An Evaluation of the FRIENDS for Life Intervention with an Autism Spectrum Population: Evaluating the Impact on Children's Anxiety

Gemma Slack

Thesis submitted to the University of Nottingham for the degree of Doctor of Applied Educational Psychology,

December 2013

THIS THESIS CONTAINS A CD WHICH WE ARE NOT PERMITTED TO COPY

PLEASE CONTACT THE UNIVERSITY IF YOU WISH TO SEE THIS MATERIAL

Abstract

This study presents an evaluation of the FRIENDS for Life program (Barrett, 2010) with an autism spectrum (AS) population. FRIENDS for Life is an intervention program underpinned by the principles of cognitive behavioural therapy (CBT) with a primary aim of reducing participant anxiety levels (Barrett, 2010). Existing research suggests it is an effective intervention in reducing participant anxiety levels (Briesch, Hagermoser Sanetti and Briesch, 2010) and it has been recognised by the World Health Organisation (2004) as the only evidence based program effective in reducing anxiety as a universal and targeted intervention. In recent years an evidence base for the application of CBT with children with AS has emerged, though primarily this research has been conducted in a clinical setting. Therefore this study aims to contribute to both evidence bases through implementing the FRIENDS for Life program within a new population as well as contributing to the broader evidence base evaluating the effectiveness of CBT with children with AS.

The study adopted a post positivist epistemology and used a single case experimental design (SCED) to evaluate the effectiveness of the intervention in reducing the anxiety of four participants, aged nine to eleven, accessing special school provision. Anxiety was measured during a baseline, intervention and follow up phase using two weekly measures: the Paediatric Index of Emotional Distress (PI-ED; O'Connor et al, 2010); a short pupil questionnaire, and a weekly observation of participant behaviour. These measures were also triangulated with pre and post measures of anxiety using the Spence Child Anxiety Scale, child (Spence, 1997) and parent (Spence, 1999) version, and the School Anxiety Scale- Teacher Form (Lyneham, Street, Abbott and Rapee, 2008).

Outcomes from the SCED showed that for all four pupils there was a significant decrease in anxiety from baseline to follow up on at least one weekly measure of anxiety, indicating a delayed effect on anxiety. The parent, child and teacher report

triangulation measures suggested there was no significant change in anxiety post intervention.

When considering outcomes, several key limitations to the study's design and implementation were taken into account including threats to construct validity and missing data in the intervention phase for two participants.

The study concludes with support for the positive impact on participant anxiety as a result of the FRIENDS for Life intervention and recommendations are made for further investigation of the use of CBT interventions in schools with an AS population.

Acknowledgements

Table of Contents

List of Tables

List of Figures

List of Appendices

Appendix One: Electronic copy of the adapted home book and activity book for the FRIENDS for Life intervention

Appendix Two: Discussion record form from initial meeting with prospective school

Appendix Three: Information shared at initial meeting with reference group to inform participant selection

Appendix Four: Invitation to parent information afternoon

Appendix Five: Information shared at parent information afternoon

Appendix Six: Example page of the adapted PI-ED

Appendix Seven: Semi-structured interview schedules for identifying anxiety related behaviour

Appendix Eight: Observation schedules for four participants

Appendix Nine: Example of material adaptations using widgit symbols

Appendix Ten: Photograph of room layout

Appendix Eleven: Intervention integrity measure

Appendix Twelve: Ethics Committee Acceptance Letter

Appendix Thirteen: Parent consent form

Appendix Fourteen: Participant consent form

Appendix Fifteen: Visual analysis inter rater agreement

Appendix Sixteen: PI-ED integrity measure

1. Chapter One: Introduction

In recent years the promotion of pupil psychological wellbeing and mental health in school settings has become increasingly high profile (Frederickson and Cline, 2009). Government policies have recognised that developing effective early intervention strategies (National Service Framework for Children, DoH, 2004) and raising staff awareness of mental health issues are particular areas for improvement (DfES, 2004).

The researcher's personal interest in supporting pupil mental health in schools developed whilst working as a primary school teacher in an inner city school in the East Midlands. The researcher worked as part of a setting that particularly valued pupils' social and emotional development and recognised the importance of this for learning to take place. The researcher has continued to appreciate the impact of social, emotional and mental health issues on child development and learning in her role as a Trainee Educational Psychologist and during her first year of training became familiar with a variety of interventions, including the FRIENDS for Life program, to support the psychological wellbeing and mental health of pupils.

This study presents an evaluation of the FRIENDS for Life program (Barrett, 2010), from here on referred to as FRIENDS, an intervention based on CBT, principally designed to reduce anxiety (Barrett, 2010). The intervention has been endorsed by the World Health Organisation as an effective intervention for anxiety, though the evidence base for its effectiveness is predominantly from outside the United Kingdom. Methodological weaknesses of previous published evaluations in an English context (Stallard et al, 2005, 2007, 2008) threaten the validity and reliability of the reported positive results on participant anxiety. However recent doctoral thesis publications (Clarke, 2011; Paul, 2011) adopting more robust study designs have found a positive impact on participant anxiety.

This study provides a unique contribution to the FRIENDS evidence base in that it was undertaken with a new population; the AS population. A particular interest in the

special educational needs of children with AS emerged during the researcher's undergraduate study of psychology, culminating in a summer internship conducting research into the stereotyping abilities of individuals with AS. While considering research options during her doctoral study the researcher decided to explore this area of interest further. An initial exploration of the literature unearthed an emerging body of research evaluating CBT as an anxiety intervention for individuals with AS, though these studies were primarily undertaken in a clinical setting. This led the researcher to propose an evaluation study that would explore the impact on anxiety levels of an intervention with an existing evidence base for a typically developing population, within the context of a new population, the new population being children with AS, a condition characterised by a high level of anxiety with relatively few evidence based interventions available (Jordan, Jones and Murray, 1998).

With the focus on evidence based practice in educational psychology (Frederickson, 2002), this evaluation study is particularly relevant. The post-positivist epistemology of this study focusing on establishing causal relationships between variables was directed by the drive towards evidence based practice within the profession. This notion of evidence based practice will be explored more fully in the methodology section (chapter three). First, chapter two will present a review of literature relevant to the areas of anxiety and AS.

2. Chapter Two: Literature Review

2.1 Introduction

This chapter reviews literature of relevance to the current study. It will begin by setting the research in a national context, providing a brief overview of the 'psychological wellbeing and mental health of children and young people' statistics within the UK and the importance of early intervention/prevention in this area. Moving from the wider topic of mental health, the chapter will then focus specifically on anxiety, providing definitions, key characteristics and considering the effectiveness of CBT as a possible intervention. Attention will then turn to the evidence base for the FRIENDS program which draws on CBT principles in reducing anxiety levels of participants.

Parallel to this, an outline of the literature around the special educational needs of individuals with AS will be considered recognising the role of anxiety in this diagnosis and therefore the possible contribution of interventions focused specifically on reducing anxiety. A systematic review will then be undertaken of the existing research literature evaluating CBT as an intervention to reduce anxiety levels of individuals with AS. The chapter will conclude by summarising the rationale and unique contribution of this study and outlining the research questions and hypotheses the study aims to answer.

2.2 Psychological Wellbeing and Mental Health of Children and Young People

A UNICEF report (Adamson, 2007) stated that of 21 industrialised countries the UK came in the bottom third in five of the six categories measuring child wellbeing (material wellbeing, educational wellbeing, family and peer relationships, behaviours

and risks and subjective wellbeing). National surveys undertaken in 1999 and 2004 in Great Britain have indicated that mental health 'disorders' (the categorical nature of this term is discussed further in section 2.3.1) may be present in as many as one in 10 children and young people (Green, McGinnity, Meltzer, Ford and Goodman, 2005). Furthermore a similar number may experience psychological problems that though not clinically significant would still benefit from intervention (Department of Health; DoH, 2004). However, the DoH (2004) report estimates that of the two million children who would benefit from psychological intervention only 40% actually receive it.

Mental health disorders are associated with other difficulties, including academic underachievement, poor social skills and concentration problems (Ialango, Edelsohn, Werthemar-Larsson, Crockett and Kellam 1994). Consequently, research undertaken primarily in the USA, has indicated that developing young people's emotional wellbeing may have a wider impact with pupils showing improvements academically, socially and behaviourally (Weare and Gray, 2003).

From a national perspective, these statistics and research highlight the prevalence of mental health difficulties in the UK and also recognise the potential benefits of psychological wellbeing and mental health interventions on children's wider education and lives. In recent years, the promotion of pupil psychological wellbeing and mental health in school settings has become increasingly high profile and explicitly highlighted within government policies (Frederickson and Cline, 2009). Raising staff awareness of mental health issues was recognised as an area for improvement in the government's Special Educational Needs (SEN) strategy (DfES, 2004) and the introduction of The Social and Emotional Aspects of Learning (SEAL) materials to all primary (DfES, 2005) and secondary (DfES, 2007) schools further highlights the government's recognition of the importance of this area. Furthermore, emphasis has been placed on adults working with children and young people recognising any difficulties as early as possible and there is an understanding that schools may be an effective setting in which to do this (DfES, 2001). Primarily working in the school setting, this shift in thinking has led to a

reconsideration of the role of the educational psychologist (EP) in developing pupils' psychological wellbeing (Rait, Monsen and Squires, 2010).

2.2.1 Role of the Educational Psychologist (EP)

Recognising the increasing demand for interventions around mental health issues, several authors (Grieg and Mackay, 2005; Squires, 2010) have identified a role for EPs in supporting initiatives in school not only through supporting others to deliver therapeutic interventions but, in some cases, delivering interventions themselves. Squires (2010) suggest that the flexibility and range of clients involved in EP work and the psychological models used by EPs provides them with a unique set of skills in being able to work effectively with children within a complex school system. They conclude that, with these skills and opportunities the EP is able to make a valuable contribution in supporting the implementation of therapeutic interventions.

2.3 Anxiety

The previous section recognised the prevalence, more broadly, of mental health disorders in the UK and also addressed reasons why intervention in this area is important, as is becoming increasingly recognised by the UK government.

Emotional disorders, including anxiety disorders, are the most common mental health problems in children (Stallard et al, 2005). A range of programs have been developed to promote children and young people's emotional and mental wellbeing. The FRIENDS program being investigated here is one of these programs and primarily aims to reduce participant anxiety (Barrett, 2010). To better understand the impact of these intervention programs it is firstly useful to consider what is meant by the term 'anxiety.'

2.3.1 Defining Anxiety – Categorical Versus Dimensional Definitions

Wigelsworth et al (2010) highlight the difficulties in operationalizing ambiguous internal constructs such as anxiety. The definition given in the FRIENDS for Life facilitator manual (Barrett, 2010), to be referred to as the FRIENDS manual from now on, is that anxiety is a common emotion that may become a problem when it is prevalent over time and inhibits a person's day to day functioning.

A medical model of mental health supposes that anxiety may be categorised and diagnosed against specific criteria leading to treatment (Scott, 2002). Donovan and Spence (2001) provide a detailed overview of these anxiety disorder categories.

The assumptions of this approach have been criticised for their lack of sensitivity to the environment and individuals' personal and social experiences. This has led to suggestions of a more dimensional approach that consider problems more idiosyncratically and in context (Williams, 2005; Tew, 2005). There is an on-going debate between 'dimensional' and 'categorical' definitions of anxiety (Watson, 2005), however some proponents of the medical model have conceded that research may benefit from an understanding of anxiety along a continuum rather than discrete categories (Watson, 2005). The definition of anxiety to be adopted in this study will be discussed further in the methodology (chapter three).

2.3.2 Anxiety and Depression

The focus of this study is anxiety. However in considering the construct and definition of anxiety it is important to make brief reference to depression as the literature indicates they are closely linked (Barrett, Farrell, Ollendick and Dadds, 2006; Bienvenu and Ginsburg, 2007). In recognition of this the FRIENDS intervention is reported as an effective intervention for both anxiety and depression. The FRIENDS manual defines depression as *'an emotional state marked by great sadness and apprehension; feelings*

of worthlessness and guilt; withdrawal from others; loss of sleep, appetite and sexual desire; and loss of interest and pleasure in usual activities' (pg. 4, Barrett, 2010). Manifestations of anxiety and depression have been found to overlap during childhood, however symptoms of anxiety often pre-date the symptoms of depression (Barrett, 2010) with depression being found more in adolescents (Barrett, 2010).

In recognising the close temporal, if not causal, link between anxiety and depression (Barrett, 2010) there is on-going debate over whether anxiety and depression are separate constructs or a unified construct along a continuum (O'Connor et al, 2010). Please refer to the methodology chapter (sections 3.6.3 and 3.6.4.1) for further discussion, related to construct validity.

2.4 Anxiety Intervention

Having defined anxiety the chapter will now turn to consider possible intervention in more detail, namely CBT. A number of randomised controlled trials (RCTs) have identified CBT as an effective intervention for reducing childhood anxiety (Stallard et al, 2005). Some purport it is the best child therapy (Graham, 2004) which is the reason for focusing solely on this intervention here. The FRIENDS program being evaluated in this study draws on cognitive behavioural principles to reduce participant anxiety (Barrett et al, 2010) through addressing avoidant coping strategies (Essau Conradt, Sasagawa and Ollendick, 2012).

2.4.1 Cognitive Behavioural Therapy - What is it?

CBT is an umbrella term for a range of techniques that draws on cognitive and behavioural psychology (Rait, Monsen and Squires, 2010) and has been broadly defined as:

"A wide range of interventions in child and adolescent mental health, including (in no particular order) psychoeducation, anger management, anxiety management, behavioural operant methods, behavioural exposure methods, self - instruction methods, graded exercise, relaxation, social skills training, some kind of parent training and cognitive restructuring in the style of adult CBT." (pg.9, Graham, 2004)

Graham (2005) has more narrowly defined CBT as therapies which recognise the links between thoughts, feelings and behaviour, in addition to an understanding that modifying these thoughts will ultimately impact positively on behaviour and emotional health.

Lang, Regester, Lauderdale, Ashbaugh and Haring (2010) suggests that though there is variety most CBTs have common elements; creating an awareness of behaviours associated with anxiety, learning how to manage anxiety and being taught additional coping strategies e.g. relaxation.

2.4.2 Cognitive Behavioural Therapy - Is it Effective?

Stemming from the effectiveness of the approach with an adult population, the first RCT evaluating the use of CBT to reduce anxiety in a childhood population was undertaken by Kendall (1994). This study undertaken with 47 nine to 13 year olds with an anxiety disorder diagnosis found that after a 16 week CBT intervention, parent and child report and behaviour observation indicated significant benefits to the treatment group in reducing anxiety compared to the wait list control. These gains were also maintained at one year follow up. However, blinding procedures were not adopted and parents and teachers were aware of the child's group allocation which could have impacted on their responses.

Since Kendall's study in 1994, a considerable amount of research has been undertaken evaluating CBT as an effective intervention for reducing child and adolescent anxiety.

These studies have been reviewed most recently in a systematic review by James, Soler and Weatherall (2009).

James, Soler and Weatherall (2009) reviewed 13 RCT studies. Each study provided a manualised CBT intervention of at least eight weeks duration to 498 subjects (aged six to 19) with an anxiety disorder diagnosis all in a community or outpatient facility. In comparing intervention to the wait list control, response rates for remission of anxiety diagnosis were 56% compared to 28.2% respectively. The systematic review suggested CBT maybe an effective treatment for childhood anxiety but there was no significant difference between an individual, group or family format for delivery. However, with remission rates of 56% they recognise there is room for further intervention development and improvement.

Evidence presented thus far has suggested CBT as an effective treatment for anxiety disorders. However there is a developing school of thought that prevention methods maybe more preferable to anxiety treatment (Donovan and Spence, 2000) which suggests there are various levels of intervention for developing a child's emotional wellbeing. This is of particular relevance to this study as the FRIENDS intervention is one that can be implemented at various levels of intervention; preventative and treatment. The various levels of preventative intervention will now be considered.

2.5 Preventative Intervention

Prevention maybe defined as:

"Interventions that occur before the onset of a clinically diagnosable disorder that aim to reduce the number of new cases of that disorder" (pg. 515, Donovan and Spence, 2000)

Due to it being an internalising disorder, others may not be aware of a child suffering with anxiety for them to access treatment (Donovan and Spence, 2000) which may go

some way to explaining the DoH (2004) statistic presented earlier: only 40% of children with anxiety access specialised treatment. For those that do access treatment they often do not complete it (Kazdin, 1996) or as already noted there are just over 40% of participants for whom CBT is not an effective intervention in that they still present with a clinically significant level of anxiety post treatment (James, Solar and Weatherall, 2009). If untreated childhood anxiety is a significant risk factor in adult anxiety and depression (James, Soler and Weatherall, 2009). In addition it is suggested that the longer the individual goes without treatment the more resistance there is to change (Fonagy, Target, Cottrell, Phillips and Kurtz, 2005). Furthermore the financial cost for individual or group based clinic treatments is expensive when compared to an alternative prevention approach (Donovan and Spence, 2000). All these reasons highlight the importance of early intervention/preventative intervention for anxiety.

Research differentiates prevention methods based on their target: universal, selected and indicated prevention (Mrazek and Haggerty, 1994). Universal interventions are implemented with whole populations whereas selected interventions are implemented with populations that have been identified as at risk of developing an anxiety disorder as a result of a biological, psychological or social risk factors (Mrazek and Haggerty, 1994). Finally, indicated interventions are targeted at individuals with symptoms of anxiety that are not yet of clinical significance (Mzarek and Haggerty, 1994).

Though some have suggested preventative programs to be preferable to treatment (Donovan and Spence, 2000), universal interventions have also been criticised for several reasons:

- substantial cost in targeting a whole population (Farrell and Barrett, 2007);
- difficulties in gaining and maintaining access to that population (Farrell and Barrett, 2007);

- efficiency of the approach in that a significant amount of time may be spent with children that are not at risk of developing anxiety disorders (Farrell and Barrett, 2007);

- diluted nature of the intervention may not be sufficient for those that are at risk (Farrell and Barrett, 2007). However, this criticism seems to be refuted by existing evidence that suggests that universal interventions are effective for those at risk children (Barrett and Turner, 2001; Lowry-Webster, Barrett and Dadds, 2001).

Unlike universal interventions, selective and indicated interventions are able to identify target groups to increase the likelihood of the intervention being effective and making them more cost efficient (Donovan and Spence, 2000). However, with that comes the difficulty in identification tools and mechanisms. Authors have highlighted the difficulty in sample selection of this type of study; what kind of measure or mechanism is sensitive enough to select participants presenting with subclinical symptomology or those at risk based on psycho-social risk factors? (Donovan and Spence, 2000). This question is of pivotal importance in undertaking an evaluation study of a selective or indicated intervention and will be explored more fully in the methodology chapter of this thesis. Generally, indicated and selected interventions are more effective than universal prevention strategies (Reivich, Gillham, Chaplin and Seligman, 2005). Reivich et al (2005) suggest this maybe because there is greater room for change in individuals already presenting with symptoms.

Further on in this literature review, the findings from a plethora of research studies, evaluating the effectiveness of the FRIENDS anxiety program, as a universal, selective and indicated intervention will be explored. Now the literature will turn to address another dimension along which anxiety intervention may differ; the context in which they are undertaken, namely a school based versus clinical setting.

2.6 School Based Intervention

Alongside an increasing evidence base that highlights the importance of prevention and early intervention for psychiatric disorders (DfES, 2001), the role of the school, (including the EP) in supporting this early identification and intervention has been considered (Rait, Monsen and Squires, 2010). Schools may be viewed as ideal places for early intervention programs, offering access to previously unidentified childhood and youth populations (Ginsburg and Drake, 2002) and overcoming barriers to community intervention such as cost, convenience and stigmatisation (Barrett and Pahl, 2006).

Neil and Christensen (2009) have undertaken a systematic review of school based prevention and early interventions for anxiety, aiming to evaluate the effectiveness of these school based programs in reducing participant anxiety. In their review of the literature, the authors also aimed to establish the relative merit of school based programs delivered as a universal, selective or indicated intervention.

The review selected 27 RCTs that evaluated 20 different anxiety programs (including FRIENDS). 67% of the studies aimed to reduce participant non-specific anxiety while 22% focused on developing child resiliency skills. The remaining 11% focused on reducing specific types of anxiety, such as test anxiety. 78% (n=22) were CBT programs. 71% of those CBT programs found a significant reduction in participant anxiety. Alternative programs utilised psychoeducation, relaxation and modelling interventions with 100% (n=five) of these studies finding significant positive effects on anxiety. Overall, 21 of the 27 studies found a significant reduction in participant anxiety, effect sizes ranged from 0.11 to 1.37.

Sixteen programs were delivered universally, eight were indicated prevention/early intervention studies, and three adopted a selective intervention strategy. Eleven of the 16 universal intervention studies found significant positive effects on participant anxiety at post intervention of which two studies reported maintained gains at follow

up (Barrett et al, 2006; Lock and Barrett, 2003; Lowry-Webster, Barrett and Dadds, 2001; Lowry-Webster, Barrett and Lock, 2003). 50% of the indicated prevention studies (n=four) found a significant reduction in anxiety at post intervention with two of the studies finding significant gains at follow up too (Kiselica et al, 1994; Roberts et al, 2004; Roberts et al, 2003). Of the three selective intervention studies, two found significant effects (Malgady, Rogler and Constantino, 1990; Castellanos and Conrod, 2006) but these were not maintained at follow up.

Five of the 27 studies in the systematic review evaluated the FRIENDS intervention (Lowry-Webster et al, 2001, 2003; Lock and Barrett, 2003; Barrett et al, 2005, 2006; Barrett and Turner, 2001; Dadds et al, 1997, 1999). This intervention will now be described in more detail, providing an overview of the program contents and theoretical underpinnings. The findings of existing evaluations of the FRIENDS intervention will then be explored in more depth.

2.7 FRIENDS for Life Intervention

The FRIENDS intervention, originally developed in Australia by Barrett, Webster and Turner (2000) is a school based, preventative program. It draws on cognitive behavioural principles and has been identified by the World Health Organisation (2004) as the only evidence based program effective in reducing anxiety as a universal and targeted intervention. The name of the program is an acronym for central components of the intervention (Barrett, 2010):

F- Feelings

R- Remember to relax. Have quiet time

I- I can do it! I can try my best!

E- Explore solutions and coping step plans

N- Now reward yourself! You've done your best!

D-Don't forget to practise!

S- Smile! Stay calm, and talk to your support networks!

The program is intended to be a 10 week intervention that can be implemented universally to whole classes or as a targeted intervention for children with anxiety disorders or those identified as 'at risk.' The FRIENDS manual lists specific objectives to be achieved each session, these objectives can be found in the activity book (see appendix one). It is understood that the facilitator maintains the sequence of these objectives but may adapt the presentation and materials to better suit the audience's needs (Barrett, 2010). The program developers also recommend running two parent sessions over the course of the intervention, and encourage daily practice in the home context. In addition the manual highlights the use of booster sessions after the 10 week program at approximately one month and three months to support the maintenance of gains (Barrett, 2010).

2.7.1 Theoretical Underpinning of FRIENDS - Cognitive Behavioural Therapy

The FRIENDS intervention is a CBT program. The theoretical model underpinning FRIENDS is outlined in Figure 2. 1. It illustrates the interaction of cognitive, physiological, attachment and learning processes in the presentation and maintenance of anxiety, and how the skills and techniques taught in the FRIENDS program punctuate these processes to reduce anxiety (Barrett, 2010).

Skills taught in the FRIENDS program
- Awareness of body clues
- Deep breathing exercises
- Relaxation activities and mindfulness
- Self awareness, awareness of others and the way you behave with others
- Importance of sleep, diet and exercise

PHYSIOLOGICAL
- Sweaty palms
- Increased heart rate
- Butterflies in stomach
- Shortness of breath etc.
- Physiologically reactive to novel situations
- Disturbed physiology (eating, sleeping, motor activity)
- Changes in arousal (aggressive, teary)

LEARNING
- Problem-solving skills deficit
- Lack of positive coping skills
- Negative social learning experiences
- Accidental rewards for avoidance behaviour
- Lack of positive role models
- Trauma (conditioning)
- Lack of attention to coping (brave) behaviour
- Withdrawal from others
- Lack of pleasure in situations/events

Skills taught in the FRIENDS program
- Problem-solving skills
- Coping skills
- Gradual exposure to fear
- Identification of rewards for practising (brave) behaviour
- Identification of positive role models
- Peer support
- Identification of pleasant events
- Awareness of the needs of others
- Learning that everyone can make a contribution
- Giving back to the family, school and community

ATTACHMENT
- Stable, unconditionally loving relationships
- Empathy
- Mirror self worth
- Acceptance
- Safety
- Developmental readiness

COGNITIVE
- Unhelpful self-talk
- Unrealistic self-evaluations
- Perfectionistic standards of performance
- Bias to interpret/perceive threat in ambiguous situations
- Negative view of self, world and future
- Spiritual concern for the wellbeing of the world
- Irrational and/or catastrophic beliefs
- Helplessness and hopelessness

Skills taught in the FRIENDS program
- Understanding feelings in yourself and others
- Emotional self-regulation
- Self-soothing ability
- Empathy skills
- Helping others
- Being kind to all living creatures
- Choosing healthy long term friendships

Skills taught in the FRIENDS program
- Identification of inner thoughts
- Use of helpful self-talk
- Techniques for challenging unhelpful self-talk
- Self-reward
- Expecting good things to happen
- Evaluation of performance in terms of partial success, trying the 'best we can'

Figure 2.1 The theoretical model for the prevention and early intervention of anxiety from pg. 7, Barrett (2010)

2.7.2 Evidence Base for the Effectiveness of the FRIENDS Intervention

In 2010 Briesch et al reviewed all the empirical studies published in peer reviewed journals about the FRIENDS program. The 14 studies selected were all undertaken in a school setting. The studies varied in the target audience of the programs they evaluated:

- Universal prevention-Barrett et al, 2006; Barrett and Turner, 2001; Lock and Barrett, 2003; Lowry-Webster, Barrett and Dadds, 2001; Mostert and Loxton, 2008; Rose, Miller and Martinez, 2009; Stallard et al, 2005 and Stallard et al, 2007;

- Selective prevention/early intervention (teacher referral or targeted selection)-Barrett, Sonderegger and Sonderegger, 2001; Barrett, Sonderegger and Xenos, 2003; Liddle and Macmillian, 2010;

- Intervention/treatment (anxiety diagnosis)- Bernstein et al, 2005; Cooley, Boyd and Grados, 2004; Shortt, Barrett and Fox, 2001.

In terms of measures, Briesch et al (2010) criticised the majority of the studies (10 of 14) for their lack of triangulation of data with multiple data collection. More specifically criticisms were made of the use of self-report data exclusively and the use of inappropriate statistical tests.

Briesch et al's (2010) review reported positive outcomes for participants, particularly those selected for intervention (mean effect size for those with anxiety diagnosis: 0.84; mean effect size for those at risk: 0.44; universal effect size: 0.24). Only one study (Bernstein et al, 2005) isolated the contribution of the parent sessions. Results identified superior results for parent session and program than program alone, but the parent sessions extended beyond the intended protocol outlined in the manual. The review also indicated that booster sessions were implemented inconsistently, which they hypothesised may impact on the maintenance of gains.

Eight studies provided follow up data indicating treatment gains at:

- six months (Barrett et al 2003; Liddle and MacMillian, 2010; Mostert and Loxton, 2008)

- twelve months (Barrett, Lock and Farrell, 2005; Lowry-Webster, Barrett and Lock, 2003; Shortt et al, 2001; Stallard et al, 2008)

- thirty six months (Barrett et al, 2006).

A selection of studies, some not included in the review, have also measured a positive impact at follow up which was not present immediately post implementation of the FRIENDS intervention (Barrett, Lock and Farrell, 2005; Dadds et al, 1999 and Dadds, Spence, Holland, Barrett and Laurens, 1997; Essau, Conradt, Sasagawa and Ollendick, 2012; Mostert and Loxton, 2008). Mostert and Loxton (2008) suggest this delayed reduction in anxiety may be due to the time required for participants to consolidate the skills taught in the intervention before applying them to reduce their anxiety.

In terms of reviewing the quality of the existing research Briesch et al (2010) noted that all the studies in the review utilised group designs i.e. evaluating the effects of the intervention on a group of participants rather than individually. It was also recognised that the majority of studies were undertaken in an Australian context by the intervention developers, highlighting a need for external replications. The only collection of studies undertaken in a British context were those led by Stallard (2005, 2007, 2008). These studies adopted a single group pre-post design, which poses serious threats to validity and reliability, weakening the conclusions about the effectiveness of the intervention. A recent doctoral thesis study (Clarke, 2011) looked to overcome the methodological weaknesses of Stallard's work and implemented a small scale RCT evaluating the FRIENDS intervention. The program was delivered as a universal prevention program for a group of nine and 10 year olds in one school in a large local authority in the East Midlands. Results indicated a significant reduction in participant anxiety and sense of relatedness (a measure of resilience) for the intervention group compared to the wait list control group.

