT for anxiety across a wide age range of children (Cartwright-Hatton, Roberts, Chitsabesan, Fothergill & Harrington, 2004; Compton et al., 2004; Davis, May & Whiting, 2011; In-Albon & Schnieder, 2006; Ishikawa, Okajima, Matsuoka & Sakano, 2007; James, Soler &Weatherall, 2005; King, Heyne & Ollendick, 2005).

Significant support has also been reported for the treatment of depression in children, with meta-analyses reporting significant treatment effects (Compton et al., 2004; David-Ferdow & Kaslow, 2008; Harrington, Whittaker, Shoebridge & Campbell, 1998; Lewinsohn & Clarke, 1999; Reinecke, Ryan & Dubois, 1998), although, Harrington et al. discuss less promising results for the treatment of severe depression and in a rigorous meta-analysis, Weisz, McCarty and Valeri (2006) report significantly lower

effect sizes than found in previous studies. Both authors highlight the need for cautious conclusions to be drawn with regards to treatment efficacy for depression. Despite these criticisms, the evidence base for the use of CBT as a treatment for childhood internalising disorders is substantial, and has led to the recommendation of the treatment in the UK by NICE for disorders such as OCD, PTSD, and Depression (2005a; 2005b; 2000c respectively).

There is less comprehensive support for the use of CBT for the treatment of children with externalising disorders (Benjamin et al., 2011). Significant treatment effects have been reported for the use of CBT for substance misuse (Waldron & Turner, 2008) and anger problems (Lochman, Barry & Pardini, 2003) in adolescents, although the evidence is somewhat less robust than for internalising disorders. Support is less forthcoming for the application of CBT to children with ADHD (Abikoff, 1991; 2009). This is relevant for both for problems associated with ADHD itself, and common co-morbid internalising disorders found in this population (Jensen, Martin & Canwell, 2009). Miller and Hinshaw (2011) and Grave and Blisset (2004) discuss the challenges of applying CBT for children with externalising disorders, in that some of the difficulties associated with the condition (for example, problems with executive functioning) preclude children from as effectively understanding the key concepts of therapy and therefore from participating effectively. Ironically, it appears that the difficulties related to the condition for which families might be seeking help might also preclude the child from engaging with a common form of therapy offered within CAMHS.

1.5.4 Critique of the Application of CBT with Children

Whilst the evidence in support of the use of CBT has increased substantially over recent years the approach is not without criticism. Stallard (2009) highlights that research

often compares CBT to no active treatment, furthermore when CBT is compared to active treatment, taking for example childhood depression, the reported significant effects are much more modest, or even fail to reach significance (March et al., 2006; Goodyer et al.,2007). This echoes the idea of the 'Dodo-bird verdict' (Rosenzweig, 1936; as introduced in section 1.3.2) and limits the conclusions that can be drawn about treatment efficacy.

Similar results are reported for the treatment of anxiety, for example Reynolds et al. (2012) reported smaller treatment effect sizes for CBT interventions for childhood anxiety when treatment was compared with active control conditions. Indeed, Speilmans et al. (2006) suggest that the reduced effect of full CBT treatment for anxious and depressed children, when compared to only cognitive, only behavioural, or other therapies indicates that the assumed critical components for CBT with adults might not be as efficacious with children.

A further criticism of the field is that the wide range of adaptations of CBT has led to an increased number of interventions that make use of cognitive and behavioural techniques. Indeed Graham (1998) discusses how it can be difficult to identify common themes in interventions labelled as CBT. Furthermore, CBT with children has been highlighted to be more heavily orientated towards behaviour therapy (cBt) with cognitive components of the intervention receiving less attention (Durlak, Fuhrman & Lampman, 1991; Stallard, 2002a) and Stallard describes how it is necessary to define more precisely what the useful component parts of CBT with children are. Despite these criticisms evidence-based guidelines for interventions are available. For example, Albano and Kendall (2002) suggest that CBT for childhood anxiety should include psychoeducation, management of somatic symptoms, exposure, cognitive restructuring and relapse prevention alongside systemic involvement.

The use of CBT with children younger than seven years old has also been a topic of debate. Spence (1994) proposes that it is not clear how age and developmental stage interact with treatment and influence its success or failure. There are also potential difficulties applying CBT with young children who are not developmentally mature (Grave & Blisset, 2004). Research has identified that in general, children above seven years of age receive more benefit from CBT based intervention than their younger counterparts (Durlak et al., 1991; Reynolds et al., 2012), however recent studies (Freeman et al., 2008; Hirshfeld- Becker et al., 2010; Scheeringa, Weems, Cohen, Amaya-Jackson & Guthrie, 2011) have highlighted significant treatment effects for CBT with children as young as three years old.

Finally, given the existing evidence base for the efficacy of CBT with children a number of researchers have suggested that researchers and clinicians are not doing enough to disseminate research findings in a way that influences day to day clinical practice and the development of service provision (Beidas & Kendall, 2010; Tansella & Thornicroft, 2009; Weisz & Grey, 2008). In accordance with this Stallard, Udwin, Goddard and Hibbert (2007) highlight the difficulty accessing CBT trained practitioners in CAMHS services in the UK. However this is set to change as CBT is a current treatment included in a pilot of Increasing Access to Psychological Therapy services for children and young people (CY-IAPT) within CAMHS (Kelvin, Layard & York, 2009). This scheme will increase the provision of CBT trained practitioners in CAMHS.

1.6. Necessary Skills and Abilities to Engage in CBT

Safran and Segal (1990) suggest a range of factors that can be used to assess suitability of adults to engage in a CBT intervention. The authors recommend that to effectively make use of a CBT adults need to be able to: understanding the CBT

rationale, recognise and work with thoughts and feelings, accept responsibility for change, be able to maintain attention, concentration and focus, demonstrate the potential to forge a therapeutic alliance and hold a degree of relative optimism about therapy. Fennel and Teasdale (1987) also suggest that the willingness to engage in homework is an important factor necessary for the success of CBT.

These factors were generated for adult populations, yet they are also relevant to engaging children in CBT interventions which often contain similar treatment processes. One key differing factor is that as children engage in treatment their cognitive ability is not fully developed. When assessing a child's suitability to engage in CBT it is important that a child's age and developmental stage, along with wider systemic and contextual factors around the child are carefully considered.

In order to fully participate in CBT interventions, with appropriate guidance, a child needs to be able to demonstrate a basic understanding of internal mental events, the concepts of thinking, feeling and acting, and be able to form links between these factors and their current internal state and external environment. Accordingly, children need to reach a stage of developmental maturity where they can meet the cognitive and language based demands of the intervention (Stallard, 2013, p24). When CBT was first employed with children it was suggested that these processes were too advanced and too abstract for children to meaningfully make use of (Ronen, 1992; Spence, 1994). However, the research demonstrating the efficacy of CBT with children would appear to suggest otherwise.

The issue of motivation to engage in therapy and optimism with regards to its outcome is more difficult to use as a guideline for therapy suitability with children. This is especially relevant given that children and young people do not often present them-

selves for therapy. Furthermore, there can also be lack of consensus within families regarding the difficulties the child is facing (Shirk & Saiz, 1992).

In order to be able to engage in CBT it is argued that children need to posses the capacity to form a therapeutic alliance. Chiu, McLeod, Har and Wood (2009) and Chu and Kendall (2009) discuss the need for the child-therapist alliance to be both engaging and flexible, so as to encourage and empower the child to actively participate in therapeutic activities. This is important since children are unlikely to be able to maintain the focus necessary to engage in therapy if it is not delivered at the appropriate developmental level.

The next section of this introduction will review research that has assessed children's ability to demonstrate core skills necessary to engage in CBT based interventions.

1.6.1 Structured Review of Methods used to Assess CBT Skill in Children

In order to identify existing research that has examined children's ability to demonstrate core skills necessary to engage in CBT a structured review of the literature was completed. The literature search was conducted using the Metalib online database (to search EBSCO, ERIC, psych INFO, Science Direct and Medline) and through an advanced search on Google Scholar. Combinations of the following search terms were used: children* ability*/skill* participate*/engage* cognitive behaviour therapy*/CBT* Truncation (*) was used to ensure that different combinations of words were obtained. Unpublished doctoral manuscripts were included in the search and papers were restricted to include articles that were published in the English language. As the search was intended to assess research that has examined children's ability to demonstrate skills necessary to engage in CBT, studies that purely examined the efficacy of CBT with child

populations were excluded. The search identified six key papers. A summary of the aims, design and participants and the main findings of the studies is included in Appendix A, Table A1.

Additionally, whilst not included in the results of the literature search, treatment guidelines outlining the use of CBT with children and young people often include informal assessment of a child's ability to demonstrate core CBT skills. For example, the Think Good, Feel Good Workbook (Stallard, 2002b) includes an exercise where the therapist can ask a child to distinguish thoughts, feelings and behaviours, thus allowing the therapist to informally examine one aspect of a child's suitability or developmental readiness to engage in CBT.

From the six identified studies all apart from Scheeringa et al. (2011) recruited a sample of normally developing children. Scheeringa et al. sought to examine whether it was feasible to apply a protocol based treatment for PTSD (Trauma Focused-CBT, from here on TF-CBT) to young children aged three to six, and the authors evaluated children's understanding of the concepts necessary to engage in CBT as the treatment took place. The successful engagement or demonstration of skill for aspects of the treatment was rated by each child's therapist using a checklist measure created to assess the content covered during the intervention (sessions were also taped and independently rated). The authors concluded that children as young as three were able to demonstrate the key skills required to engage in TF-CBT, but that it took longer for younger children to demonstrate full competency. Scheeringa et al. also conclude that these young children received benefit from the TF-CBT intervention. However, a number of limitations, such as the high drop-out rate (over 50%) and the lack of comparison to another active treatment were acknowledged by Scheeringa and colleagues.

The five remaining studies sought to examine CBT skill in samples of normally developing children between the ages of four and 11. Quakley (2002), Quakley et al. (2003; 2004) and Reynolds et al. (2006) all used the same assessment, the Card Sort Task (CST: Quakley, 2002) to test children's ability to discriminate between thoughts, feelings and behaviours. In this task children are read a brief story in which a character experiences a minor sad or happy event. The story consists of three sentences, one containing a thought, one a feeling and one a behaviour. At the end of the story the children are asked to sort and identify the component parts of the story. This task can be used with or without visual cues. With visual cues the story is read to the child and the child is required to use a puppet (of the character from the story) to post the component sentences into labelled thinking, feeling and doing post boxes. Without visual cues children are asked to verbally report whether each sentence of the story is something the character in the story had thought, felt or done after the story had been read aloud to them. Mixed findings on the use of visual cues were reported. Quakley et al. (2003) reported no significant effect in children aged seven to eight and children aged 10 to 11. However, Quakley et al. (2004) report a significant effect in children aged four to seven, with older children in the visual cue condition demonstrating superior performance, and some older children reaching ceiling on the task. Across all the studies that employ the CST, significant effects of age and verbal IQ were documented. Reynolds et al. also report a significant effect of 'at risk' status to mental health difficulties, and children whose parents identified them to be deemed 'at risk' to mental health problems demonstrated poorer ability to differentiate between thoughts, feelings and behaviours. These effects remained significant once age and IQ were controlled for. Furthermore, the CST task has also been employed successfully to examine whether individuals with a learning disability can demonstrate core CBT skill (Bruce, Collins, Langdon, Powlitch &

Reynolds, 2010; Samms, Collins & Reynolds, 2006) and the CST appears to be a brief, engaging and useful task to assess whether children can differentiate between thoughts, feelings and behaviours, a core skill thought necessary to engage in CBT. The remaining study (Doherr et al., 2005) did not use the CST, but instead asked children to name as many feelings as possible (amongst other tasks discussed below), however the authors did not explore children's ability to differentiate these feelings from thoughts and behaviours.

As well as being able to differentiate thoughts, feelings and behaviours the identified papers explored other core skills thought necessary for children to be able to engage in CBT. Doherr et al. (2005) investigated children's ability to generate alternative attributions to situations (a fundamental part of CBT intervention), although the task they used (taken and adapted from Greenberger & Paedesky, 1995) was initially designed for adults not children, which represents a limitation. Doherr et al. also investigated children's ability to link thoughts and feelings, and this was assessed by presenting a scenario to a child and asking them to imagine having a particular thought about it. The child was then asked to report how that scenario and thought would make them feel. A limitation of this assessment is that it highly depends on children's imaginative ability, and children's answers might have been influenced by whether they had experienced a situation similar to the scenarios presented to them (for example one scenario involves a child arriving at a friend's birthday party and having the thought that they do not want their mum to leave). It is not possible to be sure whether children had or had not been in the situations used in the scenarios in everyday life. However, it is possible that children who had experienced the situations might have found it easier to imagine what the scenario felt like, which might have been associated with better performance on linking the thought to the feeling. Despite these limitations Doherr et al. 2005 reported

significant effects of age, intelligence and educational experience on children's ability to name emotions, generate post event attributions and link thoughts to feelings.

Quakley (2002) also investigated children's ability to make links between thoughts and feeling and thoughts and behaviours. To do this Quakley used two tasks known as the thought to feeling story board linking tasks (TFLT) and the thought to behaviour story board linking task (TBLT). The tasks used by Quakley were adapted from tasks designed by Lagattuta, Wellman and Flavell (1977). The tasks involve illustrated stories in which focal characters experience minor sad or happy events. Later in the story the children see that the focal character encounters a visual cue which is related to the previous happy or sad event. Children are then told that the character feels or behaves in a certain way, and are asked to explain why. The most sophisticated answer involves the child demonstrating that they understand that an object in the present (visual cue) can trigger a thought or a memory, which influences current feeling (TFLT) or behaviour (TBLT) and a significant effect of age was reported on children's ability to link thoughts to feelings and thoughts to behaviours. A strength of these tasks is that the use of the pictorial stories, where the child is presented with previous context as to why a character might feel or act in a certain way reduces the difficulties associated with whether or not the child might have experienced the scenario presented to them as they are shown the character experiencing and reacting to it in the story. This also reduces some of the demands placed on the child's imagination compared to the tasks used by Doherr et al. (2005). However, an identified limitation of these tasks is that the stories focus on linking thoughts to feelings and thoughts to behaviours in others and not the self, which is key to engaging in a CBT intervention. A further strength is that the pictorial story board placed in front of the child reduces the demands made on a child's working memory when they are trying to solve the task.

The identified extant research has presented a number of methods that have been used to identify core skills thought necessary for children to be able to engage in CBT. However, to date no research has investigated the demands that these tasks place upon the child when they are asked to complete them. This thesis investigates the relationship between CBT skill and the necessary developmental modalities that a child might be required to employ to demonstrate success on the tasks. Based upon the studies reviewed this research employs the CST, TFLT and TBLT (Quakley, 2002). The tasks are outlined in more detail in Chapter Two. It is hypothesised in this current study that successful completion of the tasks requires a child to employ skills associated with executive functioning, empathy and theory of mind (ToM). For example on inspection all three tasks require children to problem solve, monitor their responses and demonstrate a degree of metacognitive awareness and cognitive flexibility. These are all skills that are associated with executive functioning. Furthermore to complete the TBLT/TFLT tasks children are required to take the perspective of the focal characters and then explain why they feel or behave in a certain way, and in the CST children are required to identify the internal and external states of the focal characters. To successfully do this it would appear that children need to be able to take or understand the perspective of others (ToM) and to empathise with the characters in the stories.

1.7 Interim Summary

Section 1.6 addresses the skills and abilities thought necessary for children to engage in CBT, and prior to this section 1.5 highlights the role of cognition in childhood and the adaptation of CBT models for use with children and adolescents. Despite some debate, the evidence in favour of the efficacy of CBT for childhood psychopathology has led to the approach being considered as the “first line of defence” (Benjamin et al., 2011, p7) and recommended by NICE (2005a, 2005b & 2005c) as best clinical practice in the

UK. Furthermore, a pilot scheme is currently running, that if adopted nationally will increase the number of specifically trained CBT therapists to work with children and young people in CAMHS.

Given the increasing use of CBT for children and young people an important aspect of research is to identify the skills and developmental abilities required for children to be able to successfully engage in the therapy. Previous research examining children's success on tasks designed to measure core CBT skills has identified a significant positive relationship between age (Quakley, 2002; Quakley et al., 2003) the absence of mental health and behavioural problems (Reynolds et al., 2006) and IQ (Doherr et al., 2005) on performance.

Kendal and Choudhury (2003) highlight that future research into the use of CBT with children should consider developmental issues. To date, the research literature has not examined how CBT skills relate to the acquisition of developmental modalities such as executive functioning, empathy and ToM. Identifying the relationship between CBT skills and these developmental modalities might allow for a more comprehensive understanding of what abilities are necessary for children to demonstrate the core skills required to engage in CBT. This will not only have clinical implications for the assessment and treatment of psychological disorders in typically developing children, but might also inform treatments for children with neuro-developmental disorders or brain injury affecting cognitive function (i.e. atypical development). Prior to outlining the aims of this research, the following sub-sections provide a brief overview on general cognitive development and the development of executive function, ToM and empathy.

1.8 Cognitive Development: A Brief Overview

Theories of cognitive development can be useful in understanding how children acquire the ability to take part in CBT. A brief review of the main theoretical considerations is presented below. It is beyond the scope of the thesis to give a full account of theories and models of cognitive development, and this review is limited to theories and models that are hypothesised to be most relevant the current study.

1.8.1 Piaget's (1952) Theory of Cognitive Development

Piaget's (1952) theory of cognitive development has largely influenced how we understand the advancement of cognitive skill in children. Piaget's theory suggests that children move through four stages of thinking, which are related to qualitative changes in intelligence. The stages are sensory-motor, (0-2 years), pre-operational (2-7 years) concrete operational (7-12 years) and formal operational (12 years and above). Piaget proposed that growth of intelligence is related to how a child adapts to their external environment by assimilating or accommodating to new knowledge, which is subsequently incorporated into developing schemas. Piaget's model assumes a hierarchical acquisition of skill, with a child not being able to move up a stage before acquiring full competency in previous stages.

In terms of the relevance with regards to children's ability to engage in CBT, Piaget's theory argues that children younger than seven years lack the skill to distinguish between physical and mental states, and children within pre and concrete operational stages have little awareness of their own thoughts. The theory also proposes that between pre and concrete operational stages children are without introspective ability and even children aged 11years cannot consider abstract concepts (Estes, 1994). Based on this traditional account of cognitive development children as old as 11 would lack the ability

to participate in CBT, this is incongruent with the empirical support for the use of CBT with children. Whilst Piaget's (1952) model was seminal in the development of understanding the acquisition of intelligence it is widely criticised for being inflexible, stage bound, and reductionist (Brown & Desforges, 1977; Donaldson, 1978; Safran & Seigal, 1998).

1.8.2 Vygotsky's (1962) Theory of Cognitive Development

Vygotsky focuses on the role of language, culture and social context in the acquisition of cognitive ability. His theory presented a major challenge to Piaget's work. Vygotsky referred to the process of scaffolding (where learning is guided by others who have more expertise), and the zone of proximal development (which is the 'distance' between what a child can do on their own, versus what they can do if they are guided by someone more knowledgeable). Vygotsky proposed that within the zone of proximal development and with guidance, a child would be able to achieve something outside of their own ability, and importantly learn from the experience. This would suggest that if child was given a task that was beyond, but within reasonable range of their Piagetian stage or developmental ability, with assistance they would be able to complete the task. The theoretical concepts of scaffolding and the zone of proximal development are applied in therapy. For example, Vygotsky's theory is a central tenant to development and application of Cognitive Analytic Therapy, (Ryle & Kerr, 2002, p14) where individuals are encouraged to recognise and alter maladaptive patterns of interpersonal responding through a therapeutic relationship, where the therapist scaffolds alternative interpersonal processes. With regards to the application of these principles to children's ability to engage in CBT, Reynolds et al. (2006) suggest that children's ability to demonstrate CBT skill can be scaffolded by help from adults and by using age appropriate adaptations, which could be provided by an appropriately trained CBT

therapist. The idea of scaffolding is relevant to this project as it is possible that other developmental modalities hypothesised in this current study to be related to CBT ability (for example executive functioning, ToM & empathy) might scaffold children's ability to complete the CBT skills tasks.

1.8.3 Models of Information Processing

Lastly, information processing models suggest that cognitive ability is acquired through the development of domain specific modules, rather than one all encompassing structure (Carey, 1985; Gardner, 1983). Information processing models propose that different cognitive modalities (for example language, working memory etc) develop in parallel, yet at different rates. However, Case (1978) explains how each modality is thought to have a shared ceiling constrained by limitations on information encoding and processing.

This model counters Piaget's claims by suggesting that the cognitive skill of younger children does not increase in defined stages, but as children increase in age their ability to encode and process information develops, so that they become more efficient in making sense of their internal and external world. This modular view of cognitive development is relevant to this research as it contributes to the understanding of how other developmental modalities (that are hypothesised here to be related to CBT skill) could help children to succeed on CBT skills tasks. This model also suggests that children's understanding of concepts hypothesised to be related to engagement in CBT, such as their knowledge of their mind and the ability to problem solve, can be seen as developing to some extent independently of other cognitive modalities. If this is the case, it illustrates the importance of understanding the contribution of specific developmental modalities (such as executive functioning, empathy and ToM) to the success of

children's ability to demonstrate CBT skill. The following sections in this chapter will continue with a brief overview of the development of executive functioning, empathy and ToM

1.9 Development of Executive Functioning, Empathy and ToM

The following sections provide a brief outline of the developmental trajectory of executive functioning, empathy and ToM. Where age is referred to the following conventional terms (taken from Carr 2006, p 22) are employed: infancy (zero to one years), toddlerhood (one to two years), preschool (two to five years) early childhood (five to seven years) middle childhood (seven to 10 years), late childhood (10-13 years) and adolescence (13 years and above).

1.9.1 Development of Executive Functioning

Executive functioning is broadly defined as a cognitive construct which includes processes that underlie goal directed responses (Hughes & Graham, 2002). Rather than referring to a single process the term encompasses a number of complex functions that are involved with planning, problem solving, decision making, initiation, organisation, emotional and behavioural regulation, impulse control and inhibition (Lezak, 2004; Norman & Shallice, 1980; Welsh, Pennington & Groisser, 1991) all of which impact upon behaviour, social skill and everyday functioning (Lezak, 2004). The origin of research into executive function is largely credited to Luria (1966), who pioneered investigations in to the link between self regulation, planning, problem solving and the prefrontal cortex and frontal lobe.

Historically, research into executive function began with veterans from WW1 who had sustained frontal injuries (Goldstein, cited in Rylander, 1939, p 20) and has

advanced through research on healthy and neurologically impaired adults and non human primates (Shallice, 1982; Stuss & Benson, 1984: Diamond, 1988). Until relatively recently research investigating the development of executive functioning in children was substantially neglected (Hughes & Graham, 2002). The authors explain that this was related to the early and somewhat out dated idea that executive functioning was only essential for abstract thinking associated with adulthood. Additionally early research led to the notion that childhood injuries to the prefrontal cortex only became problematic in adulthood (Golden, 1981) an idea that is no longer supported (Hughes & Graham).

Research has now advanced significantly and the current understanding of the developmental trajectory of executive functioning indicates a rise and fall across the life span from children through to older adults (Zelazo, Craik & Booth, 2004). Executive functioning was first seen as an adult domain, however, research using neuro-imaging demonstrates prefrontal activity in infants (Bell & Fox, 1992) and the use of developmentally sensitive measures indicates some executive skill in pre-school children (for example demonstrating success at simple problem solving tasks; Welsh & Pennington,1988). Executive skill is largely thought to develop with age and the associated neurophysiological development within the frontal lobe and extant research has demonstrated the relatively rapid acquisition of some executive skills in early and middle childhood (see Anderson, 2002). The literature indicates a slowing of development across later childhood and adolescence (Anderson, Anderson, Northam, Jacobs & Catroppa, 2001b; Blakemore & Choudary, 2006) however executive skills continue to mature through adolescence and early into adult life, alongside frontal lobe development (Diamond & Taylor, 1996; Espy, 1997).

Despite a global age related developmental trajectory, variation exists within specific component skills that comprise executive functioning (Anderson 2002). For

example, attentional control is thought to develop considerably during infancy and early childhood (Diamond, 1985; Diamond & Goldman-Rakic, 1989; Espy, 1997; Espy, Kaufman, McDiarmid & Glisky, 1999), where as self regulatory and problem solving skills do not appear to come on line until middle childhood (Anderson, Anderson & Lajoie, 1996; Anderson et al., 2001b). Following this, information processing (Anderson et al., 2001b; Gerstadt, Hong & Diamond, 1994; Kail, 1986; Welsh et al., 1991) cognitive flexibility (Krikorian & Bartok, 1998; Lenvin et al., 1991; Welsh et al., 1991) and goal setting (Anderson, Anderson & Garth, 2001a ; Jaques & Zelalzo, 2001; Welsh et al., 1991) appear to develop more rapidly in later childhood and adolescence. When investigating the development of executive function on a large sample of normally developing children aged three to 12 years old children, Welsh et al. report few significant relationships between executive function and IQ. However, Anderson (2002) discusses how tasks that measure executive functioning are required to be complex by nature (in order to successfully measure the modality), and the complexity of the task can result in sensitivity to differences in IQ (difficulties associated with the measurement of executive function are discussed further in Chapter Four of this thesis).

Metacognition has been highlighted as a related developmental modality to executive functioning (Fernandez-Duque, Baird & Posner, 2000). The concept of metacognition can be defined as a broad term for the knowledge and regulation of cognitive activity (Moses & Baird, 1999). Research into metacognition in children suggests that preschool children have a limited understanding, knowledge or awareness of their cognition (Flavell & Wellman, 1977). However metacognitive skill has been associated with memory, problems solving, social cognition and a range of other modalities of executive functioning (Flavell, 1979). Of particular relevance to this project, research highlights that whilst pre-school children have a basic sense of thoughts

as mental events, there are important limitations to their understanding. For example, Flavell (1995) hypothesises that the perception of thinking in children of this age is restricted to the notion of thoughts being represented as isolated events, which are not related to cause and effect. This limited awareness of internal cognitive processes would have clear implications on a child's ability to link thoughts, feelings and behaviours and engage in CBT.

1.9.2 Development of Empathy

The construct of empathy is broadly defined as "an emotional response that stems from another's emotional state or condition, and that is congruent with the others emotional state or situation" (Eisenberger & Strayer, 1990, p5). However, empathy can be considered as both an affective and a cognitive process. Whilst affective empathy is concerned with the vicarious feeling in response to another person's emotional state, cognitive empathy is concerned with a person's ability to accurately perceive the feelings of others (Losoya & Eisenberger, 2001) and is more similar to ToM.

In common with executive functioning, our capacity for empathy develops with age, and considerable development occurs over infancy, preschool and middle childhood (McDonald & Messinger, 2012). The early development of empathy has been linked to reflexive crying in new-born children (Sagi & Hoffman, 1976; Simmer, 1971), and infants experience of personal distress in response to the negative emotions of others is hypothesised as the pre-emptive development of empathic concern (Hoffman, 1975). During development from infancy to toddlerhood empathic responding begins to focus more on others rather than the self, and through longitudinal study Zahn-Waxler, Radke-Yarrow, Wagner and Chapman (1992) have reported that by the end of their third year children are able to display a range of empathic behaviours such as expressing verbal and

facial concern, helping behaviour, showing interest in distress of another person and attempting to distract other people in distress.

The development of empathy is closely associated with moral development (Batson, Ahmad & Lishner, 2011; Eisenberger, Spinrad & Sadovsky, 2006) and empathic responding is essential in facilitating prosocial behaviour towards others in need (Roth-Hania, Davidoff & Zahn-Waxler, 2011). The development of empathy is not just associated with age but is also influenced by a variety of other factors including, for example, a child's temperament (Cornell & Frick, 2007), the quality of parent-child attachment and relationship (Kestenbaum, Faber & Sroufe, 1989; Van der Mark, Van Ijzendoorn & Bakermans-Kranenburg, 2002) and heritable genetic factors (Knafo, Zahn-Waxler, Van Hulle, Robinson & Rhee, 2008; Zahn-Waxler, Robinson & Emde, 1998). Research has also identified differences between genders, with girls reported to develop empathic concern at an earlier age and to demonstrate the concept with more intensity compared to boys (Eisenberg & Miller, 1987; Maccoby, 1998; Mehrabian, Young & Sato, 1988). The development and parent-rated report of empathic concern does not appear to be significantly linked to general IQ (Chapman, Baron-Cohen, Auyeung, Knickmeyer, Taylor & Hackett, 2006; Dadds et al., 2008) although the more cognitive aspects of empathy, conceptualised as more similar to ToM have been linked to IQ (Hoffman, 2008). Additionally, established research has demonstrated a relationship between higher reported empathy and prosocial behaviour and lower reported empathy and antisocial behaviour (see Hoffman, 2008 for review). Issues concerning the measurement of empathy will be considered in Chapter Two and Four of this thesis.

1.9.3 Development of ToM

ToM broadly refers to the ability of an individual to understand and infer the mental states (for example, emotions, thoughts, desires, beliefs etc) of others (Baron-Cohen, 2001). The successful development of ToM is conceptualised to suggest an individual is able to understand the distinction between their mind, the minds of others and the external world (Estes, 1994), and is able to infer a range of beliefs, desires, intentions and emotions (Baron-Cohen, 2001).

Alike to the other modalities outlined here ToM ability develops with age (see Wellman, Cross & Watson, 2001; Wellman & Liu, 2004 for a comprehensive review) and significant gains are reported in children's pre and early school years. Pre-school children (aged approximately three years) are thought to demonstrate an initial understanding of internal mental states (Flavell, 1995; Leslie & Frith, 1988; Wellman, Hollander & Schult, 1996) and by the age of four years normally developing children are able to recognise the difference between appearance and reality (Flavell, Green & Flavell, 1986). By five years children begin to demonstrate the ability to infer the mental states of others, for example being able to complete a first order false belief tests such as the Sally-Anne task (Baron-Cohen, Leslie & Frith, 1985; Wellman et al., 2004; Wimmer & Perner, 1983). By this age children are also beginning to understand a person's actions in terms of desires, thoughts, beliefs and emotions (Cutting & Dunn, 1999) and are beginning to develop the ability to understand that emotions can be caused by both external situations and internal desires and beliefs (Harris, Johnson, Hutton, Andrews & Cooke, 1989). As children develop they are also able to understand more complex representations of mental states such as deception, sarcasm, metaphor and irony (Baron-Cohen, 1997; Happe, 1994; Sodian, Taylor, Harris & Perner, 1992) and demonstrate more advanced skills in inferring the mental states of others, for example demonstrating

an understanding of second order ToM (which involves making inferences on a belief about a belief; Perner & Wimmer, 1985). Liddle and Nettle (2006) investigated ToM in normally developing 10 and 11 year olds and found that the majority of children sampled were able to correctly complete first and second order tasks, but performed at chance level on third and fourth order tasks. Kinderman Dunbar and Bental (1998) report that most adults perform better than chance on tasks requiring up to fourth level inferences, but that successful completion decreases dramatically when tasks require more complex inferences. Examples of first through to fourth order ToM tasks have been included in Appendix L along with the ToM tasks used in this study, which are comprehensively introduced in Chapter 2.

Alongside age, other factors such as individual differences (Hughes et al., 2005) quality and quantity of interactions with parents, siblings and friends (McElwain & Volling, 2005; Perner, Ruffman & Leekam, 1994; Symons & Clark, 2000) have all been positively associated with ToM development. On the other hand factors such as maltreatment, social deprivation and conduct difficulties are associated with poorer ToM (Cutting & Dunn, 1999; Happe & Frith, 1996; Tarullo, Bruce & Gunnar, 2007) although causality cannot be inferred from these associations. Research demonstrates an association between language ability, verbal memory and the development of ToM as assessed through the success on false belief tasks (Jenkins & Astington, 1996) and evidence from longitudinal study supports the idea that language is fundamental to the development of ToM (Astington & Jenkins, 1999). Furthermore, through the study of individuals with ASC, a population whom more or less consistently demonstrate impaired ToM ability (Baron-Cohen, 2001) research has demonstrated a link between ToM and verbal IQ (Bowler, 1992; Ozonoff, Rogers & Pennington, 1991). The acquisition of ToM skill has also been related to competence in everyday social

situations (Frith, Happe & Siddons, 1994) and overall social competence (Liddle & Nettle, 2006). The measurement of ToM will be discussed in Chapter Four of this thesis.

1.9.4 Overlap between the Development of Executive Function, Empathy and ToM.

The developmental trajectories of executive function, empathy and ToM have been outlined above. However, it is not suggested that these modalities develop independently from each other. Rather, given that these modalities are acquired within the context of overall development, and that all three modalities develop markedly across children from pre-school age onwards, it is likely that there is some developmental overlap. Further evidence to support this comes from the study of atypical development, for example Ozonoff, Pennington and Rogers (1991) discuss how the deficiencies in executive functioning, and social functioning (including empathy and ToM) observed in children with ASC suggest that these modalities are in some way developmentally linked.

Research in this field demonstrates a relationship between the development of executive function, (and particularly the concept of inhibition) and ToM (Carlson & Moses, 2001; Hughes, 1998; Russell, 1996). The direction of the association is unclear (Carlson, Moses & Breton, 2002), however one theoretical standpoint is that the development of executive function is necessary for ToM to begin to emerge (Russell, 1996; Carlson & Moses, 2001). Another postulates that the development of executive function allows ToM to be expressed (Hala & Russell, 2001; Leslie & Polizzi; 1998). Current research findings lend more support to the notion that the emergence of executive skill is required for ToM to begin to develop (Hughes & Ensor; 2007, Perner, Lang & Stummer, 1998, Perner & Lang, 2000).

Furthermore, whilst empathy and ToM are conceptualised as distinct, but similar constructs, research suggests they share common neuronal pathways, with empathic responding being associated with the additional activation of areas responsible for processing emotions (Volm et al., 2006).

As a result of these complex relationships between modalities it can be difficult to separate out aspects of development related to the acquisition of each modality (Espy, Kaufmann, Glisky & McDiarmid, 2001). The following section will outline limited research that suggests the importance of executive function, empathy and ToM to an individual's ability to engage in CBT based intervention.

1.9.5 Relationship between Executive Functioning, Empathy and ToM and Ability to Engage in CBT

No previous research has investigated how the development of executive functioning, empathy and ToM might influence the development of CBT skill. However, limited research has explored these modalities in relation to individuals' engagement in CBT.

Turning attention first to executive functioning Mohlman and Gorman (2004) report that older adults with decreased executive function derived less therapeutic benefit from a CBT intervention for GAD. A similar effect was also reported for the treatment of depression with CBT (Alexopoulos et al., 2000). Furthermore CBT intervention augmented with executive skills training resulted in increased therapeutic and executive functioning gains (Mohlman, 2008) and James, Rechelt, Carlsonn and McAnaney (2008) highlight that executive deficits associated with depression make it harder for adults to learn new information and fully understand the rationale for engaging in CBT.

Executive dysfunction is commonly associated with externalising and developmental disorders (Ozonoff & Jensen; 1999). For example, executive dysfunction is proposed to play developmental and maintaining role in ADHD (Pennington & Ozonoff, 1996) and models of CBT based treatment for ADHD include intervention which targets executive dysfunction (Solanto, 2011). This suggests that difficulties with this modality are related to benefit that can be gained from CBT intervention.