Briesch et al (2010) also highlighted that the FRIENDS program has been led by various professionals including teachers, researchers, trained providers, and nurses. Barrett and Turner (2001) reported that they found no difference between a psychologist or teacher led intervention, however effect sizes appear lower for teacher led studies (0.22) than when researchers or trained providers deliver the intervention (0.56) (Briesch et al, 2010).

All the studies described by Briesch et al (2010) were undertaken in a mainstream school setting but a recent study by Schoenfeld and Mathur (2009) adopted a SCED to demonstrate the effectiveness of the FRIENDS intervention on academic engagement for three children with emotional and behavioural difficulties in a special school. There was also a positive effect on the teacher report of participant anxiety collected pre and post intervention. However the authors commented that the breadth of the behaviour observed (academic engagement) may mean the positive effects could have occurred as a result of other interventions such as social skills interventions, not specifically FRIENDS which primarily focuses on reducing anxiety.

2.8 Summary

The literature review thus far has provided a definition of childhood anxiety as well as considering its prevalence in the United Kingdom. The evidence base for CBT in reducing anxiety has also been reviewed. Focus was given to a particular school based intervention based on CBT; the FRIENDS program.

To address the focal population for this study, individuals with AS, the literature review will now move on to consider this developmental disorder. AS and its defining characteristics will be outlined, highlighting the unique role of anxiety in its presentation. A systematic review will then explore the existing evidence base for the use of CBT focussing specifically on anxiety within the AS population.

2.9 Autism Spectrum

2.9.1 Definitions and Characteristics

AS includes autism, high-functioning autism, Asperger's syndrome and pervasive developmental disorders (Rotheram-Fuller and MacMullen, 2011). AS is a neurodevelopmental disorder with biological origins supplemented by possible environmental factors which are yet to be defined (Medical Research Council, 2001). Individuals with AS present with a triad of impairments in communication, imagination and social interaction (Wing and Gould, 1979). This triad is illustrated more fully in figure 2.2. Difficulties in initiating and maintaining social interaction and understanding others' viewpoints may make engaging in a school setting particularly difficult for these individuals (Rotheram-Fuller, Kasari, Chamberlain and Locke, 2010).

Language and Communication:

- A lack of desire to communication at all;
- Communicating needs only;
- Disordered or delayed language;
- Poor non-verbal communication including eye contact, gesture, expression and body language;
- Good language but with limited social awareness, experiencing difficulties starting and completing a conversation;
- Only talking about own interests;
- Understanding language in literal terms, showing no understanding of idioms or jokes.

Lack of Imagination and Rigidity of Thought:

- Using toys as objects;
- Limited ability to play or write imaginatively;
- Resisting change;
- Learning things easily by rote but with little understanding;
- Limited ability to see things from others' points of view: 'Theory of Mind' deficit (Baron-Cohen, Leslie and Frith, 1985);
- Following rules rigidly and not understanding exceptions;
- Limited executive functioning skills e.g. inability to plan, organise, predict what will happen next, or recall past events without visual object cues.

Social Awareness and Interaction:

- No desire to interact with others;
- Being interested in others in order to have needs met;
- Possibly being affectionate but on own terms and not always at the right time or place;
- Lack of motivation to please others;
- Friendly but with odd interactions;
- Limited understanding of unspoken social rules;
- Limited interaction, particularly with unfamiliar people or in unfamiliar circumstances.

(Taken from Ali and Frederickson, 2006, pg. 356)

Figure 2.2 The 'Triad of Impairments' (Wing and Gould, 1979)

In Britain it is estimated that the prevalence of AS in children aged five to 15 is 26.1/10,000 (British National Survey of Mental Health; Fombonne et al, 2001), which it is believed is likely to increase as practitioners become more knowledgeable in detecting the disorders and more sensitive assessment tools are used (Wing and Potter, 2002). Greig and Mackay (2005) highlight that with this rising prevalence there are new demands on EPs to have specialist knowledge in theory and interventions relating to AS and the need for effective interventions for this population are becoming increasingly more important.

2.9.2 Role of Anxiety

Several studies have indicated co morbidity figures for anxiety and AS ranging between 35 and 84% (Rotheram-Fuller and MacMullen, 2011). The range may be due to differences in definition and diagnostic criteria (Lang, Regester, Lauderdale, Ashbaugh and Haring, 2010). The most common comorbid anxiety disorder diagnoses within the AS population are Obsessive Compulsive Disorders, Post Traumatic Stress Disorders, school refusal, selective mutism and social anxiety (Ghaziuddin, 2005). Of particular prominence is the emerging body of research exploring anxiety as an underlying factor in the social difficulties faced by children with AS (Bellini, 2004).

It appears that whether children have a comorbid diagnosis of anxiety disorder and AS or not, several characteristics typical of autism may be symptoms of anxiety (pg.149, Ghaziuddin, 2005):

- *'extreme distress at trivial changes in environment*
- *Problems with changes in schedules*
- *Difficulties in adjusting to new people or surroundings, such as changes of staff.'*

Therefore, it maybe hypothesised that interventions focusing particularly on anxiety may be effective in reducing some behaviours conceptualised as part of AS as well as being suitable for individuals with co-morbid diagnoses. As yet, few interventions for this population have specifically focused on reducing anxiety (Rotheram-Fuller and MacMullen, 2011), CBT being the exception. The research evaluating the use of CBT with an AS population will now be explored.

2.10 Cognitive Behavioural Therapy in an Autism Spectrum Population

In recent years several studies have evaluated the use of CBT to reduce anxiety in an AS population. A systematic review by Lang et al (2010) reviewed nine studies (Cardaciotto and Herbert, 2004; Chalfant, Rapee and Carroll, 2007; Greig and MacKay, 2005; Reaven and Hepburn, 2003; Reaven et al, 2009; Sofronoff, Attwood and Hinton, 2005; Sze and Wood, 2007; Sze and Wood, 2008; Wood et al, 2009) that have evaluated the use of CBT to reduce anxiety in participants (aged 9-23) with a diagnosis of AS. The review highlighted several key findings:

- All facilitators were psychologists or trained therapists;
- All studies adapted or extended the traditional CBT protocol;
- All studies included a standardised measure of anxiety;
- Every study found a reduction in anxiety on at least one dependent variable, though parent and child reports sometime showed conflicting results (Reaven et al, 2009; Wood et al, 2009);
- The intervention appears to be more effective for higher functioning individuals with AS i.e. with Asperger syndrome, but only 33% of the sample included participants with a diagnosis other than Asperger syndrome. So it would seem more evidence is needed;
- All studies were completed in a clinical setting.

Building on the findings of Lang et al's (2010) review, the author undertook a systematic review of all evaluation studies to date that measured the impact on anxiety of a CBT intervention for participants with AS. A systematic review of this literature enabled the author to synthesise the findings of relevant papers and consider the existing evidence base for the use of CBT for individuals with autism. It also enabled a review of the quality of the methods used in existing studies which informed this research question and resulting methodology.

2.11 Systematic Review

2.11.1 Rationale and Objectives for Systematic Review

A systematic review provides a process through which research evidence may be synthesised and whereby the findings that are described are more reliable and valid compared to that of a more traditional literature review (Robson, 2011). Robson highlights that this increase in reliability and validity is due to the focus upon:

- *" Providing a comprehensive coverage of the available literature in the field of interest;*
- *The quality of the evidence reviewed;*
- *Following a detailed and explicit approach to the synthesis of the data; and*
- *The use of transparent and rigorous processes throughout."*

<div align="right">(pg.103, Robson, 2011)</div>

This systematic review aimed to answer the question:

'What is the evidence base for the use of CBT to reduce the anxiety of individuals with AS?'

The following sections identify the search strategy adopted for the review including the inclusion and exclusion criteria applied. The results and findings are then discussed.

2.11.2 Inclusion Criteria and Search Strategy

The inclusion and exclusion criteria for selecting studies for this systematic review are outlined in Table 2.1.

	Inclusion criteria	Exclusion criteria
Participants	Child or young person (aged between 5-19) with Autism, AS, Asperger Syndrome or Pervasive Developmental Disorder. Also identified as having anxiety related issues or a diagnosis of an anxiety disorder. Diagnoses may be co-morbid with other difficulties such as ADHD.	Participants that do not have a diagnosis of AS or are outside the age range.
Type of study	Human Evaluation of effectiveness of intervention Data to be reported (quantitative or qualitative)	Studies that do not provide evidence as to the effectiveness of CBT in reducing the anxiety of young people with autism.
Intervention	Studies that report the effectiveness of CBT alone or supplemented by other components such as parent education.	Studies that do not involve CBT and studies that do not describe the intervention explicitly.
Outcomes	Quantitative or qualitative measure of anxiety-child, parent or other report, providing data as to the effectiveness of CBT in reducing participant anxiety.	Studies that do not measure anxiety as a result of CBT.
Type of article	Written in English Primary source	Studies that are not written in English, or are secondary sources

Table 2.1 Inclusion and exclusion criteria for systematic search

Using the eLibrary gateway from the University of Nottingham student portal, databases were searched on June 28th and 29th 2012. These were:

- PsychINFO- database of particular relevance to psychology; containing scholarly literature in the domains of behavioural science and mental health;
- ERIC (CSA) –Sponsored by the U.S Department of Education, the Educational Resources Information Center (ERIC) holds a large selection of education related literature;
- MEDLINE- MEDLINE contains over 3700 medical journals.

The reference list of a recent systematic review evaluating the evidence as to the effectiveness of CBT in reducing anxiety for individuals with AS was also consulted (Lang et al, 2010).

The key search terms were:

- Autis* OR ASD OR autism spectrum OR pervasive developmental disorder OR Asperger syndrome OR AS;
- Cognitive Behavio* Therapy;
- Anxiety.

Search results were also limited to include only journal articles. Studies were excluded on several criteria:

- Language- the study was not in English;
- Topic- the paper was not an evaluation of effectiveness study;
- Errata- study correction;
- Repetition- study was repeated;
- Participants- the sample was outside of the age range five to nineteen or did not have a diagnosis of AS;
- Intervention- studies did not use CBT or did not describe the intervention undertaken.

- Outcomes- the study did not include a measure of anxiety

- Already included- if the study had already been selected as part of a previous search

The searches undertaken and the outcomes that resulted in the final selection of 15 papers, included in the systematic review are outlined in Table 2.2.

Search Engine	Search Terms	Additional Limits	Search results	Papers Excluded	Papers Included
Psychinfo	Autis* or ASD or autism spectrum or pervasive developmental disorder or asperger syndrome or AS AND Cognitive behavio* therapy	journal	146	128 Intervention (7) Outcomes (3) Language (2) Topic (50) Participants (66)	18: Anderson and Morris, 2006; Attwood, 2004; Chalfant et al, 2007; Greig and Mackay, 2005; Lehmkuhl et al, 2008; Ozsivadjian et al 2011; Pardini, 2012; Reaven and Hepburn, 2003; Reaven et al, 2009; Reaven et al, 2012; Scarpa, 2011; Schleismann and Gillis, 2011; Sofronoff et al, 2005; Sung et al, 2011; Sze and Wood, 2007; Sze and Wood, 2008; White et al, 2009; Wood et al, 2009
ERIC	cognitive behaviour therapy AND autism OR asperger syndrome	journal	45	Topic (22) Participants (3) Intervention (8) Outcomes (3) Repetition (1) Already included (8)	
MedLine	Autis* or ASD or autism spectrum or pervasive developmental disorder or asperger syndrome or AS AND Cognitive behavio* therapy		33	Language(1) Topic (15) Participants (9) Outcomes (2) Already included (5)	1 additional paper-Ooi et al (2008)
Reference List of Lang et al (2010)				Already included (9)	
Total articles				Outcome (3) Topic (1)	15 studies

Table 2.2 Systematic searches and pathway to final paper selection

2.11.3 Results

An initial search of the three databases described previously, resulted in 224 papers being selected of which 205 papers were discounted as they did not meet the inclusion

criteria. Of the 19 papers that were believed to meet the inclusion criteria, on more thorough reading four were discounted: one was an on-going study and therefore did not provide outcome data (Attwood, 2004), two did not provide outcome data specifically about anxiety (Pardini et al, 2012; Scarpa and Reyes, 2011) and the final paper reviewed existing literature rather than providing new data evaluating the effectiveness of CBT (Anderson and Morris, 2006). This left 15 papers for inclusion in the systematic review. Further description of the selected papers may be found in table 2.3. Key information is summarised under headings of participants, design, intervention, dependent variables, results and limitations. Some studies have looked at multiple dependent variables, including social skills (Greig and Mackay, 2005) but being driven by the research question, only measures and outcome relating to participant anxiety are reported.

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (Anxiety only)	Limitations
Chalfant et al, 2007	47 participants Age-8-13 years Diagnosis- Comorbid anxiety disorder and High Functioning Autism (n=13) or Asperger Syndrome(n=34) Comorbid ADHD (n=13)	Group design CBT (n=28) Waitlist control (n=19) Clinical setting	12 group sessions, 2 hour duration (9 weekly, 3 monthly boosters) Group n= 6-8. Parent sessions too Implementer- 2 clinical psychologists Manual based- adaptation to Cool Kids Program (Lyneham et al, 2003.	Pre and post measures: Child report- Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds and Richmond, 1978), Spence Children's Anxiety Scale (SCAS; Spence, 1997, Children's Automatic Thought Scale (CATS; Schniering and Rapee, 2002) Parent report- SCAS parent report form (Spence, 1998) Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) Teacher report- SDQ teacher report (Goodman, 1997)	71.4% (20/28) of treatment group no longer fitted diagnostic criteria for anxiety disorder, 0/19 for waitlist. Significant reduction in anxiety symptoms (child, parent and teacher report) for treatment group compared to waitlist control.	Lack of long term follow up data. Small sample. No treatment integrity measures. Researcher bias- running intervention and collecting data
Greig, and Mackay, 2005	1 male, 12 years old Diagnosis- Asperger Syndrome and unspecified anxiety disorder	Single case Exploratory	15 sessions Adaptations to manual (Attwood, 2003). Implementer- doctoral level researcher	Pre and post measures; Briere Trauma Scales as measures of depression, anxiety and anger (Briere, 1996) Ongoing teacher observation	Reduction in anxiety score on Briere Trauma Scales- 19 to 5. Teacher report-less concerns at school (informal)	Lack of control group or bigger sample

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (anxiety only)	Limitations
Lehmkuhl, et al, 2008	1 male 12 years old Diagnosis- High Functioning Autism and met criteria for Obsessive Compulsive Disorder (DSM-IV-TR)	Single subject case study	10, 50 mins, CBT sessions over 16 weeks. Implementer- trained post doctoral fellow Adaptations made, Manual based- (March and Mulle, 1998)	Pre, post and 3 month follow up measures: Children's Yale-Brown Obsessive Compulsive Scale-child report (CY-BOCS; Scahill et al, 1997) Child Obsessive-Compulsive Impact Scale –child report (COIS; Piacenti etal, 2003)	Score on CY-BOCS reduced from 18 to 3. Score on COIS reduced from 40 to 3. Scores remained same at 3 month follow up.	Single subject case study limits generalisability. Participant received early interventions for autism, limits generalisation to general autism population
Ooi et al , 2008	6 participants Age- 9-13, mean 11.5 years Diagnosis- ASD or Asperger Syndrome (DSM-IV criteria). Anxiety issues as established by school psychologist.	Preliminary study- Single group pre and post test design	16 90 minute, weekly sessions of CBT. Small group (n=3) Implementer- 2 postgraduate psychologist Adaptations made to Manual (Kendall, 1994; Ollendick, 1998; Attwood, 2004)	Pre and post measures: Child anxiety (self report)- SCAS Child anxiety (parent report)- SCAS Child anxiety (teacher report)- Asian Children Anxiety Scale- Caretaker Version (ACAS)	Reduction in child anxiety (child report, teacher report) Parent report- higher anxiety at post treatment (social phobia and OCD questions saw a reduction though) None statistically significant	Small sample size- limits generalizability. No control group-threats to validity

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (anxiety only)	Limitations
Ozsivadjian 2011	6 participants 5 male, 1 female Age- 8-15 Diagnosis- Autism spectrum (ADI-R), And anxiety disorder (GAD, SAD, OCD, Phobias)	Case series, pre and post	Standard CBT package- number of sessions varied from 5-17. Implementer- same therapist for each child Manual based with adaptions (Rapee, Wignall, Hudson and Schniering, 2000)	Pre and post measures: Child anxiety (child report)- Multi Dimensional Anxiety Scale for Children (MASC; March et al, 1999) 4 children completed Anxiety Disorders Interview Schedule (ADIS-C; Silverman and Albano, 1996). CY-BOCS completed for other 2 children with OCD. Child anxiety –parental interview, no detail on procedure	MASC- 1 child's score marginly increased, 1 did not complete and 4 stayed the same or increase post intervention. CY-BOCS- one child who completed reduced from severe to moderate symptoms. 2 out of 4 children who completed ADIS no longer reached the criteria for anxiety disorder. Subjective parental and school report indicated reduction in anxiety	Design- no control group or single subject repeated measures
Reaven and Hepburn, 2003	1 female, 7 years old Diagnosis- Asperger Syndrome (ADI-R)and Obsessive Compulsive Disorder (DSM-IV)	Case report, pre and post	14 Weekly sessions of CBT over 5.5 months.. At 3 months given medication for anxiety and OCD, Follow up sessions- 3-4 weeks Implementer- doctoral level trained clinician Setting-clinic Adaptations made, Manual based (March and Mulle, 1998)	Pre and Post measures: Child anxiety (self report)- CY-BOCS Pupil generated rating scales and drawings	Improvements in OCD symptoms after 6 months- CY-BOCS (self report)- decrease from 23 to 8. Decrease in symptomology on pupil self generated rating scales	Cannot determine the unique effect of CBT or medication Limited generalizability due to single subject design

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (Anxiety only)	Limitations
Reaven et al 2009	33 children with their parents (31 completed) Age-8-14 Gender- CBT (female= 3, male= 7), wait list (female=4, male=19) Diagnosis- ASD (ADOS; Lord, Rutter, DiLavore and Risi, 1999) (autism= 15, PDD=4, Asperger syndrome= 14)and significant anxiety symptoms- parent report, SCARED	Pilot study, Quasi experimental control group design CBT (n=10) Wait list control (n=23)	12 weekly sessions of 1.5 hours. CBT with parent involvement groups of 4-5 children Implementer-trained facilitators supervised by researcher Original manual by authors	Pre and Post measures: Child and parent report- Screen for Child Anxiety and Related Emotional Disorders (SCARED; Birmaher et al , 1999)	Parent report-Significant reduction in anxiety symptoms for intervention compared to wait list Child report- no significant reduction for either group	Not random assignment to groups Relatively small sample Selection to group based on family interest, threat to validity.
Reaven et al 2012	50 Children (47 completed) with participating parent Age- 7-14 CBT- all male Control- 24/26 male Diagnosis- ASD (autism-31, PDD-3, Asperger-16) All clinically significant for anxiety disorder	Randomized control trial CBT N=24 (21 completed) Treatment as usual control N=26	12 weeks, multi-family group sessions 1.5 hour duration Groups- 3-6 children and parents, 12 groups in total. Implementers- 1 clinical psychologist and 2 therapists (trainee clinical psychologists) Original manaual developed by authors	Pre and Post measures and 3 and 6 month follow up: Anxiety Disorders Interview Schedule for Children-Parent version (ADIS; Silverman and Albano, 1996) SCARED (parent and child report) The Clinical Global Impressions Scale-Improvement Ratings (CGIS; National Institute of Mental Health, 1970)	Significant reduction in anxiety disorders for treatment group but not control (ADIS) Reduction in anxiety symptoms in treatment group (ADIS, SCARED) maintained at follow up Clinician ratings of global improvement- 50% of treatment group, 8.7% of control group	Small sample size Measures-normed on typical population Control group- had less facilitator time and attention-possible placebo effect

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (anxiety only)	Limitations
Schleismann and Gillis, 2011	1 participant 6 year old male Diagnosis- Asperger Syndrome and social phobia	Case study	11 sessions over 3 months Family based CBT package- including parent training, Personalised intervention- Adaptations to Coping Cat manual (Kendal, 1992)	Parent and child report- anecdotal, Behaviour assessments- frequency count of behaviours in treatment sessions and by parents at home Standardised measures of anxiety- RCMAS-2 (Reynolds and Richmond, 2008) and FSSC-R (Ollendick, 1983) Only completed pre intervention	Significant reduction in avoidance behaviour (parent, child report and observations)	No post intervention for standardised measures Measures are generally anecdotal Case study- limits generalisability, increased threats to validity
Sofronoff et al, 2005	71 children Age- 10-12 Diagnosis- Asperger Syndrome and anxiety symptoms based on parent report Comorbidity for ADHD and depression in each group	Randomized control trial CBT (child only) n=23 (20 male, 3 female) CBT (child and parent) n=25 (22 male, 3 female) Wait list control n=23 (20 male, 3 female)	6 group sessions of 2 hours 3 children in each group with 2 therapists Added parent component Implementer- post graduate clinical psychology students CBT Intervention developed by authors	Pre and Post measures and 6 week follow up: James and the Maths test (coping strategy vignettes) Spence Child Anxiety Scale-parent version (SCAS; Nauta et al, 2004) SCAS-child version, only pre measure. Social Worries Questionnaire-parent report (SWQ; Spence, 1995)	Child anxiety (parent report)- reduction in symptoms from pre intervention to 6 week follow up for both intervention groups (SCAS and SWQ) Significant increase in number of strategies generated on James and the Maths test Significantly larger decrease in symptoms for child and parent group than just child group (SCAS)	No self report measures of anxiety, conclusions drawn primarily from parent report.

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (anxiety only)	Limitations
Sung et al, 2011	70 children (6 dropped out) Age- 9-16 66 males and 4 females Diagnosis- ASD and anxiety related issues (detail not given)	Randomized Controlled trial CBT (n=36) Social recreational program (n=34)	16 week CBT sessions lasting 90 minutes. Delivered in groups of 3-4. Implementer- 2 trained therapists Manualized CBT program developed by Psychologists from Child Guidance Clinic and Autism Resource Centre (Singapore) SR intervention- same format as above, also manualised.	Pre, post, 3 and 6 month follow up measures: Child anxiety- SCAS (child report) Severity of anxiety- Clinical Global Impression Severity Scale-Clinician rating	Significant decrease in anxiety symptoms and generalised anxiety for both interventions (SCAS) Increase in participants categorised in normal and borderline range for both groups (CGI)	Fairly small sample size for two active treatments No parent education component Study in Singapore- generalisation to British context?
Sze and Wood, 2007	1 female 11 years old Diagnosis- High Functioning Autism, Separation Anxiety Disorder, Generalised Anxiety Disorder and Obsessive Compulsive Disorder.	Case study	16, 90 minute sessions over 4 months Each session- met with child, parent and both together. Implementer- researcher/clinician (Sze) Adaptations made to manual (Wood and Mcleod, 2008)	Pre and post measures: ADIS (child and parent interview)	No longer met criteria for SAD, GAD or OCD on ADIS (child and parent report)	Case study- threats to internal and external validity

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (anxiety only)	Limitations
Sze and Wood, 2008	1 male 10 years old Diagnosis- Asperger Syndrome, SAD and GAD	Case study	CBT intervention, length and implementer not reported Adaptations made to manual	Pre, post and 3 month follow up measures: ADIS (parent and child report) CGI (clinician report) Multi Dimensional Anxiety Scale for Children (MASC; March, 1998)- child and parent report	No longer reaching criteria for SAD and GAD (ADIS, parent and child report) sustained at 3 month follow up. Anxiety symptoms improved (CGI)- sustained at follow up. Significant decrease in anxiety symptoms (child and parent report of MASC)	Case study method- threats to internal and external validity
White, et al, 2009	4 participants Age- 12-14 Gender- 2 male, 2 female Diagnosis- 3 Asperger Syndrome, 1 PDD. Met criteria for but not diagnosed– Social Phobia, GAD, Specific Phobia, OCD	Pilot study, case series	12-13 individual therapy sessions, lasting 50-75 minutes, 5 group therapy sessions over 11 weeks. Multi- Component Integrated Treatment -CBT supplemented by parent education and group social skills training. Manual based	Pre x 2, mid, post and 6 month follow up measures: Anxiety symptoms (parent report)- Child and Adolescent Symptom Inventory (CASI; Sukhodolsky et al, 2008) ADIS- parent and child report MASC- child self report	Anxiety reduction in ¾ participants on CASI. ¾ no longer reaching diagnostic criteria for their targeted anxiety disorder(ADIS)	Small sample Case study method- threats to internal and external validity

Study	Participants	Design	Intervention	Dependent variables (anxiety only)	Results (anxiety only)	Limitations
Wood et al, 2009	40 children (36 completed) Age- 7-11 years Gender- CBT (12 male, 5 female) Control (15 male, 8 female) Diagnosis- ASD and anxiety disorder (SAD, Social Phobia or OCD) Both groups had some participants with ADHD comorbidity	Randomised Controlled Trial CBT (n=17) Waitlist Control (n=23)	16 weekly sessions of CBT, 90 minutes long (30 minutes with child and 60 minutes with parents/family) or 3 month waitlist Implementer- Trained 11 doctoral students in psychology and 2 doctoral level psychologists Manual based – adaptations made to Building Confidence program (Wood and McLeod, 2008)	Pre , post AND 3 month follow up measures: CGI-clinician report ADIS- parent and child interview MASC- parent and child report	78.5% positive treatment outcome (CGI) compared to 8.7% of control group Diagnostic outcomes- 9/14 no longer reaching criteria for anxiety disorder in intervention group, 2/22 in control group. Parent report- significant lower in intervention group (MASC) Child report- no difference between groups (MASC) Results maintained at 3 month follow up	Self report measures used in ASD population MASC doesn't measure OCD or GAD Fairly small sample size Researchers also developed the intervention-need for independent replications

Table 2.3 Descriptions of 15 studies selected for systematic review

2.11.4 Findings

2.11.4.1 Participants

In total over the 15 studies selected, 185 participants received CBT as part of an intervention group. Sample size ranged from singular case studies (n=one) to larger group designs (Sofronoff et al, 2005; n= 71). Participants ranged in age from six to 16, with an average age of 10 years 5 months. 70.3% were male and 11.3% were female. The gender of the remaining 18.4% was not disclosed. Every participant included in data collection had a diagnosis of AS: 7% High Functioning Autism, 14% Autism, 5% Pervasive Developmental Disorder-Not Otherwise Disclosed (PDD-NOS) and 54% Asperger Syndrome. A specific diagnosis was not given for 4% of the participant and the remaining 16% of participants came from Sung et al's (2011) study with a diagnosis of Autism or PDD-NOS. 51 % of participants were diagnosed with a comorbid anxiety disorder; Separation Anxiety Disorder (SAD), Obsessive Compulsive Disorder (OCD), Social Phobia, Specific Phobia or Generalised Anxiety Disorder. The remaining 49% of participants were selected for their anxiety related issues, where method was disclosed 26% through parent report and 3% through school psychologist report. Some participants also had additional diagnoses of Attention Deficit Hyperactivity Disorder, Depression, Oppositional Defiant Disorder or Post Traumatic Stress Disorder.

2.11.4.2 Design

Of the 15 studies meeting the inclusion criteria for review, a range of designs were adopted which are outlined in the table below.

Design	Studies adopting the design
RCT	Reaven et al, 2012; Sofronoff et al, 2005; Sung et al, 2011; Wood et al, 2009
Quasi experimental group designs	Chalfant et al, 2007; Reaven et al 2009

Case study	Greig and Mackay, 2005; Lehmkuhl et al, 2008; Reaven and Hepburn, 2003; Schleismann et al, 2011; Sze and Wood, 2007; Sze and Wood, 2008
Case series	Ozsivadjian et al, 2011; White et al, 2009
Single group pre and post design	Ooi et al, 2008

Table 2.4 Designs adopted by studies included in systematic review

The lack of control group or repeated measures evident within the case control, cohort studies and single group designs increases the threats to validity and reliability in drawing causal conclusions about the effectiveness of CBT from these studies (Robson, 2011). The two studies that adopted a quasi-experimental group design reduced the threats to validity by incorporating a wait list control group. However neither random assignment to groups or blinding procedures were used. The four papers reporting RCTs, though adopting a more rigorous scientific method also varied in quality. All four randomised to intervention and incorporated procedures to ensure treatment fidelity but only three of the four studies reported blinding procedures (Reaven et al, 2012; Sofronoff et al, 2005 and Wood et al, 2009). Ensuring medication intake remained consistent and no other interventions were accessed during the experimental phase was reported for three of the studies (Reaven et al, 2012, Sung et al, 2011; Wood et al, 2009). Only one of the studies (Sung et al, 2011) used an active treatment control compared to a waitlist control which does not rule out facilitator time and attention as a contributing factor to positive results.