Additionally, as discussed earlier in this chapter problems with executive functioning are thought to contribute to the difficulties that children with externalising disorders encounter when participating in CBT (Grave & Blisset, 2004). Consistently alongside this there appears to be less evidence supporting the efficacy for CBT as an intervention for childhood externalising disorder (where impairments of executive functioning are commonly associated) compared to the treatment of internalising disorders (Abikoff, 1991; 2009; Benjamin et al., 2011; Jensen et al., 2009).

Acquired brain injury is also associated with difficulties with executive functioning, ToM and empathy (Rowe, Bullock, Polkey & Morris, 2001; Tonks et al., 2009) and challenges associated with these difficulties have also been identified with applying CBT with children post injury (Laatsch, 2007). However, other difficulties, for example a child's language ability, and difficulties with insight and forming a therapeutic alliance (Judd & Wilson, 2005) might also impact on a child's ability to engage with treatment.

Ronan (1992) discusses how children's ability to distinguish between empathy for others and their own personal distress is fundamental for readiness to engage in CBT. However, there has been little research into the role that empathy and ToM plays in the ability of children to engage in CBT. Relevant research predominantly comes from the

adaptation of CBT for children with ASC. ASC's are associated with a triad of impairments which consist of deficits in imagination, communication and social relationships (Wing, 1981). Within this, individual with ASC's commonly display difficulties with taking the perspective of and empathising with others (Baron-Cohen & Wheelwright, 2004; Baron-Cohen, 2001).These impairments have been associated with difficulties using CBT with this population (Wood et al., 2009) and research has identified a need to adapt treatment so that these deficits are taken in to account (Atwood, 2004). For example, Wood et al. describe how the social impairments (including empathy and ToM) commonly associated with this population can reduce the efficacy of CBT intervention. White et al. (2010) and Wood et al. described successfully adapted CBT interventions for anxiety in children with ASC which included a focus on social skills training, alongside other adaptations, such as increasing parental involvement.

1.10 Final Summary, Aims of the Current Study and Research Questions

The previous subsections have briefly outlined the development of three modalities (executive functioning, empathy and ToM) that in this current study are hypothesised to be related to children's ability to successfully complete three measures of CBT skill. The development of these modalities is complex and appears to interact, however children appear to make significant gains through infancy to late childhood.

Research examining the use of CBT to treat psychological disorders in children has demonstrated promising findings, and there is a need for future research to focus on developmental issues (Kendall & Choudhury, 2003). An important aspect in the application of CBT with children has been to identify the skills required for children to engage in CBT. This has led to the development of CBT skills tasks, which assess children's ability to differentiate and link thoughts, feelings, and behaviours. These tasks

can be used prior to psychological treatment (Stallard, 2002b) and can inform assessments as to whether the child is 'developmentally ready' to engage in a course of CBT treatment. It is not yet known, however, how children's ability to demonstrate CBT skills relates to developmental modalities such as, executive functioning, empathy and ToM. Understanding the relationship between CBT skills and developing cognitive modalities might have important clinical implications for the assessment and treatment of psychological disorders in children with typical and atypical development.

1.10.1 Research Aim

This thesis aims to extend previous research by examining the relationships between executive function, ToM, empathy and CBT skills in children aged five to eight years old. In order to investigate this a quasi-experimental correlational design was employed. Children aged between five to eight years were asked to complete three CBT skills tasks, alongside the completion of child-assessed tasks and parental-report questionnaires that measure executive functioning, ToM and empathy. Based on findings from previous research the potentially confounding role of age, IQ and the presence of mental health/behavioural difficulties were taken in to account during the measurement and analyses of results.

The age range of five to eight years was chosen because the developmental psychology literature indicates that whilst the rudimentary foundations of executive functioning, empathy and ToM have been laid down, the modalities develop markedly over early and middle childhood. Also, previous research has indicated that children over eight years of age show ceiling effects on the CBT skills tasks (Quakley 2002; Quakley et al., 2003), and therefore, detecting a relationship between performance on the various tasks will be limited in an older age group.

The research questions and corresponding hypothesis are detailed in the following sub-section. This is followed by Chapter Two where a detailed account of the methodology employed to investigate these questions is presented.

1.10.2 Research Questions and Hypothesis.

Research Question One: Is executive functioning as assessed in children significantly related to children's performance on tasks measuring CBT skill?

Hypothesis One: Greater executive functioning skills, assessed in children, will be associated with superior ability on the CBT skills tasks

Research Question Two: Is executive functioning (as measured by parent report) significantly related to children's performance on tasks measuring CBT skill?

Hypothesis Two: Greater parental ratings of executive functioning in their children will be significantly associated with superior ability on the three CBT skills tasks

Research Question Three: Is parent rated empathy significantly related to children's performance on tasks measuring CBT skill?

Hypothesis Three: Higher parental ratings of empathy in their children will be significantly associated with greater ability on the three CBT skills task

Research Question Four: Is ToM ability significantly related to children's performance on tasks measuring CBT skill?

Hypothesis Four: Children that demonstrate higher ToM ability will perform significantly better on the three CBT skills tasks.

Chapter Two

METHODOLOGY

2.1 Overview

This chapter details the methodology employed to investigate the research questions outlined in Chapter One. Information is provided on the design, participants, recruitment strategies, measures and procedures used to carry out the research. The chapter concludes with a plan of analysis.

2.2 Design

This study aimed to investigate the relationship between executive functioning, theory of mind (ToM) and empathy, and performance on tasks designed to assess CBT skills in a normally developing sample of children. To achieve this, a quasi-experimental correlational design was employed. The criterion variables were performance on the three measures of CBT skill (card sort task (CST), thought to feeling linking task (TFLT) and thought to behaviour linking task (TBLT)). The predictor variables were measures of executive functioning, ToM and empathy.

2.2.1 Sample Size

No previous study has investigated the combined role of executive function, empathy and ToM in relation to children's ability to successfully complete tasks designed to assess CBT skill. This study is therefore considered exploratory and based on convention a moderate effect size has been estimated (Field, 2000). Based upon an estimated effect size in the medium range (rho (ρ) = 0.3), significance levels of .05 and statistical power of .8 a minimum of 64 participants was estimated to be required. In order to ensure an adequate age range, the sample was stratified by age, with at least 16 participants recruited per age group (five, six, seven and eight year olds). The actual

detected effect sizes of significant findings were calculated and are detailed in Chapter Three.

2.3 Participants

Participants were normally developing children (from here on participants are referred to as children). In addition, one parent per child was also asked to participate in the study by completing four questionnaires about their child. Information regarding the inclusion and exclusion criteria, recruitment to the study, pilot study and sample obtained is provided below.

2.3.1 Inclusion Criteria

The inclusion criteria were as follows:

1. All children recruited into the study were required to be between five years and zero months to eight years and eleven months old, the rationale for selecting this age range is provided in section 2.2.3.
2. All children had to be attending a primary school within the geographical region of East Anglia, UK.
3. All children were required to have informed consent from a parent to participate in the study. As participants were under the age of 16 years they gave their assent to take part in the study. Both consent and assent were required for entry into the study (subsection 2.5 details a full consideration of ethical issues relating to this study).
4. All children had to be proficient in spoken and written English language to an age appropriate standard. The rationale for this was that test materials were presented in English. Therefore, age appropriate proficiency was necessary to understand and complete the tasks.

2.3.2 Exclusion Criteria

The exclusion criteria were as follows:

1. All children with a learning disability, pervasive developmental disorder, ASC and/or statement of special educational needs were excluded from the study. The rationale for this was that this study aimed to assess the relationship between CBT skills, executive functioning, empathy and ToM in a sample normally developing children. Psychopathology associated with the disorders and disabilities listed above were considered likely to confound the results.
2. All children with a significant speech and language disorders were excluded from the study. The rationale for this being that the presence of expressive or receptive communication problems was likely to hinder children's ability to engage with the assessment tasks, which again was considered likely to confound results. Furthermore, the process of participating in the assessment for these children might have been a potential source of distress.
3. All children with a known mental health disorder, or who were known to be in contact with mental health services, or receiving psychological therapy were also excluded from the study. This was to ensure that the sample would provide normative data. Reynolds et al. (2006) reported that children who were rated as being 'at risk' to mental health problems on the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1998) were significantly poorer at completing the CBT skills tasks when compared to children not considered to be 'at risk'. Additionally excluding children who were known to be experiencing mental health difficulties reduced the risk of potentially distressing any child taking part in the research.

Further information on how these inclusion and exclusion criteria were implemented and managed is provided in section 2.2.4, where the recruitment strategy is discussed in more detail.

2.3.3 Pilot Study

The age range of five to eight years and 11 months old was selected for this study. The rationale for this was that previous research had suggested that children's ability to successfully engage in the tasks examining CBT skill reaches ceiling by the time they are older than eight years old (Quakley, 2002; Reynolds et al., 2006). Additionally by this age the rudimentary foundations of executive functioning, empathy and ToM are thought to have been established.

In some studies, for example Quakley (2002) children as young as four years old have been recruited, and have demonstrated some ability to complete the tasks. For the current study it was considered possible that the duration of the assessment, and the tasks used might not be appropriate for children as young as four to complete. To investigate this further a small pilot study was conducted.

After obtaining informed parental consent the assessment procedure was carried out with one child aged four years and two months. The child was assessed at home, in a familiar environment with her mother present. The assessment took approximately 65 minutes. It was noted that this was a long time to ask the child to concentrate for and small play breaks were incorporated into the session, further increasing the duration. The child reported that she enjoyed completing the tasks. However, some of the tasks were clearly beyond the range of her ability and the researcher was required to make some adjustments so that the child's experience was not predominantly one of failure. The child's mother was asked to complete the parent measures. She reported that she thought a range of the questions were not particularly appropriate for a four year old child.

The child's mother also reported that whilst her child was happy to complete the tasks at home, she was not sure if her child would be happy to meet with the researcher (a stranger) for that length of time in her school environment, (where the majority of assessments took place) especially given that she (and other potential participants aged four) had just began attending school at the start of the academic year.

Informed consent was gained to pilot the study on a second four year old. At time of testing the child decided that he did not wish to take part. His mother agreed to look through the tasks and the parent measures and her opinions on the (un)suitability of these tasks for this age range concurred with that of the first mother. Further attempts to recruit an additional two, four year old children into the study were unsuccessful. In the interests of not delaying the start of the study and in discussion with the study supervisors it was decided on the basis of the limited but consistent data from the pilot exercise that the youngest age of participation would be five years old.

As a result of this pilot exercise the youngest age for participation in this study was set at five years old.

2.4 Recruitment

Recruitment to the study took place over five months in 2012. Children were recruited from primary schools geographically located within the region of East Anglia, UK. The following section outlines the recruitment pathway from recruiting schools to the study, to recruiting participants from within these schools. Information on recruitment rates and the sample characteristics are also included below. The consort diagram in Figure 1 illustrates the complete recruitment pathway to the study.

2.4.1 Recruitment of Schools

The head teachers of schools in East Anglia (predominantly within the counties of Norfolk and Northamptonshire) were sent an information pack about the study via email

or post. This included an introductory covering letter (see Appendix B) and school information sheet (see Appendix C). The purpose of this information pack was to introduce the researcher and the project. If no reply was received from the school after approximately one week, a telephone call was made by the researcher to the head teacher to follow up the information pack. If the head teacher was interested in their school participating in the study, a meeting to discuss this further was arranged. If the head teacher was not able to, or not willing to help, they were thanked for their time and no further contact was made with the school.

The researcher met with each head teacher (or nominated deputy head teacher) prior to beginning recruitment through their school. The purpose of the meeting was to discuss the assessment tasks, recruitment procedure, and inclusion and exclusion criteria, and to answer any questions about the study. Additionally, this meeting allowed the researcher to identify whether the school had sufficient time and facilities for the researcher to complete the assessments. If the head teacher was happy for the study to go ahead then written permission was sought prior to beginning recruitment (see Appendix D).

Once written permission was received, prior to sending out any parent information packs the head or appropriate class teachers were asked to exclude any children that met the pre determined exclusion criteria (see subsection 2.2.2). In practice, limitations were identified with this strategy and will be further discussed in Chapter Four.

At this stage, the researcher also made attempts to introduce herself and the research project to the relevant class or year group via an assembly, or by visiting the appropriate class room to introduce herself (although this was variable depending on the

preference of each school). Where the researcher was given this opportunity, the project was explained to children and the researcher also explained that packs would be sent out to some but not every child. It was hoped that this allowed any excluded children not to feel marginalised by the recruitment process.

Some head teachers kindly offered to take steps to try and maximise the rate of returned consent forms. This included two head teachers writing about the study in their school newsletter. The information included the contact details of the researcher should parents have had any further enquiries about the study.

2.4.2 Recruitment Rates in Schools

As detailed in the consort diagram below (see Figure 1, pg 63) 28 schools were approached by the researcher. Of these 28 schools eight head teachers gave their permission for recruitment to go ahead. This is a total school recruitment rate of 30%. The schools were a mix of pre-preparatory, primary and junior schools. Further characteristics of the schools are outlined below in Table 1.

Table 1

Characteristics of the schools recruited to the study

	Location	
	Norfolk	Northampton
N	3	5
	Geographical Area	
	Rural	Urban
N	6	2
	Funding	
N	State	Independent
	7	1

Note: N = 8.

2.4.3 Recruitment of Individual Participants from schools

Once the steps outlined in section 2.3.1 were complete, information packs containing a parent information sheet (see Appendix E) and a parent consent form (see Appendix F) were sent to parents of children identified by staff to meet the inclusion criteria. Packs were sent home via children's book bags. In some schools (mostly the smaller ones) parents of all children who met the inclusion criteria were sent information packs. In larger schools head teachers more often selected a cluster of classes, or a whole year group from which parents of children who met the inclusion criteria were sent information packs.

Once packs were received by parents they were encouraged to contact the researcher to discuss or address any questions about the study. If parents were happy to give consent for their child to take part in the study, then they were asked to complete the parental consent form and return this to their child's school in the labelled envelope provided, by a pre-identified date. When parents gave their consent then they were asked to decide if they preferred the assessment to take place either at home or at their child's school. Once the returned consent forms were received a time was scheduled with schools or with individual parents to complete the assessments as per the study procedure (see section 2.6 for further details).

2.4.4 Recruitment through Local Networks

A small proportion of the overall sample (see Table 2) was recruited through local networks of colleagues and associates, who enquired about the study, and whose children met the inclusion criteria. In this case the study was discussed with a parent and following the same process described above information sheets and consent forms were sent out. If the consent form was returned to the researcher then an appointment to

complete the assessment was scheduled and the child's assent was taken when the researcher first met with the child.

2.4.5 Recruitment Rates of Individual Participants

As detailed in the consort diagram below (see Figure one, pg 63) a total of 510 parent information packs were sent out across all eight schools and local networks. From these 510 packs 104 signed consent forms were returned. This is an overall parental response rate of 20%. Table 2 illustrates the response from each individual school, including children recruited through local networks. To protect the confidentiality and anonymity of individual schools the table below has been anonymised.

Table 2

Response rates across individual schools and local networks

School	Number of information packs sent out	Number of returned consent forms	Percentage return rate (%)
School A	60	0	0
School B	60	12	20
School C	61	21	34
School D	120	10	8
School E	62	15	12
School F	31	13	42
School G	50	19	38
School H	60	8	13
Local Networks	6	6	100

As illustrated in the consort diagram below (see Figure 1), from the initial sample of 104 children 12 were excluded from the study at the pre-assessment phase. As a result a total of 92 children were assessed. Four of these 92 children were excluded during or post assessment. Therefore, 88 children (85 % of all those consented) were taken forward to form the sample used in this study. Based on the 510 packs originally sent out to parents this represents an overall recruitment rate of 17%.

Parents of the children who participated in the study were asked to complete four short questionnaires about their child. Out of the sample of 88 children 72 parent questionnaires packs were returned to the researcher, with 16 sets of questionnaires unreturned. This representing a parent response rate of 82%. In cases where parent packs were not returned the data from the child assessment was still included in the overall sample. As referenced above, a CONSORT diagram is provided in Figure 1. This includes detail on why children were excluded from the study at both the pre and during/post assessment time points.

Figure 1. CONSORT diagram

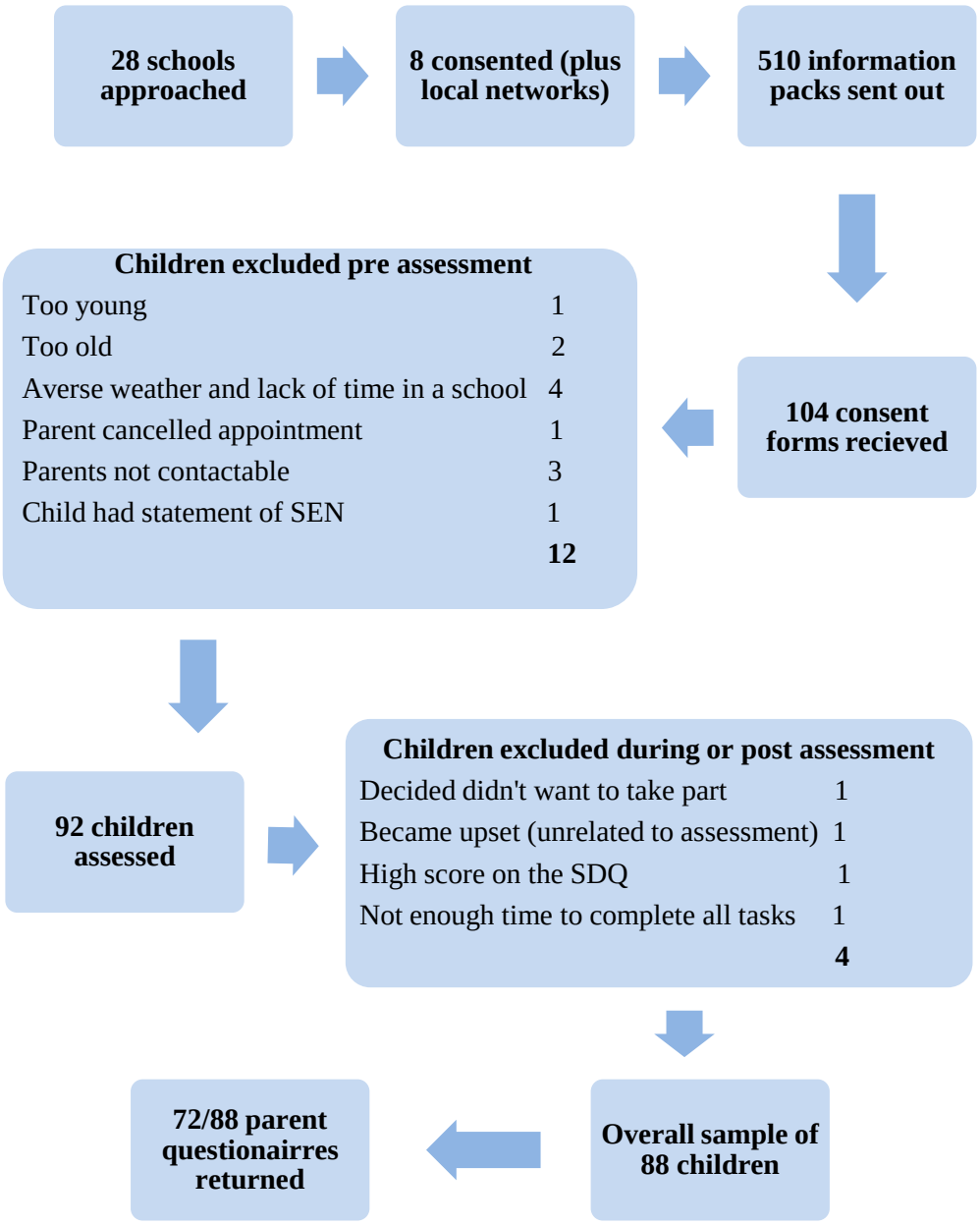

Figure 1. Flow chart detailing progress through the study, including number of schools recruited, recruited and excluded children and parental questionnaire packs returned.

2.4.6 Characteristics of Sample Obtained

The overall sample of 88 children was comprised of 46 boys and 42 girls. The mean age of the overall sample was six years and 10 months, with the oldest child aged eight years and 11 months, and the youngest aged five years and two months. Table 3 illustrates the number of children recruited to the sample across the four separate age

groups (five, six, seven and eight year olds). Out of the total sample 31 assessments (35%) were carried out at children's homes, with the remaining 57 (65%) carried out in schools. With regards to nationality, 85 of the families considered their child's nationality to be British reflecting the demographics of the area the sample was recruited from. The remaining three families classified their nationality as Indian, American-Pakistani and British-Filipino.

Table 3

Number of children of each age included in the overall sample

Age in years	*N*
Five	19
Six	18
Seven	27
Eight	24

Note: N=88.

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 2002) and the Vocabulary and Matrix Reasoning tasks from the Wecshler Abbreviated Intelligence Scale (WASI; Wechsler 1999) were included to further characterise the sample. For children younger than six the corresponding subtests of the Wecshler Pre-School and Primary Scale of Intelligence (WPPSI; Wechsler, 2003) were used (further detail on the specific measures can be found in Section 2.4.3). The mean overall difficulty score on the SDQ for the whole sample was 7.7 (SD=3.9). This score falls within the 'healthy' range of the SDQ (an overall difficulty score of above 16 indicates clinical concerns). A mean scaled score of 11 (SD=3.) on the vocabulary subtest and 10 (SD=2.2) on the matrix reasoning subtest on the WASI or WPPSI (depending on child's age) was calculated. These scores fall within the expected parameters of the 'average intelligence'

range on the Wechsler tests (Weschler, 1999; 2003). Descriptive data from all measured used is reported in Chapter Three (see Table 5, pg. 91).

2.5 Measures

This subsection is divided in to three parts: i) the tasks used to assess CBT ability; ii) measures used to assess executive function, ToM and empathy; and iii) measures used to characterise the sample as discussed above in section 2.3.6.

2.5.1 Measures of CBT Ability

2.5.1.1 Card sort task (CST; Quakley, 2002).

The CST was designed by Quakley (2002) as a way to measure children's ability to distinguish between thoughts, feelings and behaviours. The CST is completed by the researcher and child, and takes approximately 10 minutes to complete. The task consists of eight short stories in which a focal character (named Mary for girls and Harry for boys) completes an action and experiences a thought and feeling. Each story is made up of three sentences, one containing the thought, one containing the feeling, and one containing the action. Item one of CST is provided as an example.

CST Item One - Christmas was coming and Mary/Harry was very excited. Mary/Harry wished that Father Christmas would bring her a new puppy. Mary/Harry made a home for the puppy with a blanket and a cardboard box.

Thought: Mary/Harry wished that Father Christmas would bring her a new puppy

Feeling: Mary/Harry was very excited

Behaviour: Mary/Harry made a home for the puppy with a blanket and a cardboard box.

To begin, the whole story was read aloud by the researcher to the child. Following this three separate sentences are repeated out loud one-by-one. Immediately after each sentence is repeated the child is asked to respond and indicate whether that part

of the story was something Mary/Harry had been doing, something they had been thinking or something they had been feeling. The assessment was used without visual cues. The rationale for this was that it was deemed preferable to measure children's actual level of skill on the task, rather than what they can achieve with assistance.

The CST includes eight stories. The task begins with a demonstration story where the researcher demonstrates what is required from the child. This is followed by a sample story, where the child was asked to distinguish the thinking, feeling, and doing part of the story. On the sample item the child is given feedback on their answer, and is given guidance on the correct answer if they answer incorrectly. The demonstration and sample items were not scored. Following these there were six test stories. One point is awarded for each correctly identified sentence from each story; therefore the maximum score on this task was 18.

To control for practice effects the six test stories were administered in a random order. The order was randomised by asking the child to select the envelopes containing the stories one by one from a plastic wallet. When the selected story was complete the child was then asked to select another envelope until all six stories had been administered. To ensure that children could not differentiate the sentences based upon the order in which they were presented, within the story this was counterbalanced during development of the task. Additionally, half the stories included a negative emotion and half a positive emotion. In terms of psychometric properties there is currently no published data.

All eight stories that make up the CST are provided in Appendix G, along with full procedural instructions.

2.5.1.2 Thought to feeling story card linking task (TFLT) and thought to behaviour story card linking task (TBLT; Quakley 2002).

The aim of these tasks is to test children's ability to link thoughts to feelings, and thoughts to behaviours. The tasks take approximately 10 to 15 minutes to complete. The TFLT and TBLT each consist of four structurally identical short stories. In the TFLT stories the focal character experiences a minor happy or sad event. Following this, when in a different situation the character comes across a visual cue, which is related to the previous happy or sad event. The children are then told that the character feels happy or sad again and are asked to explain why. In the TBLT rather than experiencing happy or sad event the focal character carries out an action, and later in the story a visual cue prompts the character to carry out the same action and the children are asked to explain why the character repeats the action. Two of the actions in the TBLT are related to positive stories and two of the actions to mildly negative stories. Similarly, in the TFLT two of the stories are associated with positive feelings and two are associated with negative feelings. Half the characters in the TFLT and TBLT are male and half female.

The stories are presented pictorially, and for each sentence of the story there is an accompanying picture. These are brightly coloured hand drawn pictures, printed on to four by four inch squares of card. The cards are put down in front of the child one at a time, whilst the corresponding sentence of the story is read aloud. This forms a pictorial story board. Stimuli material and procedural instructions for the TFLT and TBLT are provided in Appendix H and J respectively.

In the development of this task no sample or demonstration items were included, Quakley (2002) cites that this is so that children are not cued into the type of responses that were expected, thus allowing the researcher to more accurately test their skills at linking thoughts to feelings, and thoughts to behaviours in the context of previous

experience (i.e. the first part of the story where the character feels or experiences the emotion or event).

To negate potential practice effects the order in which the TFLT and TBLT is administered is counterbalanced. Furthermore, the order of which the four stories within each task are administered is randomised. In this study, this was achieved by allowing the children to randomly draw envelopes containing the illustrations from the folder they were stored in.

Depending on the first response given for each story cue questions are asked to elicit the maximum amount of information from each child. To score the child's responses to each story, their answers are coded in to one of five categories (Quakley 2002). A detailed description of the scoring criteria is provided in Appendix I and K for the TFLT and TBLT. In brief, coding the responses requires the researcher to assess three aspects of the child's answer: i) the cue; ii) the thought and; iii) the past event. Each story is scored out of 12, with a maximum score of 48 on the TFLT and the TBLT respectively, and higher scores represent more advanced skills. The most sophisticated answer involves the child demonstrating that they understand that an object in the present (visual cue) can trigger a thought or a memory, which influences current feeling (TFLT) or behaviour (TBLT). For example, to receive the maximum score of 12 on the a TBLT story when asked "why did (insert characters name, for example Laura) (insert behaviour, for example jump up and down) right now?" the child is required to give an answer that indicates that they had noticed the cue, which cued the character into thinking about the event, which was linked to her carrying out the behaviour.

2.5.2 Measures of Executive Function, ToM and Empathy

Four measures of executive functioning, ToM and empathy were used in this study.

2.5.2.1 Executive functioning: Tower of London task (ToL; Korkman, Kirk & Kemp, 1998; Shallice, 1982).

The ToL was selected as an assessment of executive functioning. The task was originally developed by Shallice (1982), however the version used for this assessment came from the Developmental Neuropsychological Assessment – Version I (NEPSY-I; Korkman et al., 1998). The task takes approximately 10 minutes to complete. During the task the child is asked to move three coloured balls on three pegs from a start position to a specified end position, within a certain amount of moves and a time limit. The tasks consist of detailed age appropriate instructions that are demonstrated to the child to facilitate their understanding, and a pictorial representation of the desired end point is shown to the child for each item.

The aim of the task is to assess several components of executive functioning: these are planning, self monitoring and regulation, problem-solving and cognitive flexibility. There are various kinds of tasks designed to assess components of executive functioning in children. The rationale behind the selection of this task was twofold. First, it was hypothesised that the aspects of executive functioning assessed by this task overlapped with some the task demands required to successfully solve the CBT skills tasks. Second, this task is one of the few measures of executive functioning that can be reliably employed with young children (aged less than six years old). Espy (1997) and Espy et al. (2001) discuss the difficulty in differentiating between emerging cognitive processes in these children of this age and the lack of appropriate valid and reliable measures. Bull Espy and Senn (2004) report that the ToL, is one of the few reliable and valid measures of executive functioning that can be successfully employed with this age group.

When administering the ToL task the puzzles increase in complexity and the discontinue rule means the end point is reached when each child has failed to solve four consecutive items within the required number of moves and the specified time constraint. When scoring the task each correctly solved item corresponds to one point scored, therefore higher scores indicate increased skill. Psychometrically, Korkman et al. report good test re-test reliability (intra-class coefficient .89) in a sample of normally developing children.

2.5.2.2 Executive functioning: behavioural rating inventory of executive function (BRIEF; Gioa, Isquith, Guy, & Kenworthy, 2000).

The BRIEF is a standardised parent-rated questionnaire designed to assess executive functioning across a range of domains in children aged five to 18 years. The measure was selected for inclusion as it provides a screen of wider executive functioning than can be measured with the ToL task. It is completed by a parent and takes approximately 10 minutes. The measure has normative data for normally developing children, and a variety of clinical samples such as children with ADHD and children who have suffered a traumatic brain injury. The questionnaire consists of 86 items. When scoring, the items are combined to calculate an overall global executive composite score (BRIEF_GEC). The items also relate to one of three scales, which each have their own sub-scales. The three scales are behavioural regulation (BRIEF_BRI), metacognition (BRIEF_MI), and a validity scale. The behavioural regulation scale consists of three subscales, namely inhibit, shift and emotional control. The metacognition scale consists of five subscales, inhibit, plan/organise, monitor, working memory, and organisation of material. Given the task demands of the CST and TFLT/TBLT the assessment of metacognition is particularly relevant to this project. Metacognition was not otherwise directly or independently assessed due to a lack of appropriate measures for children

within the age range of this study. For example, the Metacognition Questionnaire for Children (Bacow, Pincus, Ehrenreich & Brody, 2009) is designed for children above seven years old. Finally, the validity scale is comprised of two subscales that assess negativity and inconsistency of response.

Psychometrically, Gioa et al. (2000) report that the BRIEF has high internal consistency (Cronbachs α .8-.95 across the three scales), and adequate test re-test reliability (intra-class coefficient .82). The measure can also be supplemented with a teacher rated questionnaire, however for practical reasons (i.e. not over-burdening schools) the teacher rated questionnaire was not included in the research.

2.5.2.3 ToM: first and second order ToM tasks (Liddle & Nettle, 2006).

To assess ToM ability, age appropriate first and second order ToM tasks were adapted from Liddle and Nettle (2006). The tasks were completed by the children and involved listening to two short stories that were read aloud by the researcher, and following each story answering two true/false questions. The task took approximately five minutes to complete. The purpose of the first question was to assess the child's understanding and memory of the story, and this acted as a control question. The second question then assessed the child's ToM ability.

The first order task was an adapted age appropriate version of the well known false belief task, the Sally-Anne test. The test assesses children's ability to attribute false belief to others. Traditionally in Wimmer and Perner's (1983) test, two dolls, Sally and Anne are introduced and when playing Sally takes a Marble and hides it in her basket. Sally then goes out, and whilst she is gone Anne takes the marble out of the basket and hides it in a box. Sally then returns to the room and the child is asked where she will look for the marble. In order to pass the test the child must identify that Sally will look in the basket; this is concordant with Sally's perspective, but not the child's, who has seen

Anne move the marble. In the adapted version used here, the child is presented with a story, where the focal character hides some chocolate in his room. He then goes out to play and whilst he is out his mother moves the chocolate, the child is then asked where the focal character expects the chocolate to be, upon his or her return. By understanding this scenario the child demonstrates that they understand that others can hold different views to themselves, an ability that by the age of five most children have accomplished (Wellman, Cross & Watson, 2001).

A second order ToM task was also included in the study, and takes the false belief paradigm one step further. The second order task assessed the participating child's ability to make inferences on a belief about a belief. For example, in the task used here the participating child is told a story where two children want to play on a sports team. In the story the participating child is told that one child thinks they are not as good as the other. However the participating child is also told that the coach thinks that both children are good and he wants them both on the sports team. The participating child is also told that the coach knows that one child doesn't think they will get on the team. The participating child is then asked to identify whether the focal character in the story knows that the coach wants him and his friend on the team? (the correct answer being that the child doesn't know that the coach wants him and his friend on the team).

Third and fourth order ToM tasks were not included. The rationale for this was that according to the ToM literature children older than those recruited to this sample would routinely be unsuccessful at third and fourth order complex ToM. For example, Kinderman, Dunbar and Bentall (1998) report that most adults perform at chance on fourth order tasks. Additionally, Liddle and Nettle (2006) found that children aged 10 and 11 perform only slightly above chance on third order ToM and at below chance for fourth order tasks. A copy of the ToM tasks is provided in Appendix L.

2.5.2.4 The children's empathy quotient (EQ-C; Auyeung et al., 2009).

The EQ-C (Auyeung et al., 2009) is a 27 item parent rated questionnaire of empathy, which takes approximately five minutes for a parent to complete. Each item is rated on a four point Likert scale from definitely agree to definitely disagree. The responses yield a total score of 54, and higher scores indicate higher parent reported levels of empathy. The EQ-C is an adapted version of the Empathy Quotient questionnaire, which is used with adults (EQ; Baren-Cohen & Wheelwright, 2004). The measure has been used with both normally developing and clinical samples (children with ASC). Auyeung et al. report excellent internal consistency (Cronbachs α, 0.93) and high test re test reliability over 6 months (intra-class correlation, 0.86). Furthermore, Chapman et al. (2006) report that IQ was not significantly correlated with empathy using a normally developing sample of children. However, Auyueng et al. reported that, in line with developmental literature parents of girls score their children significantly higher than parents of boys, and this will be taken into further consideration in Chapter Three. A copy of the EQ-C can be found in Appendix M.

The rationale for measuring empathy with parents was based upon review of the literature pertaining to the assessment of empathy in young children. Miller and Eisenberg (1988) discuss how traditionally empathy has been measured by child self-report or affect induction through experimental means. However, Lovett and Sheffield (2007) discuss how research investigating empathy in young children has been limited by poor measurement of the variable, and experimental tasks have been criticised for lacking psychometric evaluation (Kaplan & Arbuthnot, 1985; Lovett & Sheffield, 2007).

The Bryant Empathy Index (Bryant, 1982) is a commonly used self report scale of empathy, where children are asked to rate themselves in line with examples of empathic behaviour on a categorical yes/no scale. However, it was not employed in this

study as it is deemed more suitable for older children than were assessed here (Lovett & Sheffield, 2007). Furthermore, the use of self report measures of empathy have been criticised as they rely upon verbal and written comprehension, a child being able to report on their internal states and they can be significantly biased by confounding variables such as the gender of the researcher administering the tasks (Dadds et al., 2008; Eisenberger & Miller, 1987; Eisenberger & Lennon; 1983).

Based on these difficulties parent report has been highlighted as an alternative method to measure empathy (Auyeung et al., 2009; Dadds et al., 2008) and as a result the EQ-C was selected for use in this study. The strengths and limitations of the use of parent report measures are discussed in the methodological critique presented in Chapter Four (see section 4.4.7.1).

2.5.3 Other Measures

Two further measures were used to characterise the sample. The rationale for the inclusion of these measures was that they provided an opportunity to ensure that participants met required inclusion criteria, as well as to further characterise the sample. They also provide useful information on factors associated with performance on the measures of CBT skill, such as possible psychopathology and general intelligence (Quakley, 2002; Reynolds et al., 2006).

2.5.3.1 Wechsler abbreviated scale of intelligence (WASI; Wechsler, 1999) or Wechsler preschool and primary scale of intelligence (WPPSI-III; Wechsler, 2003).

All children completed a brief measure of general intelligence. The WASI (Wechsler, 1999) and WPPSI (Wechsler,2003) were used for this purpose. Children aged six or over completed the two subtest version of the WASI, whilst children aged five to six completed the corresponding two subtests of the WPPSI. Both the two subtest version

of the WASI and the corresponding version of the WPPSI took approximately fifteen minutes to complete with each child.

The two subtest version of the WASI (Wechsler, 1999) includes one measure of verbal and performance IQ. The particular two subtests used were: i) Vocabulary, where the individual is asked to name pictorial items and provide oral definitions of words, and; ii) Matrix Reasoning, where the child is asked to complete pictorially presented patterns by selecting the missing piece from one of five choices. These two subtests measure the individual's ability to learn, understand and verbalise vocabulary, and their ability to problem solve, alongside assessing spatial perception and visual abstract processing respectively (Kaufmann & Lichtenberger, 2005). Children aged between five and six completed the corresponding age appropriate Vocabulary and Matrix Reasoning subtests from the WPPSI (Wechsler, 2003). Unlike the WASI the WPPSI does not contain a standardised short form; however, Bishop (1980) discusses using reduced forms of the test, and reports that a variety of particular subtests used to constitute a short form of the assessment do not appear to significantly affect predictive validity (including those used here).

Psychometrically, the WASI (Wechsler, 1999) is reported to have good reliability with Wecshler (1999) reporting reliability coefficients of .93 for the two subtest version with children under 16 and .91 and .87 for the individual vocabulary and matrix reasoning subtests respectively. Good content validity with the other Wechsler tests is also documented, and furthermore, Salofske, Caravan and Schwartz (2000) report good validity in a sample of school age children. The WPPSI also has good documented psychometric properties, with test-retest reliability on the full, verbal and performance IQ scales reported as equal to or above .90 (Wechsler, 2003).

The rationale for selecting the WASI (Wechsler, 1999) rather than the WISC (Wechsler, 2004) was based on three reasons. First, the WASI already exists in a standardised two version subtest form, whereas the WISC does not. This means that alterations only need to be made to the assessment of intelligence for a smaller proportion of the overall sample. Second, the use of the WASI was more economically viable given the resources allocated to this thesis, and finally the WISC-IV is the routine measure employed in clinic to measure general ability in children, thus the use of the WASI for this project was less likely to invalidate any future IQ assessment that a participating child might undertake. Due to difficulties calculating a full scale IQ scores based only on two subtests the scaled scores were taken forward to data analysis.

Methodological difficulties identified with the combined use of the WASI and WPPSI are discussed in further detail in Chapter Four of this thesis (see section 4.4.8.1).

2.5.3.2 Strengths and difficulties questionnaire (SDQ; Goodman, 2001).

The SDQ (Goodman, 2001) is a parental report screening questionnaire for mental health/behavioural difficulties that is routinely used in clinical practice. It takes approximately five minutes for a parent of a child to complete.

The questionnaire consists of 24 descriptive items pertaining to areas of common strength and difficulty in children. Parents are asked to rate whether each item is not true, somewhat true or certainly true of their child over the last six months. The questionnaire consists of five sub-scales. The scores from the first four, namely emotional problems, conduct problems, hyperactivity and difficulties with peer relationships are combined to indicate a level of 'overall distress or difficulty'. The fifth scale indicates kind and prosocial behaviour. Scores on the measure can indicate whether overall identified difficulties are of a level of severity that would indicate clinical concern.

The measure has normative data from a sample of 10,438 children aged five to 15 from the United Kingdom (Meltzer, Gatwood, Goodman & Ford, 2000). Psychometrically, Goodman (2001) reports satisfactory internal consistency (Cronbachs α, 0.73) and test re-test reliability over six months (intra-class correlation, 0.62). Furthermore, Goodman (1997) reports good success when using the measure to discriminate between non psychiatric (dental) and psychiatric samples. The SDQ can also include a teacher rated questionnaire, however the parent rated version can be used as a standalone measure. For practical reasons (i.e. not over-burdening schools) the teacher rated component was not included in the research. A copy of the questionnaire is provided in Appendix N.

2.5.3.3 Demographics data.

Parents were asked to complete a short form which requested information on basic demographics. The form took approximately two to three minutes for a parent to complete. The questionnaire included questions on the participating child's age, nationality, parental occupation and number of siblings. The information collected was based upon other research studies using child participants (Hawley, 2003; Parslow et al., 2005; Rennie et al., 2007). The rationale for the inclusion of this measure was to allow for characterisation of the total sample.

2.5.4 Summary of Child and Parent Measures

This research used a range of child and adult measures and assessments to answer the research questions outlined in Chapter One. For clarity, a breakdown of the measures used with children and parents, and the overall time taken for each measure is summarised in Table 4. This is followed by a full review of ethical considerations, a detailed testing procedure and a data analysis plan.

Table 4

Breakdown of measures used and duration of child and parent participation.

	Measure	Duration (minutes)	Approximate overall duration (minutes)
Child assessment	CST (Quakley, 2002)	10	55-60
	TFLT/TBLT (Quakley, 2002)	15	
	ToL (Korkman et al., 1998)	10	
	ToM (Liddle & Nettle, 2006)	5	
	WASI/WPPSI (Wechsler, 1999; 2003)	15	
Parent questionnaires	BRIEF (Gioa et al. 2000)	10	20-25
	EQ-C (Auyeung et al., 2009)	5	
	SDQ (Goodman, 2001)	5	
	Demographic questionnaire	2	

2.6 Ethical Considerations

2.6.1 Ethical Approval

Prior to commencing recruitment the study was reviewed by The University of East Anglia Faculty of Medicine and Health Sciences Research Ethics Committee. The review took place in April 2012. Following some minor amendments the study was given a favourable opinion and a copy of the letter confirming ethical approval can be found in Appendix O.

2.6.2 Informed Consent

As participants were under the age of 16, informed consent from a parent or guardian was required. The parent information sheet contained all necessary information about the study. In addition, when parents received the information pack they were encouraged to contact the researcher if they had any specific questions or informal queries. A number of general enquiries were received from parents, and responded to by

the researcher. No child was included in the study without informed signed parental consent.

2.6.3 Assent, Right to Withdraw and Debrief

Alongside informed parental consent, assent from the participating child was also taken. Prior to beginning the assessment, an age appropriate rationale was explained to child (for example that they were being asked to complete to some puzzles to help with a project to learn about how children think) and they were asked if they were happy to participate (see Appendix P). During this process it was explained to each child that they could stop the assessment at any point (withdraw from the study) should they wish to. If the child was happy to take part they were asked to write their name on a study assent form (see Appendix Q). During the data collection phase, after listening to the study rationale and introduction one child decided they did not want to participate in the study.

At the end of the assessment, as a debrief exercise the researcher asked the child three questions about their experience of participation (see Appendix R). The researcher then answered any questions each child had, and thanked them for their participation. This marked the end of the child's involvement in the study. All children indicated that taking part in the study had been a positive experience.

2.6.4 Confidentiality and Anonymity.

All data containing personally identifiable information were stored securely in a locked cabinet, or digitally on password protected files. All data were coded anonymously using participant numbers, and were stored separately from any identifying information, such as participant name or contact telephone numbers. Data were stored in accordance with the Data Protection Act (1998). Access to the material was restricted to the researcher and research supervisors working at the University of East Anglia.

2.6.5 Management of Distress Arising from Research.

It was not expected that participation in the study would cause distress for any child or parent. The cognitive therapy skills tasks have previously been used with over 100 children for research purposes at the University of East Anglia (Quakley, 2002; Quakley et al., 2003; Reynolds et al., 2006). These studies reported that children found the tasks engaging and enjoyable. Furthermore, many of the other measures used with children are used routinely in clinical practice without associated distress.

Nonetheless, when designing the research procedure, several steps were incorporated to reduce the likelihood that participation would result in distress for any child. First, efforts were made to engage the child in the process so that they did not feel anxious about participating in the study or about their performance on the tasks. The rationale read aloud to the child at the start of the process included statements to inform the child that the tasks were not a test, and their answers would not be shown to their parents or teachers. Second, the rationale for giving parents the choice of assessment location (home or school) was included so that they could select the environment where their child and they would feel most comfortable. Third, when conducting the assessment the researcher was alert to signs that the child might be distressed or uncomfortable in any way.

If at any point during the assessment a participating child appeared distressed, the following plan was to be implemented. The research procedure would be halted immediately. The researcher would then try to discuss the situation with the child, put them at ease and reduce any source of worry or distress pertaining to the assessment. If the assessment took place at home then parents would be notified and any questions answered. If the assessment took place at school then the researcher would escort the child back to their classroom and the class teacher or support staff would be notified.

During the recruitment phase no child became distressed as a direct result of the assessment tasks. One child who was assessed at home did become upset shortly after the start of the assessment. The distress was related to an argument with his sibling, who was in the same room and had interfered with one of the tasks. After discussing the situation with the child and his mother, the assessment procedure was halted and the child was excluded from the study. The child's mother was in agreement with this strategy and no further action was taken or deemed necessary. This was discussed in research supervision with the study supervisors.

2.6.6 Management of Concerns Arising from the Research

A plan was made in case participation in the study identified any areas of concern for a child, or in the case that a child disclosed any issues of concern during the assessment.

If participation in the study identified any concerns, for example, a clinically elevated score on the SDQ (Goodman, 2001) the researcher would make contact with the parent to discuss the identified concern in the first instance. The researcher would signpost the parent towards their general practitioner (GP), where they could seek the appropriate assistance and if necessary onward referral to other appropriate services.

In the event of disclosure of any information of concern from a child, the researcher would follow the relevant safe guarding procedure. If appropriate the child's parent or teacher would be notified. The only exception to this would have been if this was deemed to place the child at further risk.

One child who participated in the study received clinically elevated scores on the parent rated SDQ (Goodman, 2001). The above plan was implemented. The child's parent was contacted by telephone the same day as the assessment, and was signposted to their family GP. The mother of the child was receptive to this conversation and the

researcher ensured that she had the necessary contact details should the mother or GP require any further information. This plan was discussed and agreed in research supervision with the study supervisors and no further action was taken.

2.6.7 Feedback

The parental consent form included a section where parents were able to indicate whether on completion of the study they would like to receive a written summary of the main findings, and 84/88 (96%) parents indicated that they would like to receive the summary and these have been sent out. Summaries and thank you letters were also sent to all head teachers who allowed the researcher access to their school for recruitment.

2.7 Procedure

2.7.1 Testing Procedure

Once written consent had been received the researcher arranged to meet with the child either at home or at school depending on parental preference. The researcher requested that a quiet area be available so that children were not distracted or disturbed. In practice when running the assessments in schools or at children's home this was not always possible (for example because of the presence of other children at homes and lack of free space in schools). The total duration of testing lasted on average between 55-60 minutes.

Prior to beginning the assessment the researcher introduced herself to the child and explained that she was asking the child to help her with a project. The researcher checked the child was aware of the project and was happy to find out more about it. The child was then escorted to the area designated for the study.

Before the assessment began children were asked to confirm their name and age. The researcher then talked through the rationale and gave the child the opportunity to ask

any questions. At this point, if the child was happy to begin the assessment tasks the researcher asked the child to write their name on the assent form.

Once the child had given their assent to participate testing began. The order in which the assessment tasks were administered was randomised by the researcher prior to the assessment with the child. Randomisation was completed by assigning each of the five tasks each child completed a number (from one to five) and then generating random combinations of these numbers within this range. The tasks were administered to each individual child in the order they were generated. This process was completed before recruitment began.

It was anticipated that children would complete all of the assessment tasks in a single session. However if a child requested, or appeared fatigued a short break was incorporated into testing. Additionally, because of the practical limitations of a school day (for example, break, fire drills, assembly, and emergency school closure due to adverse weather conditions) a total of 13 assessments were required to be split across two time points. Where this was unavoidable, the researcher made best efforts to complete the assessment on the same day, or within the shortest time frame possible.

All of the tasks were administered in accordance with the accompanying instructions. To check understanding of the instructions by the children demonstration and sample items were used for certain tasks, such as for the CST (Quakley, 2002) and for the ToL Task (Korkman et al., 1998).

Sessions with children were recorded using a digital audio recorder. A sample of 16 recordings (approximately 20% of the overall sample) were randomly drawn and half were rated for inter-rater reliability on the TFLT (eight) and TBLT (eight). The rating was completed by a member of staff from the DClinPsy training course. Audio recordings were destroyed at the end of this process.

Once the child had finished working through the tasks the researcher debriefed them and thanked them for their participation. The child was then escorted back to their class room, or the researcher made their parent aware that the assessment was finished. Once all the recruitment was completed three participants were drawn at random to receive a £10 voucher for a high street store of their choice. The three selected children were drawn randomly from the whole sample by a member of staff on the DClinPsy training course.

2.7.2 Completion of Parent Questionnaires

If the assessment of the child took place at school a sealed envelope containing the four parent questionnaires along with a covering letter was sent home to the parent in their child's book bag. Parents were encouraged to contact the researcher if they had any questions or concerns about the questionnaires. A stamped addressed envelope to return the questionnaires to the researcher was provided.

If the assessment took place at home then a parent was given the envelope with the questionnaires inside at the assessment appointment. To maximise return rate parents were encouraged to complete the questionnaires whilst the researcher met with the child. However, a stamped addressed envelope was provided for return if this was not possible.

Whilst completing the questionnaires some parents provided feedback on how applicable they thought the questionnaire was to their child's age, and this will be discussed further in Chapter Four.

2.8 Analysis Plan

The data analyses employed were planned in stages. First data were screened and prepared for analysis. This included inspecting the data set for missing values, analysing the impact of missing parent questionnaires and screening the data for inaccuracies and outliers. Following this the distribution of the study variables was examined and where

data were not normally distributed log transformations were used to attempt to improve the distributions.

Second, before the research hypothesis were considered correlational analyses (using either Spearman's Rho or Pearson's R as appropriate) were employed to explore the relationship between task performance and several potential confounding variables (age, gender IQ and mental health/behavioural difficulties). Correlational analyses were also employed to investigate the relationship between performance on each of the three measures of CBT skill.

Last, the research hypotheses were analysed in turn. To test if CBT skill and child assessed executive functioning were related a series of correlations were first employed (using either Spearman's Rho or Pearson's R as appropriate). Significant correlations were followed up with multiple linear regression to explore the contributory role of age and verbal IQ. The relationship between parent-rated executive functioning and CBT skill was also investigated with a series of correlational analyses (using either Spearman's Rho or Pearson's R as appropriate) and supplementary correlational analyses were used to explore the relationship between parent-rated and child assessed executive functioning. The relationships between parent-rated empathy and performance on CBT tasks were also explored using correlational analyses (using either Spearman's Rho or Pearson's R as appropriate). To investigate whether ToM ability was associated with superior performance on the CBT skills tasks, a series of one way Kruskal-Wallis tests were carried out, with Bonferroni corrected Mann-Whitney tests employed to run post-hoc comparisons. Finally, following discussion with regards to the use of parametric methods of analysis, analysis of co-variance (ANCOVA) was employed to examine the contributory role of age and IQ on the significant effect of higher ToM ability and

superior performance on CBT skill tasks. The results of these analyses are presented in Chapter Three.

Chapter Three

RESULTS

3.1 Overview

This chapter begins with information on the treatment and distribution of data, including steps taken to transform variables which were not normally distributed. Following this, descriptive data are presented for all measures and the process of assessing reliability of measures is described. Prior to considering the research hypotheses the relationship between potential confounding variables and task performance is also considered. Finally, the research hypotheses are tested, and the chapter concludes with a summary of findings which addresses each hypothesis in turn.

3.2 Treatment of Data

Data were entered in to SPSS (Version 18, 2010) and screened for errors. Unusual responses were double checked against paper copies to address potential errors from incorrect data entry.

3.2.1 Missing Data: Unreturned Parent Questionnaires

As reported in Chapter Two, 16 packs of parent questionnaires were unreturned. In these cases the data from the assessments with children were included in the overall sample. The rationale for the inclusion of this data is that the parent and child generated data were used to answer separate research questions. One limitation of this strategy is that for 16 participants where no parent data were returned there is no completed SDQ. The resultant data from the SDQ was used to characterise the sample and also served as a check to demonstrate that the sample represented healthy children with no significant psychopathology (which could potentially confound findings). However, first given the active steps the researcher took to screen out potential participants who did not meet inclusion criteria in the early stages of recruitment, and second given that no data from

any child where mental health concerns were identified by the researcher, child's teacher or parent were included in the overall sample this strategy appears justified (mental health concerns were identified for one child whose data were excluded from the sample, further detail is provided in Chapter Two).

As a further check of the appropriateness of this strategy statistical analysis was employed to check for differences on task performance between the two groups (parent measures returned vs. not returned). As deemed appropriate based on the type and distribution of the data (more detail is provided in section 3.3 and 3.4) Independent samples t-tests, Mann-Whitney tests and Chi squared tests were employed. Turning attention first to the CBT skills tasks; performance between groups on the card sort task (CST) $U = 566$, $p = .917$) the thought to feeling linking task (TFLT) $U = 679$, $p = .262$) and the thought to behaviour linking task (TBLT) $U = 592$, $p = .862$) was not significantly different between children whose parents had returned measures and children whose parents did not. Additionally, no significant differences were identified between groups on performance on the child completed ToL task ($t(86) = -.67$, $p = .503$) and overall ability on ToM tasks, ($\chi2(2) = 4.76$ $p = .092$). Finally, no significant differences were identified between groups on task performance as measured by scaled score (selected due to the use of two different Wecshler scales) on the vocabulary,($t(86) = -1.67$, $p = .100$) and matrix reasoning, ($t(86) = -1.9$, $p = .0.60$) subtests of the WASI/WPPSI.

These findings suggest that performance on child completed measures was not significantly different between children whose parents did and did not return the parent questionnaire packs. This further justifies the inclusion of the child assessed data for the 16 children where parent data were missing.

3.2.2 Missing Data: Overall Sample

There were no missing data from the tasks carried out with children. However, the 72 returned parent questionnaires included some missing data. Three parents had not completed the second side of the EQ-C. As this comprised of approximately half of the measure, data from these questionnaires were excluded. Furthermore, one parent only completed the first five items of the BRIEF (with remaining items left blank with an accompanying note explaining that she did not wish to complete it, which will be discussed further in Chapter Four). As a result the BRIEF for this participant was excluded. Additionally, when scoring the BRIEF, responses on two separate participants questionnaires indicated 'questionable' levels of validity (as assessed by the measures validity scale). To protect the validity of the overall sample these two questionnaire responses were also excluded. Validity scores for all other completed BRIEF questionnaires were rated as acceptable.

As a result the data taken forward for analysis from the returned parent questionnaires included 72 sets of data from the SDQ, and 69 sets of data from the EQ-C and BRIEF respectively.

3.3 Distribution of Data

All data apart from age, gender and variables associated with the measurement of ToM were measured on a continuous scale. Age, gender and measurement of ToM were classified as categorical in nature. ToM ability was defined as categorical as responses to the first and second order ToM tasks were either scored as correct or incorrect.

In the first instance histograms were generated to visually inspect the distribution of data across each variable. Visual inspection indicated that not all the data appeared to be normally distributed. Therefore the significance of skew and kurtosis was further

investigated by using the formulae displayed below (Field, 2000, p73) which allows for the conversion of raw scores for skew and kurtosis to *z*-scores.

$$\frac{\text{Skew}}{\text{Standard error (SE) of skew}} \qquad \frac{\text{Kurtosis}}{\text{Standard error (SE) of kurtosis}}$$

Taking into account the overall size of the sample, a significance level of .05 and the associated *z*-score of 1.96 were considered as an appropriate parameter to assess the significance of skew and kurtosis (Field, 2000, p73). Therefore, the obtained *z*-scores were deemed significant if greater than or equal to 1.96, or less than or equal to -1.96. On this basis, data from the ToL, Vocabulary, Matrix Reasoning, SDQ, EQ-C and the general executive composite score of the BRIEF (BRIEF_GEC) were considered normally distributed. The data from age, the CST, TFLT, TBLT, ToM, the behavioural regulation index (BRIEF_BRI) and the metacognition index (BRIEF_MI) of the BRIEF were considered to be not normally distributed. Log transformations were attempted to improve the distribution of the relevant non-normally distributed variables. These attempts were unsuccessful, and histograms illustrating the distribution of transformed variables are included in Appendix S.

Based upon the results of this process, combinations of parametric and non-parametric tests (as appropriate) were employed to analyse the data. Where analysis involved comparisons between variables where one was normally distributed and the other not, non-parametric tests were selected to avoid violating parametric assumptions.

3.4 Descriptive Statistics

Descriptive statistics on the main assessment measures for the whole sample are presented in Tables 5, 6 and 7. Table 5 illustrates the mean score, SD, and range for all measures.

Table 5

Descriptive statistics for all measures

Measure	N	Min	Max	Mean	SD
CST	88	6	18	15.39	2.65
TFLT	88	0	48	29.31	12.60
TBLT	88	0	46	19.64	11.95
ToL	88	2	18	10.10	2.72
ToM	88	0	2	1.39	.765
Vocabulary	88	4	18	11.01	3.05
Matrix Reasoning	88	6	16	10.76	2.27
SDQ	72	2	16	7.61	3.96
EQ-C	69	23	52	39.14	6.73
BRIEF_GEC	69	65	154	111.77	18.82
BRIEF_BRI	69	29	71	44.38	8.43
BRIEF_MI	69	32	105	73.22	13.65

Unlike the other measures employed the assessment of ToM ability produces categorical rather than continuous data. As a result the mean score is of limited use. Instead the frequency of children who answered correctly to the control question included with each ToM task (in order to assess the understanding and memory of the stories) is displayed in Table 6. Following this the frequency of correct answers to the first and second order ToM tasks is presented in Table 7. Table 7 also includes an overall ToM ability category based on the combined ToM results. The acquisition of ability with regards to understanding various levels of complexity of ToM is considered to be hierarchical (Wellman et al., 2001; Wellman & Liu, 2004). For example, it is widely accepted that an individual is not able to demonstrate second order ToM, without first acquiring and understanding first order ToM. Therefore on the ToM tasks used in this study if a child incorrectly answered the first ToM task, but then went on to correctly answer the second ToM task they were awarded a score of 0 (demonstrating no ToM), with their second response being attributed to chance. In scoring the tasks this way a

child's score was classed as demonstrating 'no ToM' (neither task correct, or first task incorrect and second task correct)' first order ToM' (first task correct, second task incorrect) or 'second order ToM' (first and second order task correct).

Table 6

Frequency of correct answers for ToM control questions and overall ability

	Frequency	Percent (%)
	Control Question – for ToM First Order story	
Correct	77	88
Incorrect	11	12
	Control Question – for ToM Second Order story	
Correct	78	89
Incorrect	10	11
	Control Question – Overall	
0 correct	3	3
1 correct	15	17
2 correct	70	80

Note. N = 88.

Table 7

Frequency of correct answers for first and second ToM tasks and overall ability

	Frequency	Percent (%)
	First Order ToM	
Correct	73	83
Incorrect	15	17
	Second Order ToM	
Correct	34	39
Incorrect	54	61
	Overall Ability	
No ToM	15	17
First Order ToM	24	27
Second Order ToM	49	55

Note. N = 88.

3.5 Reliability of Measures

All parent questionnaire measures used were standardised except for the EQ-C. As a result the internal consistency of this measure was calculated and is presented below. Of all the tasks used with children, the responses on the CST, ToL, and ToM were scored as correct or incorrect, therefore not open to potential subjective variation. However, the scoring of the TFLT and TBLT was more complex (see section 2.5.1.2 and Appendix I and K for more detail). Each answer given by the child is categorised into five separate levels of ability, and depending on the answer a variety of cue questions are asked. As a result inter-rater reliability co-efficients were calculated for the TFLT and TBLT and this is also presented below.

3.5.1 Internal Consistency of the EQ-C

Cronbachs alpha (α) was employed to investigate the internal consistency of the EQ-C. The resultant alpha level of .72 indicates acceptable levels of internal consistency (George & Mallory, 2003) but is less than the desirable .8 level which indicates good internal consistency (Field, 2000, p667). This will be taken in to consideration along with the findings related to empathy in Chapter Four.

3.5.2 Inter-rater Reliability of the TFLT and TBLT

Inter-rater reliability coefficients were calculated for scores on the TFLT and TBLT. 10% (8) of the overall sample for the TFLT and a separate 10% (8) of the overall sample of the TBLT were rated by a member of staff on the DClinPsy course. Inter-rater reliability coefficients of .96 on the TFLT and .95 on the TBLT were identified. This indicates excellent levels of inter-rater reliability (Landios & Koch, 1977).

3.6 Potential Confounding Variables

The following section investigates variables that might influence task performance and therefore confound study results. The role of age, gender, IQ and score

on the SDQ (measuring mental health and behavioural difficulties) is considered in turn. For clarity, analyses investigating the influence of the above variables are presented first for tasks assessing CBT skill. This is then followed by analyses investigating the influence of the above variables on measures of executive functioning, ToM and empathy.

3.6.1 Age

3.6.1.1 Age and CBT skill tasks.

Previous studies that have employed the three CBT skills tasks have reported a significant effect of age on the findings (Doherr et al., 2005; Quakley, 2002; Quakley et al., 2003). As a result the relationship between age and performance on the CBT skills tasks was investigated using Spearman's Rho correlational analysis. A significant relationship was identified between age and performance on the CBT tasks. As expected older children performed significantly better on the CST ($r_s(86) = .53$, $p > .001$), the TFLT ($r_s(86) = .45$, $p > .001$) and the TBLT ($r_s(86) = .33$, $p = .002$).

3.6.1.2 Age and executive functioning, empathy and ToM.

Spearman's Rho correlational analysis was also employed to investigate the relationship between age and the measures of executive functioning (BRIEF & ToL), empathy and ToM. Significant relationships were revealed for performance on the ToL, overall ToM ability and parent ratings of empathy. As would be expected older children demonstrated increased ability on the ToL task ($r_s(86) = .31$, $p = .003$) and increased overall ToM ($r_s(86) = .45$, $p > .001$). Additionally higher levels of parent rated empathy were associated with older children ($r_s(67) = .31$, $p = .010$).

There was no significant relationship identified between age and parent rated mental health or behavioural difficulties in children or the general executive component of the BRIEF.

As a result of these findings, the significant effect of age on children's performance on the CBT skills tasks, ToL, ToM and parent rated empathy has been taken into account, where relevant, when investigating the specific research hypotheses.

3.6.2 Gender

3.6.2.1 Gender and CBT skills.

Previous studies using the CBT skills task have not identified a significant effect of gender on performance on the CBT tasks. Nonetheless, this was explored as a potential confounding variable. Mann-Whitney U tests did not reveal a significant difference between gender on the CST (U = 884, p = .691), the TFLT (U = 900, p = .548) or the TBLT (U = 917, p = .682).

3.6.2.2 Gender, executive functioning, empathy and ToM.

The effect of gender on children's performance on the ToL and ToM, and parent ratings on the EQ-C and BRIEF_GEC was also investigated. An independent samples *t*-test revealed no significant difference on performance on the ToL between genders (t(86) =*.41*, p = .680) and Chi-Squared analysis revealed no significant difference between overall demonstrated ToM ability between gender (χ^2(2) = 1.57 p =.456).

Lastly, independent samples *t*-tests revealed no significant differences between gender and parent rated empathy (t(67) = -*.6*, p = .545) and parent rated executive functioning as measured by the general executive composite score on the BRIEF (t(86) = -*.45*, p = .650). These findings indicate that gender was not associated with significant differences on task performance. The finding with regards to empathy was unexpected given that previous research has demonstrated a significant effect of gender on parent-reported empathy using the EQ-C (Chapman et al., 2006). This is considered further in Chapter Four of this thesis.

3.6.3 IQ

3.6.3.1 IQ and CBT skill tasks.

Previous studies that have used the CST, TFLT and TBLT have also reported a significant effect of IQ on task performance, in particular higher verbal IQ has been associated with superior performance on the tasks assessing CBT ability (Doherr et al., 2005; Quakley, 2002; Quakley et al., 2003; Reynolds et al., 2006). As a result Spearman's Rho correlations were employed to further investigate the relationship between IQ and performance. Due to the use of two separate Wecshler tests to measure IQ scaled scores (consistent across tests with a mean of 10 and SD of 3) were used to carry out these analyses.

Significant relationships were identified between verbal IQ (as measured by the vocabulary subtest) and performance on the three CBT skills task. Better performance on the CST was associated with higher verbal IQ ($r_s(86) = .39$, $p < .001$), as was performance on the TFLT ($r_s(86) = .42$, $p < .001$) and the TBLT ($r_s(86) = .29$, $p < .001$). In addition, a significant positive relationship between performance IQ (as measured by the matrix reasoning subtest) and performance on the TBLT was revealed ($r_s(86) = .24$, $p = .025$). The relationships between performance IQ and performance on the CST ($r_s(86) = .13$, $p = .238$) and performance on the TFLT ($r_s(86) = .2$, $p = .063$) were not significant.

3.6.3.2 IQ, executive functioning, empathy and ToM.

The relationship between verbal and performance IQ and tasks assessing executive functioning, empathy and ToM were also investigated. This analysis used Pearson's *r* or Spearman's Rho as appropriate.

The analysis revealed that higher verbal IQ was significantly associated with higher scores on the ToL task ($r(86) = .25$, $p = .017$) and increased overall ToM ability ($r_s(86) = .35$, $p = .001$). Non significant relationships were identified between verbal IQ

and scores on the SDQ ($r(70) = -.14$, $p = .245$), the EQ-C ($r(67) = -.06$, $p = .636$) and the BRIEF_GEC ($r(67) = -.21$, $p = .075$). This indicates that children with higher verbal IQ demonstrated superior performance on tasks that assess ToM and executive functioning.

Correlational analyses revealed no significant results when investigating the relationship between performance IQ and performance on the ToL and ToM tasks and parent rated SDQ, EQ-C and BRIEF_GEC scores. This suggests that children with higher performance IQ did not demonstrate superior performance on tasks of ToM and executive functioning, neither did their parents rate them as having higher executive functioning skills, or increased levels of empathy.

As a result of these findings, the significant effect of IQ on children's performance on the CBT skills tasks, ToL and ToM has been taken into account, where relevant, when investigating the specific research hypotheses.

3.6.4 Mental health and Behavioural Difficulties

3.6.4.1 Mental health and behavioural difficulties and CBT skill tasks.

Previous research (Reynolds et al., 2006) has identified a relationship between 'at risk' mental health states and behavioural difficulties in children as rated by the SDQ and performance on tasks that assess CBT ability. Based upon this, the relationship between parent rated SDQ scores and the three tasks that were designed to assess CBT skill was further investigated. As all parents ratings fell within the non-clinical range on the SDQ significant associations were not expected. Analyses using Spearman's Rho correlation showed that parent rating on the SDQ and children's performance on the CST were not significantly related ($rs(70) = -.001$, $p = .992$), neither was performance on the TFLT ($rs(70) = -.21$, $p = .078$) nor performance on the TBLT ($rs(70) = -.16$, $p = .176$).

3.6.4.2 Mental health and behavioural difficulties and executive functioning, empathy and ToM.

Further correlational analyses revealed no significant relationship between SDQ scores and children's ability on the ToL task ($r(70) = -.003$, $p = .785$) or SDQ scores and children's overall ToM ability ($rs(70) = -.19$, $p = .101$).

All parental scores on the SDQ fell within the non-clinical range. Pearson's correlation revealed that higher parent ratings on the SDQ were associated with lower parent rating of child empathy on the EQ-C ($r(70) = -.43$, $p < .001$). Higher parent ratings of executive dysfunction as measured by the general executive composite score on the BRIEF (BRIEF_GEC) were also significantly associated with parental ratings on the SDQ ($r(70) = -.61$, $p < .001$). This indicates that parents who rated their child as having more difficulties on the strengths and difficulties questionnaire (even within normal range) were also more likely to rate their child as less empathic, and to report that child demonstrated poorer executive functioning skills.

3.7 Performance on the Three CBT Skills Tasks

Prior to investigating the research hypotheses it is useful to briefly consider the relationship between the three tasks developed to assess CBT skills. Spearman's Rho correlations demonstrated that superior performance on the CST was significantly associated with better performance on the TFLT, ($rs(86) = .41$, $p < .001$) and the TBLT, ($rs(86) = .33$, $p = .002$). Additionally, performance on the TFLT and TBLT was also significantly positively correlated, ($rs(86) = .47$, $p < .001$). This suggested that children who achieved high scores on the CST were more likely to achieve high scores on the linking tasks and vice-versa, and that superior ability to link thoughts to feelings was also associated with superior ability to link thoughts to behaviours.

3.8 Interim Summary

Preliminary analysis of the data revealed no significant differences on task performance between children whose parents did not return parental questionnaires and children whose parents did. On this basis, the data from 16 children whose parents did not return questionnaires were included in the relevant analyses. Based upon the distribution of data (and following unsuccessful attempts at log transformation) combinations of parametric and non parametric statistical analyses were employed to address the research hypotheses.

Examination of variables that might potentially have confounded the results revealed significant effects of age and IQ. This concurs with findings from previous studies that have also used the CBT skills tasks (Doherr et al., 2005; Quakley, 2002; Quakley et al., 2004; Reynolds et al., 2006) and where applicable these variables will taken in to account when testing the research hypotheses. As expected there were no significant effects of gender of child, or parent reported mental health and behavioural difficulties in children on CBT task performance.

The reliability of unstandardised questionnaire measures was also assessed. The internal consistency of the EQ-C was examined through calculating Cronbachs alpha and was deemed to be acceptable. Finally, inter-rater reliability coefficients on the TFLT and TBLT indicated excellent levels of inter-rater reliability for the scoring of the tasks. The following sections in this chapter will examine the results in relation to the research hypotheses.

3.9 Hypothesis Testing

3.9.1 Hypothesis One: Greater executive functioning skills, assessed in children, will be associated with superior ability on the CBT skills tasks

Non-parametric Spearman's Rho correlations were used to examine the relationship between performance on the ToL and the three CBT skills tasks. Analysis revealed a significant positive relationship between scores on the ToL and CST, (r_s (86) = .24, p = .026), and the ToL and TFLT, (r_s (86) = .25, p = .017). However, a non significant relationship was identified between the ToL and the TBLT (r_s (86) = .19, p = .082).

The above finding demonstrates that better performance on the ToL is significantly related to better performance on the CST and the TFLT, but not the TBLT. Given that preliminary analysis identified a significant relationship between both age and verbal IQ on performance on the CST, TFLT and the ToL, analysis of the identified significant relationships between ToL and CST and ToL and TFLT was extended to explore the effects of age and verbal IQ on this finding.