2.11.4.3 Intervention

All studies reported implemented a CBT package that ranged in length from five weeks to 18 (mean= 12, mode=16) with each session varying in length from 50 minutes to two hours (mean= 90 minutes). However Ozsivadjian and Knott (2011) highlight:

'Having a rigid idea of the number of sessions and how long each session should take is likely to be unhelpful as this varies enormously from individual to individual. Some clients may benefit from shorter, more frequent sessions; others may benefit from longer sessions incorporating breaks.' (pg. 211, Ozsivadjian and Knott, 2011)

Six of the 15 studies delivered the therapy in small groups ranging from three to eight children per group, (Chalfant et al, 2007; Ooi et al, 2008; Reaven et al, 2009; Reaven et al, 2012; Sofronoff et al, 2005; Sung et al, 2011). The other studies delivered it on an individual basis. White et al (2009) combined both, delivering 12 to 13 individual sessions for four participants followed by five sessions for the whole group.

Eight studies also involved parents in the therapy (Chalfant et al, 2007; Reaven and Hepburn, 2003; Reaven et al 2009; Reaven et al, 2012; Schleismann and Gillis, 2011; Sofronoff et al, 2005; Sze and Wood, 2007, White et al , 2009), with one study directly comparing CBT with parent education and CBT without parent education (Sofronoff et al, 2005). White et al (2009) delivered CBT as part of a Multi-Component Integrated Treatment (MCIT), supplementing CBT with parent education and social skills training. Where described, those who implemented the intervention were trained therapists, postgraduate psychology students or psychologists.

Twelve of the 15 studies reported making adaptations to an existing manual based intervention, with two studies by the same author (Reaven et al, 2009; Reaven et al, 2012) developing their own manual. Sofronoff et al (2005) provided a detailed description of their CBT intervention rather than referring to a manual. All studies made adaptations to the standard CBT protocol in line with existing literature around autism, aiming to make the intervention more effective for this population. The adaptations included:

- Visual aids/ cues (Chalfant et al, 2007; Ooi et al, 2008; Reaven and Hepburn, 2003; Reaven et al, 2009; Schleismann and Gillis , 2011; Sze and Wood, 2007; Sze and Wood, 2008; Sung et al, 2011)

- Social stories (Ooi et al, 2008; Greig and Mackay, 2005; Schleismann and Gillis, 2011; sofronoff, Sung et al, 2011)

- Simplifying cognitive restructuring element e.g. providing examples to support generation of own ideas (Chalfant et al, 2007; Lehmkuhl et al, 2008; Greig and Mackay, 2005; Schleismann and Gillis, 2011; Sofronoff et al, 2005)

- Video modelling (Greig and Mackay, 2005; Reaven et al, 2009)

- Extending length of program (Chalfant et al, 2007)

- Increasing the relaxation component (Chalfant et al, 2007)

- Increasing the exposure component (Chalfant et al, 2007; Lehmkuhl et al, 2008)

- Technical rather than symbolic language (Reaven and Hepburn, 2003)

- Role play (Reaven et al, 2009; Ozsivadjian and Knott, 2011; Sung et al, 2011)

- Increased parent involvement (Lehmkuhl et al, 2008; Reaven and Hepburn, 2003; Reaven et al, 2009; Reaven et al, 2012; Schleismann and Gillis, 2011; Sze and Wood, 2007)

- Predictable routines and visual structure (Reaven et al, 2009; Reaven et al, 2012; Schleismann and Gillis, 2011)

- Reinforcement for appropriate behaviour (Reaven et al, 2009; Reaven et al, 2012; Sze and Wood, 2007; Sze and Wood, 2008; Wood et al, 2009)

- Multiple choice lists (Reaven et al, 2009; Reaven et al, 2012)

- Emphasis on drawing, photography as methods of recording (Reaven et al, 2009; Reaven et al, 2012)

- Opportunities for repetition and overlearning (Reaven et al, 2009; Reaven et al, 2012)

- Incorporation of child's interests (Reaven et al, 2009; Sze and Wood, 2007; Sze and Wood, 2008; Wood et al, 2009)

- Social skills training (Wood et al, 2009; White et al, 2009)

Only one study was undertaken in a school setting (Ooi et al, 2008)). The rest of the studies took part in a clinical setting as part of a referral process.

2.11.4.4 Measures

A range of measures was used to assess the change in anxiety of participants, with 13 out of 15 studies using more than one measure of anxiety. All studies used a standardised measure of anxiety, gaining the views of the child, parent or/and the clinician. Two used standardised measures of teacher report as a measure of the dependent variable (Chalfant et al, 2007; Ooi et al, 2008). One study used a direct observation as a measure (Schleismann and Gillis, 2011). Three studies used informal teacher, parent and/or child report to supplement their standardised measures (Greig and Mackay, 2005; Ozsivadjian and Knott, 2011; Schleismann and Gillis, 2011). Two studies developed their own measures: of coping strategies (Sofronoff et al, 2005) and pupil perception of their anxiety (Reaven and Hepburn, 2003).

2.11.4.5 Results

On at least one outcome measure, all the studies saw some reduction in anxiety, though this was not always statistically significant (Ooi et al, 2008) nor consistent across all studies in a case series (Ozsivadjian and Knott, 2011).

The combination of parent, child, teacher and clinician report also highlighted some differences between reports. Ooi et al (2008) found a reduction, though it was not significant, on a teacher and child self-report measure but the parent report measure indicated an increase in anxiety from pre to post intervention. In contrast to this, Reaven et al (2009) found a significant reduction in anxiety symptoms after the intervention according to parent report but this was not reflected in the child report. Wood et al (2009) also found a positive treatment outcome indicated by the clinician report which was reflected in the parent report but not in the child report measure. The two studies that used standardised measures gaining the teacher views found these views indicated a reduction in anxiety symptoms as a result of the intervention.

Sung et al (2011) was the only study to compare CBT to another active treatment (Social Recreational Program). The results indicated that both interventions were effective in reducing participant anxiety, based on child and clinician report.

Sofronoff et al (2005) compared standard CBT protocol with CBT supplemented by an additional parent education component. Results indicated both interventions were effective in reducing participant anxiety but that the intervention with the additional parent education program was significantly more effective than CBT alone.

Seven of the 15 studies provided follow up data, ranging from six week follow up (Sofronoff et al, 2005) to six month follow up (Reaven et al 2012, Sung et al 2011, White et al, 2009). Six of the seven studies providing follow up data reported that the gains at post intervention were maintained. The only study to report equivocal results was White et al (2009) who found that although all four participants scores at follow up were lower than pre intervention, only one of the scores was significantly different to baseline.

2.11.5 Conclusion

This review has systematically searched the available literature selecting 15 papers that have sought to evaluate the effectiveness of a CBT intervention in reducing the anxiety of participants with a diagnosis of AS. The results indicate that across a range of measures, gaining the views of parents and participants and to a lesser extent clinicians and teachers, participant anxiety is reduced after the intervention. However the sparsity of research adopting a rigorous experimental design threatens the validity with which it may be confidently stated that the reduction in anxiety is caused solely by the CBT intervention. More research is needed that adopts a more rigorous experimental design. A single case experimental design (SCED) that takes repeated measures over time may also offer insight into the process of the intervention and particular elements of CBT which are most effective with this population. Future

research should also seek to gain some longer term follow up data to determine more conclusively whether intervention gains are maintained over time.

From the evidence base reviewed, only one study administered the intervention within a school setting (Ooi et al, 2008) and only two studies (Greig and Mackay, 2005; Ozsivadjian and Knott, 2011) were undertaken within a British context. Therefore future research within a British school setting would develop the evidence base further through extending it to a new context.

2.12 Current study

The purpose of this study was to explore whether the FRIENDS intervention, which has been widely researched and found to reduce anxiety in typically developing populations, may be adapted and implemented to reduce anxiety levels of primary aged pupils with a diagnosis of AS in a special school setting. Though recent evaluation studies indicate CBT maybe an effective intervention for children with AS, there is a lack of evidence for its application in a school setting.

The aim of this study was to establish a cause and effect relationship between participation in the FRIENDS intervention and reduction in pupil anxiety levels. Evidence of this relationship may add to the existing evidence base evaluating the FRIENDS intervention while illustrating its potential in a new treatment population as well as contributing to the broader research area exploring the efficacy of CBT more generally for young people with AS.

2.13 Research Questions and Hypotheses

Research Question	Research Hypothesis
Does the FRIENDS for Life intervention reduce participant's self-report of their anxiety?	The FRIENDS for Life intervention will reduce participant self-report of anxiety.
Does the FRIENDS for Life intervention reduce participant's anxiety related behaviour?	The FRIENDS for Life intervention will reduce participant anxiety related behaviour.
Does the FRIENDS for Life intervention increase alternative replacement behaviours to the participant's anxiety related behaviour?[1]	The FRIENDS for Life intervention will increase the alternative behaviours to the participant's anxiety related behaviour.
Are the expected findings of the repeated measures reflected in pre and post intervention measures of pupil anxiety by school staff?	The FRIENDS for Life intervention will reduce school staff's reports of participant anxiety.
Are the expected findings of the repeated measures reflected in pre and post intervention measures of pupil anxiety by parents?	The FRIENDS for Life intervention will reduce parent reports of participant anxiety.

Table 2.5 Research questions and hypotheses for the current study

---

[1] This research question is only applicable to one participant, Christopher. Please refer to section 3.6.4 for more detail about how it was developed.

3. Methodology

3.1 Introduction

At the outset of this chapter the concept of evidence based practice will be explored along with how this influenced the theoretical position of the study and the methodological considerations. Then the study design will be considered highlighting threats to validity and reliability and how the design attempted to overcome them. Throughout this chapter the author hopes to highlight the central consideration that was the heterogenous nature of the population being sampled in this study and how this particularly influenced the study design.

3.2 Evidence Based Practice

The starting point for this study was the opportunity to contribute to evidence based practice in the educational provision for young people with AS needs. The focus on evidence based practice in the past decade has been driven primarily by a political agenda to improve public services and equity of provision particularly in the National Health Service (Fox, 2002). At the heart of the evidence based practice climate within the EP profession is the question of what works and for whom, leading to investigations of cause and effect, i.e. intervention effects (Stoiber and Waas, 2002). Furthermore Stoiber and Waas (2002) state that finding out which interventions work in schools may be the most essential work of educational psychologists.

Emerging from the medical profession (Roth and Fonagy, 1996) the traditional hierarchy of evidence suggests certain types of designs determine more reliable and valid research evidence from which to draw upon in professional practice. This hierarchy being:

1. Several systematic reviews of randomised controlled trials

2. Systematic review of randomised controlled trials

3. Randomised controlled trials

4. Quasi-experimental trials

5. Case control and cohort studies

6. Expert consensus opinion

7. Individual opinion.

(Scott, Shaw and Joughin, 2001)

Though there is on-going debate about the most appropriate hierarchy for evaluating research (e.g. Lewis, 1998; Sinclair, 1998; Everitt and Hariker, 1996), in an article in Educational Psychology in Practice, Fox (2002) states that a consensus between stakeholders, professional bodies, the general public and government has been reached agreeing that the hierarchy described above is a suitable way to move forward. This hierarchy, adopts a positivist view of reality and knowledge (to be explored in more detail later in the chapter), i.e. using reliable and valid methods research can identify a real and objective truth and attempt to establish causal relationships between variables (Fox, 2002). Not all research explores causal relationship between variables; however, an alternative constructionist view, adopted by some psychological research focusing on personal constructs of a reality, is recognised as having limited value within the evidence based paradigm (Fox, 2002).

Based on the hierarchy of evidence, the RCT is deemed the 'gold standard' of research to inform practice (Frederickson, 2002) and has been judged the most valid method for evaluating the efficacy of psychological treatments (Roth and Fonagy, 1996). However, as recognised by the postpositivist paradigm, real world research is complex and poses difficulties when attempting to control all extraneous variables that are expected when

undertaking an RCT (Robson, 2011). This may explain why there is such limited high quality systematic research available in the area of child and adolescent mental health (Scott, Shaw and Joughin, 2001).

Related to this, Frederickson (2002) recognises the contribution of evidence adopting various study designs within the educational psychology profession by differentiating between efficacy and effectiveness studies. Efficacy studies answer the question 'Can it work?' by conducting research in controlled environments to increase the likelihood of finding an intervention effect. In comparison, an effectiveness study responds to the question 'Does it work?' and seeks to evaluate an intervention in a real world context (Harrington, 2001). Therefore Frederickson argues it is the research question which ultimately informs the design, and a RCT may not be the most suitable design for all studies particularly those studies in the real world context. Furthermore, it has been suggested that evaluations of real world interventions, particularly where there is little existing evidence (Frederickson,2002), should consider the context and circumstances in which the intervention is undertaken, making experimental/control group designs inappropriate in this respect (Taylor and Burden, 2000).

In addition to the criticisms about the type of methods used to gather evidence that is drawn upon in evidence based practice, some have criticised the notion as a whole preferring the term evidence-informed practice (Nevo, 2011). Critics have suggested that evidence based practice values research above and at the detriment of professional experience and client wishes (Nevo, 2011). Supporters of evidence based practice counter this argument by stating that the experience, values and preferences of professionals and clients are essential contributors to decision making along with identification and understanding of the highest quality scientific evidence (Dollaghan, 2004). Nevo (2011) suggests, however, that a model of evidence informed practice acknowledges more fully a wider range of sources for professional decision making including empirical studies, case studies and clinical insights to inform professional practice and intervention. Furthermore, Nevo (2011) poses a need for a dynamic equilibrium between evidence and other factors that may be practical and theoretical,

which all contribute to practice and maintain the client at the centre of decision making. This draws links with ideas presented earlier in this section that recognises the contribution of research designs other than RCT's in educational psychology that acknowledge the role of the individual and the meaning that the client brings to the intervention.

This study is being undertaken within a political climate that is heralding evidence based practice as the way forward across social policy including education (Frederickson, 2002) and more specifically mental health provision in schools (Wolpert et al, 2006). A traditional hierarchy of evidence exists, drawing on a positivist paradigm which focuses on establishing a causal relationship between variables (Fox, 2002). However it is also important to consider research in light of the population and context being studied in order to present evidence which is reliable and valid and identifies what works in what circumstances (Webster et al, 2002). Ultimately it should be the research question and purpose of the research which drives study design to produce the best available and most appropriate evidence to inform practice (Ramchandani, Joughin and Zuri, 2001). The influence of the research question in directing this study design is explored further in section 3.5.1.

3.3 Theoretical Paradigms and Philosophical Assumptions

Mertens (2005) highlights: in order to successfully plan and carry out one's own research it is important to understand and locate the research within existing theoretical paradigms and philosophical assumptions. As already recognised a key driver in the design of this study was the current climate within the EP profession of evidence based practice. As previously noted the constructivist theoretical paradigm has limited value within the concept of evidence based practice (Fox, 2002) which is traditionally set within the positivist paradigm. The positivist paradigm and its

assumptions as well as the post positivist paradigm emerging from it will now be explored, as it is these theoretical underpinnings and assumptions that informed this study's design.

3.3.1 Ontology

In order to contextualise epistemology within research, we must first briefly explore ontology. An ontological question asks 'what is the nature of reality?' (Lincoln and Guba,2000). In response to this question, a positivist/postpostivist perspective perceives there is only one reality which it is possible to know. The postpositivist stance, which emerged from the positivist paradigm, differs slightly from the views of its predecessors, in that it recognises it is within a researcher's capabilities to only understand this one reality imperfectly due to the complexity of the real world (Mertens, 2005). That is why a design which is able to limit extraneous variables, and therefore alternative explanations, may increase the probability of successfully measuring the one existing reality (Mertens, 2005).

3.3.2 Epistemology

To underpin the research design, we can now turn to issues of epistemology. An epistemological question asks 'what is the nature of knowledge and the relationship between the knower and the would-be known?' (Lincoln and Guba, 2000). The positivist and post-positivist paradigm are of most relevance to the notion of evidence based practice and therefore of most relevance to this study and will now be considered.

3.3.2.1 Positivist

The positivist paradigm, associated with traditional scientific method, assumes the researcher and subject are independent and non-influential upon each other (Lincoln and Guba, 2000), and that it is possible to observe the social world in a similar value-free way to the natural world, in order to establish causal relationships (Mertens, 2005).

The positivist paradigm has been widely criticised, particularly in relation to the assumption that observations are only impacted on by the characteristics of what is being observed, and, therefore every observer will observe the same, which is now understood not to be true (Robson, 2011).

3.3.2.2 Postpositivist

Emerging from the positivist paradigm, the postpositivist paradigm understands that though objectivity is to be strived for the beliefs and knowledge of the researcher may influence observations (Robson, 2011). Therefore it is important to define and follow rigorous procedures in order to reduce researcher bias (Mertens, 2005).

The postpositivist paradigm recognises the limitations of applying a rigorous scientific method, such as randomisation techniques, to research that involves people typical in the psychological and educational sphere (Mertens, 2005). The paradigm still adopts a scientific approach in that it starts with a theory that is then tested and either supported or refuted depending on the data collected (Robson, 2011). By outlining a small number of specific research questions or hypotheses, the postpositivist paradigm attempts to find an imperfect truth, which becomes increasingly more likely as other studies triangulate the views (Robson, 2011).

3.3.2.4 Epistemology of this study

Inherent within the aims of this study was the goal of establishing a cause and effect relationship, in evaluating the effectiveness of the FRIENDS intervention for children with AS within a real world context. To establish a causal relationship it was necessary to adopt an epistemological standpoint that views knowledge as being objective and tangible and measurable through application of a rigorous scientific method (Cohen, Manion and Morrison, 2009). However, the researcher was also aware that undertaking real world research makes exercising tight experimental control impractical and impossible in many instances: leading to the adoption of a post-positivist epistemology.

3.4 Methodology

A methodological question asks 'How can the knower go about obtaining the desired knowledge and understandings?' (Lincoln and Guba, 2000). The adoption of a particular epistemological standpoint informs the methodological considerations. The postpositivist paradigm adopted in this study is closely aligned with a fixed experimental design (Robson, 2011). A fixed design refers to studies that are theory driven and deductive where the design has been decided upon before data collection (Robson, 2011). These designs typically involve collection of quantitative data (Robson, 2011). Being theory driven, a fixed design also allows a clear link between research and theory (Robson, 2011). However these designs have been criticised, because in an attempt to control for extraneous variables and establish causal relationships between variables, they show limitations in sufficiently capturing the complexities and subtleties of human behaviour (Robson, 2011).

There are a range of fixed experimental designs. These may vary in the extent to which they adopt randomization procedures to reduce threats to validity and reliability, and

their focus at a group or individual level. A detailed exploration of each of these designs is beyond the scope of this thesis; however, reference will be made to alternative options, namely RCTs and quasi experimental group designs, when explaining the rationale for adopting a SCED for this study.

3.5 Single Case Experimental Designs

Originating from the work of Skinner (1974) a SCED aims to produce "meaningful, reliable data at the level of the individual."(pg. 118, Robson, 2011). This design attempts to establish causal relationships between variables and therefore evaluate the efficacy of an intervention, through taking repeated measures of the dependent variable over time and across phases for single cases (Kazdin, 2003). Single case research, whilst always maintaining a focus on the individual rather than group means, may use descriptive reports or more rigorous quantitative quasi-experimental methods (Frederickson, 2002).

In SCEDs, the independent variable is typically an observable behaviour (Horner et al, 2005). Observing behaviour Barlow, Nock and Hersen (2009) note that day to day fluctuations are likely. Therefore they suggest an analysis of data should focus on overall trends and patterns. A more detailed exploration of methods for analysing SCED data will be undertaken in the results chapter. The data collected may be referred to as times series and can be collected continuously with an uninterrupted collection of observations, or discretely with observations being collected at equal intervals of time (Barlow, Nock and Hersen, 2009). Ideally the multiple baseline assessments taken prior to introduction of the intervention should show stability (Kazdin, 2003). The stability of the baseline impacts on the validity of the conclusions that can be drawn about the role of the intervention if there is an observed change between baseline and intervention phases (Kazdin, 2003).

The SCED may take various forms which vary in their ability to reduce the threats to internal validity and, therefore, the strength of the causal relationship they are able to establish:

- **A-B design-** repeated measures across baseline and intervention phases (Kazdin, 2003)

- **ABA/ABAB design-** reversal of intervention after intervention phase with possible reintroduction later, aiming to increase the reliability and validity of the conclusions drawn about a causal relationship between variables (Barlow, Nock and Hersen, 2009). This design may not be practically or ethically appropriate (Kazdin, 2003).

- **Multiple baseline design-** further attempting to strengthen the causal relationship between variables without the possible ethical considerations of the above design, this design uses multiple baselines across subjects or behaviours (Kazdin, 2003). It may not be possible if the intervention has to be introduced at the same time for each participant i.e. in group interventions.

SCEDs have primarily been criticised due to their small sample size and focus at the individual level leading to a lack of generalizability (Barlow, Nock and Hersen, 2009). Further limitations of the SCED adopted in this study will be considered in the 'reliability and validity' sections (3.6.9).

3.5.1 Rationale for design of this study- Single Subject Research

As highlighted by Frederickson (2002) the research method adopted depends on the question to be asked. At the heart of the evidence based practice climate currently being heralded as the way forward in the EP profession (Frederickson, 2002), particularly when related to issues of mental health (Wolpert et al, 2006), is the question of what works and for who, leading to investigations of cause and effect (Stoiber and Waas, 2002). In addition, Odom et al (2003) conclude that to determine

the effectiveness of interventions for non-homogenous populations such as autism, the causal relationship research question is most relevant. Therefore, the research question in this study, with its focus on effectiveness and establishing cause and effect, led the researcher to consider a fixed experimental design (Robson, 2011). However, a research question focusing on establishing the effectiveness of an intervention in a real world context also made the 'gold standard' design of a RCT impractical for this study.

The researcher's decision then lay in deciding whether a fixed quasi experimental design focusing at a group or individual level was more appropriate for this study. Jordan, Jones and Murray (1998) note that the variation in behaviour and characteristics exhibited by individuals with AS means it may be beneficial to personalise interventions and review them at an individual level. Maggin and Chafouleas (2013) also highlight that for those children with special educational needs such as autism, the adaptation that is required to meet their educational needs means it is likely that their educational environment will be atypical and difficult to standardize. They advocate use of a SCED which enables a focus on individual and environmental variables as the most appropriate design in special education research. Furthermore, the lack of standardisation in the developmental pathway for the AS population may limit the effectiveness of randomisation and matching procedures used in group designs such as RCT and quasi experimental group designs (Odom et al, 2003).

As highlighted in the literature review in chapter two, though deemed the 'best available' treatment, CBT has been found to have remission rates of up to 56% (James, Soler and Weatherall, 2009). This may further support the use of a design which is more context specific, as a SCED can allow an exploration of what works, for whom, and under what conditions.

Therefore, this study chose a SCED to evaluate the effectiveness of the FRIENDS intervention in reducing anxiety levels of children with AS. For the reasons described in

this section the selection of this design, focusing at an individual rather than group level, was driven by the research question and population being investigated.

3.6 This Study Design

3.6.1 AB Design

As outlined by Barlow et al (2009), an AB design requires a clearly defined target behaviour to be measured repeatedly over a baseline (A) and intervention (B) period. The natural frequency of the behaviour may be established in the baseline phase and compared to the phase when the intervention is introduced. Barlow et al (2009) state that, 'with some major reservations changes in the dependent variable are attributed to the effects of treatment' (pg.137, Barlow et al, 2009). The design may be improved by including a follow up phase and multiple target measures (Barlow et al, 2009). Barlow et al (2009) also add that introduction of booster sessions in the follow up phase, may strengthen the causal relationship aiming to be established. Therefore, the design used in this study was an AB design with an additional follow up (C) phase, which also included two booster sessions.

Though the AB design has been criticised (Barlow et al, 2009; Kazdin, 2003; Kratochwill et al, 2010), other SCED options were explored but considered unsuitable. Due to the group nature of the intervention a multiple baseline design was not appropriate as the participants were required to undertake the intervention at the same time. A reversal design was also not seen as appropriate as the purpose of the intervention was to have a lasting impact on participant anxiety and therefore this impact could not and should not be reversed once the intervention was completed.

3.6.1.1 Baseline Phase

The single case technical documentation (Kratochwill et al, 2010) states that any phase should include at least three data points, with a recommendation of five, to provide sufficient opportunity to demonstrate an effect. The baseline may be extended to establish a stable pattern of behaviour (Barlow, Nock and Hersen, 2009).

The researcher planned for eight data points to be collected for each weekly measure of anxiety, to be undertaken once a week over eight weeks. The baseline was extended to 11 weeks of data collection due to school timetable constraints on the commencement of the intervention. Six weeks of data were collected prior to the six week school summer holiday and five weeks of data were collected after. The extension provided more time for the baseline to stabilise after the summer break, which was particularly relevant to the two participants who changed class and teaching staff after the break, thereby increasing the reliability and validity of the baseline data. The baseline phase could not be extended any further due to the practical restriction of completing the 10 week intervention prior to the Christmas break.

3.6.1.2 Triangulation Measures

Though the researcher recognises the increased threats to validity and reliability of collecting data at single points pre and post intervention (Kazdin, 2003), the purpose of collecting data at these points was to triangulate the data collected from the repeated measures. This was a strategy recommended by Robson (2011) to increase the validity and reliability of the main findings. The measures selected aimed to explore the views of other stakeholders, including parents and teachers, on participant anxiety.

3.6.2 Independent and Dependent Variables

The independent variable in this study was the FRIENDS intervention, a 10 week intervention implemented during phase B of the study.

The dependent variable was participant anxiety levels measured using two weekly repeated measures; Paediatric Index for Emotional Distress (PI-ED; O'Connor, Carney, House, Ferguson, Caldwell and O'Connor, 2010), a child questionnaire measure of anxiety, and a weekly observation of a target situation using a coding schedule for pre-identified specific behaviours (see section 3.6.4 for further detail on the measures used).

This repeated measures data was also triangulated with pre, post and follow up (teacher only) measures of anxiety, using the Spence Children's Anxiety Scale; parent (Spence, 1999) and child (Spence, 1997) version and the School Anxiety Scale- Teacher Report (Lyneham et al, 2008).

The figure below provides a timeline of data collection over the baseline, intervention and follow up phase of this study.

A	B	C
11 WEEK BASELINE PHASE	9 WEEK INTERVENTION PHASE- (10 FRIENDS FOR LIFE SESSIONS)	7 WEEK FOLLOW UP INCLUDING 2 BOOSTER SESSIONS

Weekly measures (1/wk)

- PI-ED- pupil questionnaire
- Behaviour observation- using coding schedule

Weekly measures (1/wk)

- PI-ED- pupil questionnaire
- Behaviour observation- using coding schedule

Weekly measures (1/wk)

- PI-ED- pupil questionnaire
- Behaviour observation- using coding schedule

T1 measures-

SPENCE-pupil and parent version

SAS-TF- teacher views

T2 measures-

SPENCE-pupil and parent version

SAS-TF-teacher views

T3 measures-

SAS-TF- teacher views

———— Single case experimental design

———— Triangulation of SCED findings

Figure 3.1 Timeline of data collection

3.6.3 Sampling/Participants and Recruitment

The school involved in this study was approached by the researcher, at the suggestion of professional colleagues. It was a primary special school for children with AS, but also included some children with moderate learning difficulties. It was set in a rural area in a large local authority in the East Midlands and intake covered a wide area including several surrounding local authorities. Several reasons influenced the researcher's decision to approach the school for their involvement. Being a special school setting for children with AS the researcher decided the specific sample description for this study would be most obtainable from this setting and hoped the school would be

interested in the possibility of an effective intervention for this population. Finally, the school had a particular focus on developing the emotional literacy of their pupils and the researcher felt the implementation of the FRIENDS program may support that development.

The researcher, in her post as a TEP, and her Senior EP supervisor met with the Head Teacher and the Deputy Head Teacher of the school to outline the intervention and the proposal for the study. The school were provided with opportunities to ask any questions and raise any concerns. See appendix two for the discussion record of that meeting. As an outcome of that meeting the school consented to participation in the study, with staff showing high levels of interest.

It was then necessary for the researcher to consider the most appropriate method for selecting participants for the study. Recognised in the literature review, the selection of participants for indicated studies poses many problems (Donovan and Spence, 2000), which the researcher spent much time deliberating over. Several points were considered:

- The strengths and limitations of using child self-report questionnaires as a means for identifying individuals most at risk;
- Difficulties in defining anxiety as a construct;
- Constraints with using standardised assessments with an AS population.

Referred to in section 3.6.4.1.1 there are several limitations in using child-self-report as a measure which may impact on the validity of the information gathered. Particularly with an AS population, it is likely that their triad of impairments may make it difficult for them to be able to reflect on their own emotions and give an accurate report of their anxiety. Furthermore, one of the aims of the intervention was to develop participant's recognition and understanding of their own and others feelings, which it may be possible to conclude that a measure involving this skill prior to the intervention may not be the most accurate measure of anxiety.

Considerations were also given to the use of standardised measures of verbal comprehension as part of the selection procedure. However, in discussion with the school staff it was decided that the special educational needs of the population being tested made it likely that their performance in a one-off assessment, particularly with an unfamiliar adult, may not accurately reflect their ability.

Because this study was aiming to consider changes to anxiety at an individual level rather than against a clinical cut off, it was felt a 'dimensional' understanding of anxiety, which considers behaviours within context (referred to in chapter two) would fit this purpose. Therefore, it was decided that a reference group made up of a range of experienced teaching professionals who had known the potential participants over an extended period of time, would be the most appropriate mechanism by which to select participants for the study. It was also felt, as a primary stakeholder and recipient of the intervention the school should play an integral role in the selection process.