3.9.1.1. Multiple regression analysis for ToL and CST.

Multiple linear regression was employed to test what proportion of variance of performance on the CST was accounted for by performance on the ToL task, and the effects of age and verbal IQ. The results are displayed in Table 8.

Table 8

Multiple linear regressions exploring the effects of ToL, age and Verbal IQ on performance on the CST

	Unstandardised coefficients (B)	Standard error (SE B)	Standardised coefficients (β)	Sig.
Constant	5.29	1.63	n/a	.002
ToL	.03	.097	.031	.752
Age	1.07	.232	.445	.000
Vocab.	.245	.081	.282	.003

With regards to the necessary assumptions that need to be met for this analysis to represent a valid prediction, there appears to be no problems with the assumption of linearity. However the data demonstrate a degree of heteroscedacity indicating the necessity of cautious generalisation of the overall model (plots of residuals and p-p plots are provided in Appendix T). Following the guidelines given in Field (2000, p137) the tolerance statistic (below 10) and VIF statistic (all above .2) indicate that the assumption of no mulitcollinearity was also met.

The overall model ($R^2 = .32$, $F(1, 84) = 9.176$, $p = .003$) illustrated that the three variables (ToL, Age & Vocab,) account for approximately 32% of the variance in CST score. As can be seen from Table 8 both age and verbal IQ (Vocab) account for a larger proportion of the variance on CST task than performance on the ToL. Indeed, with the addition of these variables the effect of ToL on CST performance is no longer significant. This finding indicates that executive functioning, as measured in the current study is not significantly associated with children's performance on the CST once age and verbal IQ is taken in to account.

3.9.1.2 Multiple regression analysis for ToL and TFLT.

Multiple linear regression was also employed to test the portion of variance of performance on the TFLT that was accounted for by performance on the ToL task alongside age and verbal IQ. The results are displayed in Table 9.

Table 9

Multiple linear regression exploring the effects of ToL, age and Verbal IQ on performance on the TFLT

	Unstandardised coefficients (B)	Standard error (SE B)	Standardised coefficients (β)	Sig.
Constant	-17.57	7.75	n/a	.026
ToL	.09	.46	.20	.843
Age	4.51	1.1	.39	.000
Vocab.	1.45	.38	.35	.000

Once again, with regards to the necessary assumptions that need to be met for this analysis to represent a valid prediction, there appears to be no problems with the assumption of linearity. However the data demonstrate a degree of heteroscedacity indicating the necessity of cautious generalisation of the overall model (plots of residuals and p-p plots are provided in Appendix U). Using the same procedure as described above the tolerance statistic (below 10) and VIF statistic (all above .2) indicate that the assumption of no mulitcollinearity was also met.

Similar to the model presented above, the overall model ($R2 = .32$, $F(1, 84) = 14.3$, $p < .001$) illustrates that the three variables (ToL, Age & Vocab) account for approximately 32% of the variance in TFLT score . As can be seen from Table 9 both age and verbal IQ (vocab.) account for a significantly larger proportion of the variance on the TFLT than performance on the ToL. Again with the addition of these variables the effect of ToL on TFLT performance is once more no longer significant.

This finding indicates that executive functioning, as measured in this study is not significantly associated with children's performance on the TFLT. Accordingly Hypothesis One is not supported.

3.9.2 Hypothesis Two: Greater parental ratings of executive functioning in their children will be significantly associated with superior ability on the three CBT skills tasks

Scores on the BRIEF were analysed by general executive composite (BRIEF_GEC) and the two component indices, behavioural regulation (BRIEF_BRI) and metacognition (BRIEF_MI).

The scoring of the BRIEF is aligned to measure executive dysfunction so lower scores indicate better parent- reported executive functioning. With this in mind a negative correlation between BRIEF score and CBT skill would represent an association between increased executive functioning and increased CBT skill. The measure is standardised and raw scores can be transformed to *t*-scores that indicate developmental appropriateness. Analysis of data for this study has been carried out with raw scores rather than *t*-scores. The rationale for this is that this research is concerned with ability, which is measured by each child's raw score, rather than the developmental appropriateness of each child's ability which is measured by *t*-scores (it is worthy of note however that data for all children were within normal parameters).

Non-parametric Spearman's rho correlations were used to investigate the relationship between parent-rated executive functioning as measured by the BRIEF and the three tasks of CBT ability. The relationship between three CBT tasks and scores on the three BRIEF indices is reported below.

3.9.2.1 Relationship between BRIEF scores and performance on the CST.

Turning attention first to performance on the CST, non significant relationships were found between performance on the BRIEF_GEC, (rs(67) = -.01, p = .919), BRIEF_BRI, (rs(67) = -.13, p =.288) and BRIEF_MI, (rs (67) = -.04, p =.739).This indicates that executive function as measured by the BRIEF and children's performance on the CST was not significantly related. This suggests that children whose parents reported them to have higher executive functioning did not demonstrate superior performance on the CST.

3.9.2.2 Relationship between BRIEF scores and performance on the TFLT.

Non-significant relationships were also identified between the TFLT and the BRIEF _GEC, (rs(67) = -.72, p =.554), TFLT and the BRIEF_BRI subscale,(rs(67) = -.12, p =.327) and the TFLT and the BRIEF_MI subscale (rs(67) = -.80, p =.515). This indicates that executive function as measured by the BRIEF and children's performance on the TFLT task were not significantly associated. Therefore, children whose parents reported them to have higher executive functioning did not demonstrate superior performance on the TFLT.

3.9.2.3 Relationship between BRIEF scores and performance on the TBLT.

Analysis reveals a non significant relationship between performance on the TBLT and BRIEF_GEC (rs(67) = .02, p =.879), the TBLT and BRIEF_BRI subscale (rs(67) = -.02, p =.898) and the TBLT and the BRIEF_MI subscale (rs(67) = .05, p =.657) This finding demonstrates that again as above in relation to Hypothesis Two executive functioning as measured by the BRIEF and performance on the TBLT are not significantly related. This finding indicates that children whose parents reported them to have higher executive functioning did not demonstrate superior performance on the

TBLT. Based on these findings presented here and in the two sub-sections above Hypotheses Two was not supported.

3.9.2.4 Supplementary analyses.

In addition, supplementary correlational analyses were also performed to examine the relationship between the two assessments of executive functioning, and the sub and full subscales of the BRIEF assessment. Analyses were run between full score and sub-scale scores on the BRIEF (as completed by the parents) and between full and subscale scores on the BRIEF and the ToL assessment. As would be expected analysis using Spearman's Rho correlation revealed significant relationships between the BRIEF_GEC and the BRIEF_MI subscale ($r_s(67) = .93$, $p < .001$), and the BRIEF_GEC and the BRIEF_ BRI subscale ($r_s(67) = .69$, $p < .001$). The BRIEF_BRI and BRIEF_MI subscales were also significantly positively related ($r_s(67) = .44$, $p < .001$). This demonstrates that as would be expected, the overall and sub-scales scores on the BRIEF are significantly positively correlated with one another. This indicates that parents who reported their child to have superior behavioural regulation, also reported them to have superior metacognitive skills and vice-versa, and that superior scores on the two sub-subscales were associated with superior overall executive composite score.

Pearson's correlation was used to investigate the relationship between performance on the child assessed ToL and the overall BRIEF_GEC score from the parent-rated measure, and Spearman's Rho was used to examine associations between the ToL and the BRIEF_MI and the BRIEF_BRI subscales. The relationship between performance on ToL and parent related BRIEF_GEC was not significant, ($r(67) = -.15$, $p = .236$). Furthermore, the relationship between ToL and BRIEF_BRI ($r_s(67) = -.12$, $p = .33$) and ToL and BRIEF_MI were also not significant ($r_s(67) = -.15$, $p = .23$). This finding suggests that there is no significant relationship between parent-rated executive

function (as measured using the BRIEF) and child assessed executive function (as measured using the ToL). This finding indicates children who demonstrated superior performance on the ToL did not receive higher scores of parental-rated executive function. This finding is contrary to the expected significant negative relationship between executive dysfunction as measured by the BRIEF and greater ToL performance. Further consideration to this non-significant finding will be given to this in Chapter Four of this thesis.

3.9.3 Hypothesis Three: Higher parental ratings of empathy in their children will be significantly associated with superior ability on the three CBT skills tasks

Non-parametric Spearman's Rho correlations were employed to test the relationship between parental rated empathy in their children (as measured with the EQ-C), and child performance on the CBT skills tasks.

The analysis revealed that performance on the CST and parent rated empathy were not significantly associated ($r_s (86) = .04$, $p = .715$) indicating no significant relationship between parent rated empathy and performance on the CST. In addition analyses revealed non significant relationships between performance on the TFLT and parental ratings of empathy in their children, ($r_s (86) = .15$, $p = .232$) and between performance on the TBLT and parent rated empathy in their children ($r_s (86) = .16$, $p = .186$). These three findings demonstrate that contrary to Hypothesis Three there was no significant relationship between parent-rated empathy and children's performance on the CST, TFLT or the TBLT. This indicates that children whose parents rated them as being more empathic did not demonstrate superior performance on the CBT skills tasks. Accordingly Hypothesis Three was not supported. These findings will be discussed further in Chapter Four of this thesis.

3.9.4 Hypothesis Four: Children that demonstrate higher ToM ability will perform significantly better on the three CBT skills tasks

Tables 6 and 7 (see section 3.4, pg. 92/93) display the frequencies of children that correctly answered the control questions for the ToM stories and the frequency of children who demonstrated no ToM, first order, or second order ToM. Prior to investigating the research hypothesis, analysis was carried out to investigate whether ToM ability was associated with children's correct or incorrect understanding and recall of the stories used to assess the modality. This is presented in section 3.9.4.1 below.

3.9.4.1 Preliminary ToM Analyses: Number of control questions answered correctly on the ToM stories and overall ToM ability.

Chi Squared analysis was used to examine whether there was a significant difference in ToM ability based upon children's performance on the control questions. Looking first at performance on the first order ToM task, as would be expected children that correctly completed the control question were more likely to demonstrate first order ToM ($\chi2(1) = 7.18$ $p = .007$). Similarly, children that correctly completed the control question for the second order ToM task were more likely to demonstrate second order ToM ($\chi2(1) = 4.69$ $p = .03$).

This finding remains significant when overall ToM ability demonstrated (no ToM/first order ToM/second order ToM) is compared with overall number of correct control questions for both tasks (zero/one/two). Children that answered both control questions one and two correctly demonstrated significantly more advanced ToM ($\chi2(4) = 15.21$ $p = .004$). As expected this finding indicates that children who were able to correctly answer both the control questions demonstrated higher ToM ability than children who incorrectly answered the control questions.

3.9.4.2 Main ToM analyses.

The next three subsections investigate and report differences between overall ToM ability and performance on the CST, TFLT and TBLT in turn. To analyse this data non parametric, one way Kruskal–Wallis tests with appropriate post-hoc comparisons were employed.

3.9.4.2.1 Overall ToM ability and performance on the CST.

CST performance was significantly affected by overall level of ToM ability, ($H(2) = 16.31$, $p < .001$). The histogram displayed in Figure 2 illustrates mean CST performance across the three ToM levels. This suggests that children who demonstrated higher ToM also demonstrated superior performance on the CST.

To further investigate the direction of the significant effect of CST performance and ToM ability, post-hoc Mann-Whitney U tests on the three possible comparisons of ToM ability (comparison one: children who demonstrated no ToM and children who demonstrated first order ToM , comparison two: children who demonstrated no ToM and children who demonstrated second order ToM and comparison three: children who demonstrated first order ToM and children who demonstrated second order ToM) were employed. Bonferroni corrections were applied to these post hoc tests and as a result of the effects are reported at the <.0167 level of significance. It was revealed that CST performance was no different between children who demonstrated no ToM and children who demonstrated first order ToM ($U = 122.5$, $p = .094$), additionally no significant differences on CST performance were identified between children who demonstrated first order ToM and children who demonstrated second order ToM ($U = 404$, $p = .027$). However, when comparing performance on CST across children who demonstrated no ToM and children who demonstrated second order ToM, CST performance was

significantly superior in children who demonstrated second order ToM ($U = 125.5$, $p < .001$). The effect size for this significant finding was calculated (in the form of Pearson's correlation coefficient, r) by using the formula provided in Field (2000, p555). In this case $r = .03$ representing a moderate effect (Cohen, 1988). This finding indicates that children who demonstrated second order ToM achieved superior scores on the CST compared to children who demonstrated no ToM. No significant difference on CST score was found between children who demonstrated no ToM and children who demonstrated first order ToM, and children who demonstrated first order ToM and children who demonstrated second order ToM.

Figure 2.

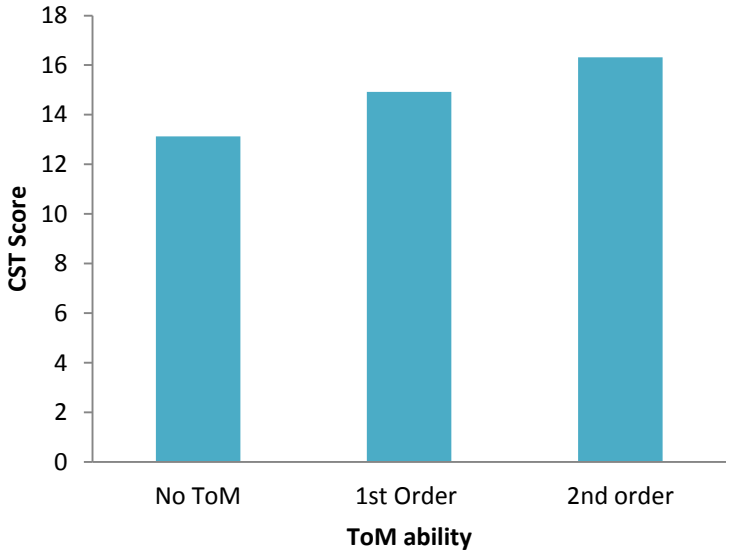

Figure 2. Mean score on CST (out of 18) and overall demonstrated ToM ability (no ToM, First Order, and Second Order)

3.9.4.2.2 Overall ToM ability and performance on the TFLT.

Performance on the TFLT (total score/48) was also significantly affected by overall level of ToM ability, ($H(2) = 9.35$, $p = .009$). The graph displayed in Figure 3 illustrates mean TFLT performance across the three levels of ToM. This indicates that

children who achieved higher ToM demonstrate superior performance on the TFLT, suggesting that children with greater ToM are more able to link thoughts to feelings.

This significant effect of ToM on TFLT score was followed up with post-hoc Mann-Whitney tests with applied Bonferroni corrections as detailed in section 3.9.4.2.1 Again, as a result of the Bonferroni correction significant effects are considered at the < 0.167 level. Performance on the TFLT by children who demonstrated no ToM was not significantly different to children who demonstrated first order ToM ($U = 262.5$, $p = .279$). Furthermore, no significant difference on TFLT performance was identified between children who demonstrated first order ToM and children who demonstrated second order ToM ($U = 399$, $p = .026$).

Similar to the findings on performance on the CST, performance on the TFLT was significantly better in those children that demonstrated second order ToM compared to children who demonstrated no ToM ($U = 206.5$, $p = .011$). The effect size was calculated as $r= 0.2$ which is classified as small (Cohen; 1988). This finding illustrates that those children who demonstrated second order ToM achieved superior scores on the TFLT, suggesting they are more able at linking thoughts to feelings when compared to children who demonstrated no ToM. No difference on TFLT score was found between children who demonstrated no ToM and children who demonstrated first order ToM, and between children who demonstrated first order ToM and children who demonstrated second order ToM.

Figure 3

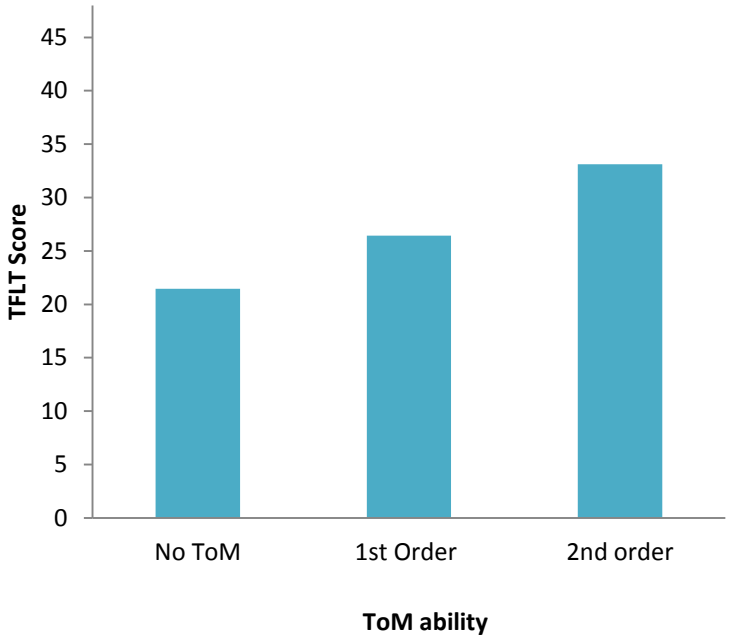

Figure 3. Mean score on TFLT (out of 48) and overall demonstrated ToM ability (no Tom, First Order, and Second Order).

3.9.4.2.3 Overall ToM ability and performance on the TBLT.

Performance on the TBLT was also significantly affected by overall ToM ability ($H(2) = 9.05$, $p = .011$). The graph displayed in Figure 4 illustrates mean TBLT performance across the three levels of ToM. Using the same methods as above, post hoc Mann-Whitney tests with Bonferroni corrections were employed to further investigate the significant effect. Again, as a result of the Bonferroni correction significant effects are considered at the < 0.167 level. No significant difference on TBLT performance was identified between children who demonstrated no ToM and first order ToM ($U = 168$, $p = .750$). However a significant difference was identified between children who demonstrated no ToM and children who demonstrated second order ToM ($U = 216$, $p = .016$). This suggests that children who demonstrate second order ToM are more able to link thoughts to behaviours compared to children who demonstrated no ToM. Furthermore, unlike the CST and TFLT a significant difference in TBLT performance

was identified between children who demonstrated only first order ToM and children who demonstrated second order ToM (U = 384, p = .016), this indicates that children who demonstrate second order ToM are also more able to link thoughts to behaviours compared to children who demonstrated only first order ToM. Effect sizes were calculated as r=-.2 for both significant findings which again according to Cohen (1988) are categorised as small.

Figure 4

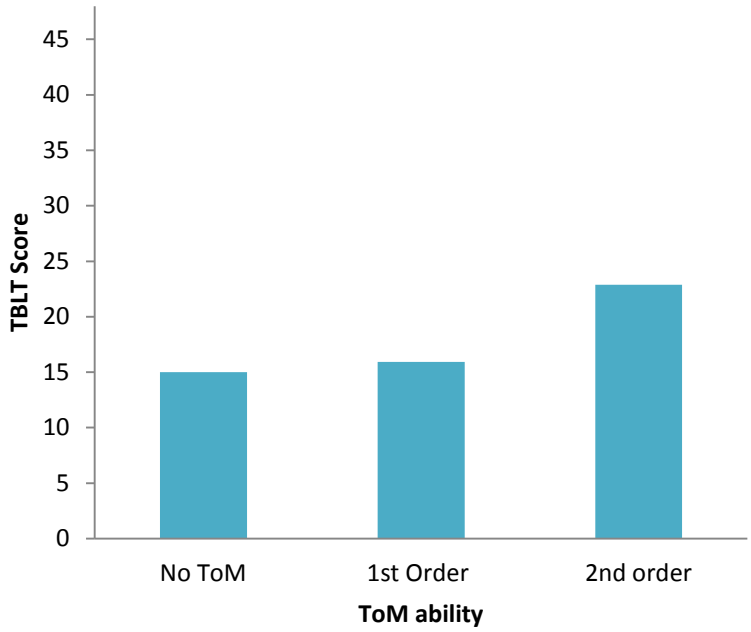

Figure 4. Mean score on TBLT (out of 48) and overall demonstrated ToM ability (no Tom, First Order ToM and Second Order ToM

3.9.4.3 Analyses controlling for the effect of age and IQ.

The results above suggest that more highly developed ToM ability is associated with better ability to differentiate and link thoughts, feelings and behaviours. Given that preliminary analyses (see section 3.6.1 and 3.6.2) identified a significant relationship between both age and verbal IQ on performance on the CST, TFLT and TBLT, it is important to control for the effects of age and verbal IQ when considering these findings.

Before this is reported the rationale for the use of parametric tests to carry out this analysis is presented.

3.9.4.3.1 Rational for the selection of parametric analysis.

Despite the abnormal distribution of CST and ToM data, following discussion with research supervisors, a decision was made to use parametric tests, namely ANCOVA to control for the potentially confounding effects of age and verbal intelligence on the significant effect of ToM ability on CST performance. The rationale for this was that these multivariate analytical methods are considered to be robust to violations of assumptions (Field; 2000, p542; Tabachnick & Fidell; 1996, p343) especially when the sample size is large, as is an N of 88 used in this analysis. As previously noted in section 3.3 the data used in this analysis violate the assumptions of normality. Additionally, the number of participants in each subgroup of ToM classification (no ToM, first and second order ToM) is unequal which can cause problems with the assumption of homogeneity of variance.

Levene's test using CST, TFLT and TBLT as dependant variables and ToM ability as the grouping variable was employed to further investigate this assumption. Analysis demonstrates that mean scores from the CST as grouped by ToM ability did violate the assumption of homogeneity of variance ($F(2,85) = 6.44$, $p = .002$) as did mean score of TFLT as grouped by ToM ability ($F(2,85) = 3.77$ $p = .027$) . However, data from the TBLT did not violate the assumption of homogeneity ($F(2,85) = .135$, $p = .874$) illustrating a smaller range of variance. When examining the variance across scores of ToM on the CST and TFLT it is apparent that the variance decreases as the numbers within each group increase. Field (2000, p 324) discusses how caution is required when

applying multivariate statistics in this situation as the violation of assumptions can lead to difficulties in controlling the Type I error rate.

Despite problems with normality and homogeneity of variance the data are independent and the dependant variables are measured on a continuous scale meeting some of the parametric assumptions. Lastly, the use ANCOVA requires that the data meet a fifth assumption, homogeneity of regression slopes. This was considered by inspecting scatter plots of CBT skill task performance across ToM group. Regression lines based upon the scatter plots were consistent, indicating no significant difficulties and therefore meeting the assumption of homogeneity of regression slopes.

On the basis of the information presented above, and the understanding that these analytical methods are considered robust to violation of assumptions, a series of parametric ANCOVA's were employed to follow up the significant findings (of superior CST, TFLT and TBLT task performance in children who demonstrated higher ToM).

3.9.4.3.2 CST and ToM: ANCOVA controlling for the effects of age and verbal IQ.

A one way between-subject ANCOVA with CST as the dependant variable, ToM ability as the grouping or independent variable, and age and verbal IQ included as covariates was undertaken. The analysis revealed that after controlling for age and verbal IQ children's performance on the CST was no longer significantly related to their overall ToM ability ($F(2, 83) = 1.94$, $p = .150$). The covariate of age was significantly related to CST performance ($F(1, 83) = 13.15$, $p = .001$) as was Verbal IQ ($F(1, 83) = 6.54$, $p = .012$). This finding indicates that once the significant effects of age and verbal IQ as covariates are taken into account higher order ToM ability is no longer associated with better performance on the CST.

3.9.4.3.3 TFLT and ToM: ANCOVA controlling for the effects of age and verbal IQ.

A second between-subjects ANCOVA with TFLT as the dependant variable, ToM ability as the grouping or independent variable, and age and verbal IQ included as covariates was used. Similar to the first finding the analysis revealed that after controlling for age and verbal IQ children's performance on the TFLT was no longer significantly related to their overall ToM ability ($F(2, 83) = .331$, $p = .719$). The covariate of age was significantly related to CST performance ($F(1, 83) = 11.8$ $p = .001$) as was Verbal IQ ($F(1, 83) = 11.8$, $p = .001$). Accordingly, this finding indicates that once the effects of age and verbal IQ are controlled for higher order ToM ability is no longer significantly associated with superior performance on the TFLT.

3.9.4.3.4 TBLT and ToM: ANCOVA controlling for the effects of age, verbal IQ and performance IQ.

Finally, a third between-subjects ANCOVA with CST as the dependant variable and ToM ability as the grouping or independent variable, with age, verbal IQ and performance IQ included as covariates was performed (performance IQ was significantly related to TBLT score only and not TFLT or CST score hence its inclusion here). Once more, the analysis revealed that after controlling for age and performance IQ children's performance on the CST was no longer significantly related to their overall ToM ability ($F(2, 83) = 1.13$, $p = .329$). In common with the first two analyses the covariate of age was significantly related to CST performance ($F(1, 83) = 4.31$, $p = .041$). However, despite significant correlations between TBLT score and verbal IQ, in this instance verbal IQ did not significantly contribute to variance in scores on the TBLT ($F(1, 83) = 1.4$, $p = .242$). This finding therefore demonstrates that once the confounding variables of age and in this instance performance IQ are controlled for, that higher level ToM ability

is not significantly associated with superior TBLT score. Based on the results of the analyses within this subsection Hypothesis Four was not supported.

3.10 Summary of Findings

To conclude this chapter the main findings in relation to the study hypotheses and additional exploratory analyses will be summarised.

3.10.1 CBT Skills Tasks and Executive Functioning

Initial analysis identified that better scores on the ToL task were positively related to superior performance on the CST and the TFLT, (however better performance on the ToL was not indicative of superior performance on the TBLT). In light of preliminary analysis that identified age and verbal IQ as potential confounding variables the analysis was adjusted to explore the role of age and verbal IQ on the two significant findings. Once the effects of age and verbal IQ were taken into account the significant identified relationship between performance on the ToL and CST and TFLT performance were no longer significant. As a result of these findings Hypothesis One (greater executive functioning skills, assessed in children, will be associated with superior ability on the CBT skills tasks) was not supported.

Scores on the BRIEF were examined in full (by using the general executive composite score) and by the component behavioural regulation and metacognition indices. No significant relationships were identified between parent rated executive functioning (either in full or across the two sub-scales) and the CST, TFLT or TBLT. Therefore, Hypothesis Two (greater parental ratings of executive functioning in their children will be significantly associated with superior ability on the three CBT skills tasks) was not supported. These non significant findings relating to Hypotheses One and Two will be discussed further in Chapter Four.

Supplementary analyses identified significant positive relationships between overall composite score and sub-scale scores on the BRIEF as expected. However, non significant relationships were identified between the parent and child ratings of executive functioning used. The implications resulting from this supplementary analysis will be discussed further in Chapter Four.

3.10.2 CBT Skills Tasks and Empathy

Analysis exploring the relationship between empathy and performance on the three CBT skills tasks revealed non-significant relationships between parent-rated empathy and performance on the CST, TFLT and TBLT. Based on the results of the analyses Hypothesis Three (higher parental ratings of empathy in their children will be significantly associated with superior ability on the three CBT skills tasks) was not supported. These non significant findings will be discussed and further interpreted in Chapter Four.

3.10.3 CBT Skills Tasks and ToM

Preliminary analyses revealed that, as expected children who had performed better on the ToM control questions, included assessing understanding and retention of the stories demonstrated higher levels of ToM**.**

Initial analyses exploring the effect of overall ToM on performance on the CBT skills task revealed a significant effect of ToM ability. In summary, it appeared that children who demonstrated second order ToM also demonstrated better performance on the CST, TFLT and the TBLT compared to children who demonstrated no Tom or first order ToM.

In light of the significant role of potential confounding variables on children's performance on the CBT skills tasks, further analysis was employed to explore the roles

of age and IQ on the significant effect of ToM ability and performance on the CST, TFLT and the TBLT. After careful consideration, despite the violation of some parametric assumptions a series of between-subjects ANCOVA's were employed. As a result of this further analysis the significant effect of ToM ability on CST, TFLT and TBLT performance did not remain once age and IQ were controlled for. Based upon these findings Hypothesis Four (children that demonstrate higher ToM ability will perform significantly better on the three CBT skills tasks) was not supported. These findings will be discussed and interpreted in line with the relevant research literature in Chapter Four.

Chapter Four

DISCUSSION

4.1 Overview

The aim of this chapter is to evaluate the study findings in the context of the relevant research literature and methodological limitations of this study. The chapter begins with a summary of the research findings and this is followed by a methodological critique. Finally, the potential clinical and theoretical implications of these findings are evaluated, and possible avenues for future research are discussed.

4.2 Summary and Interpretation of findings

The aim of this thesis was to investigate children's ability to complete tasks that aim to assess core skills deemed necessary to engage in CBT, and to investigate whether these skills were related to executive functioning, empathy and theory of mind (ToM) in a sample of normally developing children. These variables were hypothesised to be important both in terms of the demands that the CBT skills tasks place on the children when they are asked to complete them, but also in relation to the participation in CBT. This study is the first to explore the role of these variables in relation to the completion of CBT skills tasks, and therefore the findings are considered to be exploratory. A summary and interpretation of the main findings for each research hypothesis is presented below.

4.2.1 Hypothesis One: Greater executive functioning skills, assessed in children, will be associated with superior ability on the CBT skills tasks

Children that demonstrated greater executive functioning skill on the Tower of London (ToL) assessment also performed better on the card sort task (CST) and the

thought to feeling linking task (TFLT), but not on the thought to behaviour linking task (TBLT). Given the significant correlation between the ToL and the TFLT, the lack of a significant correlation between the ToL task and performance on the TBLT is perhaps surprising. One possibility is that this might be related to the fact that children generally appeared to find linking thoughts to behaviour harder than linking thoughts to feelings, and therefore scores on the TBLT were generally lower. Performance on the TBLT is further discussed later in this chapter (see section 4.4.6.1), however this discrepancy in between TFLT and TBLT scores has been identified in previous research (Quakley, 2002).

The ToL is designed to assess problem solving, planning, self monitoring and cognitive flexibility (Shallice, 1982) and is considered one of the few executive functioning tasks that can be successfully employed with young children (Anderson, Anderson & Lajoie, 1995; Bull et al., 2004). Despite the initial identified significant relationship between performance on the ToL and the CST, and the ToL and the TFLT, after taking into account the effect of age and verbal IQ the findings were no longer significant. Based on the results of the investigation of Hypothesis One there does not appear to be a significant relationship between CBT skills and child-assessed executive functioning as measured in this study.

Furthermore, the results of multiple linear regression analyses demonstrate that the combined effects of ToL performance, age and verbal IQ only account for approximately a third of the variance demonstrated in CST and TFLT scores (see Tables 8 and 9 for more detail pg. 101/102). This suggests that other factors than those assessed in the current study might have significantly influenced task performance. One potential explanation for this is that it is possible that other task demands, not measured here, such as children's attention and working memory capacity might have influenced performance

on the tasks. Additionally other factors not measure here but that are associated with the development of executive functioning, for example parental intelligence and educational achievement (Ardilla, Rosselli, Matute & Guarjardo, 2005) and socio-economic status (Farah & Hackman, 2009) might have influence children's ability on the ToL task.

These findings will be combined with research Hypothesis Two (which also examines executive functioning) and discussed with relevance to the literature in the subsection below.

4.2.2 Hypothesis Two: Greater parental ratings of executive functioning ability in their children will be significantly associated with superior ability on the three CBT skills tasks

Children whose parents rated them as having greater executive function skills on the BRIEF did not demonstrate superior performance on the three CBT skills tasks. Parental report of executive function was measured by the three scales of the BRIEF (general executive composite (BRIEF_GEC), and subscales for behavioural regulation (BEIEF_BRI) and metacognition (BRIEF_MI)) and no significant relationships were identified between these variables and performance on the three measures of CBT skill. The findings from the parent report measure suggests that the CBT skills are not associated with executive functioning as measured here.

Whilst this finding is contrary to the research hypothesis it is congruent with the findings from research Hypothesis One. Executive functioning has been measured in the current study using two separate methods of assessment (parent-report and child assessed) and no significant relationship with performance on the CBT skills tasks has been identified.

No previous study has examined the relationship between executive functioning and CBT skills. Therefore there is limited extant research within which to consider this non significant finding. The non-significant relationship between executive functioning and CBT skill is inconsistent with findings from adult research that suggests that that good executive functioning is associated with engagement and benefit from CBT interventions (Alexopoulos, 2008; James et al., 2008; Mohlman, 2008; Mohlman & Gorman, 2004). Furthermore, executive dysfunction is commonly associated with externalising and developmental disorders (Ozonoff & Jensen; 1999). For example executive dysfunction is proposed to play a developmental and maintaining role in ADHD (Pennington & Ozonoff, 1996). Taking ADHD as an example, models of CBT based treatment include intervention which targets executive dysfunction (Solanto, 2011) which suggests that impairments in executive functioning might be associated with limited ability to engage in or benefit from CBT interventions.

Additionally, as discussed in Chapter One of this thesis, problems with executive functioning are thought to contribute to the difficulties that children with externalising disorders encounter when participating in CBT (Grave & Blisset, 2004). In line with this the evidence for the application of CBT to externalising disorders in childhood is not as robust as the evidence supporting the efficacy of the treatment of internalising disorders (Abikoff, 1991; 2009; Benjamin et al., 2011; Jensen et al., 2009) .Furthermore acquired paediatric brain injury is associated with difficulties with executive functioning and these difficulties can be associated with challenges engaging these children in CBT (Laatsch et al., 2007) As a result of the above the non-significant relationship between executive function and CBT skills is unexpected. However, when considering the findings from the current study it is crucial to bear in mind that they cannot be generalised to suggest that children who achieved success on the CBT skills tasks can automatically engage in a

CBT based intervention, but, that they can demonstrate core skills that would be required of them when taking part in such an intervention.

A significant effect of age was identified on children's performance on the ToL task. This is consistent with literature that documents the development of executive function across the life span, and within the age range of childhood assessed here (Anderson, 2002; Zelazo et al., 2004). More specifically, this is consistent with the development of problem solving, planning and self monitoring modalities assessed by the ToL task, which also appear to develop rapidly through middle childhood (Anderson, 2002; Welsh et al., 1991; White, 1970). A significant effect of age was not however identified with parents rating of their children's executive functioning. This is contrary to the age related developmental trajectory discussed above, and it is possible that biases associated with parental report might have influenced the results. The strengths and limitations associated with the use of parental report measures are discussed in the methodological critique presented later in this chapter.

Contrary to expectations and previous research (see Welsh et al., for review) a significant relationship between verbal IQ and task performance on the ToL was identified. However, this might be understood within the context of the demands of the ToL task, where to successfully solve the problems children are required to comprehend the verbal instructions given to them by the researcher. Difficulties associated with the measurement of executive functioning are discussed in more detail in the methodological critique in this chapter. However, in order to measure executive functioning, tasks are required to be complex in nature. Anderson (2002) and Hughes and Graham (2005) discuss how this can result in sensitivity to the effects of IQ. This significant effect of IQ was not demonstrated with the parent-report of executive functioning (where no demands are placed on the child) and this more consistent with the suggestion from previous

research that executive function is a modality of human development that is not constrained by IQ (Welsh et al., 1991).

As expected, supplementary analysis demonstrated that subscales on the BRIEF were significantly correlated, although contrary to expectations the scores on the BRIEF and ToL were not. This was particularly unexpected for the ToL performance and the metacognition scale of the BRIEF, which considers parent report of children's ability to plan, monitor, problem solve and organise materials, functions all assessed by the ToL task. One possible factor to consider here is the role of parental response biases which might influence the way parents answer questions about their child, resulting in less objective responses which are therefore less valid and reliable (this issue is considered further in the methodological critique later in this chapter). Another factor to consider is that previous research investigating the measurement of executive function in children has demonstrated inconsistency between cognitive (such as the ToL) and behavioural (such as the BRIEF) methods of measurement (Stuss & Alexander, 2000; Stuss & Benson, 1984).

In addition, this specific non-significant finding has also been identified in clinical samples. Anderson, Anderson, Northam, Jacobs and Mickiewicz (2002) investigated the behavioural and cognitive measurement of executive dysfunction in children with neurological disease, and also identified non significant relationships between the BRIEF and performance on a ToL task, which the authors report as unexpected given both measures focus on frontal lobe functioning. More generally Anderson et al. report, at best, modest correlations between behavioural and cognitive executive functioning measures in a clinical population and Anderson (2002) suggests that each method of assessment should be viewed as providing unique information on a child's executive functioning abilities.

4.2.3 Hypothesis Three: Higher parental ratings of empathy in their children will be significantly associated with superior ability on the three CBT skills tasks.

Children whose parents rated them as being more empathic on the EQ-C did not demonstrate superior performance on the three CBT skills tasks. The current study found no relationship between parent-rated empathy and children's ability to link and differentiate thoughts, feelings and behaviours in others. This finding is unexpected given that successful completion of the CBT skills tasks appeared to require children to empathise with the characters in the stories and the situations they are presented in. No previous research has investigated whether empathy is significantly related to the demonstration of CBT skill in normally developing children. However previous research has identified difficulties applying CBT with clinical populations for whom difficulties with empathy are commonly associated. For example, with children with ASC (White et al., 2010; Wood et al., 2009). However, when considering this it is important to recognise that difficulties with empathy and social relationships are not the sole reason that children with ASC might have difficulty engaging with a CBT based intervention, and difficulties across all domains of the triad of impairment (Wing,1981) alongside individual factors are likely to impact upon engagement in therapy. Difficulties have also been identified engaging children who have suffered with an acquired brain injury in CBT (Laatsch et al., 2007) and this is another population who often have difficulties empathising with others (Tonks et al., 2009), although again it is not suggested here that challenges engaging in CBT would be purely related to a difficulty with empathy, but that this might be one contributory factor. It is also important to recognise that the demonstration of CBT skills, as assessed in the current study cannot be generalised to suggest that a child would automatically be able to engage in and receive benefit from a CBT intervention.

A significant effect of age was identified on parent-rated empathy. Parents of older children rated them as more empathic than parents of younger children. Furthermore, a significant effect of age was also identified for performance on the CBT skills tasks, this suggests that whilst no significant relationship between empathy and CBT skill was identified, the modalities do appear to develop in parallel. This identified effect of age is consistent with research on the developmental trajectory of empathy (Hoffman, 1975; McDonald & Messinger, 2012; Sagi & Hoffman, 1976; Simmer, 1971; Zahn-Waxler et al., 1992).

The finding that parent-rated empathy was not related to children's IQ is also consistent with previous research on the development and measurement of the modality (Chapman et al., 2006; Dadds et al., 2008). However, the non-significant effect of gender on parent-rated empathy is inconsistent with previous literature which reports a higher level of empathic concern in girls compared to boys (Eisenberg & Miller, 1987; Maccoby, 1998; Mehrabian et al., 1988), a finding which has also been identified with the measure used in this study (Auyeung et al., 2009). One possibility that might account for this unexpected finding is the idea of social desirability bias, which might be especially relevant given that parents were aware that data were being used for research (rather than when parents present at CAMHS services and are seeking assistance for a problem). The strengths and limitations of parent-report measures, and the selection of the EQ-C to assess empathy in the current study are discussed further in the methodological critique included in this chapter (see sub-sections 4.4.7.1 and 4.4.7.3 respectively).

4.2.4 Hypothesis Four: Children that demonstrate higher ToM ability will perform significantly better on the three CBT skills tasks.

Initial analysis on the ToM data suggested that second order ToM in children was associated with superior performance on all three of the CBT skills tasks. However, once the effects of age and IQ were controlled for these significant differences were not maintained. This finding suggests ToM as assessed here in the present study is not significantly related to children's ability to demonstrate CBT skills. Alike to the finding with regards to empathy, this finding is unexpected. Given that successful completion of the CBT skills tasks used in the current study appeared to require children to understand the mental states of the characters in the stories, this finding is contrary to what was hypothesised. No previous research has investigated the relationship between the demonstration of CBT skill and the development of ToM. However, as discussed above in relation to the findings regarding empathy, some research has suggested that ToM is important to the engagement and success of CBT based interventions in populations where difficulties with ToM are associated, for example children who have experienced an acquired brain injury, or children with ASC (Baron-Cohen, 2001; Baron-Cohen et al., 2004). Indeed CBT interventions for children with ASC are often adapted to take into account the difficulties that these children experience, and to try and increase their understanding of social situations and the mental states of others (White et al., 2010; Wood et al., 2009). Once again, when thinking about the non-significant finding within this context it is important to remember that success on the CBT skills tasks cannot be generalised to suggest that the same child would receive benefit from a CBT based intervention should they require it.

As expected, based on research that has outlined the developmental trajectory of ToM (see for example, Wellman & Cross, 2004; Wellman et al., 2001) children's ability

on the first and second order ToM tasks and the questions that assessed story comprehension increased with age. Furthermore, a significant association between children's verbal intelligence and ToM ability was identified. This is consistent with the previously reported association between ToM and verbal intelligence and/or ability (Astington & Jenkins, 1999; Bowler, 1992; Jenkins & Astington, 1996; Ozonoff et al., 1991). A significant association between performance on the CBT skills tasks, age and verbal IQ was also identified. Given that a significant relationship between ToM ability and performance on the CBT skills tasks was identified before the effect of age was controlled for it is reasonable to suggest that these modalities appear to develop in parallel with age. The method of assessment used to measure ToM in this study is further discussed in the methodological critique included in this chapter (see sub-section 4.4.7.4).

4.2.5 The Effect of Confounding Variables on Performance on the CBT Skills Tasks

Initial analyses of potential confounding variables on children's performance on the three tasks of CBT skill identified that age and verbal IQ significantly contributed to children's ability to demonstrate success on the CBT skills tasks, where as executive functioning, ToM and empathy did not. These findings suggest that increased demonstration of CBT skill is associated with age and verbal IQ. In the methodological critique provided below (see section 4.4) it is suggested that difficulties in measuring executive functioning, empathy and ToM, alongside difficulties drawing apart the relationship between development of these modalities across age, means that the results reported in this study might be, in part, due to methodological error. However, it is important to acknowledge that it is also just as likely that these results highlight the underlying contributory processes necessary for the demonstration of CBT skill (age and verbal IQ), and are not simply due to methodological error.

Turning attention first to the significant role of age on CBT skill, the findings here are consistent with previous research that has used these tasks (Quakley, 2002; Reynolds et al., 2006). This finding is also consistent with research that demonstrates that older children achieve more benefit from CBT based interventions (Durlak et al., 1991; Reynolds et al., 2012). However, as previously discussed, limitations with the generalisability of findings should be considered. The finding that verbal IQ also significantly influenced performance on the CBT skills tasks is also congruent with findings identified by Quakley and Reynolds et al. Furthermore, these results are consistent with research that demonstrated that children with higher IQ were more able to demonstrate core CBT skills that were employed by Doherr et al. (2005). These tasks involved naming emotions, linking thoughts and feelings and generating post event attributions.

The finding that performance IQ was significantly associated with scores on the TBLT, but not with performance on the CST or TFLT is interesting. One possible explanation for this, is that children appeared to find this task harder compared to the than when compared to the TFLT (see Table 5, pg. 91 for descriptive data) and therefore it required them to employ more cognitive resources in order to solve the stories and link thoughts to behaviour. Looking further at performance on the TBLT and TFLT, one possible reason that children might have found the TFLT easier is that it might be easier to link two internal states together (i.e. a thought to a feeling) rather than an internal state to an external state (i.e. a thought to a behaviour). The use of and performance on the CBT skills tasks are discussed further in the critique of the measurements employed in this study presented below.

4.3 Interim Summary

Section 4.2 above outlines the main study findings. These findings do not support the research hypotheses, and this is discussed in the context of the limited, but wider research literature. Before considering the theoretical and clinical implications of these findings a critique of the methodology is presented. This allows for the theoretical and clinical implications of the study findings to be considered within the context of the processes employed to investigate the research questions.

4.4 Methodological Critique

4.4.1 Design

The quasi-experimental correlational design selected allowed the relationships between the criterion and predictor variables to be explored. As with all correlational methods the exploration of the relationships between variables cannot demonstrate causality.

4.4.2 Statistical power

The power calculation used to determine the sample size was based upon a medium effect size, as deemed appropriate for exploratory studies (Field, 2000). The sample size successfully recruited to the study exceeded that deemed necessary and the N of 88 children assessed is considered to be a strength of the study. The large sample size suggests that the non-significant findings with regards to the main study hypotheses are not due to insubstantial statistical power, but more likely represent the (lack of) relationships between the modalities of development as measured across this sample.

Whilst the sample size is considered to be large for this type of project, the limited and uneven number of children within each age groups meant that the study did

not have sufficient statistical power to investigate performance within each age group (five, six, seven and eight years old) which would have explored the potential confounding effect of age. A larger sample size, with an even distribution of children within age categories would have increased statistical power for this type of analysis. However, Field (2000) illustrates how large samples can inflate the likelihood of type I error, as they can result in the detection of very small but erroneously significant effect sizes. The age of participants is further discussed in subsections that discuss the inclusion and exclusion criteria, recruitment of participants and suggestions for future research.

4.4.3 Inclusion and Exclusion Criteria

A small pilot study was undertaken to assess the suitability of the assessment materials with four year old children. The results of this preliminary study led to the decision to increase the lower age from four years to five years old. As discussed in Chapter Two, two main issues were identified through the pilot study. First, based on parent feedback and the experience of the four year old assessed as part of the pilot, the duration of the assessment (approximately 55-60 minutes) was deemed to be inappropriately long for a four year old child. Second, based on the assessment tasks and the results of the pilot study, the researcher was concerned that a four year old child's experience would predominantly be one of failure which could potentially make testing an aversive experience.

Based upon this information and in consultation with the study supervisors it was decided to raise the age limit to exclude four year old children. This decision did narrow the pool of potential participants from consented schools from which the researcher could recruit from. However, this did not appear to significantly impede recruitment to the study. The findings of this study suggest a significant relationship between age and

performance on the measures of executive functioning, empathy and ToM. This is to be expected given that these modalities develop with age. However, given that executive functioning, empathy and ToM develop with age it is also possible that it was not possible to detect the impact that the individual modalities of development had on children's ability to demonstrate CBT skill. With hindsight the role that executive functioning, ToM and empathy play in CBT skill task performance might have been better explored in a sample of children all the same age. This might have allowed for exploration of potential associations between variables whilst limiting the confounding effects of age.

Further inclusion criteria were set in order to recruit a healthy and normally developing sample into the study. This appeared justified given that Reynolds et al. (2006) found that children considered to be 'at risk' to mental health or behavioural difficulties performed poorly on the CBT skills tasks when compared to a healthy sample. Despite the researcher ensuring that all head teachers were aware of the inclusion criteria and exclusion criteria it would appear that some packs were sent out to children that were not eligible to take part in the study (for example a consent form was received from one child with learning difficulties). To ensure that there were no identified concerns with any children for whom parental consent forms were received, the researcher checked the names of consented children with each head teacher before beginning the assessments at their school. This gave the head teacher the opportunity to alert the researcher to any child who met the exclusion criteria, but for whom consent had been received. When discussing the recruitment criteria with head teachers it appeared that. although they understood rationale for selection there was a preference for a more inclusive recruitment strategy, so that particular children did not feel excluded. The researcher tried to reduce the possibility of children feeling excluded by explaining to the

appropriate class or year that some, but not all children in their class might receive packs home, and assuring children that if they did not receive a pack not to be concerned.

4.4.4 Recruitment

An overall recruitment rate of 17% of all those invited to take part chose to participate in the study. This indicates that the sample tested is unlikely to represent the wider population. It was not possible to assess whether families who consented to the study differed from those who chose not to. The literature on why parents consent to research is limited and comes mainly from medical settings, however factors associated with parents withholding consent include, anxiety about the procedure of giving informed consent, wordy and un-user friendly information sheets and more generally a wish to not involve their children in research (Elmeraid et al., 2012). Furthermore a study exploring factors that motivated British parents to consent for research on behalf of their child, (Sammons, Atkinson, Choonara & Stephenson, 2007) reported that parents who gave consent were influenced by the thought that research would benefit their own child first followed by the idea of participation benefitting other children or the advancement of science.

Future studies should encourage recruitment by ensuring that information packs and consent forms sent to parents include very clear and succinct study information. This is especially relevant in this study as parents were asked to consent by post and not through face-to-face discussion with the researcher, although parents were encouraged to contact the researcher should they wish to discuss any aspect of the study.

It is also noted that there was a substantial difference in the return rate of packs between schools, with the percentage of packs returned between 0 and 42% (see Table 2, pg. 62 for more detail). It is difficult to identify definite factors that account for this

variation. The highest recruitment rate of 42% came from the only independent school recruited in the sample. As discussed in section 2.3.1 some schools took active steps to attempt to increase the return rate by publicising the study in the school newsletter, however it is not possible to ascertain how this affected the number of packs returned in these schools, and furthermore these schools were not amongst the schools with the highest response rate.

From informal feedback gathered from parents a strength of the recruitment strategy was providing parents with a choice of location for the assessment to take place (school or home). Through talking to parents on home visits the researcher was informed that some would not have consented if the only option was for the researcher to visit their child at school. The reasons for this appeared to be threefold. First, some parents reported that they thought the study duration was a relatively long time for their child to be out of class. Second, some parents quite understandably wanted to meet the researcher and find out exactly what their child would be asked to do. Third, some parents felt that their child would be happier completing the assessment at home. From this feedback it appears that whilst this strategy was associated with some additional costs (time, travel and financial) it resulted in increased and successful recruitment to the study.

A further difficulty associated with the recruitment strategy was that given the difficulties predicting response rate across schools it was very difficult to control the number of children of a particular age category that were recruited. The researcher tried to monitor this and attempted to target particular age groups when beginning recruitment in a new school. Despite attempts to balance the age of children recruited to the sample ultimately the researcher was bound by the classes or year groups that head teachers were happy to allow access to.

4.4.5 Participants

This study used healthy participants, this was deemed appropriate given the exploratory nature of the investigation between the variables. Indeed clinical and developmental research often begins with studies using non-clinical samples and the use of healthy participants has a number of advantages. First, the recruitment of a normally developing sample of children, whilst not without its own challenges, is less complicated compared to recruitment of a clinical sample. Second, the use of non clinical samples means there are fewer potential confounding variables that might influence the processes being explored (Kazdin, 1978). Third, research with non-clinical child samples reduces the possibility of ethical difficulties arising throughout the research process (Gibbs, 1996). It is however, possible that the lack of significant relationship between the CBT skills tasks and developmental modalities investigated is associated with the fact that the children were all normally developing, and therefore demonstrated no significant problems with ToM, empathy and executive functioning compared to what might have been identified in a clinical sample, this is further discussed in subsection 4.7.

Regarding participants' ethnicity the large majority of the sample was white British. This is representative of the geographical areas covered by the sampled primary schools. However, it is not possible to generalise these results to a population with greater ethnic diversity and the limited diversity of the sample is considered a study weakness.

4.4.5.1 Feedback from participants.

At the end of the assessment the researcher asked the children several questions about their experience of participating in the study (this was part of the study debrief and

a copy is provided in Appendix R). This process allowed the researcher to collect some feedback from children.

Anecdotal feedback suggested that the majority of the children who took part in the study found the process both engaging and enjoyable, and feedback given appeared to be consistent with the researcher's observations. The ToL task appeared to be particularly popular, with many children requesting to continue trying to solve the problems after the formal assessment had ended. On the other hand, some children remarked upon the repetitive structure and time taken to complete the TFLT and TBLT stories, which were sometimes reported as boring and often considered the least favourite activity of the overall assessment.

Some parents also provided feedback on the parental-report measures, in particular the BRIEF. Despite the measure being designed for children within this age range, two parents left notes to the researcher on the assessment explaining that they did not think it was suitable for their child. In these cases the parents returned the measures by the post so the researcher was not able to discuss this further. However, no parents reported difficulties with the measure during home visits where the researcher was able to briefly discuss the measures with a parent. Feedback from participants is valuable when considering adaptations that could be made to future research.

4.4.6 Measurement of criterion variables

4.4.6.1 CBT skills tasks

All children were able to achieve at least some level of success on the CBT skills tasks. An obvious methodological limitation is that the measures lack data on psychometric properties. The measures also require children to recognise and link the

thoughts, feelings and behaviours in others, rather than in themselves, as would be required of a child who took part in CBT. Both of these problems are highlighted further in section 4.7 (future research). However, it is worth noting that it was the tasks focus on others rather than the self that led the researcher to consider the task demands and the developmental skills a child would potentially require to complete the tasks (for example, being able to empathise with the focal character in the TFLT and TBLT stories), and therefore that an investigation into executive function, ToM and empathy would be an interesting area to pursue. Furthermore, when engaging a child in CBT, a common element of socialisation to the model includes asking children to imagine how other children might think, feel and behave in particular situations and then using these instances to build up links between the identified thoughts, feelings and behaviours. Furthermore these types of tasks are often included in CBT work books for clinicians working with children (for example, Stallard, 2002b) and can be a useful element of the psycho-education stage of intervention.

In addition, as mentioned previously in this chapter it is not suggested that success on these tasks would equate to a child being able to engage in and potentially benefit from a CBT based intervention should they require it. There are clearly many other factors involved in successful participation in CBT, such as identifying and understanding the problem, a willingness to work towards change, being able to maintain attention, concentration and focus and the ability to successfully form a therapeutic alliance (Safran & Segal, 1990).

As shown in the descriptive data reported in Table 5 (pg. 91) and from observations by the researcher children appeared to find linking thoughts to feelings easier than linking thoughts to behaviours and this is consistent with findings from other studies that have used these tasks (Quakley, 2002). One potential explanation might be

that the linking of two internal states is easier than asking a child to link and internal thought with an external behaviour.

Furthermore, it was noted by the researcher that when asked to explain why a focal character behaved in such a way on the TBLT, children would often attribute the characters' behaviour to a feeling rather than a thought. For example, story three on the TBLT involves the character Laura being shown pictures from a Disneyland holiday brochure and then being told that she is going to Disneyland on holiday, and jumping up and down. The children are then shown that some days later when playing with her friend, Laura comes across the Disneyland brochure and they see her jump up and down again. The children are asked to explain why Laura jumped up and down. A comprehensive answer would include mention of the cue, a thought and the past event, demonstrating that the child understands that a present object can trigger a thought or memory of a past event, which influences behaviour. For example "Laura jumped up and down as she found the Disneyland brochure which reminded her that she is going on holiday to Disneyland". However, during the assessment the researcher noted a tendency for a child to answer with a feeling rather than a thought, for example responding that Laura "saw the book and was excited/happy to go on holiday". An answer where the child focuses on a feeling, whilst conceivably correct given the context of the story, limits the score the child can receive (as they have linked a feeling to the behaviour rather than a thought or memory to the behaviour as required for this task). To clarify children's responses the researcher used follow up questions as prescribed in the scoring system where appropriate (see Appendix I and K for more detail on the scoring system). The researcher noted this type of response on several occasions, and as discussed above it is apparent that children found the TBLT stories more difficult than the TFLT stories.

It is possible that it is genuinely more difficult for developing children to link thoughts to behaviours than thoughts to feelings. However, given the difficulties described above it is also important to bear in mind that the possibility that the TBLT is a less valid tool for eliciting the understanding of relationships between thoughts to behaviour than the TFLT is for eliciting the understanding of relationships between thought and feelings. Suggestions for further research into the validity and reliability of these tasks are discussed further in section 4.7. Despite these observations inter-rater reliability of the scoring of the TFLT and TBLT (see section 3.5.2 for more detail) demonstrated excellent compliance to the scoring system.

4.4.7 Measurement of predictor variables

The predictor variables were measured using a combination of child assessment and parental report of their children's abilities. The use of parental-report measure is further discussed below. This is followed by a critical evaluation of the measures used to assess the predictor variables.

4.4.7.1 Use of parental-report measures

Three parental report questionnaires were employed by this study, two were included to answer research questions on executive functioning and empathy (BRIEF and EQ-C) and one to further characterise the sample (SDQ). There are a number of strengths and limitations regarding the use of parent-report measures.

A strength of the use of parental-report is that it provides information that children themselves are unlikely to be able to objectively report, for example Dadds et al. (2008) discuss how children demonstrate empathic behaviour long before they develop the ability to self report it. Auyeung et al. (2009) highlight that a further strength of

collecting data through parent-report methods over self-report is that measurement of the variables does not rely upon the reading and comprehension abilities of the children assessed. This is particularly relevant to the assessment of executive functioning, where the necessary complexity of the tasks used to assess the specific modality can place demands on other cognitive modalities (Hughes & Graham, 2005). Based on these strengths, the use of parent informed questionnaires is a pragmatic way to collect data on constructs that are not easily measured in young children, and to sample data from a range of informant sources. Furthermore, it allows the data to be collected in an efficient way that in this instance did not add extra time on to an already lengthy assessment with a child.

As mentioned in the sections above a considerable limitation of the inclusion of parent-report data is that it allows for the possibility of response biases. In particular social desirability is cited as a common source of bias in questionnaire based studies (Grimm, 2010; Nederhof, 1985). It is possible that in this, as in any study, parents' answers might (unconsciously or otherwise) portray their child in a more favourable and socially desirable light, rather than reflect an accurate portrayal of their child's skill and abilities. For example, Bates and Bayles (1984) highlight a significant difference between mother's objective and subjective report of their child's temperament and problem behaviour. The authors suggest that when employing parental report measures researchers need to be aware that as well as assessing a parent's reflection on their child's behaviour, the measures also reflect parent's cognitive characteristics and their beliefs about what might be appropriate to report based on their child's age and or developmental stage.

In a series of recent studies Lagattuta, Sifyan and Bamford (2012) investigated parents' perceptions of everyday emotions in their children. The authors report that when

compared to a child's self report, parents significantly under report anxiety and worry and over report optimism, suggesting a parental positivity bias. Lagattuta et al. also identified an egocentric bias in their sample, where parents self-reported emotions significantly correlated with how they reported their child's emotions. These sources of bias are important to consider when interpreting the findings of this study.

A further methodological consideration with the inclusion of parental report measures was that 16 (18%) of the parental packs were not returned. A stamped addressed envelope was provided for return but in future studies a reminder letter to parents would perhaps have enhanced return and is a consideration for inclusion in further research. Where parental data were missing the data from the child assessments were included in the sample. Appropriate statistical analyses (see section 3.2.1) were undertaken to investigate whether data from children whose parents had not returned the measures significantly differed from data from children whose parents had. No significant differences between groups were identified which suggests that in this instance this strategy was a valid way to maximise the use of collected data.

The strengths and limitations of the use of this method of data collection should be taken into consideration when interpreting the research data collected through parental-report.

4.4.7.2 Measurement of executive functioning

Several difficulties have been identified with the measurement of executive functioning in children (Hughes & Graham, 2002). Walsh, (1978) reports the need for tasks to be novel and complex however Anderson (2002) highlights that the use of novel assessment tasks means that ecological validity is hard to ascertain and the tasks often make demands on other modalities, for example expressive and receptive language

abilities and IQ. Alexander and Stuss (2000) discuss the opinion that to some extent all cognitive assessments involve executive skill, and difficulties are associated with separating and measuring the various processes involved in cognitive development (Espy 1997; Espy et al., 2001).

Furthermore, Shordonne (2000) and Anderson (1998) discuss how executive functioning is often assessed in an artificial environment, where distractions are kept to a minimum, and where the researcher provides instructions and plans and initiates activities (as it was here with the ToL task). Indeed Stuss and Alexander (2000) discuss how when employing cognitive measures of executive functioning such as the ToL, the researcher in effect becomes the 'frontal lobes of the patient'. This results in the method of assessments used actually supporting the skills being assessed. This could have implications on the validity of the results, although in this study the ToL was administered by following the same procedure for all children, therefore reducing the impact of potential confounding variables.

Based on the difficulties measuring executive functioning in young children and that the ToL task only assesses part of the range of domains encompassed by the umbrella term of executive functioning, the inclusion of the BRIEF as a secondary parent-informed measure that assesses everyday behaviour was justified. A strength of the assessment is that it covers both the behavioural regulation and metacognitive aspects of executive functioning, allowing for a comprehensive screen of the various functions that comprise the modality.

A further domain of executive functioning that might be relevant to children's engagement in CBT is the concept of inhibition. This cognitive process involves being able to prevent or delay a learned, automatic or reinforced response (Barkley 1997; Luria,

1966). This is relevant to the engagement in CBT, as during therapy children are often guided to inhibit previously learned unhelpful responses to particular situations. Future research could assess inhibition and its potential relationship to the CBT skills tasks using the cleverly adapted animal Stroop task (Wright, Waterman, Prescott & Murdoch-Eaton, 2003), which is designed to assess inhibition in children aged three and upwards. In the task children are shown pictures of farmyard animals where the body and face of the animal do not match, and children are instructed to name the body of the animal they see, despite the face it is presented with. Originally, this was planned to be included in the current study, but was removed due to the concerns regarding the duration of the assessment session

4.4.7.3 Measurement of Empathy

The measurement of empathy represents a limitation of this research as the variable was only measured with parental report. As discussed in Chapter Two (further detail is provided in 2.5.2.4.1) previous research has identified difficulties with the valid and reliable self-reports of empathy in young children (Dadds et al., 2008; Eisenberger & Miller, 1987; Eisenberger & Lennon, 1983) and experimental tasks have been criticised for lacking psychometric evaluation (Lovett & Sheffield, 2007). This has led to relatively recent development of parent-report measures as a way to examine this construct (Auyeung et al., 2009; Dadds et al., 2008).

The use of parent-rated measures has been suggested as one way to address some of the difficulties identified with measuring empathy, although, it is acknowledged that measurement via parent report does not exist without its own problems, and the strengths and limitations of this method of measurement have been discussed in section 4.4.7.1. In particular when inspecting the items on the EQ-C it is conceivable that a parent might

respond about their child in a socially desirable way especially on the items that attempt to ascertain a lack of empathic behaviour towards others, which is considered socially undesirable (for example my child has been in trouble for physical bullying/name calling or teasing). This is especially relevant given that research has demonstrated that empathy is a construct that individuals significantly associate with morality and prosocial behaviour which are often deemed desirable traits (Cawley, Martin & Johnson, 2000; Hoffman, 2008).

Future studies should seek to measure empathy through both informant and child assessed behavioural measures. Furthermore, the Griffith Empathy Measure (Dadds et al., 2008), is an established parental-report assessment of empathy which could be employed in place of the EQ-C

4.4.7.4 Measurement of ToM

The measurement of ToM was taken from Liddle & Nettle (2006) who adapted a series of ToM tasks designed for adults (Stiller & Dunbar, 2007). The tasks require children to answer forced choice questions on social stories that require perspective taking of multiple characters. Children were tested on first and second order ToM, and higher order problems were excluded based on the age of children recruited to this sample.

A limitation of these stories is that they rely heavily on children's verbal abilities, as demonstrated by the significant effect of verbal IQ on findings, and verbal ability has been closely associated with the development of ToM (Astington & Jenkins, 1998). The successful solving of false belief type problems is also thought to place demands on attention and working memory (Bloom & German, 2000). As a result the use of the paradigm is criticised as not being a pure assessment of ToM. Bloom and German

highlight that a child can fail a false belief task because they cannot meet the demands of the task, rather than not being able to reason about the mental states of others. In order to assess whether a child was able to understand the stories presented to them, a control question was included in the assessment. As can be seen in Table 6 (see section 3.4, pg. 92) 79% of the overall sample answered both control questions correctly suggesting that the majority of the children were able to understand both of the stories.

For future research the use of a pictorial story board for children to refer to as the story is told might have reduced demands on working memory and held children's attention on task, thus potentially freeing up more cognitive resources for solving the ToM problems. In order to more rigorously assess children's ability a second set of first and second order tasks could also have been included from the Liddle and Nettle (2006) battery however, this would have increased the length of the assessment which was undesirable.

4.4.8 Measurement of additional variables

4.4.8.1 General Intelligence

Based upon the age range sampled for this study it was not possible to select one measure of IQ to assess the whole sample. The Wechsler assessments standard clinical assessments used to measure general intelligence, and the use of scaled scores allows performance to be compared across measures. The rationale for selection of the WASI and WPPSI is described in Chapter Two (see section 2.5.3.1) and will not be fully repeated here. However, one of main reasons for using the WASI over the WISC-IV for the older children was that the WASI exists in short form, meaning that alterations that are likely to affect the psychometric properties needed only be made to one measure. Nonetheless research does suggest that the WISC-IV is a more valid tool for assessing

general intelligence in young children (Crawford, Anderson, Rankin &Macdonald, 2010) than the WASI. At the time of study design the most psychometrically sound short form of the WISC-IV comprised of seven subtests (Crawford et al., 2010), which was too long to have feasibly been used in this study. However a more reliable and flexible short form assessment (Crawford et al., in preparation) with the option of two subtests has recently been developed and might in future offer a more psychometrically sound and practical method to measure general intelligence in children than the WASI.

4.4.8.2 Mental Health and Behavioural Difficulties

The SDQ it is open to the response bias discussed above in section 4.4.7.1. This bias could have potentially been reduced by the use of the corresponding teacher rated SDQ questionnaires, where one might expect a more objective rating. However, to not over-burden schools, or put them off from allowing recruitment to take place the parent version of the measure was used alone. This was considered an appropriate strategy given that the inclusion of the measure was not directly related to the research hypotheses.

4.4.9 Procedural and environmental limitations

The study was designed to be carried out in one session. When visiting children at their homes this was always possible, however, when assessing children in schools some assessments had to be split over two sessions. This was necessary due to a variety of reasons, including break times, school assemblies, emergency school closure due to adverse weather and fire alarms. In these situations the splitting of assessments over two sessions was unavoidable. When running assessments the researcher tried to time them so they were not interrupted by school break times. However, for the researcher to test every consented child within the time allotted by schools this was not always possible.

To try and minimise any effects of conducting the assessment in two sessions the researcher made efforts to complete the second half of the assessment as soon as possible after the first half.

When considering other procedural issues it is important to note that whilst running the assessments the researcher was aware of the hypotheses being investigated. This introduced the possibility of unintentional researcher bias, however the researcher was careful to follow the procedure and implement the assessments as consistently as possible with each child. The introduction of bias was unavoidable in the current study but could be addressed in future by the use of an independent researcher who collected data, but was blind to the study hypotheses.

A final factor worth considering is the environment in which assessments took place. When discussing the study with head teachers the researcher requested a quiet space in which to run the assessments. In some schools free physical space was limited and the researcher was required to carry out the assessments in less than ideal physical environments, for example on a table placed in the school corridor. When conducting the assessments in open environments the researcher attempted to control the situation somewhat, for example by temporarily halting assessment if a class passed through the corridor so the child would not be distracted or feel self conscious. Furthermore, the researcher observed that in schools where physical space was limited children would often complete individual work with class room assistants in communal areas. Therefore working with the researcher in this way was a familiar and potentially comparable experience to usual school practices.

A further factor to consider was assessing children at home, where the researcher was in a novel environment. In these situations the researcher requested that she meet

with the child in a quiet space where there was a space to work, but again a great deal of flexibility was required. In this situation the researcher also had to bear in mind the impact of curious parents and siblings who were often present when the assessment took place. To try and negate the impact of family presence on the child's performance the researcher often showed the tasks to parents before beginning the assessment with their child and interested siblings who did not meet the inclusion criteria were assured that if their parents gave permission, that they would be allowed to play with some of the puzzles once the researcher had finished working with their brother or sister. By adopting these strategies parents appeared more comfortable leaving their child to complete the assessments and curious siblings were assured they were not missing out, therefore providing less of a distraction to the child being assessed.

One way to have reduced the potential effects of environmental differences would have been to ask the child and parent to attend a particular independent location to complete the assessment. Whilst this would have resulted in a more controlled assessment experience it was not possible for this project and would have required more effort for families, which might have impeded recruitment. Furthermore, by assessing children in an environment in which they felt comfortable and familiar it was hoped that they were less likely to feel anxious about participating, which might have adversely affected performance on the study tasks.

It is important to consider these procedural and environmental limitations, as they represent some of the difficulties encountered when conducting clinical research with children in day-to-day settings such as schools and families homes. Whilst these limitations detract some methodological rigour from the study, the pragmatic and flexible approach to recruitment and assessment was vital to recruiting the sample.

4.4.10 Statistical analysis

A large proportion of the variables were not normally distributed and attempted log transformations did not significantly improve the distribution in order to warrant the complete use of parametric analysis. The use of non parametric statistics is often cited as less desirable than the parametric alternatives as they provide less statistical power (Field, 2000, p 567; Howell, 1999, p393). However as non parametric methods make fewer assumptions about the format of the data they can be used to analyse skewed and categorical variables (Siegel & Castellan, 1988; Whitley & Ball, 2002).

One exception to this rule was made. Despite the non normal distribution multivariate parametric methods were used to examine the influence of age and verbal IQ on the relationship between ToM and performance on CBT skills task. This exception was considered justified as the multivariate family of tests are considered to be particularly robust to violations of parametric assumptions (Field; 2000, p542; Tabachnick & Fidell; 1996, p343), however this strategy requires that data relating to the series of ANCOVA's employed be interpreted with caution.

4.5 Interim Summary

Section 4.4 has provided a methodological critique which identifies strengths and limitations of the design and procedures used to explore the research questions posed by this thesis. The following section goes on to discuss the theoretical and clinical implications of the study findings. When considering these issues it is important to take into account the identified methodological difficulties. As a result the theoretical and clinical implications of these findings are discussed within this context.

4.6 Implications of study findings

4.6.1 Theoretical Implications

The null findings identified between the three developmental modalities assessed here and performance on the tasks assessing CBT skill suggests performance on the CBT skills tasks is more significantly associated with general development rather than the development of executive functioning, empathy or ToM. This is supported by the significant effects of age and IQ on task performance as identified by this study and previous research (Reynolds et al., 2006; Quakley, 2002). However, it is important to note that alongside performance on the tasks that assess CBT skills, performance on the measures of child-assessed executive functioning and ToM and parent-assessed empathy also increased with age (as would be expected), and therefore it is difficult to ascertain whether as these modalities develop with age they also influence children's ability to achieve success on the CBT skills tasks. Research on child development has identified difficulties drawing apart emerging and related developmental processes (Espy et al., 2001; Anderson, 2002).