In creating a reference group the researcher considered the potential power hierarchy and group dynamics in a group containing teachers and senior management and how these may impact on decision making. In an attempt to control for the potential influence of a power imbalance on decision making, the researcher outlined clear roles for each group member highlighting a shared responsibility for selecting participants. Class teachers were responsible for selecting pupils in their class and the deputy head was present as the school contact point for the researcher throughout the study.

At a meeting on January 17th 2012 the reference group, which included class teachers from the current year four, five, six and the Deputy Head Teacher met with the researcher and EP colleague (also joint facilitator). The researcher summarised the study proposal for the group and provided a clear sample description for participants being sought in the hope that the children selected would most benefit from the intervention, and to develop a group understanding of the anxiety construct (see appendix three for the information shared with the reference group). The table below

details the sample description shared, the rationale behind each criteria and the information provided at the meeting to support the group's decision making.

Sample Description	Rationale	Information Provided
N=Six	The FRIENDS manual highlights this intervention maybe delivered as a group or whole class in a school setting. As a pilot study of newly adapted materials it was felt a group would be more appropriate than a whole class.	The group were given a guideline of six participants to be selected as the intervention was to be delivered in a group format.
Autism Spectrum Diagnosis	The focus of this study was to evaluate the effectiveness of this intervention for reducing the anxiety of children with social and communication difficulties, specifically AS.	The reference group were told that this study was for a particular target population, and that participants selected should have a diagnosis of AS (see later in this section for allowances made within this criteria).
Aged between eight and 11	The materials are aimed at primary school aged children but the researcher decided with the additional needs of the target population, the older end of this range (key stage two) may engage with and benefit most from the intervention. In addition, Barrett et al (2006) also highlights that the optimal time for targeting anxiety is ages nine and 10.	The group were asked to select individuals from years four or five as the study would run over two academic years these children would then move into years five and six.
Anxious	The intervention is designed for universal, selective prevention/early intervention, or as intervention/treatment for children with an anxiety diagnosis. The literature highlights selected and indicated interventions are generally more effective and the existing literature for use of CBT with an AS population is for children identified as being anxious, whether this is	DSM IV (APA, 1994) and ICD 10 (WHO, 1992) criteria for a generalised anxiety disorder were shared with the group along with the definition of anxiety given in the FRIENDS manual, in an attempt to unify the groups construct of anxiety.

	diagnosed or not. In line with this literature and for ethical reasons, the researcher wanted to select participants who were identified as anxious, though it was not necessary for them to have a diagnosis.	Co-morbid diagnoses were also included.
Verbal comprehension and expressive vocabulary	The FRIENDS intervention draws on Peer Learning Models and Experiential Learning Models (Barrett et al, 2010), which requires participants to share ideas and participate in the group verbally.	Sections from the FRIENDS manual highlighting the learning models used in the intervention were shared with the group. It was highlighted to the group that children who are best able to access these models of learning will most benefit from the intervention.

Table 3.1. Selection criteria for participants in this study

The reference group selected five possible participants that met the inclusion criteria for the study. A letter (see appendix four) was sent out to the parents of these five children inviting them to attend an information session led by the researcher to provide information about the FRIENDS program and the evaluation study (see appendix five for information provided) . Three parents attended the information session and gave informed consent. A total of four parents gave informed consent for their child to participate in the study (see section 3.6.7 for a full description of the ethical procedures followed to enable recruitment).

Below is a descriptive profile of the four children who participated in the study (names are pseudonyms). This information was collected from school staff and parents, in addition to special educational needs documentation provided by school. As the school they attended was a primary special school all four children had a statement of special educational needs. All staff attending the reference group agreed that the four children presented with anxiety but none had a comorbid diagnosis of an anxiety disorder.

- Christopher

Christopher was an eleven year old male in year six at the time of the intervention. He moved from year five to year six during the baseline phase, however the teaching staff remained the same. He was in a class of 12 children with a male class teacher supported by two teaching assistants (one male, one female). He had a diagnosis of AS. He also had involvement from speech and language therapy focusing on his receptive vocabulary, which set a program delivered by school staff. His statement of special educational needs identified Christopher's main areas of need as social interaction, communication and understanding related to his diagnosis. The statement also highlighted him as a visual and kinaesthetic learner and stated that he finds it difficult to understand concepts he can't see.

- Jack

Jack was a ten year old male and in the same class as Christopher. He had a diagnosis of moderate learning difficulties and also had additional speech and language difficulties. His statement of special educational needs highlighted that he had "possible autistic traits" and his main areas of need included social communication and interaction. The statement also stated he responded well to structure and routines and a visual approach to learning, typical of individuals with autism.

In discussion with home and school both agreed that Jack presented with characteristics of autism. Staff, experienced working with children with autism, stated that Jack responded well to the autism friendly curriculum offered by the school and had responded well to interventions designed for children with autism during his time at the school. Jack was accessing special primary school provision mainly for children with autism spectrum accredited by the National Autistic Society since 2001, where home and school viewed his needs as being met. For these reasons a formal autism diagnosis had not been sought.

The school identified Jack as a child most at risk in terms of anxiety and meeting all the other criteria. Though lacking a formal diagnosis due to him already accessing appropriate provision the researcher took the decision from an ethical perspective that

it was not appropriate to not include him in the intervention when a triangulation of views indicated he presented with characteristics of autism and the lack of seeking a diagnosis was due to his needs being met in a special school provision specialised in meeting the needs of children with autism spectrum.

- Cameron

Cameron was a nine year old male in year five, consisting of 15 pupils taught by a female class teacher and teaching assistant at the point of the intervention. He moved from year four to year five, including a change of staff, during the baseline phase. He had a diagnosis of AS, Oppositional Defiant Disorder and Attention Deficit and Hyperactivity Disorder. He had had historical involvement from speech and language support service who reported that he had above average general language comprehension but had difficulty responding to questions related to social understanding e.g. facial expressions.

- Matthew

Matthew was a nine year old male in the same class as Cameron. He had a diagnosis of AS.

3.6.4 Measures

This section provides detail about the measures used in this study including; why they were chosen, their reliability and validity and how data was collected. Reference is also made to the piloting phase that was undertaken prior to the baseline data collection, where adaptations were made to the self-report scales and the observation schedules developed. Also highlighted are the procedures the researcher undertook to ensure the measures were correctly implemented to reduce the instrumentation threat to validity.

3.6.4.1 Paediatric Index of Emotional Distress (PI-ED; O-Connor et al, 2010)

The PI-ED is a 16 item child-self-report questionnaire, adapted from the HADS (Hospital Anxiety and Depression Scale) that provides a measure of emotional distress for children aged eight to 16 (O-Connor et al, 2010). It supposes that anxiety and distress are part of a unified construct and should be considered together, hence the label of emotional distress rather than individual scales of anxiety and depression. In the questionnaire seven items report anxiety and nine items report depression. The scale has however been reported as a reliable and valid measure of cothymia, anxiety and depression against the Beck Youth inventories (O'Connor et al, 2010) which is why the researcher decided it was a suitable measure of anxiety for this study.

This measure was selected over other anxiety scales (Spence Child's Anxiety Scale; Spence, 1997, and the Multi-Dimensional Anxiety Scale for Children; March, 1998) because it was shorter than other measures and asked recipients to reflect on the last week in marking their responses, which the researcher decided would make it more suitable as a weekly repeated measure.

This measure was implemented by the researcher weekly on a Thursday morning, where possible, and prior to the intervention during the intervention phase. The implementation of the measure was also observed twice over the study period to ensure the researcher was implementing the measure as the manual (O-Connor et al, 2010) intended.

Recommended by Webster et al (2002), the researcher made adaptations to the presentation of both child report measures (the PI-ED and the Spence Child Anxiety Scale) to make them more 'autism friendly,' and increase their validity and reliability. The researcher used the Communicate: In Print 2 (widgit, 2011) program, recommended and used frequently by the school, to add widgit symbols to the text in the questionnaires. The researcher argues that even though these adaptations were not in line with the standardised protocol of either child report measure, neither measure was being used as a standardised measure in this study and their purpose

was to be, as much as possible, an accurate measure of a pupils' anxiety. Therefore, the adaptions were supporting the measure in this purpose.

In addition, pictures (smiling or sad faces) to accompany the response categories for these scales were also introduced: a format used by the school for other emotional literacy questionnaires. The PI-ED was then piloted with an 11 year old child with AS who would have met the criteria for participation in the study had they attended the school. The child provided feedback on the layout and format of the questionnaire, suggesting that the faces accompanying the response criteria should be neutral rather than expressing an emotion, as the emotion they conveyed impacted on his response choice. In light of this comment, the pictures were changed from a face to a whole person, with a more neutral expression, that varied in size depending on how much the statement was like the person responding, i.e. the 'not at all' response had a small person next to it, and the person gradually increased in size to its largest next to the 'always' response option (see appendix six for an example page of the adapted PI-ED).

3.6.4.1.1 Child Self-report

Across the paediatric health literature there is suggestion that children are capable of reliably reporting about their own health if the measure is appropriate developmentally and cognitively (Limbers, Newman and Varni, 2008). The child also has access to the most detailed information about themself of any of the possible respondents (Wigelsworth et al, 2010). However, there has also been some criticism of the reliability of child self-report measures and the need to interpret them with caution (Punch, 2002; Lewis and Lindsay, 2000). Issues that have been raised include:

- Children being vulnerable to the unequal power relationship with the adult researcher resulting in them potentially responding in a way they think they should rather than honestly (Punch, 2002);

- Young children's self-reports showing bias to the here and now (Wigelsworth et al, 2010).

As a repeated measure, self-report measures may be sensitive to the testing threat of internal validity (Cook and Campbell, 1979): a child's self-report of anxiety may increase as a direct result of being repeatedly asked about their anxiety rather than an intervention effect (see section 3.6.8 for further detail).

For these reasons caution needs to be taken in interpreting the data. Dockrell et al (2000) suggest that triangulation of the data using a range of methods, as in this study, is important in strengthening the validity of self-report findings.

3.6.4.2 Behaviour Observation

The dependent variable in a SCED is typically an observable behaviour (Horner et al, 2005). Observations are advantageous in their directness (Robson, 2011) but to increase their validity and reliability observable behaviours should be operationally defined, measured repeatedly, assessed for consistency (through such methods as interobserver agreement) and be of social significance for the participant (Horner et al, 2005).

Prior to the baseline phase, semi structured interviews were undertaken with a member of staff in each child's class, in order to identify and operationally define an anxiety related behaviour to observe for each participant (see appendix seven for semi-structured interview schedule). These conversations were supported by data from a narrative exploratory observation of each child undertaken by the researcher and a review of school documentation including individual education plan targets.

As a result of the semi structured interview with school staff around Christopher's anxiety related behaviour, there emerged two behaviours that staff were wanting to promote as a replacement for the target anxiety related behaviour. These behaviours

were incorporated in to the study at this point for Christopher only, represented in research question three.

The typical frequency of the identified behaviours determined whether the researcher completed the observations (two pupils in year five; 15 minute observation period each) or school staff (two pupils in year six; observation over one school day).

Over a period of two weeks prior to the baseline phase a pilot study of the observational measures was undertaken which established:

- A refined operational definition of the target behaviour;

- Exhaustive and exclusive (Robson, 2011) observation categories for all behaviour being observed;

- A clear procedure for the timings of the observations and confidence and fluency in undertaking the procedure;

- A suitable observation schedule with intervals small enough to capture the intended behaviours.

For the two participants who were being observed by school staff over a day long period, though there was opportunity to refine the observation schedules during this pilot phase no adaptations were made and therefore the data collected during this time was included in the baseline phase for these two participants.

Table 3.2 provides an operational definition of the behaviour observed and the schedule that was developed for each child (templates of the observation schedules may be found in appendix eight).

Participant	Operational Definition of Behaviour	Observation Schedule	Context of Observation
Christopher	Target Behaviour - Christopher waits for an adult to come to him individually to support him to start an independent activity, or uses non-verbal cues to gain the adults attention to signal he would	Event coding - observer/s tallys whenever the three pre-identified behaviours occur.	Completed every Friday through each of the phases of study by two members of staff. A discussion at the end of the day between the two observers rectified

	like help. **Replacement Behaviour One -** Christopher initiates a verbal adult prompt to support him in starting an independent activity. **Replacement Behaviour Two -** Christopher begins an independent task independently after the initial instructions given by the adult without seeking additional help.		any discrepancies in frequency data collected. Data was only collected for independent learning activities. These activities may have occurred in the classroom or other lesson specific rooms such as the computer suite. Not included was playtime, swimming, paired, group or whole class activities.
Jack	**Target Behaviour -** The number of times Jack tells an adult about a 'small problem.' That is something that is happening in the classroom that is not related to what Jack is working on e.g. something that someone else in the class is doing that is not related to the task that Jack has been set. Jack's questions related to the task or statements about activities related to him are not included.	Event coding - observer/s tallys whenever the target behaviour occurred.	Completed every Friday through each of the phases of study by two members of staff. A discussion at the end of the day between the two observers rectified any discrepancies in frequency data collected. Data was only collected during timetabled lessons, playtime was not included.
Cameron	**Target Behaviour -** Whilst working on task independently Cameron seeks reassurance or assistance about his work from a peer or adult by either asking a question about the task or checking out what he is doing is right. **Target Behaviour -** Cameron engages in off task behaviour, not following instructions whether that be to listen or work independently. Instead he interacts with other children in the class, not related to his task e.g. what are you doing?, or looking at others work to see	Interval coding - The observer had the choice of 5 codes: - on task working independently - seeking adult or peer attention related to task - off task peer related - off task non-peer related -working with an adult or peer. Observer to code with the category that best described	Completed by the observer every Thursday morning, where possible, during a 'basic skills' classroom session between 9 and 9.30am. During these sessions children were required to work predominantly independently other than when reading to an adult on activities designed to develop their basic literacy and numeracy skills.

	what they are doing.	the behaviour that was occurring in each 10 second interval over 15 minutes.	
Matthew	**Target Behaviour -** Matthew is chewing, putting something in his mouth or touching his mouth. This may involve one or both hands, maybe inside or touching mouth and includes behaviour such as nail biting. It also includes chewing objects such as a pen, inserting object into mouth, or touching mouth with object. **Dominance -** Dominance is equal to over 50% of the 20 second interval being taken over with that behaviour. Pen being placed in mouth and immediately removed is equal to 1 second. If more than one behaviour is occurring simultaneously neither is dominant.	Interval coding - observer to code which of 3 states was occurring during 20 second intervals over 10 minutes; -target behaviour -physical movement of hands that was not the target behaviour -hands resting. All 3 states could occur within the interval but the dominance category was used to quantify the frequency of behaviour within the interval. The observer circled the dominant behaviour within each interval.	The observation was undertaken by the observer every Thursday morning, where possible, during the same 'basic skills' classroom session as Cameron.

Table 3.2 Description of observations for each participant

3.6.4.3 Spence Child Anxiety Scale (SCAS, Child version; Spence, 1997)

The SCAS is a 44 item questionnaire measure of child self-reported anxiety. Participants answer on a Likert scale ranging from never, sometimes, often to always. It is a standardised measure showing good internal reliability and high internal validity as well as good concurrent validity and high internal consistency (Nauta, 2005; Spence, Barrett and Turner, 2003). It has also been used widely in the existing FRIENDS literature as a measure of anxiety. The measure was collected at two points, pre and post intervention, to triangulate the findings of the repeated measures data.

3.6.4.4 Spence Child Anxiety Scale (Parent version; Spence, 1999)

This 38 item questionnaire includes the same items as the child version of the scale, minus the filler items, but the statements are rephrased into observable behaviours for parents. The total scale shows good internal consistency (Nunnally, 1978) and significant correlation with the CBCL internalizing scale (Nauta et al, 2004). In terms of discriminant validity, results showed significantly higher scores on the scale for parents of anxiety disordered children than the normal sample (Nauta et al, 2004).

The measure was chosen because it is a *'relatively quick, but sufficiently detailed, reliable and valid parent questionnaire,'* (pg.72, Nauta, 2005). This measure was collected at pre and post intervention. The researcher had initially intended to also complete the measure at follow up, but due to low return rates the measure was only sent out at two points.

3.6.4.5 School Anxiety Scale-Teacher Form (SAS-TF; Lyneham et al, 2008)

The SAS-TF is a 16 item questionnaire for teachers assessing children's anxiety on a four point Likert scale (Lyneham et al 2008). This was the only questionnaire found that gained the teachers views specifically about anxiety. It has been tested on two samples, one community (pupils=240, aged 5-12 and 66 teachers) and one clinical (pupils=140 with diagnosis of an anxiety disorder, teachers=140). It was found that the scale has high internal consistency and satisfactory test retest reliability (Lyneham et al, 2008). This questionnaire was completed by classroom staff and the Deputy Head Teacher, three times over the study (pre, post and at follow up).

3.6.5 Stakeholders

Potential Stakeholders in this study include:

- University of Nottingham

- Participating school

- Local Authority

- Developers of the FRIENDS Program

- Other researchers interested in the program or interventions for children with AS more generally

The researcher was supported in the design and implementation of this study through supervision by the University and the local authority where she is employed as a Trainee Educational Psychologist. It is intended that the outcomes of the study will be shared with the local authority by the researcher during an EP development day. The study findings will also be shared with the participating school, parents and participating children.

The researcher has been in contact with the program developers in Australia and key drivers of the intervention in the UK, who have shown interest the study. The researcher has valued their expertise in development of the design and intends to share the findings with these stakeholders.

3.6.6 Implementation of Intervention in This Study

The FRIENDS program was run over 10 weeks for approximately an hour each week on a Thursday morning. In line with the manual recommendations, the facilitators ran two booster sessions during the follow up period (31st January 2013 and 28th February 2013). The manual recommends these sessions to promote long term maintenance of gains. The sessions focused on recapping the key skills covered in the 10 week intervention and discussing coping strategies for once the intervention was complete. Further detail of the content of these sessions may be found in the activity book in appendix one.

The course facilitators were the researcher and another EP colleague; both were trained in the FRIENDS program and the EP had previously run FRIENDS in a special school setting. Having two facilitators provided a contingency plan for illness and enabled the facilitators to work collaboratively in adapting materials.

Originally it was planned for the Deputy Head Teacher to attend every session to support the facilitators and to support generalisation of the techniques. However after the first session it was felt the ratio of three adults to four children was too high and it was agreed that the researcher and EP colleague would continue alone but still liaise with the Deputy Head Teacher if any issues arose. With the Deputy Head Teacher now not attending the sessions, the researcher liaised directly with the class teachers regarding the content of the sessions to support the generalisation of techniques. After each session staff were provided with a brief written description of the content of the session and the target and homework to be completed that week.

3.6.6.1 Adaptations to Materials

Some adaptations were made to the delivery methods of the FRIENDS intervention in light of the available research around approved teaching practices for individuals with autism. The FRIENDS manual approves this course of action, *"Teachers can be as creative as they wish in extending the current content of the FRIENDS program, as long as they follow the structure and sequence of the skills taught in the sessions"* (pg.11, Barrett, 2010). At frequent intervals these adaptations were also shared with the Deputy Head Teacher who offered suggestions about effective practices used specifically in their school context.

Adaptations included:

- Visual aids/ cues- widgit symbols to accompany written learning aims (see appendix nine for example);

- Simplifying cognitive restructuring element e.g. providing examples to support generation of own, ensuring examples were relevant to school and individual context;
- Increasing time spent on certain components- recognising feelings;
- Reducing volume and academic level of information shared- reduced number of objectives for each week, drawing on activities in My Little Fun Friends Book (Barrett, 2011) and the Fun Friends Facilitator Manual (Barrett, 2008) an anxiety program developed also by Paula Barrett for younger children (aged four to seven);
- Role play using puppets;
- Predictable routines and visual structure- visual timetable (see appendix ten for a photograph of the room layout including visual timetable);
- Reinforcement for appropriate behaviour- stickers, sharing successes with class teachers;
- Multiple choice lists- offering ideas to draw upon rather than needing to generate own;
- Emphasis on range of recording methods including scribing, drawing and writing;
- Opportunities for repetition and overlearning- homework, including behaviour target and written task, was made more explicit and recorded in the home books;
- Increased parent involvement- home book and parent sessions (attempted)

The facilitators made the adaptations outlined above and collated their adaptations in two small booklets, a FRIENDS for Life activity book which was used in the sessions and a FRIENDS for Life home book which participants could take home every week to complete their homework and also share what they had been doing in the sessions with parents. The facilitators hoped having these two separate books would overcome any difficulties with participants forgetting to return booklets each week and encourage parent involvement (see appendix one for a copy of these materials).

3.6.6.2 Intervention Integrity

Gutkin (1993) highlights that if an intervention is not implemented with fidelity it makes it difficult to draw causal inferences about the effectiveness of the intervention and, therefore, affects the validity of the findings. An existing FRIENDS intervention integrity measure (Gallegos, 2000) was adapted in line with the adaptations to the materials identified in the previous section, which the facilitators jointly completed at the end of every session (see appendix eleven for an example of the measure). For two of the sessions an external observer, another EP colleague, completed the intervention integrity measure to ensure that the sessions were following the sequence of objectives outlined in the manual.

3.6.6.3 Parental Involvement

The facilitators encouraged parent involvement from the outset through running a parents information afternoon during the initial selection process. In line with the manual recommendations the researchers intended to run a further two parent sessions through the course of the intervention. However, with uptake of only one parent at the first session it was decided that running a second session was not time effective.

Parents were kept informed of the content of each session and given opportunity to provide feedback by means of the home books. Letters were also sent home at frequent intervals letting parents know when the intervention was starting, finishing and when booster sessions were due to take place. The letters included contact details for the facilitators if parents wished to discuss anything further. At the end of the intervention, parents were invited to speak with the facilitators regarding their child's experience of the FRIENDS program, however no parents accepted the offer.

3.6.7 Ethics

The British Psychological Society Code of Ethics and Conduct (2009) and the University of Nottingham Code of Research Conduct and Research Ethics (http://www.nottingham.ac.uk/fabs/rgs/documents/code-of-research-conduct-and-research-ethics-approved-january-2010.pdf) were referred to in considering the ethical issues for this study. Approval from the University of Ethics Committee was also obtained on the 27th February 2012 (see appendix twelve). The key ethical considerations are summarised in Table 3.3.

Ethical Issue	Design consideration
Informed consent (Principle 1:3; BPS, 2009) Right to withdraw (Principle 1.4; BPS, 2009)	School, parent and participant informed consent was gained for this study. Three parents attended an information session and gave written informed consent. One parent stated that they were interested in their child taking part in the intervention and study but was unable to attend the information session. The information from the session and a consent form was sent to that parent in addition to the researcher's contact details for if they wished to discuss anything further. The parent signed and returned the consent form without seeking any further information from the researcher or school. Prior to the first point of data collection, the researcher also gained written informed consent from each of the four children who agreed to take part. Refer to appendix thirteen and fourteen for parent and participant consent forms. The researcher also highlighted, in addition to it being written in the consent form, that both parents and participants had the right to withdraw at any stage of the study without giving a reason. Parents were also informed that any concerns raised as part of the study would be raised with the school.
Confidentiality (Principle 1.2; BPS, 2009)	At the parent information afternoon, also attended by the Deputy Head Teacher, the researcher assured that all data collected would be anonymous and confidential and when written up would not be identifiable.
Concerns raised about participants during study (Principle 1:1, BPS, 2009)	It was agreed with the Deputy Head Teacher at the outset of the study that any concerns noted about the child during either data collection or the intervention would be raised with her and she would involve the appropriate people. When establishing ground rules with the group in the first session, limits of confidentiality were also discussed with them i.e. sharing information with relevant people if the facilitators questioned participant safety as a result of any disclosure.

| Safeguarding | All adults involved in the study were CRB checked. |
| Debriefing (Principle 3.4; BPS, 2009) | The researcher will ensure that the findings will be disseminated to all relevant stakeholders. See stakeholder section for more detail. |

Table 3.3 Ethical considerations for this study.

3.6.8 Reliability and Validity

3.6.8.1 Internal Validity

If a study is able to show a causal relationship between treatment and outcome, i.e. the introduction of the treatment caused the change in outcome, the study has internal validity (Robson, 2011). Cook and Campbell (1979) suggest 12 possible extraneous variables, also termed 'threats to validity,' which may lead to mistakenly identifying a causal relationship between variables.

The SCED inherently attempts to reduce threats to internal validity by undertaking repeated measures over time for a single participant (Horner et al, 2005). SCED studies may also improve their internal validity through collecting data from multiple outcome measures one of which should be based on observation, ensuring the intervention procedure is standardised, formalised and recorded, and studying the effect of a direct intervention across multiple cases (Kratochwill, 1992). All of these criteria were incorporated into the design of this study.

Threats to internal validity, drawing on the extraneous variables identified and defined by Cook and Campbell (1979), are described below along with explanations of how the research design attempted to reduce these threats. Where these threats were not able to be reduced, they were considered as limitations in the discussion of the research findings (see chapter five).

Threat to Internal Validity	How the Study Design May Control for These Threats
History - things that have changed in the environment other than the intervention	To reduce this threat, as part of the selection procedure it was requested that children did not begin any new interventions during the study period. Using an AB design it is not possible to control for this threat particularly if there is a major event in school which may impact on all children involved. The use of multiple cases may reduce but not eliminate it. Therefore it must be considered as a limitation in the discussion of results.
Maturation - growth, change or development in participants unrelated to the intervention.	Investigations involving multiple cases, as in this study may reduce this threat, as may the presence of a stable baseline. The researcher followed guidelines by Kratochwill et al (2010) suggesting five points in the baseline phase is required to give sufficient opportunity for stability. The presence of anxiety over time was highlighted in the selection criteria giving an indication of the stability of the problem before the intervention commenced which may also reduce this threat. However it cannot be completed eliminated and will need to be considered as a limitation in the discussion.
Testing - changes occurring as a result of practice or experience on any tests	Multiple assessments during the baseline phase should highlight any changes as a result of practice and experience of the weekly measure before the intervention starts, therefore reducing the testing threat to validity. In addition the self-report weekly measure is supplemented by an observational weekly measure, and pre and post self-report measures, triangulation of which should reduce this threat.
Instrumentation- changes in aspect/s of the way participants are measured.	Fidelity checks of implementation of the PI-ED measure as well as joint observations over the course of the study should reduce this threat to validity.
Statistical regression - subsequent scores by participants tend to regress towards the mean.	Multiple measures over time should reduce this threat to validity. This may be a threat to the pre and post test measures however these are not providing the primary data for this study.
Hawthorne Effect (Landsberger, 1958) - the psychological	Blinding procedures were not possible in this study, therefore this threat to validity remains and will be considered as a limitation in the discussion.

effects resulting from participation in an intervention	

Table 3.4 Threats to internal validity for this study

The author directs the reader to other sections on intervention integrity (3.6.6.2), measures (3.6.4), reliability (3.6.8.5) and researcher role (3.6.9) as these are recognised as other potential threats to internal validity. The sections offer explanations of how the design attempted to overcome these threats.

3.6.8.2 Construct Validity

Cohen, Manion and Morrison (2009) state that to demonstrate construct validity a measure should show correlation with a theoretical construct and/or other instruments also aiming to measure that construct.

The available literature reporting the psychometric properties of the measures used; PI-ED, Spence Child Anxiety Scale (Child and Parent Version) and School Anxiety Scale, indicate them to be reliable and valid measures of anxiety and strongly associated with other measures measuring the same construct (see section 3.6.4 for further detail).

Where there maybe conflict in defining a construct, it is important for the researcher to acknowledge this and identify the interpretation to be adopted (Cohen, Manion and Morrison, 2009). In recognition of this, the researcher shared the ICD 10 (WHO, 1992) and DSM IV (APA, 1994) definitions of generalised anxiety disorder and the definition of anxiety as described in the FRIENDS manual at the reference group meeting. This was an attempt to unify staff's understanding of the anxiety construct in selecting suitable participants. Staff used these criteria to match to children's behaviour they had observed, thereby selecting participants.

In addition, the researcher has acknowledged in the literature review the existing debates in terms of defining anxiety; dimensional versus categorical definitions as well as the anxiety construct's link with depression. The rationale for adopting certain definitions has been clarified in the methodology (section 3.6.3 and 3.6.4.1) and will be considered again in a review of findings in chapter five.

3.6.8.3 Social/Ecological Validity

Social/ecological validity refers to the practicality of research procedures and findings, which is particularly relevant in education when evaluating the effectiveness of interventions in real world contexts (Horner et al, 2005). Drawing on guidelines provided by Horner et al (2005), this study attempted to increase the social/ecological validity by:

- Approaching a school that was particularly interested in developing their interventions around emotional literacy;

- Working jointly with school staff to make adaptations to materials that increase the feasibility, effectiveness and therefore the likely sustainability of the intervention within that context;

- Developing target behaviours for observation in conjunction with school staff, to ensure their relevance;

- Using intervention integrity measures that allow the facilitators to consider the integrity and feasibility of implementation on a weekly basis;

- Adopting a triangulation approach that considers a practical and significant change from a range of perspectives and measures.

3.6.8.4 External Validity (generalizability)

A major limitation of the SCED is that, even with multiple cases the small sample makes generalizability of conclusions difficult (Barlow, Nock and Hersen, 2009). However, the intention of this study was not to achieve external validity, but to consider the effectiveness of this intervention specifically for the four children involved and contribute to a relatively new and expanding evidence base. Following suggestions made by Horner et al (2005), efforts were made to improve the external validity of the study by including multiple cases and multiple measures of behaviour. Horner et al (2005) also highlighted the importance of providing detail about the sample and context to indicate who the intervention may be effective or ineffective for. This detail may be found in section 3.6.3.

3.6.8.5 Reliability

Robson defines reliability as *'the stability or consistency with which we measure something'* (pg.85, Robson, 2011). He adds that there are a range of sources of unreliability including participant error, participant bias, observer error and observer bias, that need to be considered in order to increase the reliability of the data collected.

To reduce the participant error in this study data collection where possible was undertaken on the same day and approximately same time each week. However this was not possible at all times due to school timetable conflicts. In implementing the self-report measures the researcher highlighted to the participants each week that there was no right or wrong answer in an attempt to reduce participant bias.

3.6.8.5.1 Reliability of structured observation

A high level of inter rater agreement may increase the reliability and validity of observation data (Robson, 2011). Inter rater agreement is the extent of agreement of two or more observers observing the same behaviour using the same schedule (Robson, 2011). In this study 20% of the observations undertaken by the researcher were undertaken jointly and Cohen's Kappa (Cohen, 1960) was used to provide a statistical measure of agreement. For the two participants who were observed over a day long period by school staff, two members of staff were used in an attempt to reduce the observer bias and increase the reliability of the observational data.

Undertaking joint observations through each of the design phases was also intended to reduce the threat of:

- Observer drift - potential change in the way the observer used the schedule as they became more familiar with it (Robson, 2011)
- Expectancy effects- influence of the observer's expectations that there would be a positive impact on the behaviour as a result of the intervention (Robson, 2011). However this threat could not be fully removed as blinding procedures were not used in this study.

To try and control for reactivity of the participants i.e. their behaviour changing due to being observed, the observer attempted to be as unobtrusive as possible by avoiding eye contact with the participant and sitting in the corner of the classroom at a distance approximately five metres from the participants but with a clear view of their behaviour. It was also hoped that the pilot study and length of the baseline phase would allow adequate time for participants to become habituated to the observer's presence, a strategy used to minimise observer effects (Robson, 2011). The pilot phase also enabled the observer to become accustomed to the coding schedule procedure, prior to the baseline phase, aiming to reduce the potential of observer error and inconsistency once the baseline phase observations began.

3.6.9 Researcher Reflexivity

It is now widely accepted in experimental research, that the researcher's beliefs, values and expectations may influence the research at every stage (Robson, 2011). Traditionally seen as a threat to validity in quantitative research, reflexivity maybe defined as 'the practice of paying attention to the role of the researcher in the research' (Miller and Todd, 2002). In this study the researcher developed a close relationship with both the setting and participants as a result of her integral involvement in both the data collection and delivery of the intervention. This may introduce a level of researcher bias in to the study design (Robson, 2011).

Robson (2011) suggests that data triangulation through use of a range of methods of data collection undertaken over a prolonged period of time by the researcher may reduce such threats to validity and reliability as reactivity and respondent bias. The introduction of measures of inter rater agreement at both the data collection and data analysis stage also aimed to reduce the potential of researcher bias in this study.

3.7 Summary

This chapter has recognised the prominence of evidence based practice within the EP profession and reviewed the theoretical positions and methodological considerations associated with this. A detailed account of the design for this study was described including how participants were selected, ethical considerations and how the design attempted to control for particular threats to validity and reliability.

4. Results

4.1 Introduction

In this section the author will consider the debate between visual and statistical analysis of SCED data, and also suitable methods for analysing single point pre and post data. The results for this study will then be presented and analysed in relation to each research question, with each participant being considered individually within those research questions. Intervention integrity and reliability data will also be presented. The section will conclude with a summary and interpretation of the results pertaining to each participant.

4.2 Analysis of Results

4.2.1 Visual Analysis of SCED Data

Over recent decades there has been considerable debate as to the most suitable method for analysing single case data. In light of the movement proposing evidence based practice in the EP profession (Fox, 2002) there has been a renewed interest in resolving this debate (Shadish and Rindskopf, 2007) but it remains open (Maggin and Chafouleas, 2012).

Investigators have traditionally relied on visual analysis in evaluating single case data (Kratochwill et al, 2010). As for a statistical analysis, the goal of the evaluation is 'to identify if the effects are consistent, reliable and unlikely to have resulted from chance fluctuations between conditions' (pg.291, Kazdin, 2003). A judgement about intervention effect is made by visually inspecting continuous data where for consecutive periods the data is collected in the absence of the intervention (baseline) followed by the intervention (Kazdin, 2003). By analysing the differences between

these phases, a judgement can be made about the effect of the intervention (Horner et al, 2005). More conclusive judgements about the effectiveness of an intervention may occur when the behaviour being evaluated is in an extreme in the baseline phase (either not present or occurs frequently) (Kazdin, 2003). The rarity of these extreme scenarios further highlights the need for clear criteria when evaluating change using a visual analysis (Kazdin, 2003). Even those in support of visual analysis suggest that further statistical analysis is recommended particularly where the baseline phase is unstable and the intervention effect cannot be well predicted as in a new intervention (Kazdin, 1982).

Other critics have suggested that visual analysis maybe susceptible to type I errors, falsely identifying an effect (Todman and Dugard, 2001). The possibility of autocorrelation of time series data may be a contributing factor to this, as Matyas and Greenwood (1990) found that the likelihood of type I errors increases with higher degrees of autocorrelation. Autocorrelation, which is the growing interdependence of data points collected for a single case over time, may therefore impact on the reliability and validity of visual analysis (Matyas and Greenwood, 1990).

Advocates of the statistical approach to analysing single case data have suggested that visual analysis may leave itself open to subjective judgements of intervention effect (Kazdin, 2003) and therefore low inter rater agreement between judges (DeProspero and Cohen, 1979). Introduction of quantitative methods to analyse graphical data can increase the reliability and validity of visual interpretations (Brossart, Parker, Olson and Mahadevan, 2006) and has been found to improve levels of agreement between judges (Hojem and Ottenbacher, 1988). Despite criticisms there is a wealth of evidence that suggests visual analysis is at least as reliable and replicable as an alternative statistical method (Kazdin, 2003). However, in light of the criticisms already raised Brossart et al (2006) have recommended several points to consider to improve the reliability and validity of the method:

"1. Graphs should be fully contextualized, describing a particular client, target behavior(s), time frame, and data collection instrument.

2. Judges should not be asked to predict the size or significance of a particular statistic, but rather should be asked to judge graphs according to their own criteria of practical importance, effect, or impact.

3. Judges should not be asked to make dichotomous yes/no decisions, but rather to judge degree or amount of intervention effectiveness.

4. No single statistical test should be selected as "the valid criterion"; rather, several optional statistical tests should be tentatively compared to the visual analyst's judgments."

(pg. 6, Brossart et al, 2006)

Outlined by Kazdin (2003) and Harbst, Ottenbacher and Harris (1991) and also in the Single-Case Design Technical Documentation (pg. 18, Kratochwill, et al, 2010), key criteria for evaluations using a visual analysis approach are presented in table 4.1.

Characteristic	Definition of the Characteristic
Changes in Means	Changes in the mean (average) score between phases (Kazdin, 2003). Percentage of mean change between phases may be calculated to give a mean shift (Harbst, Ottenbacher and Harris, 1991).
Changes in Level	The change between last data point in one phase and the first data point in the next phase, providing a measure of shift in performance between phases (Kazdin, 2003). The absolute change in level across phases may be calculated by dividing the larger number by the smaller number (Harbst et al, 1991).
Changes in Trend	A trend line provides an indicator of systematic increase or decrease in data over time (Kazdin, 2003). A change in slope gives an indicator of change across phases and an intervention effect (Kazdin, 2003). To measure the degree of change in slope between phases the slope from one phase may be subtracted from the slope in another phase. The larger the absolute value, the larger the change in slope (Harbst et al, 1991).
Changes in	Variability is the fluctuation in data within or across phases which

Variability	may be measured by the standard deviation within a phase (Harbst et al, 1991).
Immediacy of the effect	Measuring the change between the last three data points in one phase compared to the first three data points in the next phase. Kazdin (2003) suggests that the more immediate the change after the introduction of the intervention the clearer the intervention effect.
Overlap of data points between phases	Proportion of data points in one phase which overlap with the data points from the previous phase. The smaller the degree of overlap the more likely the intervention effect (Kratochwill et al, 2010).
Consistency of data patterns across phases	Looking at the pattern and consistency of data within similar phases such as all baseline phases, all intervention phases (Kratochwill et al, 2010).

Table 4.1. Key Criteria for Evaluating Single Case Data Using Visual Analysis

These criteria may be used to analyse both the available data but also to make predictions about expected patterns, had interventions not been introduced, which can then be compared to data collected (Kratochwill et al, 2010). Analysis should occur across each phase as well as observing patterns in the design as a whole and it is the role of the inspector to judge the extent to which changes in the aforementioned criteria are present across the phases (Kazdin, 2003).

4.2.2 Statistical Analysis of SCED Data

As previously mentioned, statistical analysis maybe a welcome addition to visual analysis particularly where the baseline is unstable (Kazdin, 1982; Kazdin, 2003). Visual analysis may be subjective and miss smaller effects that may be captured with a statistical analysis (Kazdin, 2003).

Several suggestions have been made for statistics to be used in analysing single case data:

- **Conventional T and F tests**

While t-tests and ANOVAs have been widely used in the group design literature to evaluate the impact of interventions, there are difficulties in applying them to single case data (Kratochwill et al, 1974). SCEDs are characterised by their small sample size which makes it less likely that the assumptions of parametric tests are met (Seigel and Castellan, 1988). The autocorrelation of single case data also violates the assumption of independence made by parametric tests (Barlow et al, 2009) and these tests also do not account for trend in any phases (Barlow et al, 2009). Consequently, this makes these tests unsuitable for SCED data both in general and specifically for this study.

- **Interrupted Time Series Analysis (ITSA)**

Not being reliant on parametric assumptions, ITSA has been considered as a possibility for analysing single case data (Barlow et al, 2009). Through accounting for autocorrelation (Barlow et al, 2009) ITSA requires at least 50 data points (Barlow et al, 2009) which may be difficult to obtain for the majority of SCEDs, including the one reported here, and is therefore not suitable for this study.

- **Randomisation Tests**

Randomisation tests assume that the treatment intervention (Independent variable) is randomly assigned to measurement occasions (Barlow et al, 2009; Todman and Dugard, 2001). As in group designs this randomisation may reduce certain threats to internal validity (Barlow et al, 2009). However Barlow et al (2009) also note that the software to conduct these tests is not readily available at present. For this reason and as a result of the non-random assignment of treatment to measurement occasions this method was not adopted for this study.

- **Effect sizes**

Brossart et al (2006) suggest that *practical* rather than *statistical* significance may be a more useful measure of intervention effect for single case data where the primary aim is a favourable change in outcome for participants. This practical change as a result of

an intervention may be evaluated using an effect size measurement (Brossart et al, 2006).

Several methods have been suggested for measuring effect size in single case data which may broadly fall in to three categories; regression models, percentage of non-overlap methods and standardised mean difference methods (Ross, 2012). Kratochwill et al (2010) suggest that the regression models may be the most appropriate statistic to use at present as unlike the other options they are able to account for trend in the data. However these models do not provide a result which can be compared to the outcomes of group design studies unlike the standardised mean difference method, nor can they account for the threat provided by autocorrelation (Shadish et al, 2008).

Non parametric effect size estimators such as the non-overlap methods (PND; percentage of non-overlapping data and PAND; percentage of all non-overlapping data) are popular due to them being easily calculable (Campbell, 2004). However neither method accounts for trend or ceiling effects in the data (Ross, 2012).

Standardised mean difference methods described by Busk and Serlin (1992) have been found to be superior to regression models in differentiating between effective and ineffective interventions (Manolov and Solanas, 2008). However, like the non-overlap methods, they are not able to account for trend in the data.

With no clear 'gold standard' model, and further research needed in applying and analysing these methods (Kratochwill et al 2010), as well as comparative studies suggesting different models produce different results (Parker and Brossart, 2003) choosing statistical analysis when analysing SCED data is controversial (Robson, 2011).

4.2.3 Analysis of Pre and Post Measures

This study focuses on a small number of participants with data being analysed as single cases due to the personalisation of the observation measures for each case. Therefore,

statistical analysis of pre and post data using group means was not appropriate. The reliable change index (RCI; Jacobson and Truax, 1991) provides a mechanism for evaluating the change between two single points to see whether that change is statistically and clinically significant. A score above 1.96 indicates that the change could not have occurred by chance and is a reliable clinical change (Jacobson and Truax, 1991). It has been widely used as a measure of therapeutic/ intervention change (Speer and Greenbaum, 1995).

This method has been criticised for not controlling potential sources of error such as regression to the mean in the pre and post test scores that are used to calculate RCI (Speer 1992; Wise, 2004). However, Speer and Greenbaum (1995) in their comparative study of RCI and three other pretest posttest methods recommended that Jacobson and Truax's (1991) RCI be used because it is easily computable, has been previously used in the literature and avoids statistical problems that may be linked with residualized true score adjustments. In addition, they stated that regression to the mean may not be as large a concern as previously anticipated.

The RCI is calculated by dividing the difference in scores by the standard error using the following formula:

$$ RCI = \frac{X_{post} - X_{pre}}{\sqrt{2\left(S_{pre}\sqrt{1-r_{xx}}\right)^2}} $$

X_{post} = The post intervention participant score

X_{pre} = The pre intervention participant score

S_{pre} = The standard deviation for the pre intervention result

r_{xx} = measure of reliability

4.2.4 This Study

In considering possible statistical options for analysis in this study, the number of data collection points (less than 50) and the lack of randomisation, made Interrupted Time Series Analysis and Randomisation Tests respectively, both inappropriate options. In terms of effect size measures, as highlighted above there is no clear model that is advocated as the 'gold standard' for use with SCED data (Kratochwill et al 2010). Regression models have been highlighted by several authors (Shadish et al, 2008; Kratochwill et al, 2010) as the best available model at present as unlike other methods such as overlapping models and standardised mean difference methods they account for trends in the baseline data. However they are still threatened by autocorrelation in single case data. Therefore it was decided that a visual analysis of the data using quantitative measures outlined in the Single Case Technical Documentation (Kratochwill et al, 2010), with due regard to the limits of confidence of the interpretation, would be adopted for this study.

In response to the first three research questions, the data will be presented in a graphical format and analysed visually as follows:

Characteristic	Description of How it is to be Computed in this Study
Changes in Means and Mean Shift	The average will be calculated for each phase and then the mean shift will be calculated by dividing the difference between phases by the first phase. A positive value indicates an increase in mean shift between phases (Harbst et al, 1991)
Changes in Level	The change between the last data point in one phase and the first data point in the next phase. A negative score indicates a decrease in score (Kazdin, 2003).
Changes in Trend	In this study the trend lines for each phase will be computed by the linear regression line in Excel 2010. The difference between trend lines in each phase will be calculated to provide a measure of the magnitude of

	change (Harbst et al, 1991).
Changes in Variability	Both the range and standard deviation will be reported in this study as measures of variability (Harbst et al, 1991; Kratochwill et al, 2010).
Immediacy of the effect	In this intervention, previous literature indicates the effects are likely to be cumulative rather than immediate therefore the data was not analysed on this criteria in this study.
Overlap of data points between phases	The number of data points in one phase that fall within the data range of the comparing phase will be calculated as a percentage of all the data points in that phase (Harbst et al, 1991).
Consistency of data patterns across phases	As an AB design was adopted it was not possible to analyse the data on this criteria.

Table 4.2. Criteria for visual analysis to be used in this study

The x axes of the graphs do not include weeks where data was not collected due to school holidays. The dates of collection give an indication of the location of school holidays within the timeline of the study. Data points have also been joined over single weeks where data was not collected due to participant illness. The graphs are presented in this way to support the researcher in exploring overall patterns in the data.

The graphs were also analysed by the researcher and another Trainee Educational Psychologist, familiar with issues in SCED (see appendix fifteen for the table completed by the evaluators). Evaluators were given the criteria for visual analysis described in Table 4.2. In line with Brossart et al's (2006) recommendations, they were then asked to rate on a scale of 1 (not at all convinced) to 5 (very convinced) a response to this question:

"How certain or convinced are you that the child's responses underwent a practical and significant improvement during each of the phases?"

Using the Statistics Package for Social Sciences (SPSS, 2009) outcomes from the two evaluators were analysed for the degree of agreement by calculating Cohen's kappa (Cohen, 1960). Landis and Koch's (1977) categories were used to define the level of

agreement as being less than chance agreement (<0), slight agreement (0.01-0.2), fair agreement (0.21-0.4), moderate agreement (0.41-0.6), substantial agreement (0.61-0.8) or almost perfect agreement (0.81-0.99).

The pre and post measures were analysed using Jacobson and Truax's (1991) Reliable Change Index. The RCI calculator developed by the University of Leeds (Agnostinis, Morley and Dowzer, 2008) was used to calculate the statistic.

The measure of reliability used to calculate standard error for the RCI was Cronbach's alpha co-efficient. Required for the RCI, the psychometric data for the Spence Child Anxiety Scale; child (Spence, 1997) and parent (Spence, 1999) version, was obtained from Nauta (2005) and Spence, Barrett and Turner (2003). The psychometric properties for the School Anxiety Scale-Teacher Form were found in Lyneham et al (2008).

4.3 Research Question One- Does the FRIENDS for Life intervention reduce participant's self-report of their anxiety?

4.3.1 Christopher

4.3.1.1 Repeated Measures

The graph below shows Christopher's scores on the Paediatric Index of Emotional Distress, taken weekly over the baseline, intervention and follow up phase.

A Scatter Graph to Show Christopher's Scores on the Paediatric Index of Emotional Distress During the Baseline, Intervention and Follow Up Phase

Figure 4.1 A Scatter Graph to Show Christopher's Scores on the Paediatric Index of Emotional Distress During the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive outcome	Numerical outcome (2 d.p)
Mean	The mean of the intervention phase is slightly lower than the baseline phase. The mean of the follow up phase is considerably lower than both the baseline and intervention phase.	Mean of the baseline phase= 20.45 Mean of the intervention phase= 19.67 Mean of the follow up phase= 12.29 Using mean shift calculation: Change in phase mean between the baseline and intervention=-0.04 Change in phase mean between the intervention and follow up=-0.38 Change in phase mean between the baseline and follow up= -0.4
Level	There was a small decrease in level between the end of the baseline and beginning of the intervention phase. There was a further decrease from the end of the intervention phase to the beginning of the follow up phase.	Change in level between baseline and intervention= -2 Change in level between intervention and follow up= -5
Trend	The baseline displays a slight accelerating trend. In the intervention phase there is a clear decelerating trend and in the follow up phase there is a slight decelerating trend. The magnitude of slope change indicates the largest change is between baseline and intervention phase, and the smallest is between intervention and follow up phases.	Baseline phase trend= 0.5 Intervention phase trend=-1.25 Follow up phase trend= -0.54 Magnitude of change between baseline and intervention phase= 1.75 Magnitude of change between intervention and follow up phase= 0.71 Magnitude of change between baseline and follow up phase = 1.04
Variability	The range and standard deviation of the scores was largest in the baseline phase. The range of scores in the intervention and follow up phase were similar and both lower than the baseline phase. The standard deviation was lowest in the follow up phase.	Range (and standard deviation) in the baseline phase= 16 (5.11) Range (and standard deviation) in the intervention phase= 12 (4.58) Range (and standard deviation) in the follow up phase=11 (3.99)
Overlap	All the data points in the intervention phase overlapped with the baseline phase. Under half of the points in the follow up phase overlapped with points in the intervention and just over half in the baseline phase.	Percentage of data overlap between baseline and intervention phase= 100% Percentage of data overlap between intervention and follow up phase= 42.86% Percentage of data overlap between baseline and follow up phase= 57.14%

Table 4.3 Visual Analysis of Christopher's scores on the Paediatric Index of Emotional Distress

4.3.1.1.1 Summary of Findings From Figure 4.1

Figure 4.1 shows 100% overlap between the data in the baseline and intervention phase and less than one point score difference in the means of these two phases, suggesting there is no significant change in anxiety during the intervention phase. However from a gradual accelerating trend in the baseline phase there is a clear decelerating trend in the intervention phase which may be used to predict the direction of scores in the follow up phase.

The decelerating trend apparent in the intervention phase does continue at a slower rate in the follow up phase, with the mean score indicating a significant reduction in anxiety scores during the follow up. There is also a reduction in range and variability from baseline through to follow up.

In relation to question one, the graph suggests there has been a positive impact on Christopher's self-report of anxiety in the follow up phase, which may be interpreted as a delayed effect on anxiety.

4.3.1.2 Pre and Post Measure- Participant Self-Report

The table below presents Christopher's scores on the Spence Child Anxiety Scale (Spence, 1997) at two points in time, prior to and post intervention.

Time of Data Collection	Score on Spence Child Anxiety Scale
PRE	54
POST	40
Difference	-14
RCI	1.92
Significance (yes/ no)	No

Table 4.4 Christopher's Scores on the Spence Child Anxiety Scale

4.3.1.2.1 Summary of Findings From Table 4.4

Christopher's scores on the Spence Child Anxiety Scale show a non-significant change in anxiety on the Reliable Change Index (RCI; Jacobson and Truax, 1991) suggesting any change in scores could have occurred by chance.

4.3.2 Jack

4.3.2.1 Repeated Measures

The graph below shows Jack's scores on the Paediatric Index of Emotional Distress, taken weekly over the baseline, intervention and follow up phase.

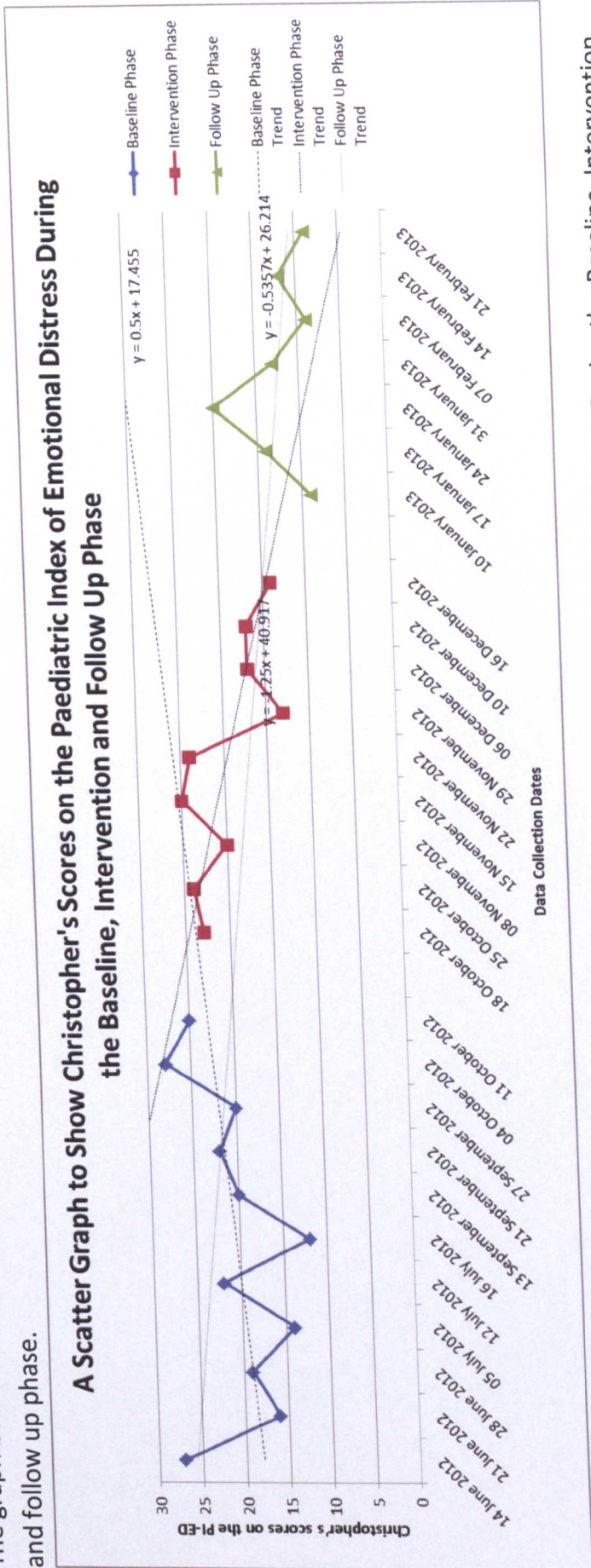A Scatter Graph to Show Jack's Scores on the Paediatric Index of Emotional Distress in the Baseline, Intervention and Follow Up Phase

Figure 4.2 A Scatter Graph to Show Jack's Scores on the Paediatric Index of Emotional Distress in the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive Evaluation	Numerical Evaluation (2 decimal places)
Mean	The mean in the intervention phase is higher than the baseline phase. The mean of the follow up phase is lower than both the intervention and baseline phase. The largest mean shift is between the intervention and follow up.	Mean of the baseline phase= 14.7 Mean of the intervention phase= 16.33 Mean of the follow up phase= 13.57 Using mean shift calculation: Change in phase mean between the baseline and intervention= 0.11 Change in phase mean between the intervention and follow up=-0.17 Change in phase mean between the baseline and follow up= -0.08
Level	There was a slight decrease in level between the baseline and the beginning of the intervention. There was no change in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -2 Change in level between intervention and follow up= 0
Trend	There is a small accelerating trend in the baseline and intervention phase. There is a clear decelerating trend in the follow up phase. The largest change is between intervention and follow up phase.	Baseline phase trend= 0.16 Intervention phase trend= 0.32 Follow up phase trend= -0.5 Magnitude of change between baseline and intervention phase= 0.16 Magnitude of change between intervention and follow up phase= 0.82 Magnitude of change between baseline and follow up phase =0.66
Variability	The range of the scores is identical in the baseline and intervention phases and increases slightly in the follow up phase. The standard deviation increases slightly through each of the three phases.	Range (and standard deviation) in the baseline phase= 4(1.16) Range (and standard deviation) in the intervention phase=4 (1.58) Range (and standard deviation) in the follow up phase= 6 (1.9)
Overlap	Only a third of data points in the intervention phase overlap with the baseline phase. Under half of the points in the follow up phase overlap with the intervention phase. There is considerable overlap between the follow up and baseline phase.	Percentage of data overlap between intervention and baseline phase= 33% Percentage of data overlap between follow up and intervention= 28.57% Percentage of data overlap between follow up and baseline phase= 71.42%

Table 4.5 Visual Analysis of Jack's Scores on the Paediatric Index of Emotional Distress

4.3.2.1.1 Summary of Findings From Figure 4.2

Figure 4.2 shows an increase in Jack's scores on the PI-ED through the baseline to intervention phase but then a drop in scores to a level slightly lower than the baseline level during the follow up phase.

In relation to research question one, 'does the FRIENDS for Life intervention reduce participant's self-report of their anxiety?,' the data indicates an increase rather than a decrease in self-reports of anxiety between baseline and intervention phases. Neil and Christenson (2009) suggest that this finding may be explained by a period of heightened awareness of their anxiety by participants as a result of the intervention. This explanation will be explored more fully in the discussion. There appears to be a decrease in anxiety during the follow up phase but the number of data points available in the phase does not enable the researcher to be confident in concluding that there was a practical improvement from baseline to follow up.

4.3.2.2 Pre and Post Measure- Participant Self-Report

The table below presents Jack's scores on the Spence Child Anxiety Scale (Spence, 1997) at two points in time, prior to and post intervention.

Time of Data Collection	Score on Spence Child Anxiety Scale
PRE	34
POST	36
Difference	+2
RCI	-0.27
Significance (yes/no)	No

Table 4.6 Jack's Scores on the Spence Child Anxiety Scale

4.3.2.2.1 Summary of Findings From Table 4.6

There was no significant change, according to the RCI, between Jack's pre and post scores on the Spence Child Anxiety Scale suggesting any change in Jack's anxiety could have occurred by chance.

4.3.3 Cameron

4.3.3.1 Repeated Measures

The graph below shows Cameron's scores on the Paediatric Index of Emotional Distress, taken weekly over the baseline, intervention and follow up phase.