Returning to the theories of cognitive development discussed in Chapter One (see section 1.8) the children assessed here fell largely within what is considered by Piagetian theory (1952) as the pre-operational (two to seven years old) and concrete operational (seven to 12) stages of development. Children's performance on measures used increased with age, which is consistent with Piaget's theory, however children were able to consider abstract internal concepts, such as thoughts and feelings that Piaget proposed was more consistent with the formal operational stage of development (12 years and above). The ability of children within the pre and concrete operational stages to distinguish and link internal and external concepts, such as thoughts, feelings and

behaviours demonstrated in this study, is consistent with the research literature that suggests that children younger than the formal operations stage (12 years) can understand abstract internal concepts, and therefore do possess an essential skill thought necessary to engage in adapted CBT interventions.

It was suggested that the developmental modalities assessed here might have scaffolded (Vygotsky, 1962) children's ability to engage in the CBT skills task however this was not apparent in this study. However, age and verbal IQ do appear to have scaffolded children's ability across both the measures of executive functioning, empathy and ToM and the measures of CBT skill, and as discussed above children's ability on these tasks appears to have increased in parallel with age. Adaptations to CBT based intervention to account for a child's age and developmental stage could allow an appropriately trained CBT therapist to scaffold and guide children's abilities. Finally, information processing models of cognitive development suggest that cognitive ability is acquired through the development of domain specific modules, which are constrained by an age related ceiling (Carey, 1986; Gardner, 1983). The modalities assessed here were heavily influence by age, which as proposed by the information processing model could represent associated gains in working memory ability. This would allow children to encode and process increasing amounts of information as they increase in age, which would in all likelihood lead to better performance on the study tasks.

A further theoretical consideration is that the developmental trajectories of child-assessed executive functioning, empathy and ToM demonstrated here appear consistent with the general age related gains across early and middle childhood documented by developmental research. The following section considers the clinical implications of the findings of the study.

4.6.2 Clinical Implications

Due to the substantial evidence base advocating treatment effectiveness and the time limited nature of the intervention, CBT is becoming an increasingly popular first line treatment for childhood psychopathology (Benjamin et al., 2011). Furthermore, if continued the current CY-IAPT pilot will greatly increase the number of specially trained CBT therapists to work with children and young people (Kelvin et al., 2009). It is therefore important that research aids the understanding of the necessary developmental skills that children require to effectively participate in CBT.

This study investigated whether children's developing executive functioning, empathy, and ToM were related to tasks that assess core skills thought necessary to engage in CBT. The identified null findings suggest the normal development of executive functioning, empathy and ToM are not associated with children's ability to demonstrate CBT skills between the ages of five to eight years old.

Had a relationship between CBT skills and the modalities of development assessed been identified it might have been possible to suggest here that instead of using tasks that assess core CBT skill such as these or tasks provided in guidelines or workbooks on CBT for children (Stallard, 2002b) clinicians could use information about a child's development (i.e. whether the child demonstrated normal executive function, empathy and ToM for their age) to inform them about whether a child was likely to be able to demonstrate core skills thought necessary to engage in a CBT intervention. However this is not the case and the results identified here suggest that general development across age and a child's IQ are more significantly associated with ability to differentiate and link thoughts, feelings and behaviours.

The finding that older and more intelligent children demonstrate superior CBT skill is consistent with research that suggests older children receive more benefit from CBT based intervention (Durlak et al., 1991; Reynolds et al., 2012), along with findings from previous research that used the CBT skills tasks employed here (Quakley, 2002; Quakley et al., 2003; Reynolds et al., 2006). This significant effect of age suggests that as discussed in Chapter One skilled adaptations would need to be made (by appropriately trained therapists) to assist young children to engage in CBT based interventions, and the emerging evidence base of the feasibility of CBT with young children (under eight) suggests this is possible (Freeman et al., 2008; Hirshfeld- Becker et al., 2010; Scheeringa et al., 2011). Furthermore, given the significant effect of general development on children's ability to demonstrate CBT skills, the results here suggest that as previously acknowledged, it is necessary that CBT interventions are set at a developmentally appropriate level for each individual child (Grave & Blisset, 2004; Ollendick, Grills & King, 2001; Kingery, 2006; Stallard, 2002).

4.7 Future Research

Suggestions for adaptations to future research have been identified throughout this chapter. In light of the methodological limitations identified with this study future research would be well placed to begin by addressing some of these problems. Rather than examine the three predictor variables at once future studies might consider the methodological problems identified here and make adjustments to more thoroughly and carefully measure the predictor variables individually.

One way to address age related developmental trends that influence children's ability on the research tasks would be to recruit a sample of children of the same age and examine the relationship between CBT skills and executive functioning, empathy and

ToM. However, one possible explanation for the null findings in the current study is that healthy children did not display enough variance in performance on either the tasks that assess CBT ability or the measurements of executive functioning, empathy and ToM, and limiting the age of children assessed would in all likelihood further limit the variance of scores across the assessments used. CBT has more recently been adapted for a younger age group and is also employed with children from a range of populations, some of whom experience difficulties with executive functioning, ToM and empathy. Future research with these clinical populations, where deficits in the developmental modalities assessed mean that greater variance in ability might be demonstrated, could help to ascertain whether the developmental predictor variables have any bearing on CBT skill as measured here. For example, CBT is employed with children with ASC, children who have suffered traumatic and acquired brain injuries and children diagnosed with ADHD (and difficulties with executive functioning, empathy and ToM are commonly associated with these populations). As a result future research that recruited participants from one or more of these populations would be well placed. Furthermore, difficulties with executive functioning and specifically executive control have been associated with the presence of internalising disorders in childhood, and in particular in anxiety disorders and depression (Emerson, Mollet & Harrison, 2005; Eysenck, Derakshan, Santos, & Calvo, 2007). Future studies could evaluate how deficits in executive functioning in children experiencing internalising disorders might impact on their ability to engage in CBT treatment for anxiety or depression.

Additionally with regards to the CBT skills tasks, future research to examine the psychometric properties of the measures would be valuable, in particular observations and findings from this study suggest that the TBLT requires further investigation. Furthermore, the results from this study suggest that it is difficult to ascertain what these

tasks are assessing in children aside from general age related cognitive and social development. Future research might also explore other factors, not measured here that might explain the variance in performance on CBT skills tasks, for example it might be interesting to explore the effects of emotional intelligence (see Salovey, Bedell, Bedell & Mayer, 2008 for definition and review) on performance on the CBT skills tasks.

Finally, as discussed by Quakley (2002) future research could focus on adapting the tasks so that they focus on the self rather than the thoughts, feelings and behaviours of others. For example, children could be asked to imagine themselves instead of the focal character and they could be asked what their thoughts, feelings and behaviours might be in the situations within the stories. This adaptation would allow for the assessment of a child's own abilities to recognise and link their own internal thoughts and emotional states with their behaviour, which would potentially provide a more valid clinical assessment tool. However, the development of these tasks would require the careful selection of scenarios that children could all have been expected to have experienced, for example, a first day at school etc.

4.8 Final summary and conclusions

This study employed a quasi-experimental design to investigate the relationship between three developmental modalities (executive functioning, empathy and ToM) and tasks that assess CBT skill (Quakley, 2002). The developmental modalities were hypothesised to be related to both the demands placed on children by the CBT skills tasks, and children's ability to engage in a CBT based intervention. The research is well placed given the increasing employment of CBT in CAMHS services (Benjamin et al., 2011; Kelvin et al., 2009) and the increasing evidence base advocating for the efficacy of the treatment approach in children and young people (Graham & Reynolds, 2013).

Data from 88 children between the ages of five to eight years old, whose parents gave informed consent for their participation were included in the overall sample. The criterion and predictor variables were measured through individual assessment with children and the collection of parent-report data. Once participants' age and general intelligence were controlled for statistical analyses revealed no significant relationships between performance on tasks assessing CBT skill and children's executive functioning, empathy and ToM. It is concluded that children's executive function, empathy and ToM as measured in the current study are not related to the demonstration of core skills thought necessary to engage in CBT. However, a number of methodological limitations were identified that might partially account for the non-significant findings. Future research should address some of the identified methodological limitations, as well as exploring the validity of the CBT skills tasks.

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Appendices

Appendix A

Summary of Articles Acquired in Literature Search (Table A1)

Table A1

Summary of Articles Acquired in Literature Search

Reference	Study Aim	Design and Participants	Main findings
Doherr, Reynolds, Weatherly & Evans (2005)	Study 1. To pilot tasks to assess children's ability to participate in CT. Study 2. To assess the effects of IQ , age and educational experience on children's ability to participate in CT	Study 1. Quasi-experimental Correlational design with 14 children aged 5-11 Study 2. Between subjects design with 72 children aged between 5 and 7 and split into groups depending on age and school attended.	Study 1. Majority of children demonstrated some success at naming emotions, linking thoughts and feelings and generating post event attributions. Study 2. In children aged 5-7 performance was associated with IQ and educational experience but not age.
Quakley, 2002.	As per Quakley et al. 2004 (which is part of this thesis that was published). Also to investigate whether children link thoughts to feelings and thoughts to behaviours in the context of previous experience.	Between subjects design with 96 children aged 4-7 split by age group,	Older children were more able to link thoughts with emotions and thoughts with behaviour in the context of previous experience when compared to younger children.
Quakley, Coker, Palmer & Reynolds (2003)	To assess whether children could distinguish between thoughts and behaviours and to investigate whether the use of a visual cue aided performance.	Cross-sectional design assessing 72 children aged 7-8 and 10-11. Half of each age group were assigned randomly to cue – no cue condition	Older children performed significantly better at distinguishing thoughts and behaviours. The use of a visual cue did not aid performance. Verbal IQ was significantly associate with performance of 7-8 year olds
Quakley, Reynolds & Coker (2004)	To investigate whether children could distinguish thoughts, feelings and behaviours and to assess whether	Between subjects design with 96 children aged 4-7 split by age group and randomly assigned to	Young children could discriminate between thoughts feelings an behaviours and the use of simple visual cues

	visual cues aided performance	visual cue/no visual cue condition.	increased performance
Reynolds, Girling, Coker, & Eastwood (2006)	To assess whether children with mental health problems perform as well as healthy children on tasks assessing skills relevant to CBT (distinguishing thoughts, feelings and behaviours)	Between group subjects design with 193 children aged 6-7 assessed and assigned to groups on their mental health status	Children deemed 'at risk' to mental health problems demonstrated significantly worse performance on tasks assessing core skills required for cognitive therapy.
Scheeringa, Weems, Cohen, Amaya-Jackson, & Guthrie (2011)	To examine the feasibility of manualised trauma-focused cognitive therapy (TF-CBT) with young children and to explore whether children of this age could engage in and understand CBT treatment	Between groups trial with children randomly assigned to treatment or wait list control. Of children in treatment group feasibility of intervention was assessed with 46 children aged 3-6 years old.	Children were deemed to be able to participate in the intervention and results support the feasibility of a structured TF-CBT treatment protocol for very young children.

Note: Quakley et al 2004 is the published paper resulting from Quakley, 2002 (doctoral thesis manuscript) both the thesis and published paper are included here as the thesis includes data on two CBT skills tasks that are included in this study, but that were not included in publication. Throughout this thesis, for clarity, Quakley is referenced as Quakley (2002) as this encompasses both the published and unpublished information.

Appendix B

Covering Letter from Researcher to Schools

Amy Carroll
Trainee Clinical Psychologist
Room 2.30 Elisabeth Fry Building
Norwich Medical School
University of East Anglia
Norwich
Norfolk
NR4 7TJ

CBT skills in Typically Developing Children, the Role of Executive Function, Empathy and Theory of Mind

Dear

My Name is Amy Carroll I am a third year Trainee Clinical Psychologist studying on the Doctoral Programme in Clinical Psychology at the University of East Anglia. I am writing to enquire about whether you would be willing to help me with a piece of research I am carrying out.

I have enclosed a school information sheet on the project and would be grateful if you had a few minutes to read this and consider if you would be willing to allow me to recruit for the project in your school. This would not be burdensome on your time, staff or resources.

If would like to discuss any aspect of the project then please feel free to contact me on the details provided on the information sheet. I will follow this letter up with a telephone call over the next week.

Yours sincerely

Amy Carroll.

Trainee Clinical Psychologist

Appendix C

School Information Sheet

University of East Anglia

Head Teacher /School Information Sheet

CBT skills in Typically Developing Children, the Role of Executive Function, Empathy and Theory of Mind

What is the purpose of the project?
This project aims to investigate young children's ability to identify and make links between thoughts, feelings and behaviours. This is a skill that is required to be able to take part in a psychological therapy known as cognitive behaviour therapy or CBT. CBT is a type of therapy used commonly to help children to overcome mental health problems such as anxiety and depression. It is based on the premise that the way we think is linked to our feelings and behaviours. I am specifically interested in how skills needed to successfully take part in CBT, such as identifying and linking thoughts, feelings and behaviours develop alongside other skills, such as a child's ability to empathise with others, recognise that others may have a different perspective to us, and to plan, organise and monitor their behaviour. In order to investigate this I am asking healthy children from the age of four to eight to complete a range of tasks and puzzles. It is hoped that the results of the project will help develop our understanding of psychological therapy for children.

Why has my school been invited to participate?
Your school has been asked to participate as it is a primary school located in East Anglia.

What will happen if I decide to allow my school to take part?
If you decide that you might be interested in allowing your school to participate in this project then I will arrange a meeting with you to discuss this further. If you would like I am also happy to speak with your staff team and introduce myself to your pupils. Following this, parents of children who meet the inclusion criteria will be sent information sheets and consent forms and will be asked to return the consent from to the school if they are happy for their child to participate. When the consent form is received I will arrange with you to come and meet with the child. This should take approximately fifty minutes to one hour and I will be guided by you as to the most convenient time. Parents will have the option to request I visit them at home. If they select this then I will not carry out the project with their child during school time.

What's involved for the children?
I will meet with each consented child on one occasion and ask them to carry out a series of tasks and puzzles. I will make it clear that these are not a test, and that there is no right or wrong answers, but that I am interested in their ideas. It will be explained that they can stop participating at any time should they wish to. The tasks consist asking children to sort cards into different categories, and answer questions on short stories and solving puzzles. The tasks have been used before in research at UEA with hundreds of children. Feedback so far is that children find the experience engaging and enjoyable. In the very unlikely event that a child becomes distressed in any way whilst participating I will stop the session immediately and notify their class teacher.

I will also one parent to fill out three brief questionnaires on your child and provide some basic demographic information. This should take no more than 25 minutes and forms will be sent home with the child and returned directly to me in a stamped addressed envelope.

What do I have to do if I am happy for my school to take part?
I will follow this correspondence up with a telephone call. If you are interested in taking part then I will arrange a meeting to discuss this with you and to obtain signed consent.

Does my school have to take part?
No your school is under no obligation to participate in this project. If when I call to follow this letter up you are unable to help then I will not contact you again.

Are there any expenses or payment involved in the study?
Your schools involvement in the study will not involve any financial expense on your part. All correspondence that needs to be returned to me will be sent with a stamped addressed envelope. As a thank you for taking part at the end of the study all children will be entered in to a prize draw to win one of three £10 vouchers for a high street store of their choice.

What are the possible benefits of my school taking part?
There is little direct benefit for your school or yourself from taking part. However, the information we get from this study will help improve our understanding of how psychological treatments can be applied to help children who are experiencing mental health problems. I will provide you with a summary of the results and am willing to provide feedback to your staff team.

What are the disadvantages and risks of my school taking part?
I do not think there are any significant disadvantages or risks that arise from allowing your school to take part in the study. I am fully CRB checked and work regularly with children. I will treat your school, staff and pupils with the upmost respect and when carrying out the project I am happy to ensure that I fit in with the school day so as to cause as minimal disruption as possible. If parents would prefer I can also visit their child at home.

It is considered unlikely, however if taking part in the study causes any parent worry or concern about their child they will be encouraged to contact one of the research team to discuss this or to visit their family GP. Should whilst running the study something arise that would cause concern about the welfare of the participant or the welfare of others, we would have a duty of care to take appropriate action and follow local safe guarding procedures. In these circumstances I would discuss this with my primary supervisor, Dr Sian Coker and we would inform the parents of the participant about this (or teacher if appropriate) unless this was deemed to put the participant at risk.

Will information be kept confidentially?
I will keep all information private and safe. Data will be kept in a locked cabinet and files on computers will be password protected. No identifying information (such as names) will be included on the data and numbers will be used instead. Participation will be audio recorded and a small random sample of recordings listened to by one of my supervisors. This is to ensure that I carry out the research properly. All recordings will be securely destroyed once this procedure has taken place. At the end of the project all hard data will be securely stored at the University of East Anglia in a locked cabinet for five years. After this time the data will be destroyed.

Who has reviewed the study?
All research carried out at the University of East Anglia is looked at by an independent group of people called a Research Ethics Committee, to protect your interests. This study has been reviewed and approved by the University of East Anglia Faculty of Medicine and Health Ethics Committee

Thank you for taking the time to read this information sheet. I hope you will decide to allow your school to participate. Should you have any questions I would be very happy to discuss my project further with you and can be contacted on 01603 591507 (please leave a message and I will get

back to you) or email me on amy.carroll@uea.ac.uk. My research supervisors are Dr. Sian Coker, Clinical Psychologist and Senior Clinical Lecturer and Dr. Anna Adlam, Clinical Psychologist and Clinical Lecturer. Should you be unhappy with any aspect of this study or wish to speak to one of my supervisors then they are contactable on 01603 593310.

Many Thanks, Amy Carroll.

Appendix D

Head Teacher Consent Form

University of East Anglia

Consent form for Head Teachers

CBT skills in Typically Developing Children, The Role of Executive Function, Empathy and Theory of Mind

I (insert name) head teacher of*(insert school name)* school

1. Have read the letter dated *(insert date)* sent to me by Amy Carroll, Trainee Clinical Psychologist about the research study entitled 'Cognitive Behavioural Therapy Skills in Typically Developing Children, The Role of Executive Function and Empathy. ☐

(Please Initial)

2. I **give consent/do not give consent** (please delete as applicable) for the children of this school to be invited to participate in the above research project ☐

(Please Initial)

3. I understand that the parents of potential participants will be contacted via the school and sent an information and consent sheet about the study. Parents will be asked to return a signed consent form if they are happy for their child to participate. I understand that no child will participate in the study without written parental consent. ☐

(Please Initial)

4. I understand that the data collected will solely be used for this research project, and that neither the school, nor individual children will be identified. ☐

(Please Initial)

Signature:.....

Date.....

Many Thanks,

Amy Carroll.
Trainee Clinical Psychologist.
Email: Amy.Carroll@uea.ac.uk
Phone: 01603 591507

Appendix E

Parent Information Sheet

Parent Information Sheet
An investigation into children's developing ability to engage in cognitive behavioural therapy

My name is Amy Carroll and I am a Trainee Clinical Psychologist based at the University of East Anglia (UEA). I am writing to invite you and your child to take part in a research project. This information sheet is to help you decide if you are happy for your child to participate. Please take time to read it carefully and discuss it with your child. Please feel free to contact me should you require any further information. My research supervisors are Dr Sian Coker, Clinical Psychologist and Senior Clinical Lecturer and Dr. Anna Adlam, Clinical Psychologist and Clinical Lecturer.

What is the purpose of the project?
This project aims to investigate young children's ability to identify and make links between thoughts, feelings and behaviours. This is a skill that is required to be able to take part in a psychological therapy known as cognitive behaviour therapy or CBT. CBT is a type of therapy used commonly to help children to overcome mental health problems such as anxiety and depression. It is based on the premise that the way we think is linked to our feelings and behaviours. I am specifically interested in how skills needed to successfully take part in CBT, such as identifying and linking thoughts, feelings and behaviours develop alongside other skills, such as a child's ability to empathise with others, recognise that others may have a different perspective on the world and to plan, organise and monitor their behaviour. In order to investigate this I am asking healthy children from the age of four to eight to complete a range of tasks and puzzles. It is hoped that the results of the project will help develop our understanding of psychological therapy for children.

Why has my child been invited to participate?
Your child has been asked to participate as they are between the age of 5 and 8 years old and they Are attending *(insert school).* I have discussed the study with *(insert teacher's name)* and (*he/she)* is happy for me to carry out the project at the school.

Does my child have to take part?
No your child does not have to take part in this project. If you decide you do not wish your child to participate then this will not affect their education in any way.

What will happen if I decide to give consent for my child to take part?
If you decide that you are happy for your child to take part in the project I will meet with your child on one occasion at school or at your home (depending on your preference). I will ask them to carry out a series of tasks and puzzles. I will make it clear that these are not a test, and that there is no right or wrong answers, but that I am interested in their ideas. It will be explained to your child that they can stop participating at any time should they wish to. It will take approximately 50 minutes to complete the tasks and your child can have a break whenever they wish.

The tasks consist asking children to sort cards into different categories, and answer questions on short stories and solving puzzles. The tasks have been used before in research at UEA with hundreds of children. Feedback so far is that children find the experience enjoyable. In the very unlikely event that your child becomes distressed in any way I will stop the session immediately

and notify yourself or their class teacher. In this situation I would also inform my research supervisor about the situation; however no personal details will be shared.

I will also one parent to fill out three brief questionnaires on your child and provide some basic demographic information. This should take no more than 25 minutes of your time.

What do I have to do if I am happy for my child to take part?
As your child is under 16, before I can include them in the project I need you to prov *Please Turn Over*
parental consent. If you are happy for them to participate then please complete and sign the attached consent form and send this back to the school office in the envelope provided. I will also ask your child if they are happy to take part and they will sign a form to give their agreement. Even after receiving your consent if your child decides they do not want to take part then they will not be included.

If you are not happy for your child to participate then you need not do anything else.

Are there any expenses or payment involved in the study?
Your child's involvement in the study will not involve any financial expense on your part. All correspondence that needs to be returned to me will be sent with a stamped addressed envelope. As a thank you for taking part at the end of the study all children will be entered in to a prize draw to win one of three £10 vouchers for a high street store of their choice.

What are the possible benefits of my child taking part?
There is little direct benefit for your child or yourself from taking part. However, the information we get from this study will help improve our understanding of how psychological treatments can be applied to help children who are experiencing mental health problems.

What are the disadvantages and risks of my child taking part?
I do not think there are any significant disadvantages or risks of taking part. I will carry out the project at school or home based on your preference. If you would prefer me to see your child at school then I will try to ensure that I fit in with their school day so that participating causes minimal disruption to their education. I am fully CRB checked and work regularly with children.

In the unlikely event that participating in this project raises concerns about your child then please feel free to contact myself or Dr Sian Coker using the contact details below. If the concerns are about the child's health then it might be appropriate to contact your family GP. Should, whilst taking part in the study something arise that would cause concern about the welfare of the participant, or the welfare of others we would have a duty of care to take appropriate action and follow local safe guarding procedures. In these circumstances I would discuss this with my primary supervisor, Dr Sian Coker and we would inform you about this, unless this was deemed to put the child at risk.

Will information be kept confidentially?
I will keep all information private and safe. Data will be kept in a locked cabinet and files on computers will be password protected. No identifying information (such as names) will be included on the data and numbers will be used instead. Participation will be audio recorded and a small random sample of recordings listened to by one of my supervisors. This is to ensure that I carry out the research properly. All recordings will be securely destroyed once this procedure has taken place. At the end of the project all hard data will be securely stored at the University of East Anglia in a locked cabinet for five years. After this time the data will be destroyed.

Who has reviewed the study?
All research carried out at the University of East Anglia is looked at by an independent group of people called a Research Ethics Committee, to protect your interests. This study has been

reviewed and approved by the University of East Anglia Faculty of Medicine and Health Ethics Committee

Thank you for taking the time to read this information sheet. I hope you will decide to allow your child to participate. Should you have any questions I would be very happy to discuss my project further with you and can be contacted on 01603 591507 (please leave a message and I will get back to you) or email me on amy.carroll@uea.ac.uk. Should you be unhappy with any aspect of this study or wish to speak to one of my supervisors then they are contactable on 01603 593310.

Many Thanks, Amy Carroll.

Appendix F

Parent Consent Form

University of East Anglia

Parent Consent Form

An investigation into children's developing ability to engage in cognitive behavioural therapy

Please Initial the Boxes

1. I confirm that I have read the information sheet dated May 2012 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my child's participation is voluntary. That they and I are free to withdraw involvement at any time, without giving reason and without their educational services being affected. ☐

3. I understand that all data collected will remain anonymous and confidential. ☐

4. I understand that the appointment will be audio recorded and that this recording will be stored securely and destroyed at the end of the study. ☐

5. I give consent for my child to take part in the above study ☐

6. Would you like to receive a written summary of the findings on completion of the research? Please delete as applicable -- **YES/NO**

7. Would you prefer me to visit your child at home or at school? Please delete as applicable -- **SCHOOL/HOME**

_____ _____

Name of Child Date of Birth

_____ _____ _____

Name of Parent Date Signature

Contact Telephone Number: _____

If you have indicated that you are happy for me to visit you and your child at home then I will contact you directly on this number to arrange a convenient time. Please return this form in the envelope provided. When I receive the form I will arrange to visit your child either at home or at school depending on your indicated preference. If I visit your child at school I will send four short questionnaires home with your child for you to complete which I will ask you to return to me in a stamped addressed envelope.

Thank you very much for your help.

Amy Carroll,
Trainee Clinical Psychologist Email: Amy.Carroll@uea.ac.uk
Phone: 01603 591507

Appendix G

Procedural Instructions and stimuli material for the Card Sort Task

(Quakley, 2002)

Procedural instructions for the CST from Quakley et al. (2002)

I am going to read you some stories about a girl called Mary (or a boy called Harry, for boys). In each of the stories you will find something out that Mary has been doing, something that Mary has been thinking, something that Mary has been feeling. When I have finished reading the story I will read you three different cards one by one, which each have different parts of the story on them. I would like you to tell me which card is about something that Mary was doing 'a doing part' which card is about something that Mary was feeling, 'a feeling part' and which card is about something that Mary was thinking, 'a thinking part'.

Say: 'let me show you'

Demonstration story *(Behaviour-feeling-thought, positive) (not scored)*
Read demonstration story to child: Mary cleaned her teeth before bedtime. Mary was very happy because the next day she was going on holiday. Mary wondered if there might be a bouncy castle.

Say: 'now I am going to read three cards to remind us of what happened in the story'.

Read card 1, a 'doing sentence' card: 'Mary cleaned her teeth'
Say: 'Now, **'**Mary cleaned her teeth', was something that Mary was doing so this is a 'doing' part of the story'.

Read card 2, a 'feeling sentence' card: 'Mary was very happy'.
Say: 'Now, 'Mary was very happy' was something that Mary was feeling, so this is a 'feeling' part of the story.'

Read Card 3, a 'thinking sentence card': 'There might be a bouncy castle on holiday'
Say: 'Now, 'there might be a bouncy castle on holiday', was something which Mary was thinking, so this is a 'thinking part of the story'.

Say: 'Now i would like you to try'.

Sample Story *(Thought-behaviour-feeling, positive) (not scored)*
Read sample story to child: 'Mary knew that it was her friend Emma's birthday next week. Mary bought Emma some chocolate for a present. Mary was happy that she had bought her friend a present'.

Say: 'Now i am going to read you three cards to remind you of what happened in the story. I would like you to tell me which card tells you something which Mary was doing, 'a doing part', which card tells you something which Mary was feeling, 'a feeling part', and which card tells you something which Mary was thinking 'a thinking part'

Read card 1, a 'feeling sentence card': 'Mary was Happy'.
Say: 'Now. Is this something which Mary was doing, 'a doing part', or is it something that Mary was feeling ' a feeling part', or is it something which Mary was thinking, 'a thinking part?'.

Note the child's response. If the child answers correctly praise the child and move on to the next item.
Say: Very good, let's try another'.

Read card 2, 'a doing sentence card': Mary bought her friend some chocolate'
Say: 'Now. Is this something which Mary was doing, 'a doing part', or is it something that Mary was feeling ' a feeling part', or is it something which Mary was thinking, 'a thinking part?'.

Note the child's response. If the child answers correctly praise the child and move on to the next item.

Say: 'Very good, let's try another'.

Read card 3, a 'thinking sentence card': 'It's Emma's Birthday next week'

Say: 'Now. Is this something which Mary was doing, 'a doing part', or is it something that Mary was feeling ' a feeling part', or is it something which Mary was thinking, 'a thinking part?'.

Note the child's response.

If all items are correct proceed with main task.

Say: 'Well done I am going to tell you some more stories about Mary now and ask you some more questions about the stories'

If a child gets any of the items on the sample story incorrect, correct the child by saying for example:

Say: 'good try, 'but Mary bought her friend some chocolate' is something which Mary was doing, so it is a doing part of the story'.

After an incorrect response proceed with the other items until all three cards have been read out.

At the end of the task repeat incorrect items. Continue to correct the child until the child has got each item correct. When all items have been sorted correctly proceed with the main task.

Say: 'well done, I'm going to tell you some more stories about Mary now and ask you some more questions about the stories.

Proceed with the main task

Read each story out to the child. For each story randomise the order in which the three 'thought, feeling and doing' test cards are read out to a child by drawing them blind from and envelope. Note child's responses, but do not correct incorrect items.

After reading out each test card say:

Say: ‘Now. Is this something which Mary was doing, ‘a doing part’, or is it something that Mary was feeling ‘ a feeling part’, or is it something which Mary was thinking, ‘a thinking part?’

After each response from the child say:

Say: ‘good let’s try another’

After each story say:

Say: Well done, I’m going to tell you another story about Mary now, and ask you some more questions about the story.

Stimuli for the CST task from Quakley et al. (2002)

The character is called Mary for girls and Harry for boys.

Demonstration story *(Behaviour-feeling-thought, positive) (not scored)*
Mary cleaned her teeth before bedtime. Mary was very happy because the next day she was going on holiday. Mary wondered if there might be a bouncy castle.

Sample Story *(Thought-behaviour-feeling, positive) (not scored)*
Mary knew that it was her friend Emma's birthday next week. Mary bought Emma some chocolate for a present. Mary was happy that she had bought her friend a present.

Item 1 *(Feeling-thought-behaviour, positive) (scored)*
Christmas was coming and Mary was very excited. Mary wished that father Christmas would bring her a new puppy. Mary made a home for the puppy with a blanket and a cardboard box.

Item 2 (*Feeling-behaviour-thought, negative) (scored)*
Last week at school Mary was very upset. Mary ran into the school cloakroom to hide from everybody. Mary wondered if anyone would come to find her.

Item 3 *(Behaviour-thought-feeling, negative) (scored)*
It was home time from school and no bad yeas there to pick Mary up. Mary walked into the playground to find her mum. Could it be that her mum had forgotten to come to the school? Mary was very worried.

Item 4 (*Behaviour-feeling-thought, positive) (scored)*
Mary went shopping with her mum on Sunday. Mary was very pleased with her new hat. Mary hoped that her new hat would match her scarf.

Item 5 *(Thought-feeling-behaviour, negative) (scored)*
Last night there was a loud thunderstorm. The thunder sounded a bit like fireworks to Mary. Mary was very frightened. Mary hid under the table.

Item 6 *(Thought-behaviour-feeling, positive) (scored)*
It was teatime on Tuesday. Mary wondered what her mum was cooking. Mary shouted into the kitchen to find out. Mary was very happy to hear she had chips which were her favourite.

Appendix H

Procedural Instructions and stimuli material for the Thought to Feeling Linking Task

(Quakley, 2002)

Procedural instructions and stories for the 'Thought to Feeling Story Card Linking Task'.

Say: 'I am going to tell you some short stories about some different children. I am also going to ask you some questions about different things that happen to the children in the stories. There are no right or wrong answers; I am just interested in why you think certain things may have happened in the stories'

Place the cards one at a time on the table in the sequence depicted in the picture card presentations which follow the written instructions. Read the corresponding part of the story to the child.

Item 1:

Place picture 1 on the table: Picture of Sally.
Say: 'This is Sally'.

Place picture 2 on the table: Picture of Sally's rabbit in a hutch
Say: 'this is Sally's rabbit living in his hutch.

Place picture 3 on the table: Picture of Sally playing with her rabbit.
Say: 'One day Sally was playing with her Rabbit'.

Place picture 4 on the table: Picture of Spotty dog chasing Sally's Rabbit away.
Say: 'When a spotty dog chased Sally's rabbit away'.

Place picture 5 on the table: Picture of Sally looking sad.
Say: 'Sally was very sad'
Say: 'Why did Sally feel sad?
Control question to help remember and check memory – not scored.

Place picture 6 on the table: Picture of Sally playing with her friend James.
Say: 'Many days later Sally was playing with her friend James'.

Place picture 7 on the table: Picture of a photograph of Sally's rabbit.
Say: 'When Sally saw a photograph of her Rabbit'.

Place picture 8 on the table: Picture of Sally looking sad.
Say: 'Sally was very sad'.
Say: Why did Sally start to feel Sad right now.

To help elicit and encourage explanations paraphrase the child's answers back to them and encourage them to guess.

The four items are detailed below. Pictures of the visual stimuli material are presented following these

Thought to Feeling Linking Task Stories

Item One: Sad story, Female Character

Detailed on procedural instructions (page above)

Item Two: Sad Story, Male Character

This is Adam. This is Adams new bicycle and bicycle helmet. One day Adam rode over a hole in the grass and he fell off his bicycle. Adams bicycle was broken and had to be thrown away. Adam was very sad. Why was Adam sad? (Control question). Many days later, Adam was playing with his friend Annie. When he noticed his bicycle helmet. Adam was very sad. Why did Adam start to feel sad right now?

Item Three: Happy Story, Female Character

This is Emily. It was school sports day at Emily's school. This is the running track for all the races. Emily ran in a race on school sports day/ Emily won the race and got a gold medal. Emily was very happy. Why was Emily very happy right now? (Control question). Many days later, Emily was playing with her friend Luke. When Emily noticed a photo of her running in the race. Emily was very happy. Why did Emily start to feel happy right now?

Item Four: Happy Story, Male Character

This is William. This is William in his classroom with some glue and paper. All the children had to make a paper aeroplane with some paper and glue. William's aeroplane was the best in the class and William got a sticker from his teacher. William was very happy. Why was William very happy? (Control question). Many days later, William was playing with his friend Jane. When William noticed his paper aeroplane on a table. William was very happy. Why did William feel happy right now?

TFLT Stimuli Material

Story One:

Story Two:

Story Three:

Story Four:

Appendix I

Scoring Criteria for the Thought to Feeling Linking Task

(Quakley, 2002)

1. Scoring Criteria For the 'Thought to Feeling Story Card Linking Task'.

Three main elements score points for children's responses to the stories; mention of 'the cue', mention of 'a thought' and mention of the 'past event'. Each element gains a score of 4 points if mentioned spontaneously following the first question apart from if the child mentions the 'past event' only (which can only receive a score of between 1 and 3 points). Children do not score 4 points if they mention the past event only, because they have not been able to indicate spontaneously that the characters current emotion is closely linked to something occurring in the current situation.

Higher scores indicate more advanced answers. The maximum score for each story is 12 points. There are five response categories for the 'Thought to Feeling Story Card Linking Task'. For each of the scoring categories further points may be gained through cueing questions. Children are awarded fewer points for answers following cueing questions, in comparison to spontaneous answers. In the following scoring criteria, specific examples of all categories of answers are given for Item 1 of the 'Thought to Feeling Story Card Linking Task', which is shown here as a reminder, and specific examples of the most complex answers (Category Five, Cognitive Cueing Reponses) are given for all stories.

ITEM NUMBER ONE 'THE LOST RABBIT':

Picture 1: Picture of Sally.

Say: 'This is Sally'.