A Scatter Graph to Show Cameron's Scores on the Paediatric Index of Emotional Distress During the Baseline, Intervention and Follow Up Phases
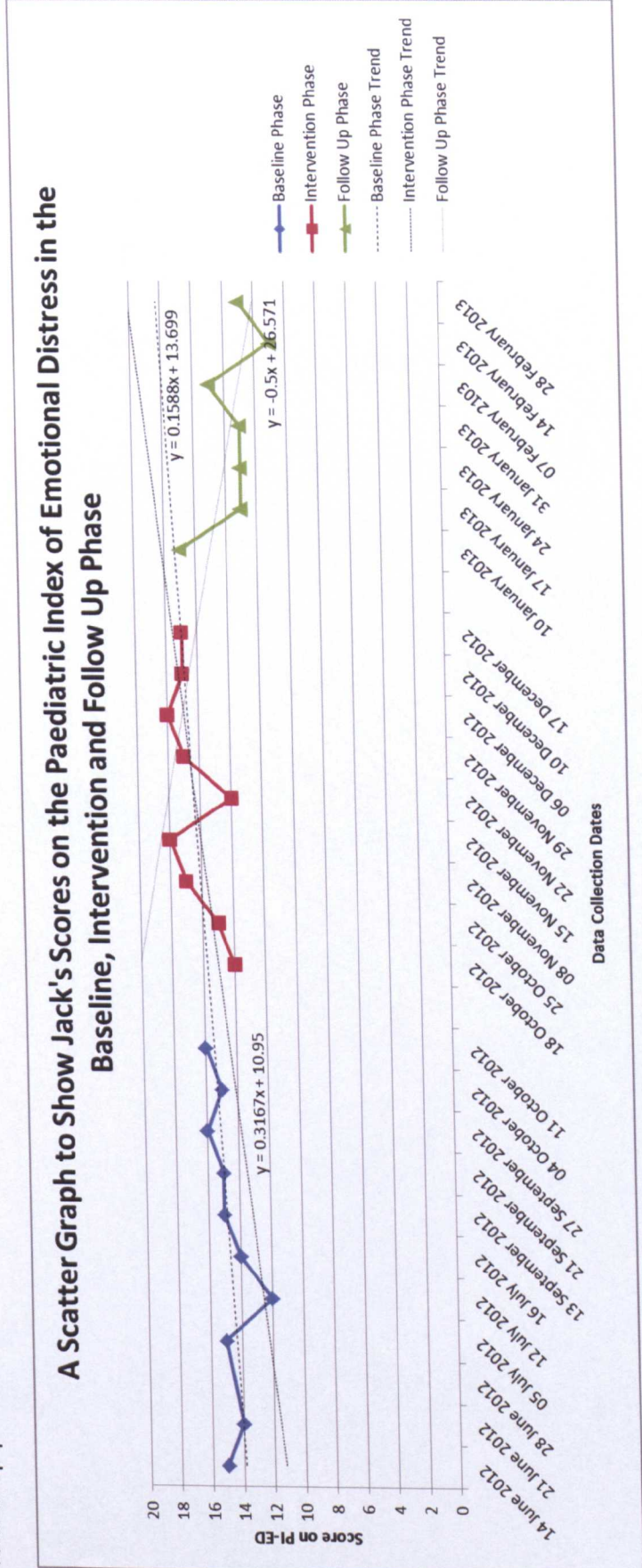
Figure 4.3 A Scatter Graph to Show Cameron's Scores on the Paediatric Index of Emotional Distress During the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive Evaluation	Numerical Evaluation
Mean	There was small reduction in mean in the intervention phase compared to the baseline. There was a further slight reduction in the mean in the follow up phase.	Mean of the baseline phase= 11.78 Mean of the intervention phase= 11 Mean of the follow up phase= 10.71 Using mean shift calculation: Change in phase mean between the baseline and intervention= -0.07 Change in phase mean between the intervention and follow up= -0.03 Change in phase mean between the baseline and follow up= -0.09
Level	There was a decrease in level between the baseline and the beginning of the intervention. There was also a slight decrease in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -2 Change in level between intervention and follow up= -1
Trend	There was a small accelerating trend in the baseline phase which became more pronounced in the intervention phase. There was a slight decelerating trend in the follow up phase.	Baseline phase trend= 0.1 Intervention phase trend= 0.2 Follow up phase trend= -0.14 Magnitude of change between baseline and intervention phase= 0.1 Magnitude of change between intervention and follow up phase= 0.34 Magnitude of change between baseline and follow up phase =0.24
Variability	The range of scores decreased considerably from baseline to intervention phase and increased slightly from the intervention to the follow up phase. A similar pattern was also evident in the standard deviation.	Range (and standard deviation) in the baseline phase= 7(2.11) Range (and standard deviation) in the intervention phase= 2 (0.87) Range (and standard deviation) in the follow up phase= 4 (1.5)
Overlap	All the data points in the intervention phase overlap with the baseline phase. All but one point in the follow up phase overlaps with the intervention phase. All of the points in the follow up phase overlap with the baseline phase.	Percentage of data overlap between intervention and baseline phase= 100% Percentage of data overlap between follow up and intervention= 85.71% Percentage of data overlap between follow up and baseline phase= 100%

Table 4.7 Visual Analysis of Cameron's Scores on the Paediatric Index of Emotional Distress

4.3.3.1.1 Summary of findings from Figure 4.3

Figure 4.3 indicates little change in scores between any of the three phases, as indicated by the mean scores for each phase and large degree of overlap between phases. However, range and variability of scores does decrease from baseline to intervention, suggesting an increase in stability of the behaviour.

In relation to question one considering the effectiveness of the FRIENDS for life intervention on participant self-report of anxiety, the available data indicates there was no practical improvement on Cameron's self-report of anxiety in the intervention or follow up phases.

4.3.3.2 Pre and Post Measure- Participant Self-Report

The figure below presents Cameron's scores on the Spence Child Anxiety Scale (Spence, 1997) at two points in time, prior to and post intervention.

Time of Data Collection	Score on Spence Child Anxiety Scale
PRE	26
POST	21
Difference	-5
RCI	0.69
Significance (yes/no)	No

Table 4.8 Cameron's Scores on the Spence Child Anxiety Scale

4.3.3.2.1 Summary of Findings From Table 4.8

There was a non-significant change in Cameron's scores on the Spence Child Anxiety Scale from pre to post intervention suggesting the intervention did not have a significant effect on his anxiety.

4.3.4 Matthew

4.3.4.1 Repeated Measures

The graph below shows Matthew's scores on the Paediatric Index of Emotional Distress, taken weekly over the baseline, intervention and follow up phase.

A Scatter Graph to Show Matthew's Scores on the Paediatric Index of Emotional Distress During the Baseline, Intervention and Follow Up Phases

$y = 0.587x + 1.2826$

$y = -0.4884x + 23.302$

$y = -0.4755x + 16.196$

Legend:
- Baseline Phase
- Intervention Phase
- Follow Up Phase
- Baseline Phase Trend
- Intervention Phase Trend
- Follow Up Phase Trend

Y-axis: Score on PI-ED (0, 5, 10, 15, 20, 25)

X-axis (Dates of Data Collection): 14 June 12, 21 June 12, 28 June 12, 05 July 12, 12 July 12, 16 July 12, 13 September 12, 21 September 12, 27 September 12, 04 October 12, 11 October 12, 18 October 12, 25 October 12, 08 November 12, 15 November 12, 22 November 12, 29 November 12, 06 December 12, 10 December 12, 18 December 12, 10 January 13, 17 January 12, 24 January 12, 31 January 12, 07 February 12, 14 February 12
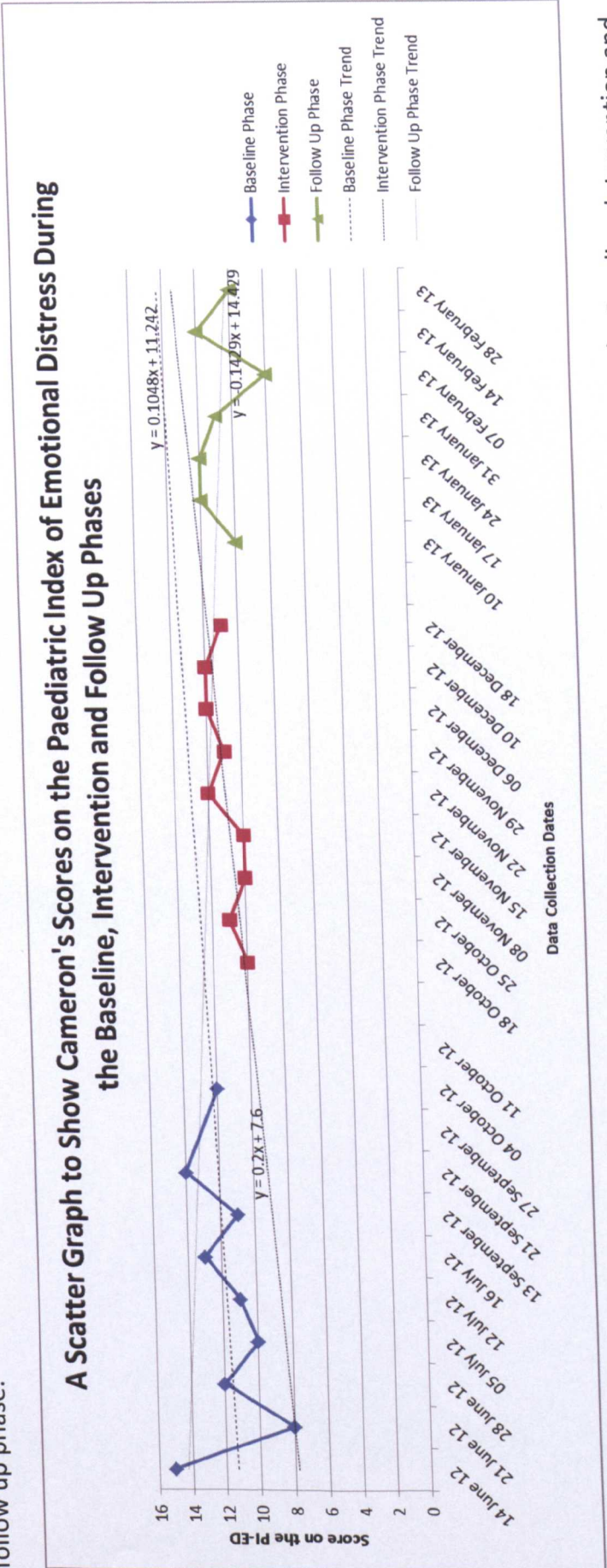
Figure 4.4 A Scatter Graph to Show Matthew's Scores on the Paediatric Index of Emotional Distress During the Baseline, Intervention and Follow Up Phases

119

Criteria	Descriptive Evaluation	Numerical Evaluation (2 decimal places)
Mean	There was a decrease in the mean from the baseline to intervention phase. There was a further small reduction in the mean in the follow up phase.	Mean of the baseline phase= 13.2 Mean of the intervention phase= 11.43 Mean of the follow up phase=10.83 Using mean shift calculation: Change in phase mean between the baseline and intervention= -0.13 Change in phase mean between the intervention and follow up= -0.05 Change in phase mean between the baseline and follow up= -0.18
Level	There was a decrease in level between the baseline and the beginning of the intervention. There was an increase in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -3 Change in level between intervention and follow up= 3
Trend	There was a decelerating trend in the baseline and follow up phase. In the intervention phase there was a clear accelerating trend.	Baseline phase trend= -0.48 Intervention phase trend= 0.59 Follow up phase trend= -0.49 Magnitude of change between baseline and intervention phase= 1.07 Magnitude of change between intervention and follow up phase= 1.08 Magnitude of change between baseline and follow up phase = 0.01
Variability	The range of scores and standard deviation decreased through each phase of the study. The range and standard deviation decreased the most between intervention and follow up phase.	Range (and standard deviation) in the baseline phase= 11(3.36) Range (and standard deviation) in the intervention phase= 9 (3.15) Range (and standard deviation) in the follow up phase= 4(1.33)
Overlap	All but one of the data points in the intervention phase overlaps with the baseline phase. All but one of the data points in the follow up phase overlaps with the intervention phase and baseline phase.	Percentage of data overlap between intervention and baseline = 85.71% Percentage of data overlap between follow up and intervention= 85.71% Percentage of data overlap between follow up and baseline= 100%

Table 4.9 Visual Analysis of Matthew's Scores on the Paediatric Index of Emotional Distress

4.3.4.1.1 Summary of Findings From Figure 4.4

Figure 4.4 indicates there is a small decrease in mean and a large decrease in variability from baseline to intervention and follow up. However there is also a larger overlap in points across all phases that makes it difficult to conclude there has been a positive improvement on Matthew's self-report of anxiety as a result of the FRIENDS intervention.

In contrast to the mean scores, the trend lines illustrate a definite change in direction of results from the decelerating trend evident in the baseline phase particularly towards the end, to the clear accelerating trend in the intervention phase. This indicates an increase in anxiety during the intervention phase relative to the end of the baseline period. This may be explained by the heightened awareness hypothesis described by Neil and Christensen (2009) and will be explored more fully in the discussion. The follow up phase presents a pattern of scores a similar level to that at the end of the baseline.

In relation to question one therefore the data does not provide conclusive evidence that there was a practical and significant decrease in anxiety levels in the intervention or follow up phases compared to the baseline. Furthermore, the trend line analysis indicates a potential increase in anxiety levels during the intervention phase relative to the end of the baseline period.

4.3.4.2 Pre and Post Measure- Participant Self-Report

The figure below presents Matthew's scores on the Spence Child Anxiety Scale (Spence, 1997) at two points in time, prior to and post intervention.

Time of Data Collection	Score on Spence Child Anxiety Scale
PRE	14
POST	6
Difference	-8
RCI	1.1
Significance (yes/no)	No

Table 4.10 Matthew's Scores on the Spence Child Anxiety Scale

4.3.4.2.1 Summary of findings From Table 4.10

The RCI indicates a non-significant change in Matthew's scores on the Spence Child Anxiety Scale from pre to post intervention suggesting any change in anxiety may have occurred by chance.

4.4 Research Question Two- Does the FRIENDS for Life intervention reduce participant's anxiety related behaviour?

4.4.1 Christopher

4.4.1.1 Repeated Measures

The graph below shows the frequency of Christopher's target behaviour observed weekly where possible over the baseline, intervention and follow up phase.

Operational Definition of Target Behaviour- Christopher waits for an adult to come to him individually to support him to start an independent activity, or uses non-verbal cues to gain the adults attention to signal he would like help.

A Scatter Graph to Show the Percentage of Independent Activities That Began With an Adult Prompt During Observations in the Baseline, Intervention and Follow Up Phase
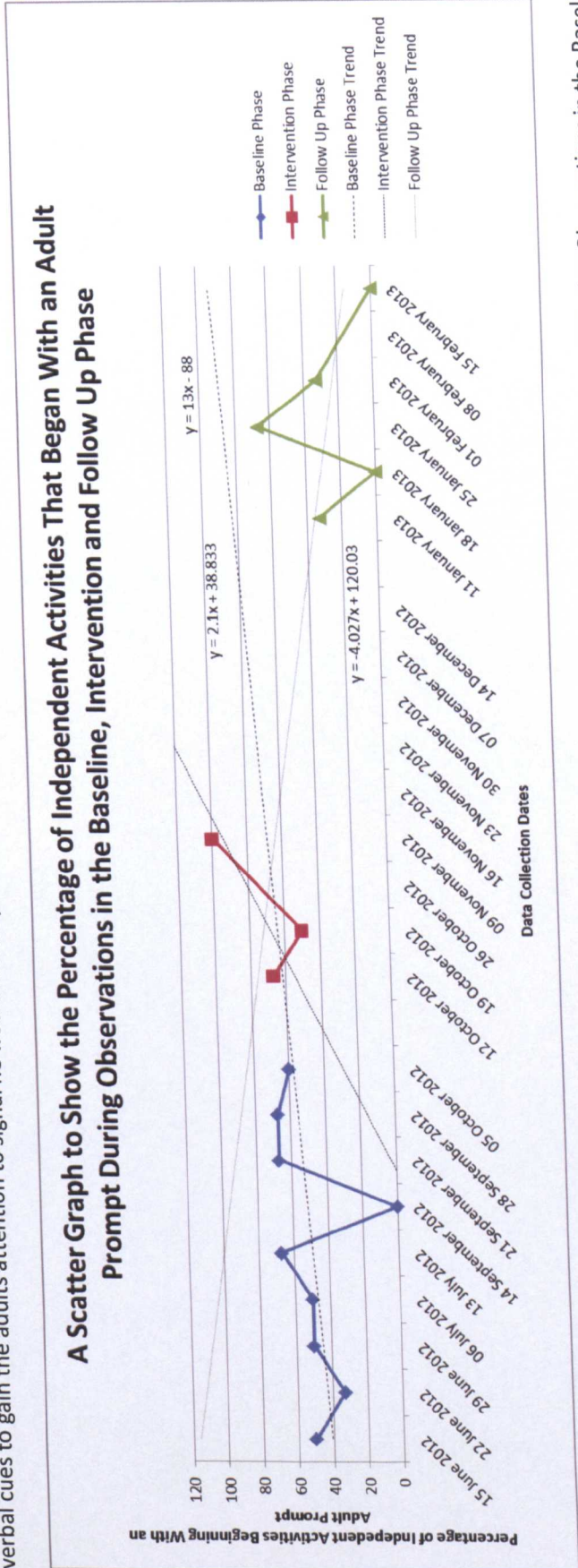
Figure 4.5 A Scatter Graph to Show the Percentage of Christopher's Independent Activities That Began With an Adult Prompt During Observations in the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive outcome	Numerical outcome (2 decimal places)
Mean	The mean in the intervention phase is higher than the baseline phase. The mean of the follow up phase is lower than both the baseline and intervention phase. The largest mean shift is between the intervention and follow up.	Mean of the baseline phase= 49.33 Mean of the intervention phase= 72.33 Mean of the follow up phase= 26.6 Using mean shift calculation: Mean shift between the baseline and intervention= 0.47 Mean shift between the intervention and follow up= -0.63 Mean shift between the baseline and follow up= -0.46
Level	There was a slight increase in level between baseline and intervention phase. There was a considerable decrease between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= +7 Change in level between intervention and follow up= -67
Trend	There was an accelerating trend in both the baseline and intervention phase. The accelerating trend was largest in the intervention phase. There was a clear decelerating trend in the intervention phase. The largest change in slope was between the follow up phase. The largest change in slope was between the intervention and follow up phase.	Baseline phase trend= 2.1 Intervention phase trend=13 Follow up phase trend= -4.03 Magnitude of change between baseline and intervention phase=10.9 Magnitude of change between intervention and follow up phase=17.03 Magnitude of change between baseline and follow up phase =6.13
Variability	The range of the scores was the same in the baseline and follow up phases and slightly smaller in the intervention phase.	Range (and standard deviation) in the baseline phase= 67% (1.81) Range (and standard deviation) in the intervention phase= 50% (0) Range (and standard deviation) in the follow up phase= 67% (1)
Overlap	Two thirds of the data points in the intervention phase overlapped with the baseline phase. Only one of the five data points in the follow up phase overlapped with the intervention phase, but there was complete overlap of scores between the follow up and baseline phase.	Percentage of data overlap between intervention and baseline phase=67% Percentage of data overlap between follow up and intervention= 20% Percentage of data overlap between follow up and baseline phase= 100%

Table 4.11 Visual Analysis of Christopher's Observational Data

4.4.1.1.1 Summary of Findings From Figure 4.5

Figure 4.5 illustrates a clear rise in the target behaviour from baseline to intervention phase. From intervention to follow up there is a clear reduction in the target behaviour, demonstrated by very little overlap of data points between these phases. The mean scores also indicate the frequency of the target behaviour is lower in the follow up than in the baseline phase.

In relation to question two, 'does the FRIENDS for Life intervention reduce participant's anxiety related behaviour?,' the apparent increase in the anxiety related target behaviour from baseline to intervention phase, may suggest an increase in anxiety during this phase in the opposite direction to the research hypothesis. However it is difficult to draw meaningful conclusions about changes in anxiety within this phase due to the limited number of data points.

It appears there is a reduction in Christopher's anxiety related behaviour from baseline to follow up however the variability in the data collected in the baseline and follow up phase makes interpreting the graphical data more difficult. The author turns to a seminal text on single case design in resolving this. Barlow, Nock and Hersen (2009) highlight variability in behaviour is typical even when attempting to control for nuisance variables which encouraged the author to look for overall trends and patterns in the data rather than individual data points. In light of this the graphical data seems to indicate a reduction in anxiety from baseline to follow up.

4.4.2 Jack

4.4.2.1 Repeated Measures

The graph below shows the frequency of Jack's target behaviour observed weekly where possible over the baseline, intervention and follow up phase.

Operational Definition of Target Behaviour- The number of times Jack tells an adult about a 'small problem.' That is something that is happening in the classroom that is not related to what Jack is working on e.g. something that someone else in the class is doing that is not related to the task that Jack has been set. Jack's questions related to the task or statements about activities related to him are not included.

A Scatter Graph to Show the Frequency of Target Behaviour During Observations in the Baseline, Intervention and Follow Up Phase
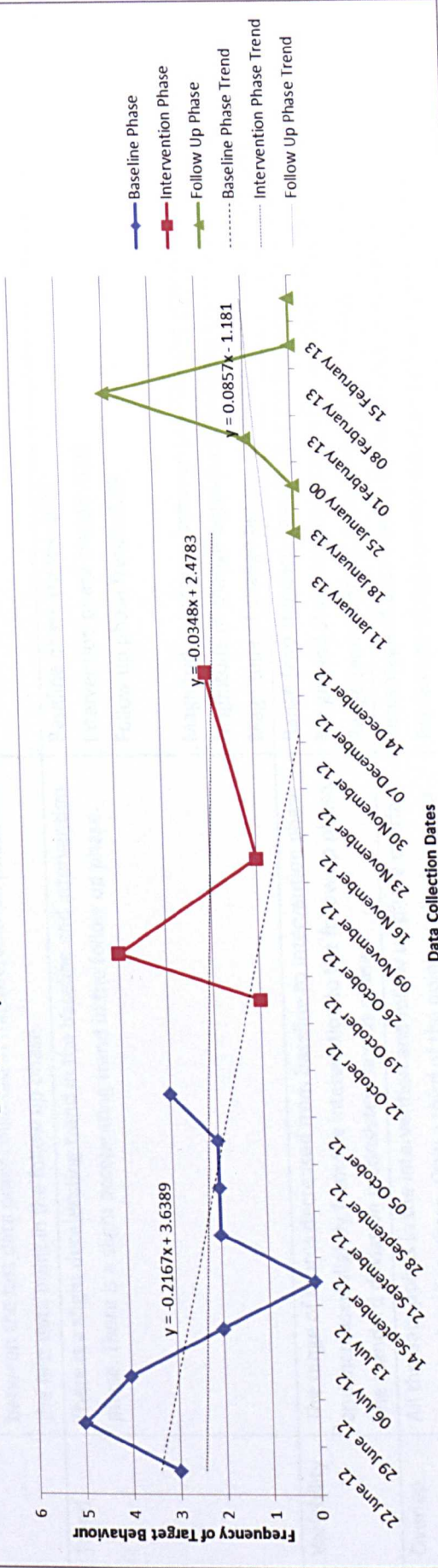
Figure 4.6 A Scatter Graph to Show the Frequency of Jack's Target Behaviour During Observations in the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive Evaluation	Numerical Evaluation
Mean	There was a small reduction in mean in the intervention phase compared to the baseline. There was a further larger reduction in the mean in the follow up phase.	Mean of the baseline phase= 2.56 Mean of the intervention phase= 2 Mean of the follow up phase= 0.83 Using mean shift calculation: Change in phase mean between the baseline and intervention= -0.22 Change in phase mean between the intervention and follow up= -0.59 Change in phase mean between the baseline and follow up= -0.68
Level	There was a slight decrease in level between the baseline and the beginning of the intervention. There was the same change in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -2 Change in level between intervention and follow up= -2
Trend	There is a slight decelerating trend in the baseline and intervention phase. There is a slight accelerating trend in the follow up phase.	Baseline phase trend= -0.22 Intervention phase trend= -0.03 Follow up phase trend= 0.09 Magnitude of change between baseline and intervention phase=0.19 Magnitude of change between intervention and follow up phase= 0.12 Magnitude of change between baseline and follow up phase =0.31
Variability	The range of scores decreased from baseline to intervention phase and increased slightly from the intervention to the follow up phase. The standard deviation is consistent across phases.	Range (and standard deviation) in the baseline phase= 5(1.42) Range (and standard deviation) in the intervention phase=3 (1.41) Range (and standard deviation) in the follow up phase= 4 (1.6)
Overlap	All the data points in the intervention and follow up phase overlap with the baseline phase. Only a third of the points in the follow up phase overlap with the intervention phase.	Percentage of data overlap between intervention and baseline phase= 100% Percentage of data overlap between follow up and intervention= 33% Percentage of data overlap between follow up and baseline phase= 100%

Table 4.12 Visual Analysis of Jack's Observational Data

4.4.2.1.1 Summary of Findings From Figure 4.6

An analysis of figure 4.6 suggests there is a little difference in the frequency of Jack's anxiety related behaviour between baseline and intervention as demonstrated by the small change in mean scores and 100% overlap of data. The data suggests that there is a reduction in the frequency and variability of the behaviour during the follow up phase. The mean shift calculation indicates a prominent reduction in anxiety between baseline and follow up, which may suggest a delayed reduction in anxiety after the intervention.

There is however large variability within phases which makes interpretation of data more difficult. With the understanding that variability on direct measures of behaviour is not atypical (Barlow, Nock and Hersen, 2009) the researcher places greater emphasis on the interpretational value of overall patterns within the data rather than individual points in drawing the conclusion that there is a reduction in anxiety related behaviour from baseline and intervention, to follow up.

4.4.3 Cameron

4.4.3.1 Repeated Measures- Target Behaviour One

The graph below shows the frequency of Cameron's target behaviour one observed weekly over the baseline, intervention and follow up phase.

Operational Definition of Target Behaviour- Whilst working on task independently Cameron seeks reassurance or assistance about his work from a peer or adult by either asking a question about the task or checking out what he is doing is right.

A Scatter Graph to Show the Percentage of Intervals Where Cameron was Seeking Adult or Peer Reassurance or Assistance About His Independent Work During Observations in the Baseline, Intervention and Follow Up Phase
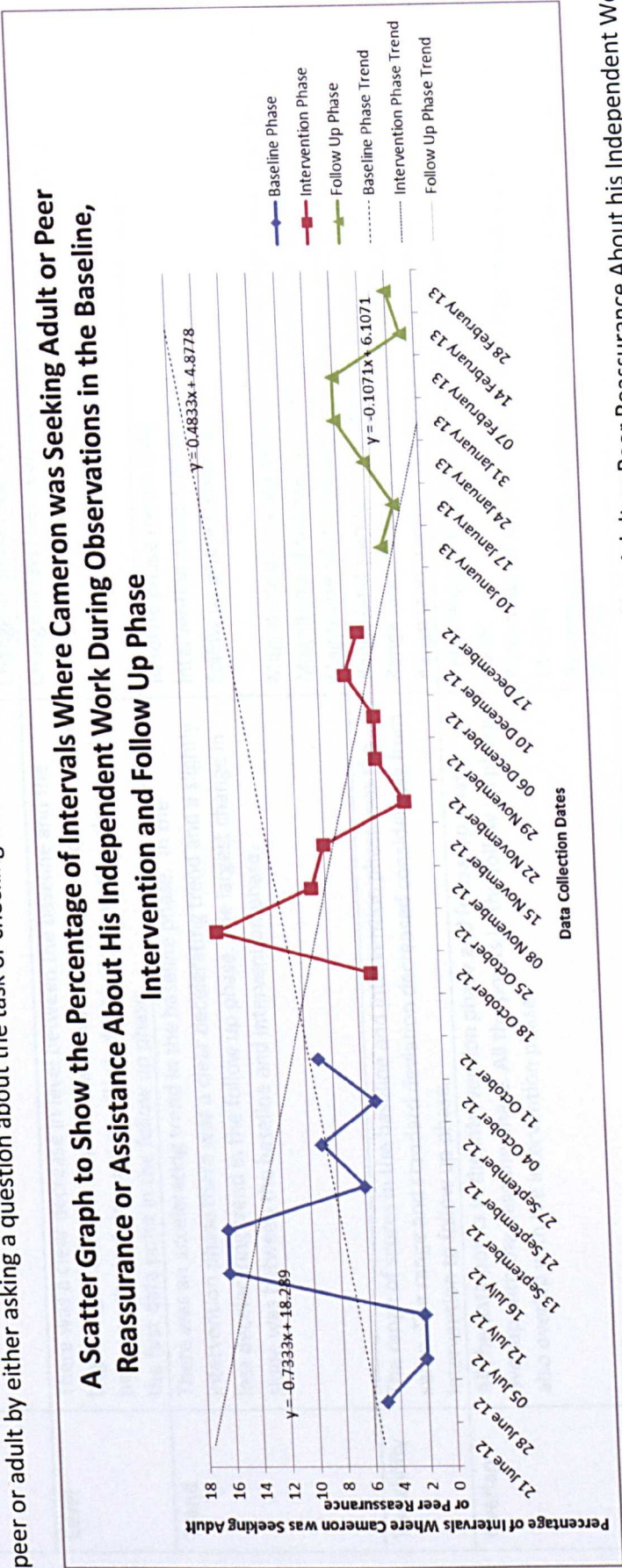
Figure 4.7 A Scatter Graph to Show the Percentage of Intervals Where Cameron was Seeking Adult or Peer Reassurance About his Independent Work During Observations in the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive Evaluation	Numerical Evaluation
Mean	There was small reduction in mean in the intervention phase compared to the baseline. There was a further reduction in the mean in the follow up phase.	Mean of the baseline phase= 7.78 Mean of the intervention phase= 6.56 Mean of the follow up phase= 3.43 Using mean shift calculation: Change in phase mean between the baseline and intervention= -0.16 Change in phase mean between the intervention and follow up=-0.48 Change in phase mean between the baseline and follow up= -0.56
Level	There was a clear decrease in level between the baseline and the beginning of the intervention. There was also a slight decrease in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -4 Change in level between intervention and follow up= -2
Trend	There was an accelerating trend in the baseline phase. In the intervention phase there was a clear decelerating trend and a slightly less decelerating trend in the follow up phase. The largest change in slope was between the baseline and intervention phase.	Baseline phase trend= 0.48 Intervention phase trend= -0.73 Follow up phase trend= -0.11 Magnitude of change between baseline and intervention phase=1.21 Magnitude of change between intervention and follow up phase= 0.62 Magnitude of change between baseline and follow up phase =0.59
Variability	The range of scores in the baseline and intervention phase was the same. The range and standard deviation decreased considerably from intervention to follow up phase.	Range (and standard deviation) in the baseline phase= 14(5.29) Range (and standard deviation) in the intervention phase= 14(4.13) Range (and standard deviation) in the follow up phase= 5 (1.99)
Overlap	All the data points in the intervention phase and follow up phase overlap with the baseline phase. All the points in the follow up phase also overlap with the intervention phase.	Percentage of data overlap between intervention and baseline phase= 100% Percentage of data overlap between follow up and intervention= 85.71% Percentage of data overlap between follow up and baseline phase= 85.71%

Table 4.13 Visual Analysis of Cameron's Observational Data (Reassurance or Assistance From Adult or Peer)

4.4.3.1.1 Summary of findings from Figure 4.7

Figure 4.7 shows little change in scores between the baseline and intervention phases, as indicated by the mean scores for each phase and 100% overlap between the phases. Apart from a slight increasing trend in the baseline phase, there appears to be a clear decelerating trend through the intervention phase which continues into the follow up phase. There also appears to be a reduction in the frequency and the variability of the behaviour during the follow up phase which may suggest a delayed reduction in anxiety.

4.4.3.2 Repeated Measures- Target Behaviour Two

The graph below shows the frequency of Cameron's target behaviour 2 observed weekly over the baseline, intervention and follow up phase.

Operational Definition of Target Behaviour -Cameron is engaging in off task behaviour, not following instructions whether that be to listen or work independently. Instead he is interacting with other children in the class, not related to his task e.g. what are you doing?, or looking at others work to see what they are doing.

A Scatter Graph to Show the Percentage of Intervals Where Cameron was Engaging in Off Task Behaviour Involving His Peers During Observations in the Baseline, Intervention and Follow Up Phase
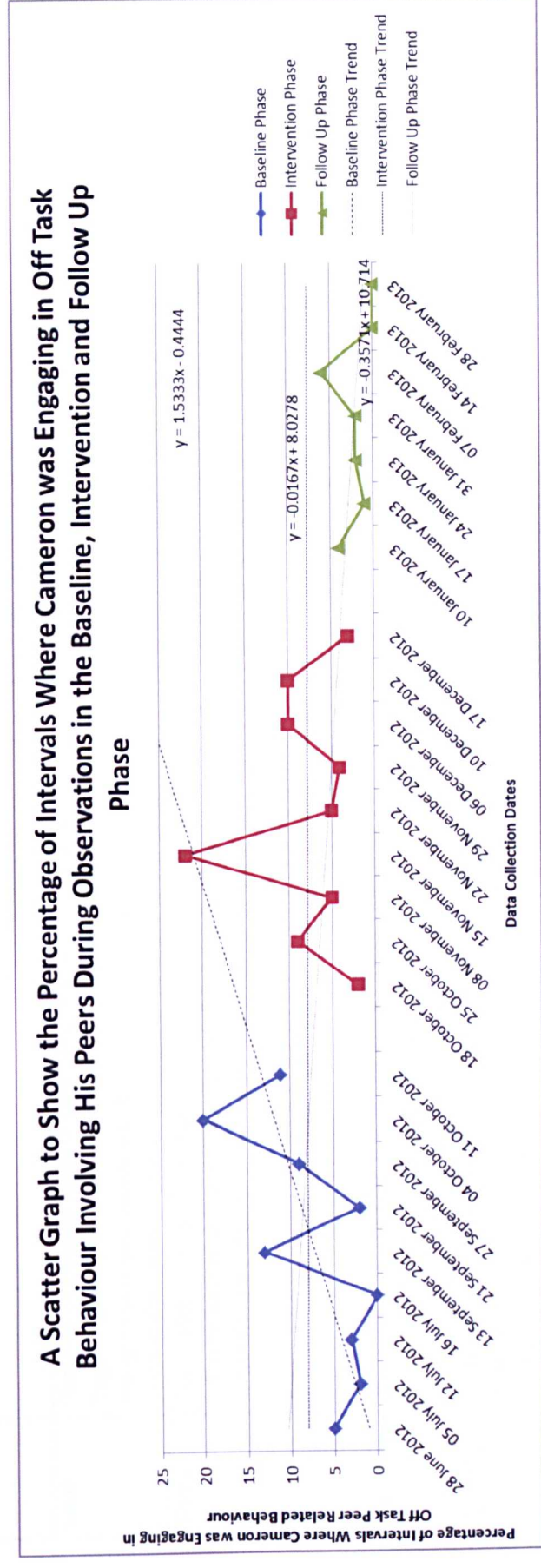
Figure 4.8 A Scatter Graph to Show the Percentage of Intervals Where Cameron was Engaging in Off Task Behaviour During Observations in the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive Evaluation	Numerical Evaluation
Mean	There was small increase in the mean from baseline to intervention phase. There was a clear reduction in the mean in the follow up phase.	Mean of the baseline phase= 7.22 Mean of the intervention phase= 7.78 Mean of the follow up phase= 2.14 Using mean shift calculation: Change in phase mean between the baseline and intervention= 0.08 Change in phase mean between the intervention and follow up= -0.72 Change in phase mean between the baseline and follow up= -0.7
Level	There was a clear decrease in level between the baseline and the beginning of the intervention. There was a slight increase in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -9 Change in level between intervention and follow up=+ 1
Trend	There was a clear accelerating trend in the baseline phase. In the intervention phase there was a very small decelerating trend and a slightly larger decelerating trend in the follow up phase.	Baseline phase trend= 1.53 Intervention phase trend= -0.02 Follow up phase trend= -0.36 Magnitude of change between baseline and intervention phase= 1.55 Magnitude of change between intervention and follow up phase= 0.34 Magnitude of change between baseline and follow up phase = 1.89
Variability	The range and standard deviation in the baseline and intervention phase was the similar. The range and standard deviation decreased considerably from intervention to follow up phase.	Range (and standard deviation) in the baseline phase= 20(6.55) Range (and standard deviation) in the intervention phase= 20 (6.12) Range (and standard deviation) in the follow up phase= 6 (2.19)
Overlap	All but one of the data points in the intervention phase overlaps with the baseline phase. Just over half of the data points in the follow up phase overlap with the intervention phase. All the points in the follow up phase overlap with the intervention phase.	Percentage of data overlap between intervention and baseline = 89.9% Percentage of data overlap between follow up and intervention = 57.14% Percentage of data overlap between follow up and baseline = 100%

Table 4.14 Visual Analysis of Cameron's Observational Data (Peer Related Off Task Activity)

4.4.3.2.1 Summary of Findings From Figure 4.8

An analysis of figure 4.8 indicates a clear decrease in the frequency (based on mean scores) and variability of the target behaviour in the follow up compared to the baseline and intervention phases. As with the other behaviour data collected for Cameron the researcher takes in to consideration the likelihood of variability in data collected from behaviour observations (Barlow, Nock and Hersen, 2009) in concluding with caution that there is a reduction in anxiety related behaviour from baseline to follow up. This suggests a delayed reduction in anxiety related behaviour, to be explored more fully in chapter five.

4.4.3.3 Inter Rater Agreement

Joint observations for Cameron were completed 6 times (twice in each phase) over the investigation period to increase the reliability of the observational measure. Cohen's kappa coefficient (Cohen, 1960) was calculated for the observations as a whole, including both target behaviours being studied to provide a measure of inter rater agreement. Landis and Koch's (1977) categories were used to define the level of agreement.

Over the six joint observations the kappa ranged from 0.776 to 1.0 (absolute agreement) with a mean of 0.869. According to Landis and Koch's (1977) categories this mean would indicate an almost perfect level of agreement (Landis and Koch, 1977).

4.4.4 Matthew

4.4.4.1 Repeated Measures- Presence of Target Behaviour

The graph below shows the frequency of Matthew's target behaviour observed weekly over the baseline, intervention and follow up phase.

Operational Definition of Target Behaviour- Matthew is chewing, putting something in his mouth or touching mouth. This may involve one or both hands, maybe inside or touching mouth and includes behaviour such as nail biting. It also includes chewing objects such as a pen, inserting object into mouth, or touching mouth with object.
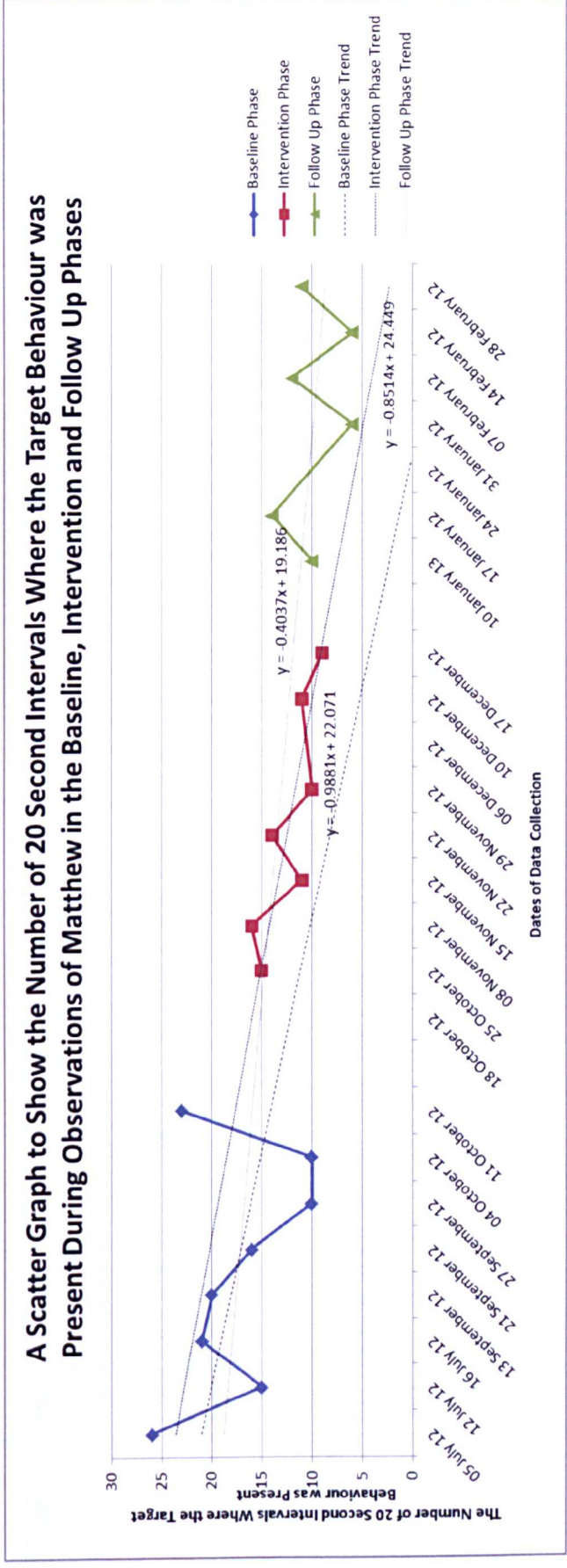
Figure 4.9 A Scatter Graph to Show the Number of 20 Second Intervals Where Matthew's Target Behaviour was Present During Observations in Each Phase.

Criteria	Descriptive Evaluation	Numerical Evaluation
Mean	There was a decrease in the mean from the baseline to intervention phase. There was a further small reduction in the mean in the follow up phase.	Mean of the baseline phase= 17.63 Mean of the intervention phase= 12.29 Mean of the follow up phase=9.83 Using mean shift calculation: Change in phase mean between the baseline and intervention= -0.3 Change in phase mean between the intervention and follow up= -0.2 Change in phase mean between the baseline and follow up= -0.44
Level	There was a decrease in level between the baseline and the beginning of the intervention. There was a small increase in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -8 Change in level between intervention and follow up= +1
Trend	There was a clear decelerating trend in all three phases, particularly in the baseline phase. The largest change in slope was between the baseline and follow up phase.	Baseline phase trend= -0.99 Intervention phase trend= -0.85 Follow up phase trend= -0.4 Magnitude of change between baseline and intervention phase= 0.14 Magnitude of change between intervention and follow up phase= 0.45 Magnitude of change between baseline and follow up phase = 0.59
Variability	The range of scores and standard deviation decreased considerably from baseline to intervention phase. There was a small increase in range and standard deviation from intervention to follow up phase.	Range (and standard deviation) in the baseline phase= 16(5.88) Range (and standard deviation) in the intervention phase= 7(2.69) Range (and standard deviation) in the follow up phase= 8 (3.25)
Overlap	All but one of the data points in the intervention phase overlaps with the baseline phase. All but one of the data points in the follow up phase overlaps with the intervention and baseline phase.	Percentage of data overlap between intervention and baseline phase= 85.71% Percentage of data overlap between follow up and intervention= 67% Percentage of data overlap between follow up and baseline phase= 67%

Table 4.15 Visual Analysis of Matthew's Observational Data (Number of intervals where target behaviour is present)

4.4.4.1.1 Summary of Findings From Figure 4.9

Figure 4.9 shows that though there is quite a high degree of overlap of data points there is a gentle decrease in the presence of the target behaviour through each of the phases as highlighted by the mean scores. The mean shift and magnitude of slope change further indicate the largest change is between the baseline and follow up phases.

It appears that there has been a positive impact on the anxiety related behaviour in the intervention phase that continues in the follow up, but the decelerating trend in the baseline phase makes concluding meaningful change as a result of the intervention difficult.

4.4.4.1.2 Inter Rater Agreement

Joint observations for Matthew were completed six times (twice in each phase) over the investigation period to increase the reliability of the observational measure. Cohen's kappa coefficient (Cohen, 1960) was calculated to provide a measure of inter rater agreement. Landis and Koch's (1977) scale of agreement was used to interpret the kappa statistic.

In identifying the presence of the target behaviour, over the 6 joint observations the kappa ranged from 0.497 to 0.78 with a mean of 0.703. This mean would indicate a substantial level of agreement (Landis and Koch, 1977).

4.4.4.2- Repeated Measures- Intensity of Target Behaviour

The graph below shows the number of intervals during the observations where the target behaviour was the dominant behaviour during the baseline, intervention and follow up phases.

Operational Definition of Dominance- Dominance is equal to over 50% of the 20 second interval being taken over with that behaviour. Pen being placed in mouth and immediately removed is equal to 1 second. If more than one behaviour is co-occurring, neither is dominant.
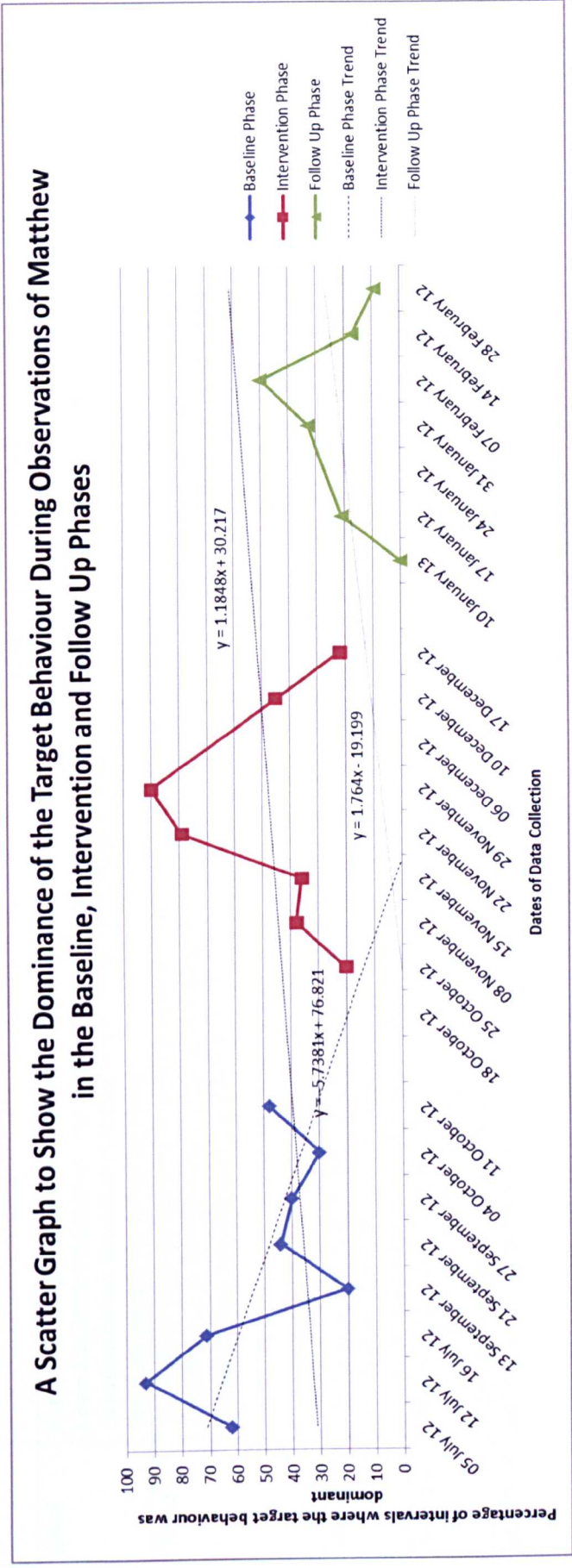
Figure 4.10 A Scatter Graph to Show the Dominance of Matthew's Target Behaviour During Observations of Matthew in the Baseline, Intervention and Follow Up Phase.

Criteria	Descriptive Evaluation	Numerical Evaluation
Mean	There was a decrease in the mean from the baseline to intervention phase. There was a further larger reduction in the mean in the follow up phase. The mean shift was larger between the intervention and follow up phase and baseline and follow up phase.	Mean of the baseline phase= 51 Mean of the intervention phase= 47.14 Mean of the follow up phase= 21.67 Using mean shift calculation: Change in phase mean between the baseline and intervention= -0.08 Change in phase mean between the intervention and follow up= -0.54 Change in phase mean between the baseline and follow up= -0.58
Level	There was a large decrease in level between the baseline and the beginning of the intervention. There was a further decrease in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= -28 Change in level between intervention and follow up= -22
Trend	There was a large decelerating trend in the baseline. In the intervention and follow up phase there was a clear accelerating trend. The largest change in slope was between the baseline and follow up phase.	Baseline phase trend= -5.74 Intervention phase trend= 1.18 Follow up phase trend= 1.76 Magnitude of change between baseline and intervention phase= 6.92 Magnitude of change between intervention and follow up phase= 0.58 Magnitude of change between baseline and follow up phase = 7.5
Variability	The range of scores decreased through each phase of the study. The standard deviation increased between baseline and intervention phase but decreased to its lowest in the follow up phase.	Range (and standard deviation) in the baseline phase= 73(23.5) Range (and standard deviation) in the intervention phase= 70 (27.18) Range (and standard deviation) in the follow up phase= 50(17.8)
Overlap	All of the data points in the intervention phase overlap with the baseline phase. Half of the data points in the follow up phase overlap with the intervention phase and baseline phase.	Percentage of data overlap between intervention and baseline = 100% Percentage of data overlap between follow up and intervention= 50% Percentage of data overlap between follow up and baseline = 50%

Table 4.16 Visual Analysis of Matthew's Observational Data (Percentage of Intervals Where Target Behaviour Dominant)

4.4.4.2.1 Summary of Findings From Figure 4.10

Figure 4.10 shows that with 100% overlap between baseline and intervention there is no evidence of an effect on behaviour between baseline and intervention phase. The large reduction in mean score and mean shift indicates there is a pronounced reduction in anxiety related behaviour between baseline and follow up phases.

Whilst it appears that there has been a positive impact on the dominance of the anxiety related behaviour between baseline and follow up phases, drawing conclusions about the positive effect of the intervention is more difficult due to the decelerating trend in the baseline phase. However the behaviour does appear to stabilise at the end of the baseline phase.

4.4.4.2.2 Inter Rater Agreement

Joint observations for Matthew were completed 6 times (twice in each phase) over the investigation period to increase the reliability of the observational measure. Cohen's kappa coefficient (Cohen, 1960) was calculated for each of the behaviours being studied to provide a measure of inter rater agreement. Landis and Koch's (1977) scale of agreement was used to interpret the kappa statistic.

In identifying the target behaviour as the dominant behaviour, over the six joint observations the kappa ranged from 0.44 to 0.783 with a mean of 0.634. This mean would indicate a substantial level of agreement (Landis and Koch, 1977).

4.5 Research Question Three- Does the FRIENDS for Life intervention increase alternative replacement behaviours to the participant's anxiety related behaviour?

4.5.1 Christopher

4.5.1.1 Repeated Measures- Replacement Behaviour One

The graph below shows the frequency of Christopher's replacement behaviour one observed weekly where possible over the three phases of the study.

Operational Definition of Target Behaviour- Christopher waits for an adult to come to him individually to support him to start an independent activity, or uses non-verbal cues to gain the adults attention to signal he would like help. **Operational Definition of Replacement Behaviour One-** Christopher verbally asks an adult for help in starting an activity.
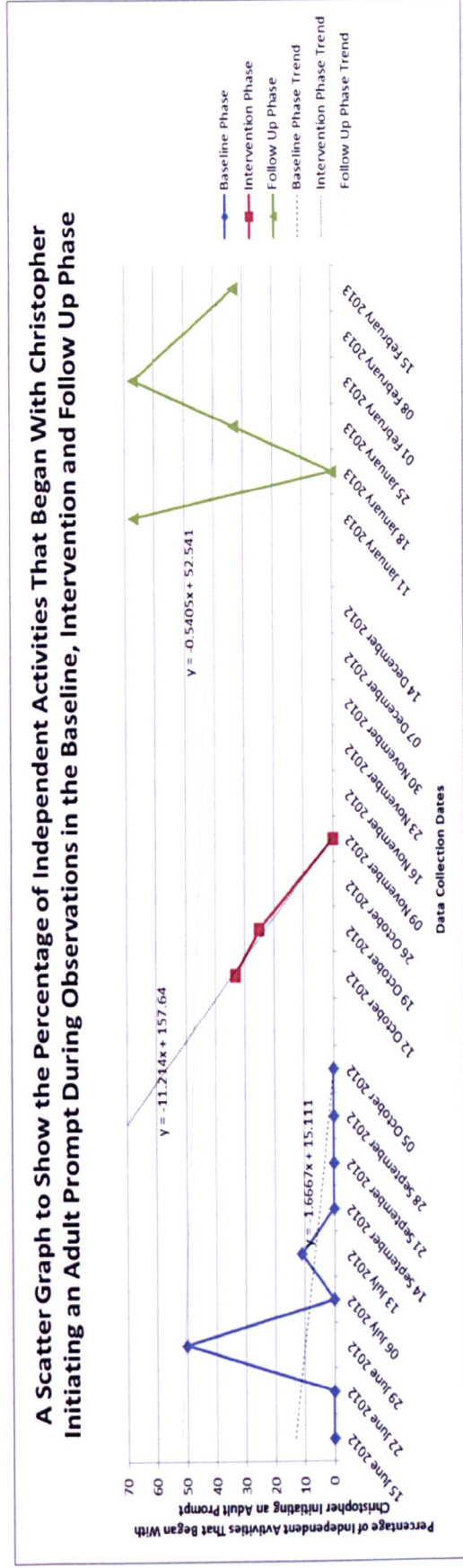
Figure 4.11 A Scatter Graph to Show the Percentage of Independent Activities That Began With Christopher Initiating an Adult Prompt in Each Phase

Criteria	Descriptive outcome	Numerical outcome
Mean	The mean percentage in the intervention phase is higher than the baseline phase. The mean of the follow up phase is considerably higher than both the baseline and intervention phase. The largest mean shift is between the baseline and follow up phase.	Mean of the baseline phase= 6.78 Mean of the intervention phase= 19.33 Mean of the follow up phase= 40 Using mean shift calculation: Change in phase mean between the baseline and intervention= 1.85 Change in phase mean between the intervention and follow up= 1.07 Change in phase mean between the baseline and follow up: 4.9
Level	There was an increase in level between baseline and intervention phase. There was also an increase between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= 33 Change in level between intervention and follow up= 67
Trend	All three phases show a decelerating trend, with the most significant being in the intervention phase and the smallest slope in the follow up phase. The largest change in slope is between the intervention and follow up phase.	Baseline phase trend= -1.67 Intervention phase trend=-11.21 Follow up phase trend= -0.54 Magnitude of change between baseline and intervention phase= 9.54 Magnitude of change between intervention and follow up phase=10.67 Magnitude of change between baseline and follow up phase =1.13
Variability	The range of the scores decreased between baseline phase and intervention, but the standard deviation increased. The range of scores and standard deviation in the follow up phase was larger than both the baseline and intervention phase.	Range (and standard deviation) in the baseline phase= 50 (16.61) Range (and standard deviation) in the intervention phase= 33(17.21) Range (and standard deviation) in the follow up phase=67(28.09)

Overlap	All the data points in the intervention phase overlapped with the baseline phase. 3 of the 5 points in the follow up phase overlapped with the intervention phase and baseline phase.	Percentage of data overlap between intervention and baseline phase= 100% Percentage of data overlap between follow up and intervention= 60% Percentage of data overlap between follow up and baseline phase= 60%

Table 4.17 Visual Analysis of Christopher's Observational Data (Child Initiated Adult Prompt)

4.5.1.1.1 Summary of Findings From Figure 4.11

Analysis of figure 4.11 shows that despite variability within phases particularly the baseline and follow up which is not to be unexpected in behaviour observations over time (Barlow, Nock and Hersen, 2009), there is a clear increase in the frequency of the replacement behaviour from baseline to follow up phase.

In relation to question three, 'does the FRIENDS for Life intervention increase alternative replacement behaviours to the participant's anxiety related behaviour?', the data suggests there has been a positive change, an increase in the frequency of the replacement behaviour, since the conclusion of the FRIENDS intervention.

4.5.1.2 *Repeated Measures- Replacement Behaviour Two*

The graph below shows the frequency of Christopher's replacement behaviour 2 observed weekly where possible over the baseline, intervention and follow up phase.