Picture 2: Picture of Sally's rabbit in a cage.

Say: 'This is Sally's rabbit living in his cage'.

Picture 3: Picture of Sally playing with her rabbit.

Say: 'One day Sally was playing with her rabbit'.

Picture 4: Picture of a spotty dog chasing Sally's rabbit away.

Say: 'When a spotty dog chased Sally's rabbit away'.

Picture 5: Picture of Sally looking sad.

Say: 'Sally was very sad'.

Say: Why did Sally feel sad?

(This is a control question to help the child to remember the events of the story and is not marked).

Picture 6: Picture of Sally playing with James.

Say: 'Many days later, Sally was playing with her friend James'.

Picture 7: Picture of a photograph of Sally's rabbit.

Say: 'When Sally saw a photograph of her rabbit'.

Picture 8: Picture of Sally looking sad.

Say: 'Sally was very sad'.

Question: 'Why did Sally start to feel sad right now?'

CATEGORY NUMBER ONE: SITUATIONAL RESPONSES:

The child's response is unrelated to the events of the story.

AN EXAMPLE OF A SITUATIONAL RESPONSE: 'She was sad because she wanted her tea and it wasn't there'.

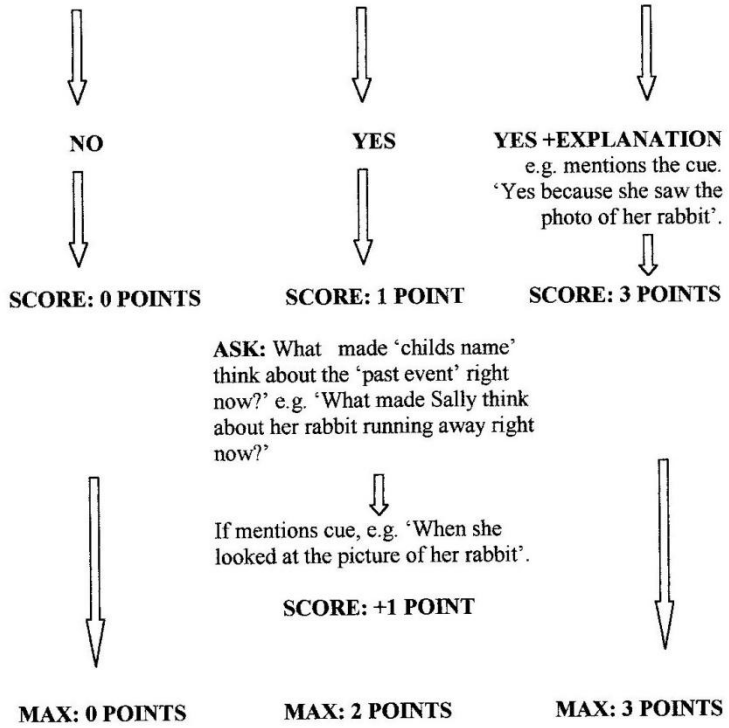
SCORE: 0 POINTS.

CATEGORY NUMBER TWO: PAST EVENT RESPONSES:

The child responds by mentioning the past event. This demonstrates a memory of the past event even if the 'memory' or 'thought' of the past event is not explicitly mentioned.

AN EXAMPLE OF A PAST EVENT RESPONSE: 'Because the rabbit ran away'.

ASK: 'Is 'child's name' thinking about the 'past event' right now?' e.g.'Is Sally thinking about her rabbit running away right now?'



CATEGORY NUMBER THREE: CUE RESPONSES:

The child responds by mentioning the cue. This demonstrates an understanding that recognition of an object, which was previously related to an emotional event, can elicit an emotional response in the 'here and now'. The child does not however explicitly mention 'thinking'. Extra points can be scored for mentioning the 'past event' in the first instance or by mentioning the 'past event' or 'thinking' following cueing questions.

EXAMPLES OF CUE RESPONSES:

1. The child mentions the cue only (not 'thinking' and not the 'past event').
e.g. 'Because she saw the photo.'

SCORE: 4 POINTS

2. The child mentions the cue and the past event but not 'thinking'.
e.g. 'She saw the photo and the rabbit had been chased away'.

SCORE: 8 POINTS

ASK: Why did seeing 'the cue' make 'child's name feel 'emotion'? e.g. 'Why did seeing the photo make Sally feel sad?'

+2 points mentions thinking e.g.
'Because it made her remember the rabbit'

+2 points mentions past event e.g
'Because her rabbit got chased away'

MAXIMUM = 8 POINTS

+2 points mentions thinking e.g.
'Because it made her remember the rabbit'.

MAXIMUM = 10 POINTS

CATEGORY NUMBER FOUR: THINKING RESPONSES:

The child responds by mentioning the characters 'thoughts'. This demonstrates an understanding that an object, which was previously related to an emotional event, can elicit a cognition / thought in the 'here and now'. The child does not however explicitly mention 'the cue'. Extra points can be scored for mentioning the 'past event' in the first instance or by mentioning the 'past event' or 'the cue' following cueing questions.

EXAMPLES OF THINKING RESPONSES:

1. The child mentions 'thinking' only not the 'cue' and not the 'past event').
e.g. 'Because she was reminded of her rabbit.'

SCORE: 4 POINTS

2. The child mentions thinking and the past event but not 'the cue'.
e.g. 'She was thinking about her rabbit that was chased away'.

SCORE: 8 POINTS

ASK: What made 'child's name' think about that right now?
e.g. 'What made Sally think about that right now?'

+2 points mentions 'the cue' e.g. 'Because she saw the photo'

+2 points mentions past event e.g 'and her rabbit got chased away'

MAXIMUM = 8 POINTS

+2 points mentions 'the cue'e.g. 'Because of the rabbit photo'

MAXIMUM = 10 POINTS

CATEGORY NUMBER FIVE: COGNITIVE CUEING RESPONSES:

These are the most complex types of response in which the child spontaneously mentions all three elements of the story required for a top score (4 points for each part) 'the cue', 'a thought' and the 'past event'. This type of response clearly demonstrates that an object in the present can trigger a thought or memory of a past event, which influences current emotion.

EXAMPLE OF A COGNITIVE CUEING RESPONSE:

'When Mary saw the photo it made her think about the time when her rabbit got chased by a spotty dog.'

SCORE: 12 POINTS.

EXAMPLES OF 12 POINT COGNITIVE CUEING RESPONSES FOR STORIES 2-4.

STORY NUMBER 2: 'THE BROKEN BICYCLE'.

'The helmet was there and it made him think about when he fell off his bike and it broke'.

STORY NUMBER 3: 'SCHOOL SPORTS DAY'.

'In the race she won a medal and that photo is of the race and it reminded her of winning'.

STORY NUMBER 4: 'THE PAPER AEROPLANE'.

'When he saw the paper aeroplane he thought about the time when he got a sticker for making it, because it was a really good one'.

Appendix J

Procedural Instructions and Stimuli Material for the Thought to Behaviour Linking Task

(Quakley, 2002)

Procedural Instructions and Stories for the 'Thought to Behaviour Story Card Linking Task'.

Say: 'I am going to tell you some short stories about some different children. I am also going to ask you some questions about different things that happen to the children in the stories. There are no right or wrong answers, I am just interested in why you think certain things may have happened in the stories'

Place the cards one at a time on the table in the sequence depicted in the picture card presentations which follow the written instructions. Read the corresponding part of the story to the child.

Example: Item 1:

Place picture 1 on the table: Picture of Ben.
Say: 'This is Ben'.

Place picture 2 on the table: Picture of Ben in his school playground
Say: 'this is Ben's playground in his new school'

Place picture 3 on the table: Picture of Ben playing in his school playground
Say: 'One day Ben was playing in his new playground'.

Place picture 4 on the table: Picture of Ben being called names by some big boys.
Say: 'When some big boys in red coats came over and called Ben names'.

Place picture 5 on the table: Picture of Ben Running away.
Say: 'Ben Ran away to hide'
Say: 'Why did Ben run away to hide?
Control question to help remember and check memory – not scored.

Place picture 6 on the table: Picture of Ben playing with his friend Clare.
Say: 'Many days later Ben was playing with his friend Clare'.

Place picture 7 on the table: Picture of the big boys
Say: 'When Ben saw the big boys in red coats'

Place picture 8 on the table: Picture of Ben running away.
Say: 'Ben ran away to hide
Say: Why did Ben run away to hide right now.

To help elicit and encourage explanations paraphrase the child's answers back to them and encourage them to guess.

The four items are detailed below. Pictures of the visual stimuli material are presented following these

Thought to Behaviour Linking Task Stories

Item One: Sad story, Male Character
Detailed on procedural instructions (page above)

Item Two: Sad Story, Female Character
This is Wendy. These are Wendy's new lace up shoes which have long red shoe laces. One day Wendy was at school when her shoe laces came undone but she couldn't tie them up. Many children laughed at Wendy because she couldn't tie her laces. Wendy ran away to practice tying her laces alone. Why did Wendy run away to practice tying her laces alone? (Control question). Many days later, Wendy was playing with her friend Steven. When she noticed her new shoes, with the long red laces, in a cupboard. Just then Wendy went away on her own to practice tying her shoe laces. Why did Wendy go away on her own to practice tying her shoe laces right now?

Item Three: Happy Story, Female Character
This is Laura. This is Laura's mum and dad looking through a Disneyland holiday book. One night Laura and her mum and dad sat down and watched a Disney film. When Laura's mum and dad told her they were going to take her on holiday to Disneyland and they showed her the pictures in the Disneyland holiday book. Laura jumped up and down. Why did Laura jump up and down? (Control Question) Many days later, Laura was playing with her friend Tom. When she found the holiday book about Disneyland. Laura jumped up and down. Why did Laura jump up and down right now?

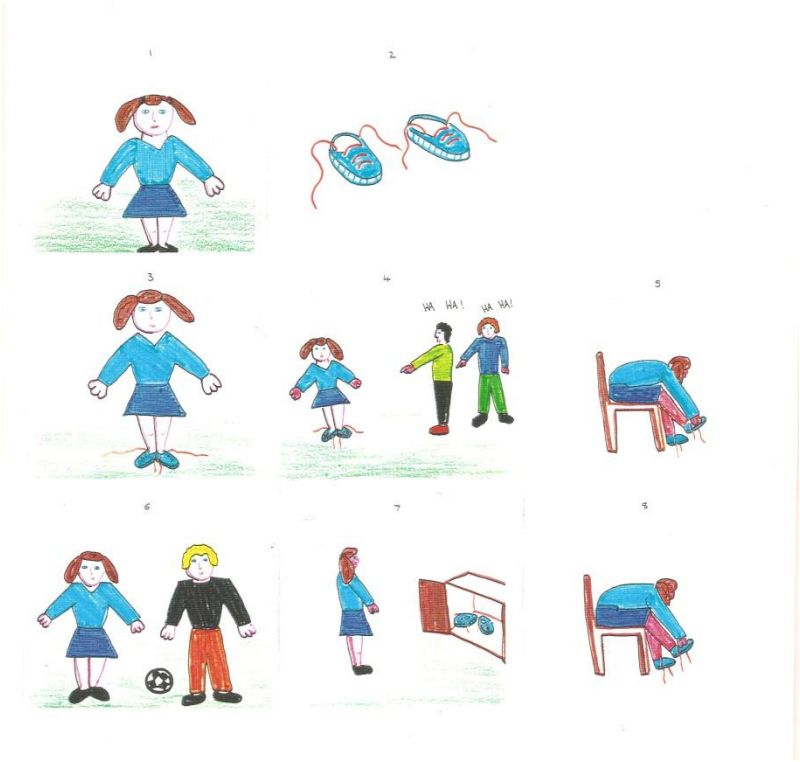
Item Four: Happy Story, Male Character
This is Peter. This is Peter's best friend Nicola, with her favourite Teddy. Peter's friend Nicola had to move a long way away and change school, so Peter didn't get to see her very often. One day Peter gets a letter from Nicola to say that she will come to visit soon, because she left her teddy behind last time that she came to stay. Peter ran over to look at the window. Why did Peter run over to look out of the window? (Control Question). Many days later, Peter was playing with his sister. When he notices Nicola's letter on the kitchen table. Peter ran over to look out of the window. Why did Peter run over to look out of the window right now?

TBLT Stimuli Material

Story One:

Story Two:

Story Three:



Story Four:

Appendix K

Scoring Criteria for the Thought to Behaviour Linking Task

(Quakley, 2002)

1. Scoring Criteria For the 'Thought to Behaviour Story Card Linking Task'.

Three main elements score points for children's responses to the stories; mention of 'the cue', mention of 'a thought' and mention of the 'past event'. Each element gains a score of 4 points if mentioned spontaneously following the first question apart from if the child mentions the 'past event' only (which can only receive a score of between 1 and 3 points). Children do not score 4 points if they mention the past event only, because they have not been able to indicate spontaneously that the characters current behaviour is closely linked to something occurring in the current situation.

Higher scores indicate more advanced answers. The maximum score for each story is 12 points. There are five response categories for the 'Thought to Behaviour Story Card Linking Task'. For each of the scoring categories further points may be gained through cueing questions. Children are awarded fewer points for answers following cueing questions, in comparison to spontaneous answers. In the following scoring criteria, specific examples of all categories of answers are given for Item 1 of the 'Thought to Behaviour Story Card Linking Task', which is shown here as a reminder, and specific examples of the most complex answers (Category Five, Cognitive Cueing Reponses) are given for all stories.

ITEM NUMBER ONE 'NAME CALLING':

Picture 1: Picture of Ben.

Say: 'This is Ben'.

Picture 2: Picture of Ben in his school playground.

Say: 'This is Ben's playground in his new school'.

Picture 3: Picture of Ben playing in his new playground.

Say: 'One day Ben was playing in his new playground'.

Picture 4: Picture of Ben being called names by some big boys.

Say: 'When some big boys in red coats came over and called Ben names'.

Picture 5: Picture of Ben running away.

Say: 'Ben ran away to hide'.

Say: 'Why did Ben run away to hide?'

(This is a control question to help the child to remember the events of the story and is not marked).

Picture 6: Picture of Ben playing with his friend Clare.

Say: 'Many days later, Ben was playing with his friend Clare'.

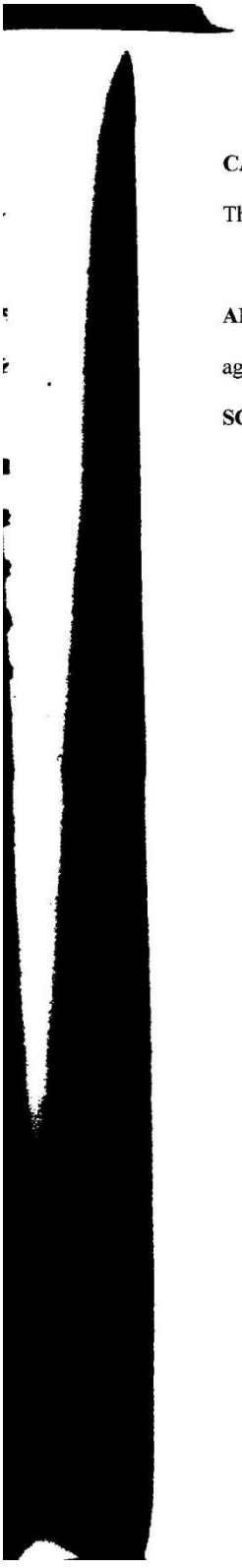
Picture 7: Picture of the big boys.

Say: 'When Ben saw the big boys in red coats'.

Picture 8: Picture of Ben running away.

Say: 'Ben ran away to hide'.

Question: 'Why did Ben run away to hide right now?'



CATEGORY NUMBER ONE: SITUATIONAL RESPONSES:

The child's response is unrelated to the events of the story.

AN EXAMPLE OF A SITUATIONAL RESPONSE: 'He ran away to play football again'.

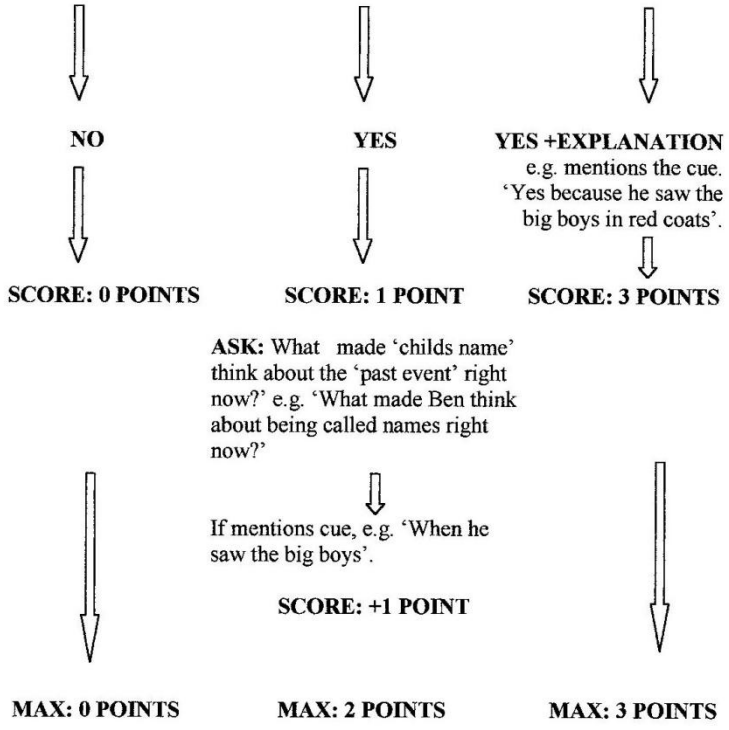
SCORE: 0 POINTS.

CATEGORY NUMBER TWO: PAST EVENT RESPONSES:

The child responds by mentioning the past event. This demonstrates a memory of the past event even if the 'memory' or 'thought' of the past event is not explicitly mentioned.

AN EXAMPLE OF A PAST EVENT RESPONSE: 'He was called names before'.

ASK: 'Is 'child's name' thinking about the 'past event' right now?' e.g.'Is Ben thinking about being called names right now?'



CATEGORY NUMBER THREE: CUE RESPONSES:

The child responds by mentioning the cue. This demonstrates an understanding that recognition of an object, which was related to a past event, can elicit a behavioural response in the 'here and now'. The child does not however explicitly mention 'thinking'. Extra points can be scored for mentioning the 'past event' in the first instance or by mentioning the 'past event' or 'thinking' following cueing questions.

EXAMPLES OF CUE RESPONSES:

1. The child mentions the cue only (not 'thinking' and not the 'past event').
e.g. 'Because he saw the big boys.'

SCORE: 4 POINTS

2. The child mentions the cue and the past event but not 'thinking'.
e.g. 'He saw the big boys who called him names before'.

SCORE: 8 POINTS

ASK: Why did seeing 'the cue' make 'child's name 'perform action'? e.g. 'Why did seeing the big boys make Ben run away?'

+2 points mentions thinking e.g. 'Because he could remember when…'

+2 points mentions past event e.g '…they called him names before.'

MAXIMUM = 8 POINTS

+2 points mentions thinking e.g. 'Because he remembered they called him horrible names'.

MAXIMUM = 10 POINTS

CATEGORY NUMBER FOUR: THINKING RESPONSES:

The child responds by mentioning the characters 'thoughts'. This demonstrates an understanding that an object, which was related to a previous event, can elicit a cognition / thought in the 'here and now'. The child does not however explicitly mention 'the cue'. Extra points can be scored for mentioning the 'past event' in the first instance or by mentioning the 'past event' or 'the cue' following cueing questions.

EXAMPLES OF THINKING RESPONSES:

1. The child mentions 'thinking' only not the 'cue' and not the 'past event'). e.g. 'Because he remembered them'

SCORE: 4 POINTS

2. The child mentions 'thinking' and the 'past event' but not 'the cue'. e.g. 'He was thinking about being called names before'.

SCORE: 8 POINTS

ASK: What made 'child's name' think about that right now?
e.g. 'What made Ben think about that right now?'

+2 points mentions 'the cue' e.g. 'Because he saw the big boys'
+2 points mentions past event e.g 'and they said nasty names to him last time'

MAXIMUM = 8 POINTS

+2 points mentions 'the cue'e.g. 'Because the boys in red coats were there'

MAXIMUM = 10 POINTS

CATEGORY NUMBER FIVE: COGNITIVE CUEING RESPONSES:

These are the most complex types of response in which the child spontaneously mentions all three elements of the story required for a top score (4 points for each part) 'the cue', 'a thought' and the 'past event'. This type of response clearly demonstrates that an object in the present can trigger a thought or memory of a past event, which influences current behaviour.

EXAMPLE OF A COGNITIVE CUEING RESPONSE:

'He ran away because the big boys were there and he remembered they called him names one time'

SCORE: 12 POINTS.

EXAMPLES OF 12 POINT COGNITIVE CUEING RESPONSES FOR STORIES 2-4.

STORY NUMBER 2: 'TYING SHOE LACES'.

'When she looked at the shoes she remembered people laughed at her before so she went to practise doing them up in-case he laughs too'.

STORY NUMBER 3: 'GOING TO DISNEYLAND'.

'Because she's noticed the book and remembers that her mum and dad are going to take her on holiday'.

STORY NUMBER 4: 'LETTER FROM A FRIEND'.

'In the letter it says that his friend is coming to visit so when he saw it again he thought about her and wants to see if she's there yet'.

Appendix L

First and Second order ToM tasks used in the study and examples of 3rd and 4th order tasks

(Liddle & Nettle, 2006)

Cognitive Behavioural Therapy Skills in Children who have survived a Traumatic Brain Injury

Theory of Mind Task

Say: 'I am going to tell you two stories about some children now. I am also going to ask you some questions about different things that happen to the children in the story. There are no right or wrong answers, I am just interested in what you think may have happened in the story'

First Order Theory of Mind Task

Say: 'Bobby *(Sally)* loves chocolate. Bobby's mum knows that chocolate is Bobby's favourite thing in all the world. He keeps lots of chocolate bars in the cupboard in his bedroom. Bobby's mum doesn't like him eating chocolate. It might spoil his tea! One day when he has gone to his friend's house, Bobby's mum moves the chocolate bars and she puts them into her pink shopping bag'

Memory:
Say: Which one is true?
a) Bobby's mum's shopping bag was yellow.
b) Bobby's mum's shopping bag was pink.

Theory of mind Level 1:
Say: Which one is true?
a) Bobby thinks his chocolate is in his mum's shopping bag.
b) Bobby thinks his chocolate is in his cupboard.

Second Order Theory of Mind Task

Say: Johnny and Bob (*Hannah and Olivia)* are best friends. They really enjoy playing football *(Netball)* together. Johnny and Bob both want to play on the school football team. The school football team plays every Monday after school. Johnny thinks that he is not as good at football as Bob is. He thinks that the football manager is more likely to choose Bob for the football team. But the football manager thinks that both Johnny and Bob are good football players. He wants them both to play in the school football team. But the manager knows that Johnny doesn't think he will get on the team.

Memory:
Say; Which one is True?
a) Johnny and Bob are best friends.
b) Johnny and Bob are brothers.

Theory of Mind Level 2:
Say: Which one is True?
a) Johnny doesn't know that the manager wants both him and Bob on the team.
b) Johnny thinks that the manager wants both him and Bob on the team.

(Characters name for girls)

Examples of 3rd and 4th order ToM tasks

Third order

Class four were having a spelling test on Friday. Mrs Smith, the teacher for class four, told all the children to work really hard. Hard work meant that they would do really well in the test, Kirsty wanted to do well. She wanted to please her mum. She learned all the words that she knew would be in the test. When Kirsty went into class on Friday, she told Mrs Smith that she had been learning the words all week so that her mum would be pleased with her test score. When the spelling test started, Mrs Smith turned to James first. James was a friend of Kirsty but sometimes he was rather lazy. "James" said Mrs Smith "how do you spell balloon?" James had not been learning his spellings. He could not remember how to spell balloon. He did not know how to spell balloon. But James did remember that there was a poster in the classroom which had balloons on it. He knows the word balloon was written on that poster. The poster was behind Mrs Smith. She could not see it. James cheated and spelled out the worked balloon from the poster – b-a-l-l-o-o-n. Mrs Smith said "well done, James, that's correct"

Level three questions – Ask the child "which one is true?"

a) James thinks that Mrs Smith believes that he knows how to spell 'balloon'
b) James thinks that Mrs Smith knows that he doesn't really know how to spell 'balloon'

Fourth Order

Sarah and Joe are in the same class at school. Sarah and Joe often sit next to each other. Their teacher is Mrs Brown. One day Mrs Brown suggests that Sarah and Joe bring a video in to school to watch with the other children as a treat for being in class. Mrs Brown says to them "make sure you bring in something really funny that I will like too!" Sarah's favourite videos are cartoons. Joe's favourite videos are adventure films. Which will it be? Cartoons or adventure films? Joe says to Sarah: "we just can't decide so I think we should take in the film that Mrs Brown would like. Sarah do you know which Mrs Brown would like best?" Sarah has a little think. She doesn't have a clue which film Mrs Brown would like! But Sarah decides to tell Joe that she knows that Mrs Brown likes cartoons best. Sarah thinks that this will make Joe decide to take cartoon videos in to school Joe listens to this and then Joe says; "we will take in a video of cartoons then". So Sarah gets to enjoy her favourite cartoons!

Level four questions – Ask the child "which one is true?"

a) Sarah hoped that Joe would know that she didn't know what Mrs Brown wanted
b) Sarah hoped that Joe would believe that she knew what Mrs Brown wanted

Appendix M

The Empathy Quotient for Children

(Auyeung et al., 2009)

University of East Anglia

Empathy Quotient – Child

Please tick the most appropriate box for each statement

		Definitely Agree	Slightly Agree	Slightly Disagree	Definitely Disagree
1	My child likes to look after other people.				
2	My child often doesn't understand why some things upset other people so much.				
3	My child would not cry or get upset if a character in a film died.				
4	My child is quick to notice when people are joking.				
5	My child enjoys cutting up worms, or pulling the legs off insects.				
6	My child has stolen something they wanted from their sibling or friend.				
7	My child has trouble forming friendships.				
8	When playing with other children, my child spontaneously takes turns and shares toys.				
9	My child can be blunt giving their opinions, even when these may upset someone.				
10	My child would enjoy looking after a pet.				
11	My child is often rude or impolite without realising it.				
12	My child has been in trouble for physical bullying.				
13	At school, when my child understands something they can easily explain it clearly to others.				
14	My child has one or two close friends, as well as several other friends.				
15	My child listens to others' opinions, even when different from their own.				

		Definitely Agree	Slightly Agree	Slightly Disagree	Definitely Disagree
16	My child shows concern when others are upset.				
17	My child can seem so preoccupied with their own thoughts that they don't notice others getting bored.				
18	My child blames other children for things that they themselves have done.				
19	My child gets very upset if they see an animal in pain.				
20	My child sometimes pushes or pinches someone if they are annoying them.				
21	My child can easily tell when another person wants to enter into conversation with them.				
22	My child is good at negotiating for what they want.				
23	My child would worry about how another child would feel if they weren't invited to a party.				
24	My child gets upset at seeing others crying or in pain.				
25	My child likes to help new children integrate in class.				
26	My child has been in trouble for name-calling or teasing.				
27	My child tends to resort to physical aggression to get what they want.				

Appendix N

The Strengths and Difficulties Questionnaire

(Goodman, 2001)

Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of the child's behaviour over the last six months or this school year.

Child's Name ..... Male/Female

Date of Birth.....

	Not True	Somewhat True	Certainly True
Considerate of other people's feelings	☐	☐	☐
Restless, overactive, cannot stay still for long	☐	☐	☐
Often complains of headaches, stomach-aches or sickness	☐	☐	☐
Shares readily with other children (treats, toys, pencils etc.)	☐	☐	☐
Often has temper tantrums or hot tempers	☐	☐	☐
Rather solitary, tends to play alone	☐	☐	☐
Generally obedient, usually does what adults request	☐	☐	☐
Many worries, often seems worried	☐	☐	☐
Helpful if someone is hurt, upset or feeling ill	☐	☐	☐
Constantly fidgeting or squirming	☐	☐	☐
Has at least one good friend	☐	☐	☐
Often fights with other children or bullies them	☐	☐	☐
Often unhappy, down-hearted or tearful	☐	☐	☐
Generally liked by other children	☐	☐	☐
Easily distracted, concentration wanders	☐	☐	☐
Nervous or clingy in new situations, easily loses confidence	☐	☐	☐
Kind to younger children	☐	☐	☐
Often lies or cheats	☐	☐	☐
Picked on or bullied by other children	☐	☐	☐
Often volunteers to help others (parents, teachers, other children)	☐	☐	☐
Thinks things out before acting	☐	☐	☐
Steals from home, school or elsewhere	☐	☐	☐
Gets on better with adults than with other children	☐	☐	☐
Many fears, easily scared	☐	☐	☐
Sees tasks through to the end, good attention span	☐	☐	☐

Signature ..... Date .....

Parent/Teacher/Other (please specify:)

Thank you very much for your help

Appendix O

UEA Faculty of Health Ethical Approval Letter

Faculty of Medicine and Health Sciences Research Ethics Committee

Amy Carroll
Room 2.30, Elizabeth Fry Building
Norwich Medical School
University of East Anglia
Norwich
NR4 7TJ

Research & Enterprise Services
West Office (Science Building)
University of East Anglia
Norwich Research Park
Norwich, NR4 7TJ

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Fax 01603 591550
Email: fmh.ethics@uea.ac.uk

Web: www.uea.ac.uk/researchandenterprise

23rd May 2012

Dear Amy

Title: Cognitive Behavioural Therapy Skills in Typically Developing Children, The Role of Executive Function, Empathy and Theory of Mind. Reference 2011/2012-40

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

Please could you ensure that any further 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 Committee would like to wish you good luck with your project

Yours sincerely

Yvonne Kirkham
Project Officer

Appendix P

Rationale Read to Children at the Beginning of Assessment

Rationale provided to children at the beginning of the assessment session (adapted from Quakley 2002)

‘I would like you to help me with some work that I am doing, which looks at how children think. It is not a test and there are no right or wrong answers. I won’t be telling your mum and dad or your teachers how you do, the answers are just for my project, to help me understand how children think about things’

‘I will make some notes on this paper as we go along, but I won’t write your name down on the notes, only a number. I will be recording our meeting on this recorder so that my supervisor, who is a bit like my teacher can listen to make sure I have asked all the questions properly, i won’t put your full name on the tape, it is only being made to make sure i ask my questions properly. i will be asking lots of children your age the same questions’

‘Are you happy to take part in my study? Do you have any questions for me now? If you think of questions later then you can ask me at any point. If you feel that you want to stop at any point, or change your mind about taking part then just say and we will stop’

Appendix Q

Child Assent Form

University of East Anglia

Assent form

I have met Amy and she has talked to me about some games and puzzles that we are going to do together

I am happy to do these games and puzzles with Amy and understand that Amy will not tell anyone my results

Amy has explained that if I decide I don't want to carry on with the games and puzzles at any time then we will stop.

Name:.....

Age.....

Thank you very much 

Appendix R

Debrief Questions

University of East Anglia

Debriefing (adapted from Quakley 2002)

At the end of the assessment tasks children will be asked the following questions

1. Was that hard or easy?

2. Did the task make you think about anything?

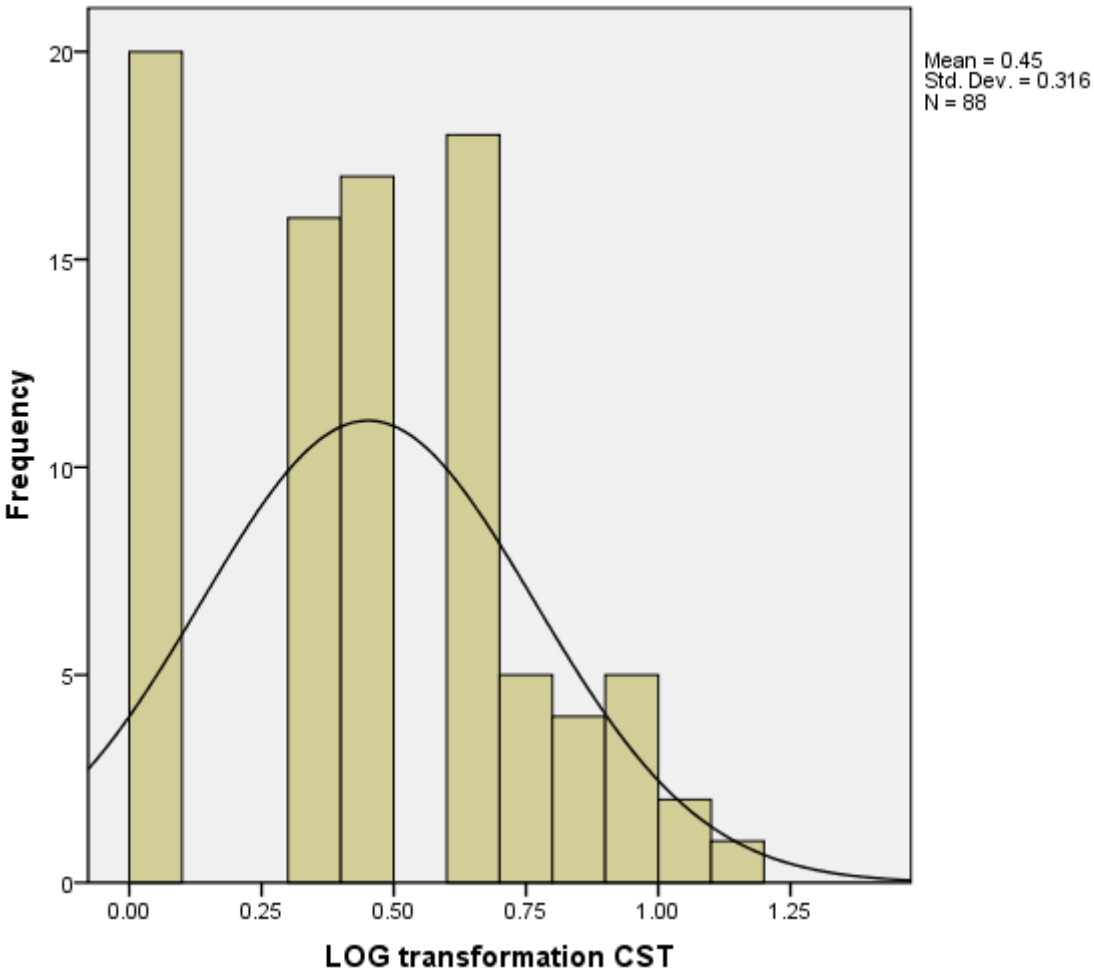
3. Do you have any questions?

After this the children will be thanked for their participation.

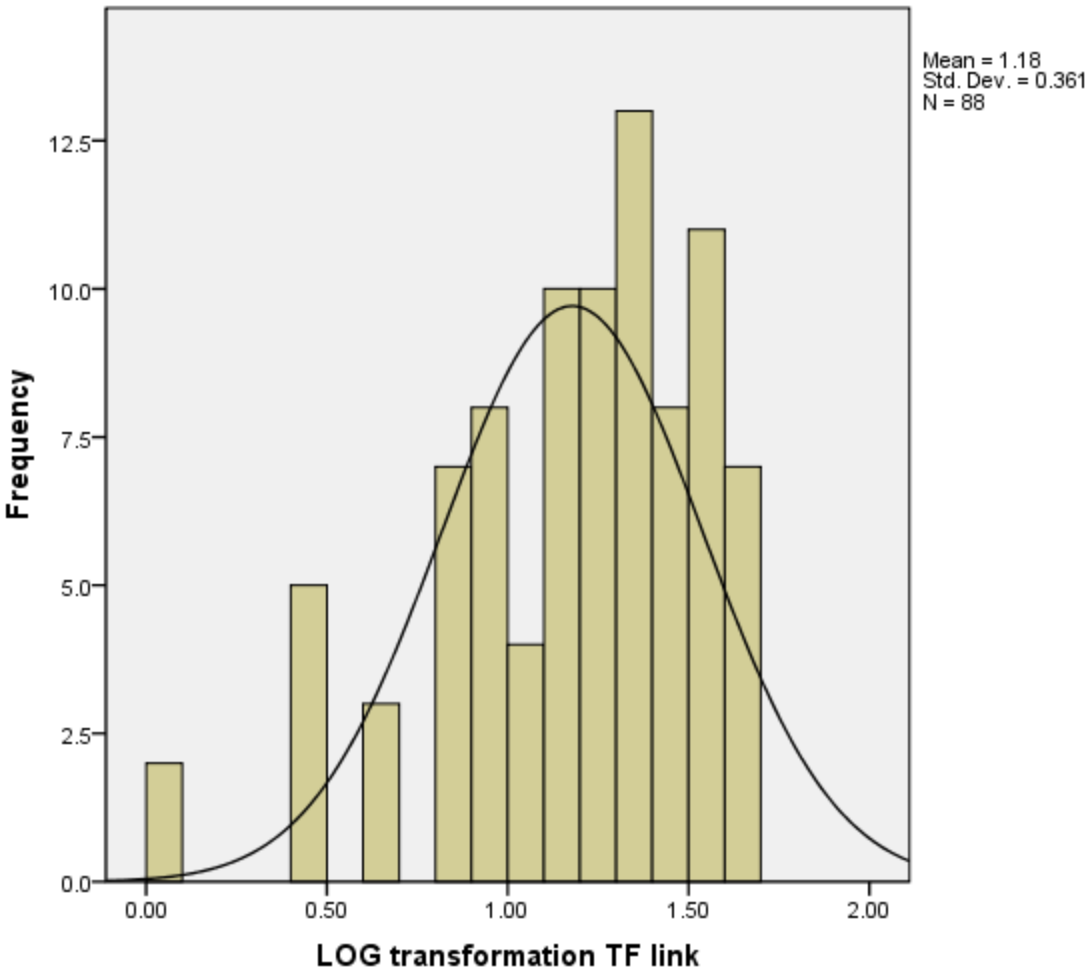
Appendix S

Histograms Illustrating Unsuccessful Log Transformations of Non-Normally Distributed Variables (CST, TFLT, ToM, BRIEF_MI and BRIEF_BRI)

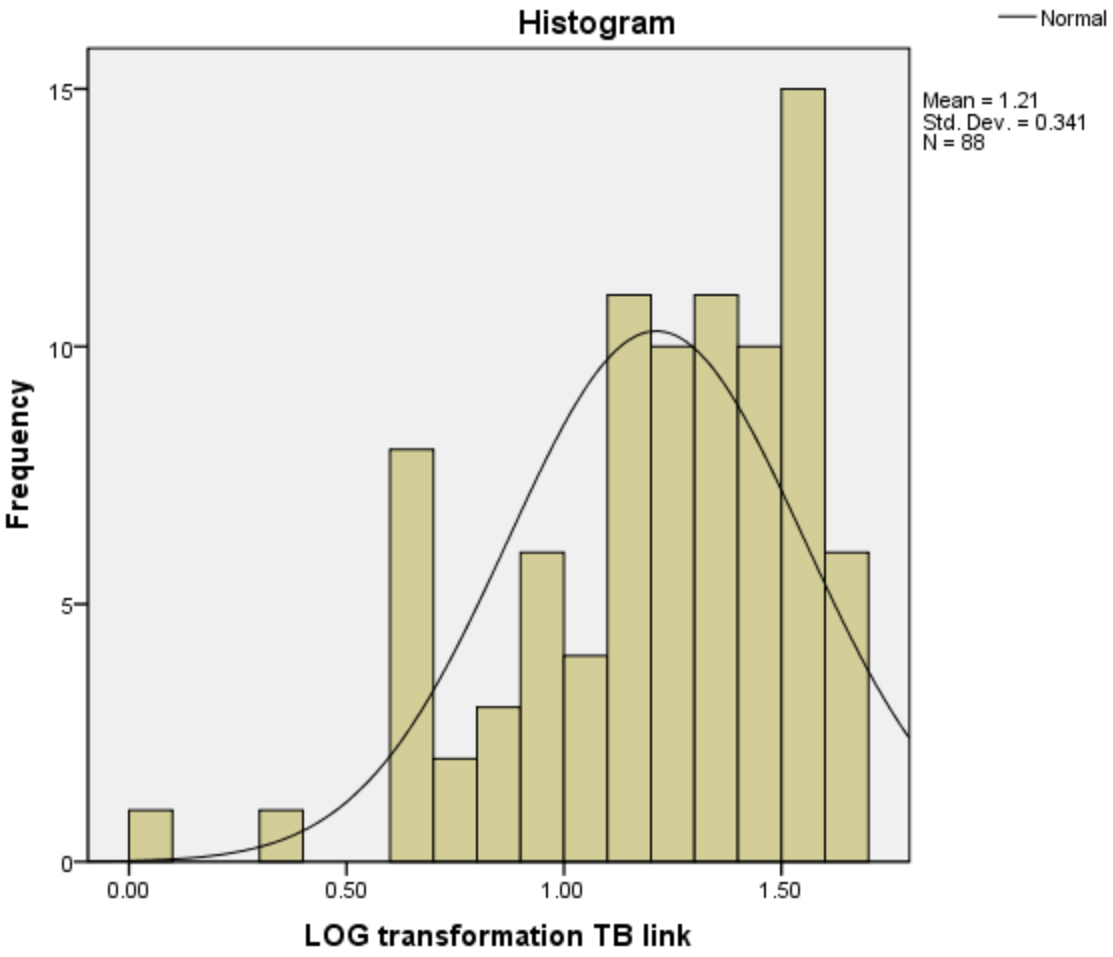
Distribution of CST following LOG transformation



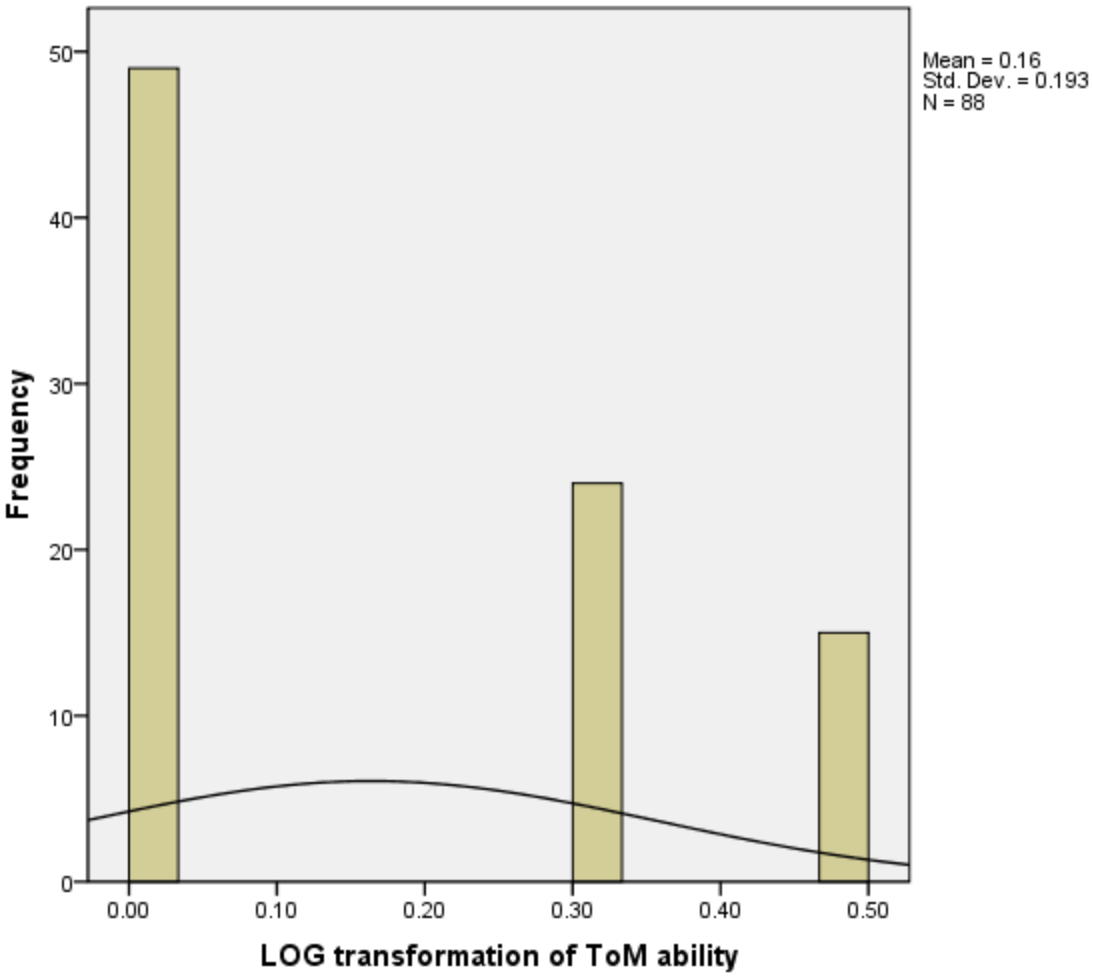
Distribution of TFLT following LOG transformation



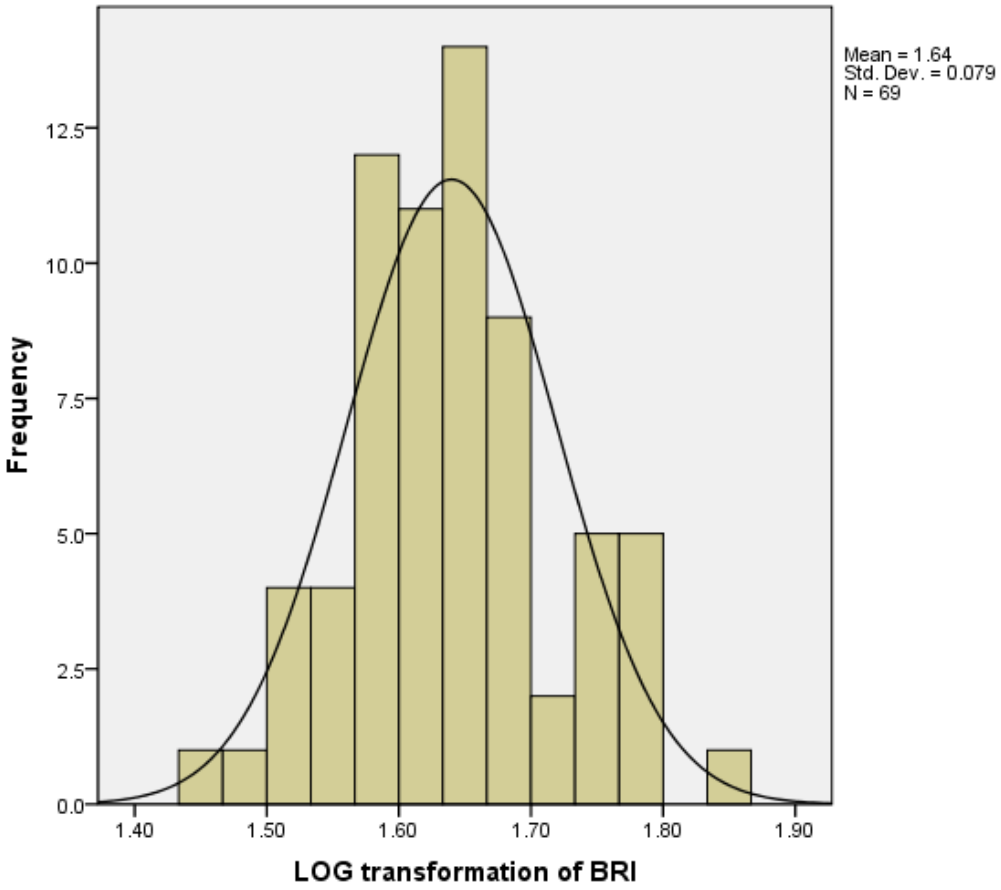
Distribution of TBLT following LOG transformation



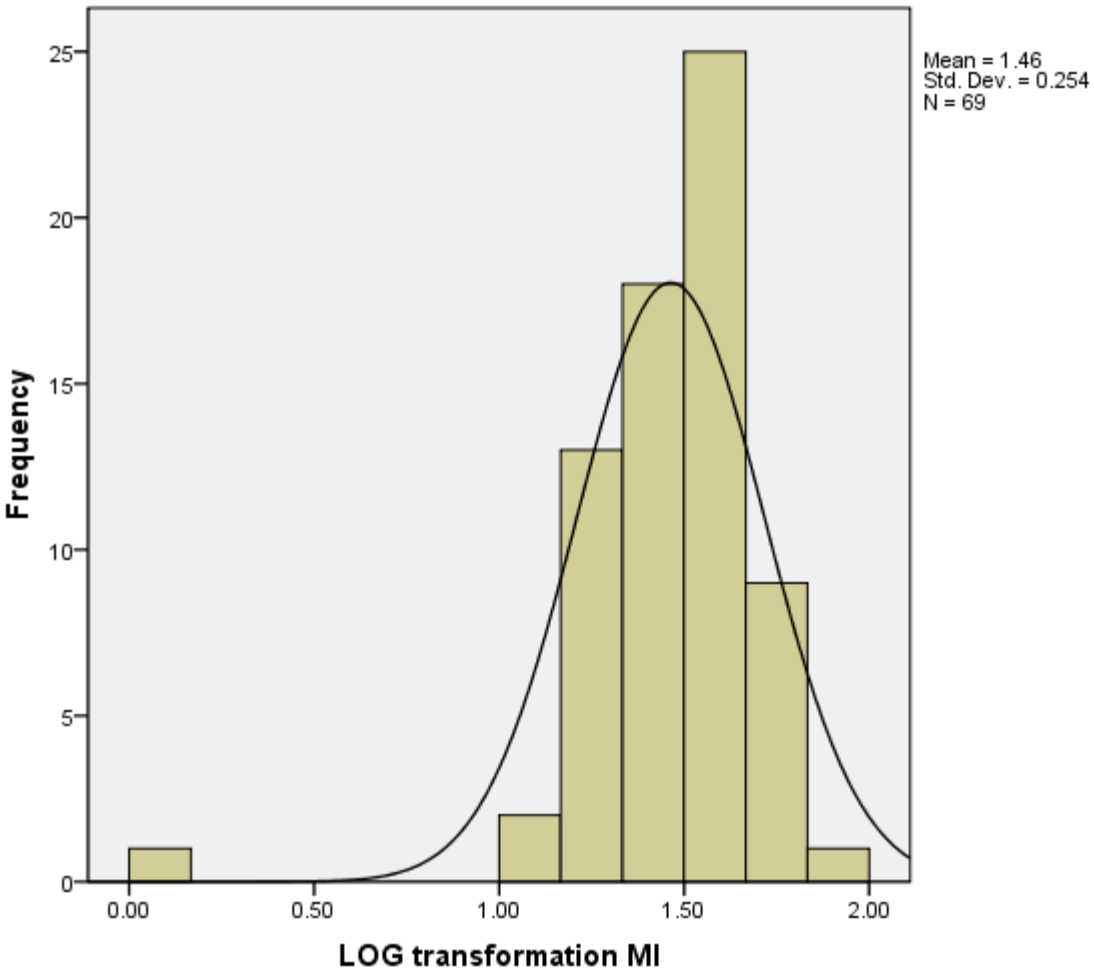
Distribution of ToM following LOG transformation



Distribution of BRIEF_BRI following LOG transformation

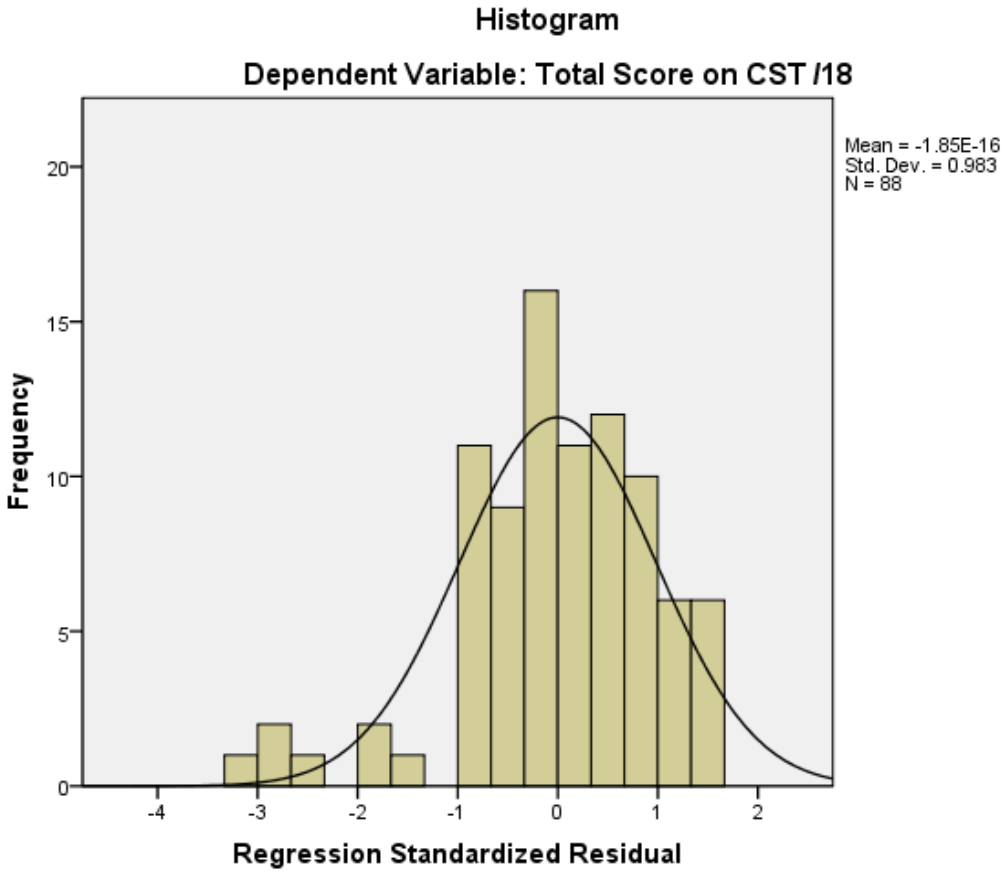


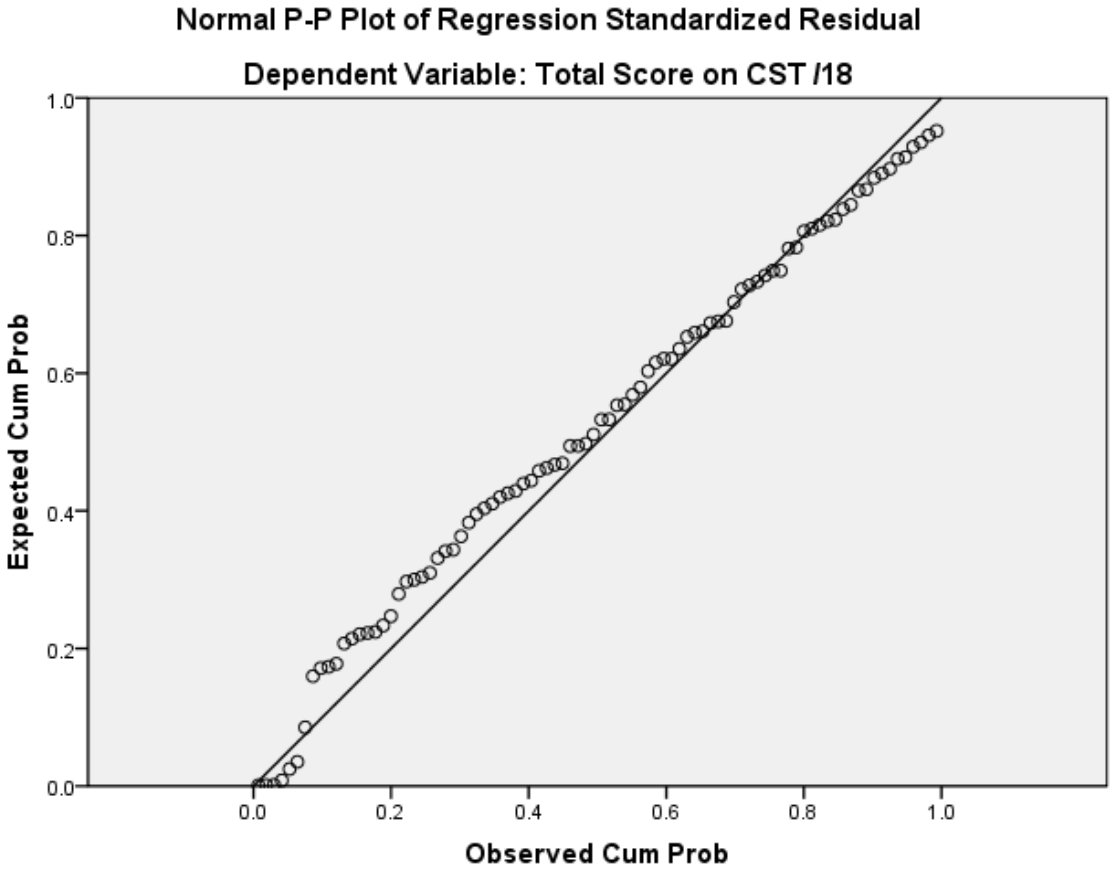
Distribution of BRIEF_BRI following LOG transformation

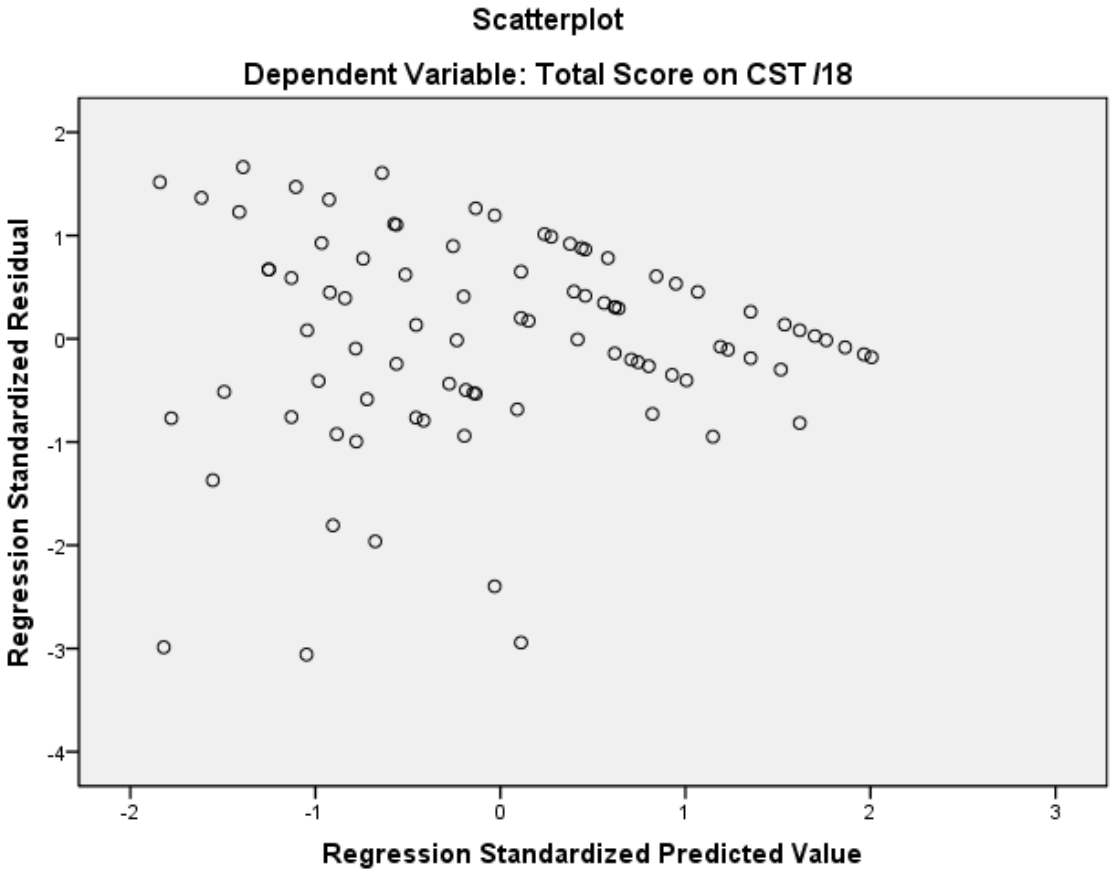


Appendix T

Histogram of Residuals, p-p Plot and Scatter Plot for Multiple Linear Regression between CST Performance and ToL Performance, Age and Verbal IQ.

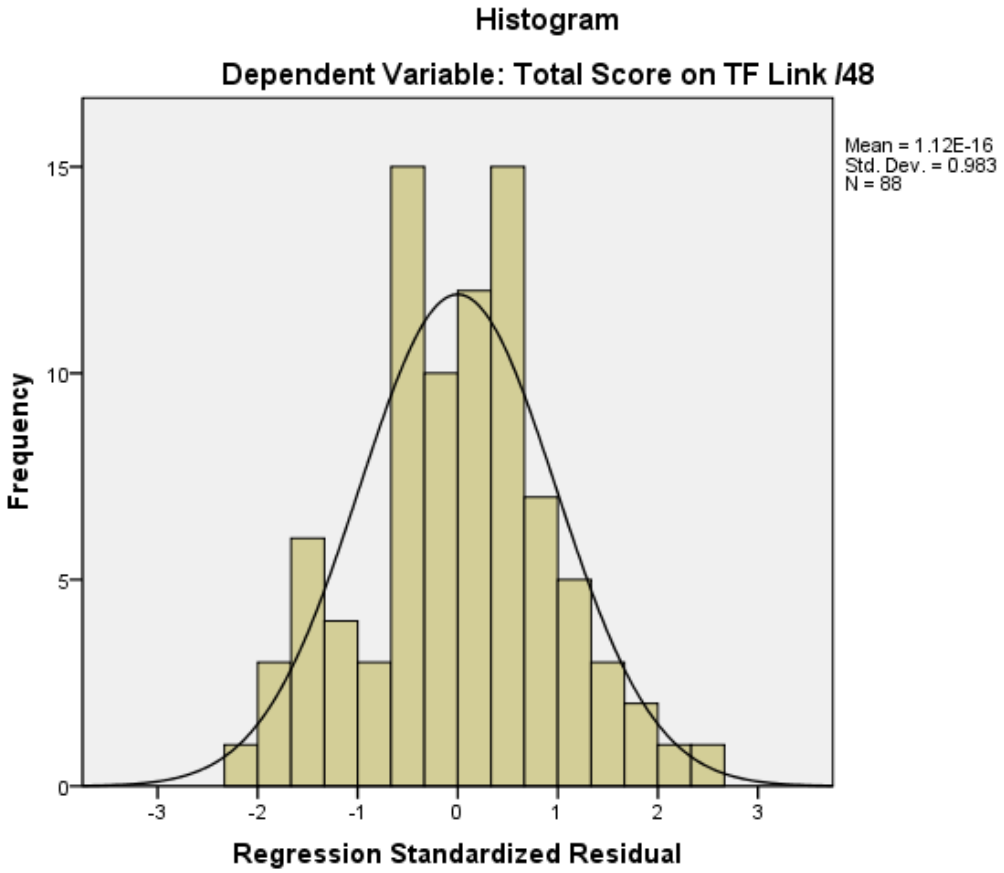

Histogram
Dependent Variable: Total Score on CST /18
Mean = -1.85E-16
Std. Dev. = 0.983
N = 88
Frequency
20
15
10
5
0
-4
-3
-2
-1
0
1
2
Regression Standardized Residual

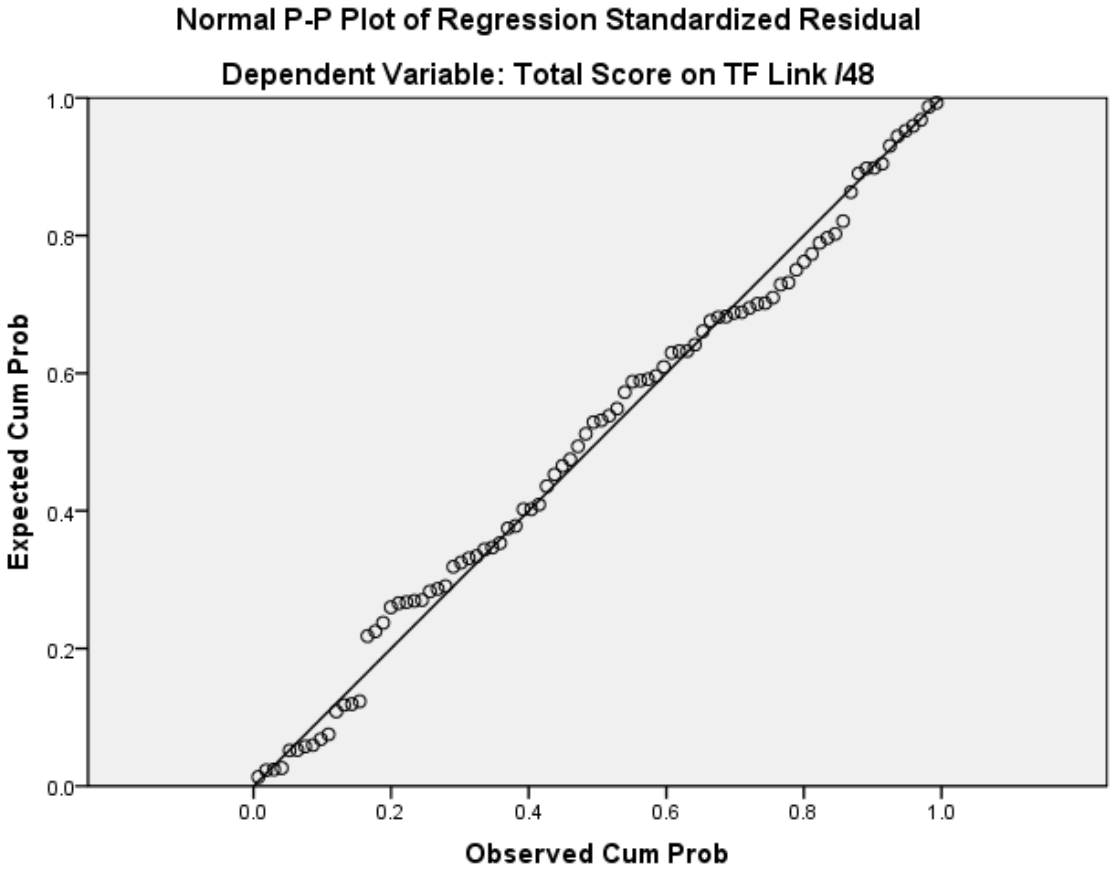

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Total Score on CST /18
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

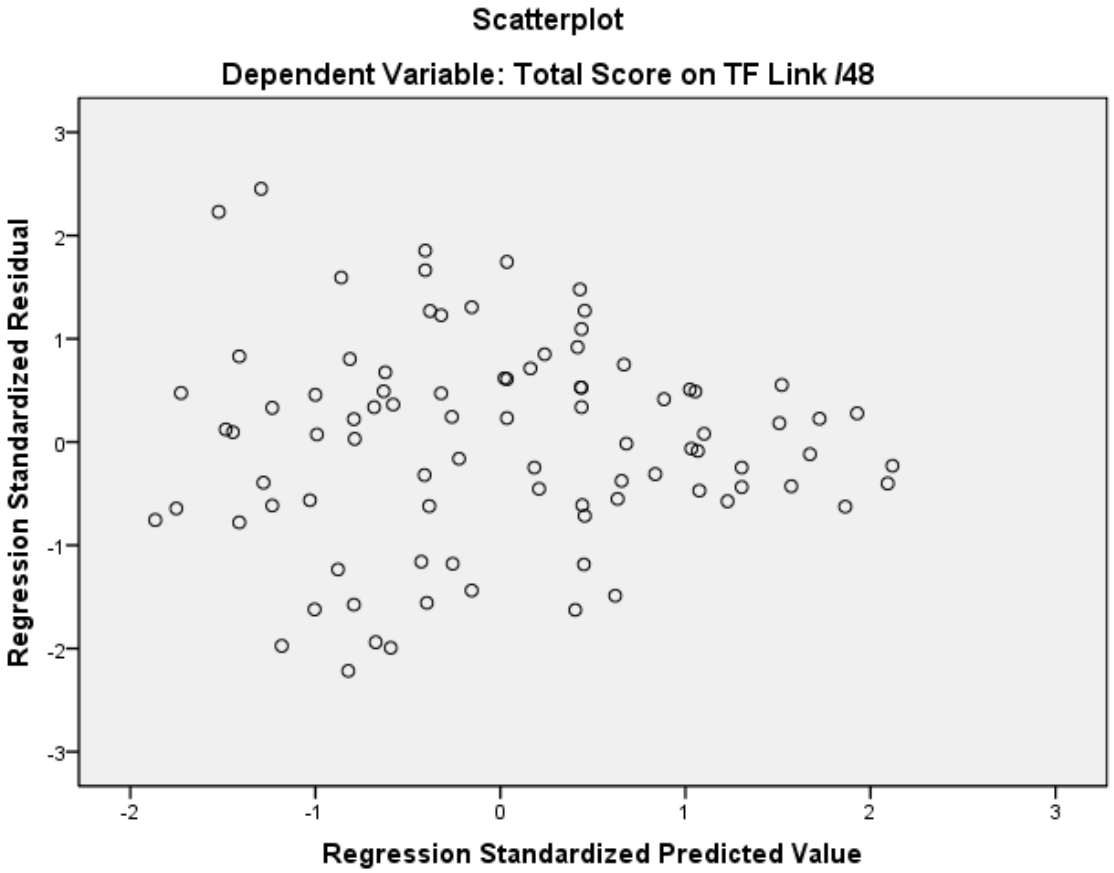

Scatterplot
Dependent Variable: Total Score on CST /18
Regression Standardized Residual
Regression Standardized Predicted Value
2
1
0
-1
-2
-3
-4
-2
-1
0
1
2
3

Appendix U

Histogram of Residuals, p-p Plot and Scatter Plot for Multiple Linear Regression between TFLT Performance and ToL Performance, Age and Verbal IQ.


Histogram
Dependent Variable: Total Score on TF Link /48
Mean = 1.12E-16
Std. Dev. = 0.983
N = 88
Frequency
15
10
5
0
-3
-2
-1
0
1
2
3
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Total Score on TF Link /48
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: Total Score on TF Link /48
Regression Standardized Residual
Regression Standardized Predicted Value
3
2
1
0
-1
-2
-3
-2
-1
0
1
2
3