Operational Definition of Target Behaviour- Christopher waits for an adult to come to him individually to support him to start an independent activity, or uses non-verbal cues to gain the adults attention to signal he would like help. **Operational Definition of Replacement Behaviour 2-** Christopher begins an independent task independently after the initial instructions given by the adult without seeking additional help.
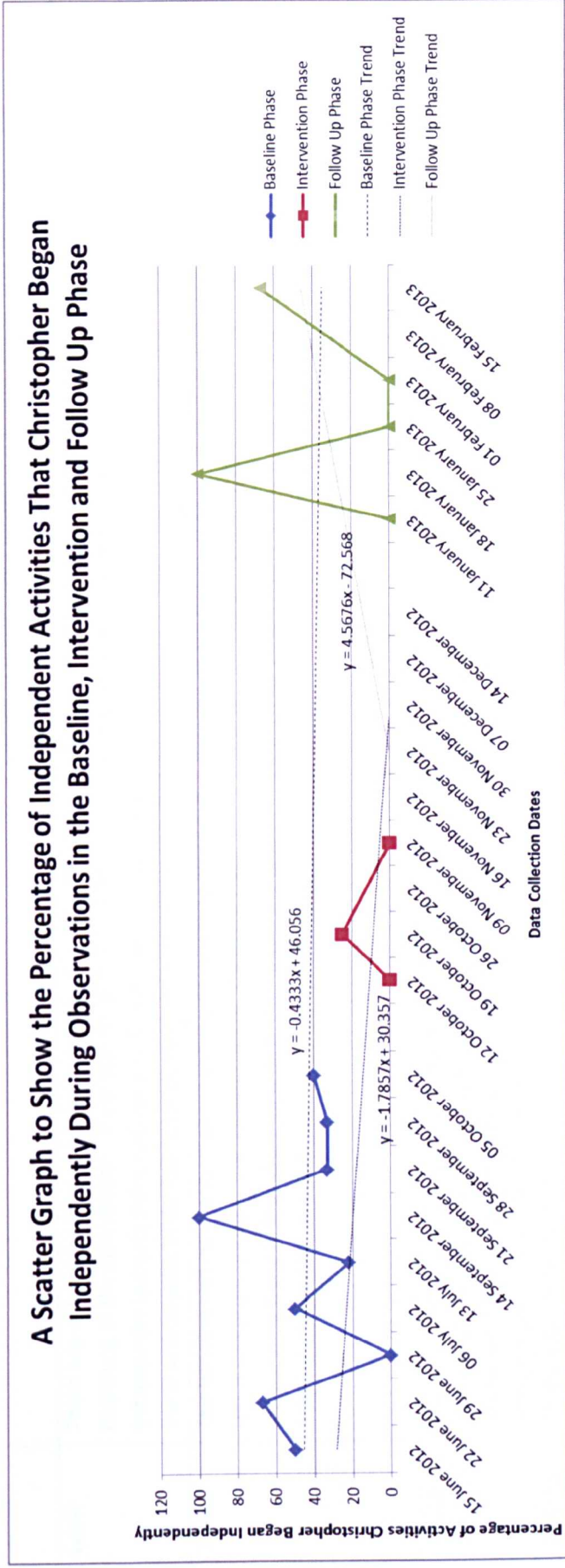
Figure 4.12 A Scatter Graph to Show the Percentage of Independent Activities That Christopher Began Independently During Observations in the Baseline, Intervention and Follow Up Phase

Criteria	Descriptive outcome	Numerical outcome
Mean	The mean of the intervention phase was considerably lower than the baseline phase. The mean of the follow up phase was higher than that of the intervention phase but lower than the baseline phase. The largest mean shift was between the intervention and follow up phase.	Mean of the baseline phase= 43.89 Mean of the intervention phase= 8.33 Mean of the follow up phase= 33.4 Using mean shift calculation: Change in phase mean between the baseline and intervention= -0.81 Change in phase mean between the intervention and follow up= 3.01 Change in phase mean between the baseline and follow up= -0.24
Level	There was a decrease in level between the baseline and the beginning of the intervention. There was no change in level between the last data point collected in the intervention phase and the first data point in the follow up phase.	Change in level between baseline and intervention= 40 Change in level between intervention and follow up= 0
Trend	The baseline and intervention phase show a decelerating trend but this is less pronounced in the baseline phase. There is a clear accelerating trend in the follow up phase. The largest change in slope is between the intervention and follow up phase.	Baseline phase trend= -0.43 Intervention phase trend= -1.79 Follow up phase trend= 4.57 Magnitude of change between baseline and intervention phase= 1.36 Magnitude of change between intervention and follow up phase= 6.36 Magnitude of change between baseline and follow up phase =5
Variability	The range of the scores decreased between baseline phase and intervention but increased to its original value in the follow up phase. Similarly the standard deviation decreased from baseline to intervention, but was largest in the follow up phase.	Range (and standard deviation) in the baseline phase= 100 (28.32) Range (and standard deviation) in the intervention phase= 25 (14.43) Range (and standard deviation) in the follow up phase= 100 (47.2)
Overlap	All the data points in the baseline phase overlap with the intervention phase. Two thirds of the points in the follow up phase overlap with the intervention phase.	Percentage of data overlap between intervention and baseline phase= 100% Percentage of data overlap between follow up and intervention= 60% Percentage of data overlap between follow up and baseline phase= 100%

Table 4.18 Visual Analysis of Christopher's Observational Data (Activities Christopher Began Independently)

4.5.1.2.1 Summary of findings from Figure 4.12

With 100% overlap in data points between intervention and baseline phases and a clear decrease in mean from baseline to intervention, figure 4.12 demonstrates there has been no increase in the number of activities that Christopher began independently as a result of participating in the FRIENDS intervention. Instead the data indicates an apparent decrease but this is difficult to conclude with the bottoming out effect on the frequency count and the limited number of data points in the intervention phase.

There is an increase in mean and variability from intervention to follow up phases however this mean is not as high as the baseline mean nor does any single data point in the follow up period exceed the highest point of the baseline. Therefore, it is concluded that on this measure the available data does not demonstrate a practical significant improvement has taken place as a result of the FRIENDS intervention.

4.6 Are the expected findings of the repeated measures reflected in pre and post intervention measures of pupil anxiety by school staff?

At this stage it is important to remind the reader of the severe threats to validity and reliability of data collected at single points pre, post and follow up. The purpose of this data was to triangulate the findings from the SCED, which attempts to reduce potential threats to validity and reliability through adoption of an experimental design.

The threats to validity and reliability of single point data need to be considered when interpreting findings for this research question, and may offer an explanation as to any differences reported by the triangulation measures compared to the repeated measures data which will be explored further in chapter five.

4.6.1 Christopher

The table below shows the views of school staff (Class Teacher, Teaching Assistant and Deputy Head Teacher) about Christopher's anxiety as rated on the School Anxiety Scale-Teacher Form (Lyneham et al, 2008) collected prior to and post intervention.

	Class Teacher	Teaching Assistant	Deputy Head Teacher
Pre	23	20	21
Post	15	13	13
Difference	-8	-7	-8
RCI	1.91	1.67	1.91
Significance (yes/no)	No	No	No

Table 4.19 School staff ratings for Christopher on the School Anxiety Scale-Teacher Form pre and post intervention

School staff also completed the scale during the follow up phase. The difference in scores on the scale between post intervention and follow up are presented in table 4.20.

	Class Teacher	Teaching Assistant	Deputy Head Teacher
Post	15	13	13
Follow Up	16	17	21
Difference	+1	+4	+8
RCI	-0.24	-0.96	-1.91
Significance (yes/no)	No	No	No

Table 4.20 School staff ratings for Christopher on the School Anxiety Scale-Teacher Form post intervention and at follow up

The differences in scores prior to the intervention and at follow up are reported in table 4.21.

	Class Teacher	Teaching Assistant	Deputy Head Teacher
Pre	23	20	21
Follow Up	16	17	21
Difference	-7	-3	0
RCI	1.67	0.72	0
Significance (yes/no)	No	No	No

Table 4.21 School staff ratings for Christopher on the School Anxiety Scale-Teacher Form pre intervention and at follow up

4.6.1.1 Summary of Findings from Tables 4.19, 4.20 and 4.21

The RCI indicates that the changes in scores for all staff members across all three phases of the study are non-significant. This suggests that staff report no significant changes in Christopher's anxiety at intervention or follow up, according to this measure.

4.6.2 Jack

The table below reports the scores of school staff (Class Teacher, Teaching Assistant and Deputy Head Teacher) on the School Anxiety Scale-Teacher Form (Lyneham et al, 2008) for Jack, collected prior to and post intervention.

	Class Teacher	Teaching Assistant	Deputy Head Teacher
Pre	14	11	19
Post	6	4	16
Difference	-8	-7	-3
RCI	1.91	1.67	0.72
Significance (yes/no)	No	No	No

Table 4.22 School staff ratings for Jack on the School Anxiety Scale-Teacher Form pre and post intervention

The data was also collected for all three staff members during the follow up phase. Table 4.23 compares staff scores at post intervention to follow up.

	Class Teacher	Teaching Assistant	Deputy Head Teacher
Post	6	4	16
Follow Up	9	6	20
Difference	+3	+2	+4
RCI	-0.72	-0.48	-0.96
Significance (yes/no)	No	No	No

Table 4.23 School staff ratings for Jack on the School Anxiety Scale-Teacher Form post intervention and at follow up

Table 4.24 compares staff scores from prior to the intervention to follow up.

	Class Teacher	Teaching Assistant	Deputy Head Teacher
Pre	14	11	19
Follow Up	9	6	20
Difference	-5	-5	+1
RCI	1.19	1.19	-0.24
Significance (yes/no)	No	No	No

Table 4.24 School staff ratings for Jack on the School Anxiety Scale-Teacher Form pre intervention and at follow up

4.6.2.1 Summary of Findings From Tables 4.22, 4.23 and 4.24

According to the RCI changes in staff scores across the three phases of the study are non-significant, suggesting there was no change in anxiety at intervention or follow up according to school staff report.

4.6.3 Cameron

Table 4.25 presents the views of the Deputy Head Teacher about Cameron's anxiety as rated on the School Anxiety Scale-Teacher Form (Lyneham et al, 2008) collected prior to, post intervention and in the follow up phase. Data was also collected for the Class Teacher and Teaching Assistant during each phase; however, due to the changes in staff over the baseline period and variation in whether the questionnaires were completed jointly or individually, it was decided that the threats to validity and reliability of the data were too great for the data to be meaningful in evaluating the effectiveness of the intervention. Therefore this data is not reported here.

Phases being compared	First score	Second score	Difference	RCI	Significance(Yes/no)
Pre and post	18 (pre)	9 (post)	-9	2.15	Yes
Post and follow up	9 (post)	12 (follow up)	+3	-0.72	No
Pre and follow up	18 (pre)	12 (follow up)	-6	1.43	No

Table 4.25 Deputy Head Teacher ratings for Cameron on the School Anxiety Scale-Teacher Form pre, post intervention and at follow up

The Deputy Head Teacher's scores show a significant decrease from pre to post intervention, indicating a significant reduction in pupil anxiety based on her report. However, a slight increase in score at follow up shows this significant change was not maintained at follow up.

4.6.4 Matthew

Table 4.26 presents the views of the Deputy Head Teacher about Matthew's anxiety as rated on the School Anxiety Scale-Teacher Form (Lyneham et al, 2008) collected prior to, post intervention and in the follow up phase. Data was also collected for the Class Teacher and Teaching Assistant during each phase, however due to the changes in

staff over the baseline period and variation in whether the questionnaires were completed jointly or individually, it was decided that the threats to validity and reliability of the data were too great for the data to be meaningful in evaluating the effectiveness of the intervention. Therefore this data is not reported here.

Phases being compared	First score	Second score	Difference	RCI	Significance (yes/no)
Pre and post	24 (pre)	19 (post)	-5	1.19	No
Post and follow up	19 (post)	23 (follow up)	+4	-0.96	No
Pre and follow up	24 (pre)	23 (follow up)	-1	0.24	No

Table 4.26 Deputy Head Teacher ratings for Matthew on the School Anxiety Scale-Teacher Form pre, post intervention and at follow up

According to the RCI all changes in the Deputy Head Teacher's views across the three phases of the study were non-significant, suggesting there was no significant change in Matthew's anxiety in the intervention or follow up phase on this measure.

4.7 Are the expected findings of the repeated measures reflected in pre and post intervention measures of pupil anxiety by parents?

The parents of Matthew and Cameron did not return the Spence Child Anxiety Scale-Parent Version prior to the commencement of the intervention. Therefore no further attempts were made to obtain data from them.

4.7.1 Christopher

Table 4.27 shows the scores of Christopher's parent on the Spence Anxiety Scale-Parent Version, completed pre and post participation in the FRIENDS intervention.

Time Information Collected	Score on Spence Child Anxiety Scale-Parent Version
PRE	28
POST	33
Difference	+5
RCI	-0.76
Significance	No

Table 4.27 Parent Scores on Spence Child Anxiety Scale Pre and Post Intervention

Table 4.27 shows that the change in parent score between pre and post intervention was non-significant, suggesting there was no significant change in Christopher's anxiety after the intervention according to parent report.

4.7.2 Jack

Table 4.28 presents the views of Jack's parent as measured by the Spence Anxiety Scale- Parent Version, completed pre and post participation in the FRIENDS intervention.

Time Information Collected	Score on Spence Anxiety Scale-Parent Version
PRE	3
POST	7
Difference	+4
RCI	-0.6
Significance	No

Table 4.28 Parent Scores on Spence Child Anxiety Scale Pre and Post Intervention

Table 4.28 shows there was no significant change in Jack's anxiety according to his parent's scores on the Spence Child Anxiety Scale from pre to post intervention.

4.8 Reliability Measures

4.8.1 Inter Rater Agreement for Visual Analysis

The level of agreement between the two evaluators using Cohen's kappa (1960) was 0.786 which according to Landis and Koch's (1977) interpretation scale indicates a substantial level of agreement. This agreement increases the reliability of the visual analysis judgements made by the researcher.

4.8.2 Paediatric Index of Emotional Distress Integrity Measure

The delivery of the Paediatric Index of Emotional Distress was observed twice during the study period. An integrity measure was developed by the researcher (see appendix sixteen) requiring the observer to rate how well the researcher addressed features identified in the PI-ED manual (O'Connor et al, 2010) as important for the reliable and valid delivery of the measure. The outcome of the measure indicated the researcher met all of the criteria extremely well in one observation and all but one aim extremely well in the other observation, the one being rated as moderately well.

4.8.3 FRIENDS for Life Intervention-Intervention Integrity

Outcomes on the weekly intervention integrity measure, completed on 8 occasions by the facilitators and on 2 occasions by an external observer, were:

29/ 59 of the aims were met extremely well.

28/ 59 of the aims were met moderately well.

2/ 59 of the aims were met not very well.

0/59 of the aims were not met at all.

For the two aims that were met 'not very well', this was because time constraints prevented the activities being fully completed in the first session. However, in using this intervention integrity measure to review after each session ensured that any aims not met in the first session were then completed in the following session.

4.9 Interpretation of findings

Having presented the findings according to research question, an interpretation of the findings for each participant will now be offered to conclude this chapter.

As recognised in the method (chapter three) and previously highlighted in this chapter, remaining threats to validity and reliability, particularly the effect of history and maturation, need to be considered in interpreting the findings. It is therefore with caution at this point that conclusions about any positive effects on anxiety due to the intervention are made.

4.9.1 Christopher

The repeated measures data collected for Christopher on the weekly self-report measure of anxiety shows a significant reduction in mean scores and variability during the follow up phase compared to the baseline and intervention phase, suggesting a delayed positive impact on anxiety. Christopher's scores on the Spence Child Anxiety Scale show a non-significant change in anxiety from pre to post intervention suggesting any reported change could have occurred by chance.

Visual analysis of the graph depicting the weekly observation data illustrates a clear increase in the target behaviour, independent activities beginning with an adult prompt, from baseline to intervention, in the opposite direction to the research hypothesis. However the missing data in the intervention phase makes interpretation

of the data more challenging. There is a reduction in the behaviour during the follow up phase, which may indicate a delayed impact on anxiety, however the variability in the data collected in the baseline and follow up phase makes interpreting the graphical data more difficult. In observing behaviour Barlow et al (2009) suggest an analysis of data should focus on overall trends and patterns as day to day fluctuations are likely. In doing so, the graphical data suggests a reduction in anxiety from baseline to follow up.

In analysing the repeated measures data for the pre-defined replacement behaviours there appears to be a clear increase in the frequency of one of the behaviours, *Christopher initiating an adult prompt*, from baseline to follow up phase. The repeated measures data collected for the other alternative behaviour observed, *the number of activities Christopher began independently*, indicates no improvement from baseline to intervention or follow up.

Responses from school staff and parent indicate a non-significant difference as measured by the RCI (Jacobson and Truax, 1991) between pre, post and follow up scores suggesting there was no significant changes in anxiety on these measures across all phases.

4.9.2 Jack

The repeated measures data for Jack's self-report of anxiety indicates an increase rather than a decrease in anxiety between baseline and intervention phases. There appears to be a decrease in anxiety during the follow up phase, which may indicate a delayed reduction in anxiety, however the number of data points available in this phase does not enable the researcher to confidently conclude that there was a practical improvement from baseline to follow up. There was no significant change, according to the Reliable Change Index, between pre and post scores on the Spence Child Anxiety Scale suggesting any change in anxiety could have occurred by chance.

The repeated measures observational data suggests there is little change during the intervention phase but a reduction in anxiety at follow up, possibly indicating a delayed reduction in anxiety, though this is concluded with caution due to the large variability within each phase.

Responses from school staff and parent indicate a non-significant difference between pre, post and follow up scores, which, when analysed using the Reliable Change Index (Jacobson and Truax, 1991) suggests that the changes in scores could have occurred by chance and there was not a significant change in anxiety after the intervention.

4.9.3 Cameron

The repeated measures data collected on the participant self-report measure shows little change in scores between any of the three phases which suggests there is no practical improvement on Cameron's self-report of anxiety in the intervention or follow up phases. This is replicated by the non-significant change between pre and post scores on the Spence Child Anxiety Scale.

The repeated measures data collected for both target behaviours shows a decrease in frequency and variability of both anxiety related behaviours from baseline to follow up, suggesting a possible delayed decrease in anxiety.

The Deputy Head Teacher's scores show a significant decrease from pre to post intervention, indicating a significant reduction in pupil anxiety from her view point. However, a slight increase in score at follow up suggests this significant change was not maintained at follow up. On the parent report measure there was a non-significant change in anxiety from pre to post intervention, suggesting any change in anxiety could have occurred by chance.

4.9.4 Matthew

Due to the large overlap in data points across phases, collected from the child self-report measure, there is not conclusive evidence to suggest there was an improvement in Matthew's self-report of anxiety in the intervention or follow up phase. Furthermore, the trend lines indicate a change in direction of results from the decelerating trend evident in the baseline phase particularly towards the end, to the clear accelerating trend in the intervention phase suggesting a possible increase in anxiety during the intervention phase relative to the end of the baseline period, which is opposite to the research hypothesis. The non-significant difference between Matthew's pre and post scores on the Spence Child Anxiety Scale suggests no significant change in anxiety post intervention with any change being attributed to chance.

The repeated measures observational data suggests that there is a positive impact on the frequency of the anxiety related behaviour through the intervention phase that continues to decrease during the follow up phase. In terms of the intensity of the behaviour there appears relatively little difference between the baseline and intervention phase, but there is a reduction at follow up. However, it is with caution that the positive impact of the intervention is accepted from the graphical data due to the decelerating trend in the baseline phase (Kratochwill et al, 2010).

The school staff and parent report triangulation measures show a non-significant change in pupil anxiety between all three phases, suggesting any change in their reports could have occurred by chance.

4.10 Summary

This chapter has analysed the SCED data using visual graphical analysis in addition to using the RCI to statistically analyse the single point triangulation data. A summary of

the findings for each participant has been offered and the next chapter will further explore a range of interpretations of the data in light of remaining threats to validity and reliability of the design. The next chapter will also place the findings within the context of the two primary evidence bases the study was attempting to contribute to: the effectiveness of the FRIENDS intervention and the effectiveness of CBT with an AS population.

5. Discussion

5.1 Introduction

This chapter aims to explore further the findings shared in chapter four in light of the theory and research presented in the literature review (chapter two) and the design and procedures outlined in the methodology (chapter three).

The chapter will begin by exploring possible explanations of the findings related to each research question in light of the potential threats to validity and reliability of the design. This will enable the researcher to draw firmer conclusions about the effectiveness of the FRIENDS intervention for the four participants in this study. For each research question a decision to reject or accept the research hypothesis will be undertaken for each individual participant, retaining the idiographic nature of the study.

The findings from this study will be theoretically located within the existing evidence base for the FRIENDS intervention and for the use of CBT with an AS population. A review of methods involved will also be undertaken. In addition, consideration will be given to the implications of the findings for future research and EP practice. The section will conclude with a summary incorporating the researcher's personal reflections on the research experience.

5.2 Interpretation of Findings Related to Each Research Question

5.2.1 Research Question One: Does the FRIENDS for Life Intervention Reduce Participant Self-Report of Their Anxiety?

Research Hypothesis

The FRIENDS for Life intervention will reduce participant self-report of anxiety.

5.2.1.1 Key Findings

For one participant, Christopher, the data indicated a decrease in anxiety at follow up compared to the baseline and intervention phase.

For two of the four participants the data indicated an increase in anxiety during the intervention phase followed by a delayed reduction in anxiety during the follow up, that was equal to or lower than baseline phase.

For one participant there appeared to be no impact on anxiety through any of the phases but what was apparent was a slight decelerating trend in the follow up phase not present in the other phases.

For all four cases the pre and post triangulation measures showed a non-significant difference in participant self-reports of anxiety suggesting any changes could have occurred by chance.

5.2.1.2 Possible explanations for findings relating to the existing literature

A visual analysis of the repeated measures data on the self-report measure of anxiety suggests there was no significant difference in anxiety scores between the baseline phase and intervention phase for any participant, providing no evidence of an intervention effect on this measure immediately post intervention. This interpretation

of the data would seem to contrast with the existing evidence base for the FRIENDS intervention, summarised in a systematic review of 14 studies by Briesch et al (2010) that reported positive outcomes for participants at post intervention.

However in analysing the repeated measures data across the whole study including the follow up phase, two patterns emerged across the four participants which are worth exploring more fully in considering the effect of the intervention:

- **Reduction from baseline to follow up**

For one participant, Christopher, there appeared to be a clear reduction in anxiety from baseline to follow up. For the other three participants where a clear intervention effect was not apparent in the repeated measures data, there appeared to be a clear decelerating trend in all three follow up phases that was not apparent in any of the intervention phases. If this decelerating trend was to continue, it may be hypothesised that the anxiety scores would reduce further, below the baseline level, and demonstrate a delayed positive impact on anxiety. Therefore, one conclusion is that the length of the follow up phase has prevented a delayed reduction in anxiety being fully demonstrated, a concern raised by Neil and Christensen (2009) in their review of existing research literature for school based anxiety interventions.

- **Increase from baseline to intervention**

For two participants, an apparent accelerating trend in anxiety scores during the intervention phase was observed. One persuasive potential explanation for this is described by Neil and Christensen (2009). They suggest that an initial period of elevated risk as participants become more aware of their anxiety is necessary as a result of the introduction of the intervention. Therefore, positive effects of the intervention on anxiety may take time to show, which may be linked with the hypothesis of a delayed positive impact on anxiety described above.

This initial increase in self-report scores of anxiety may also be explained by the testing threat to internal validity (Cook and Campbell, 1979). Repeatedly asking children about their anxiety as a result of the repeated measure coupled with increasing their knowledge of anxiety through the intervention may increase their sensitivity and awareness to any potential anxiety which is reflected in the initial increase in scores.

In considering these findings in relation to the existing literature, the delayed pattern of effect has been observed previously in the more general school based anxiety intervention literature (Gillham et al, 2006; Misfud and Rapee, 2005) and specifically in evaluations of the FRIENDS program (Barrett, Lock and Farrell, 2005; Dadds et al, 1999 and Dadds, Spence, Holland, Barrett and Laurens, 1997; Essau, Conradt, Sasagawa and Ollendick, 2012; Mostert and Loxton, 2008). Mostert and Loxton (2008) hypothesised that the delayed effect may be due to the time required for participants to become accomplished in the coping and problem solving skills taught in the FRIENDS program. They suggest that it is only when participants become accomplished in these skills that they are able to reduce their symptoms of anxiety. This explanation may be applied to this study's findings in explaining the positive improvement during the follow up phase.

Within a UK setting, a recently published evaluation group study (Thornbery, 2012), reports a non-significant decrease on a self-report measure of anxiety at post intervention. The author also refers to Neil and Christensen's (2009) hypothesis to explain their findings, suggesting the time needed to consolidate the skills learnt in the intervention and therefore reduce anxiety was not captured by the pre-post group design. A widely referenced to set of published studies evaluating the FRIENDS intervention in an UK school setting are those by Stallard et al (2005, 2007, 2008). These studies found a significant positive impact on anxiety between pre and post intervention. However, their post intervention measures were undertaken at three months after the intervention, which means a delayed effect cannot be ruled out as a possible explanation for their findings.

In accepting the persuasive argument of a 'delayed' intervention effect there is an acknowledgement that the intervention effect is time dependent, and therefore, should be considered within the context of the length of the intervention. The average length of the intervention for the studies included in the systematic review in chapter two was 12 weeks, with the most popular length being 16 weeks. This study was only 10 weeks in duration therefore it may be hypothesised that if a positive impact on anxiety was time dependent the length of the intervention would impact on whether the positive effect was detected at post intervention or follow up, and why the positive effect at post intervention found in the majority of studies included in the systematic review was not reported here.

In exploring a range of interpretations of the data relating to this research question, there is a need to acknowledge remaining threats to validity and reliability that may have impacted on the findings, and therefore, the confidence with which an intervention effect may be concluded. In reviewing the methods of the studies included in their review Briesch et al (2010) rated 10 of the 14 studies as being weak/marginal evidence in the measurement category due to their reliance exclusively on self-report data of anxiety. Briesh et al (2010) along with several other authors (Punch, 2002; Wigelsworth et al, 2010) have recognised the sensitivity of self-report data to the impact of social desirability and power influence between researcher and participant which may impact on the reliability of results. It may be possible that the social difficulties of individuals with AS, described by Wing and Gould's (1979) triad of impairment, may make their self-report less susceptible to social desirability, due to their lack of awareness of social expectation. In this respect it may make their results more reliable and offer an explanation as to why the findings of this study contrast with the majority of the existing evidence base adopting self-report measures to evaluate the FRIENDS intervention in typically developing populations.

In contrast, Schleismann and Gillis (2011) suggest that self-report assessments of anxiety with children with AS in particular may be even less reliable due to communication and cognitive difficulties that are characteristic of the diagnosis: they

are likely to find it more difficult to understand their own emotions and express their views. This reason was particularly influential in the decision to not use a self-report measure as a means of selecting participants for the study, and may have impacted on the validity and reliability of the findings.

Having recognised the limitations of self-report measures generally, in this particular study it may also be possible that a positive reduction in participant anxiety in the intervention phase was not sufficiently captured by the specific self-report measure selected (a Type II Error). The PI-ED is a measure of emotional distress, which encompasses items related to both anxiety and depression (O'Connor et al, 2010). It was chosen due to its simplicity and ease of use for the population being studied. However only seven of the 16 items relate specifically to anxiety which may reduce its sensitivity in noting any changes.

Also relevant to this design are the remaining threats to validity of history and maturation (Robson, 2011) which may mean any reduction in anxiety may be explained by participant's maturation over time or changes in their school context such as school holidays or them becoming more familiar and settled in their classroom setting rather than an intervention effect. As with 14 of the 15 studies included in the systematic review, the lack of active control group in this study means facilitator time and participation in the intervention (Hawthorne Effect; Landsberger, 1958) cannot be ruled out as a possible explanation of any possible positive outcomes either.

Having explored the data collected as part of the SCED, discussion moves to the triangulation measure. The discrete pre and post measure, the Spence Child Anxiety Scale, suggest there was no effect of the intervention for any of the participants. The purpose of this measure was to increase the reliability and validity of the repeated measures data through triangulation (Robson, 2011). Single point data considered alone has numerous threats to validity and reliability namely, it is very difficult to conclude that a score for one pupil at one point in time is an accurate and consistent reflection of their views. In addition there are difficulties in concluding any change

between two points, pre and post intervention, is due to the intervention rather than a number of uncontrolled for extraneous variables in the environment (Kazdin, 2003; Robson, 2011). Due to these numerous threats to validity and reliability it may not be surprising that the findings are in contrast to the repeated measures data that has attempted to control for these threats. However it is for these reasons relating to the reliability and validity of the single point data that the author will not consider this contrast in findings further.

5.2.1.3 Conclusions

The most persuasive interpretation of this data is that there is a delayed reduction in anxiety on the weekly self-report measure, demonstrated by the decelerating trend and the lowest mean scores in the follow up phase for all four participants. The length of the follow up phase, however, means the researcher is only able to hypothesise this reduction in anxiety for three participants. The presence of the history and maturation threats to validity and the limitations associated with the use of self-report measures also prevents the author concluding with more certainty the positive impact of the intervention. With this in mind the author concludes that for one participant only, Christopher, the research hypothesis can reasonably be accepted for research question one.

5.2.2 Research Question Two: Does the FRIENDS for Life intervention reduce participant anxiety related behaviour?

Research Hypothesis

The FRIENDS for Life intervention will reduce participant anxiety related behaviour.

5.2.2.1 Key Findings

For all four participants the graphical data indicated the largest reduction in the target behaviour was between baseline and follow up. For one behaviour, Matthew's, the frequency appeared to begin to decrease during the intervention phase and continued to do so in the follow up phase. For the other participants there appeared to be little difference in behaviour between baseline and intervention phases, suggesting any effect on anxiety was delayed.

5.2.2.2 Possible explanations for findings relating to existing literature

For all four participants the findings may be interpreted as showing a reduction in anxiety related behaviour after the introduction of the intervention whether this was accumulative through both phases or delayed, occurring during the follow up phase. For one participant, Christopher, there was an initial increase in behaviour during the intervention phase before a reduction in the follow up phase. This again may be explained by Neil and Christensen's (2009) previously presented suggestion outlining an initial period of elevated risk. However, with only four data points in the intervention phase (not reaching the minimum number of five recommended by Kratochwill et al (2010) to establish an effect) there are limitations on the conclusions that can be drawn about the meaningfulness of the change in scores related to the intervention.

Based on the existing literature evaluating the FRIENDS intervention (Briesch et al, 2010) and CBT for children with autism (see systematic review in chapter two), these positive findings on anxiety were predicted. In addition, this study may also contribute to an area of limited evidence (Lang et al, 2010); the effectiveness of CBT with children with AS with diagnoses other than Asperger syndrome. However use of a SCED and visual analysis does not correspond to the existing CBT literature for typically developing and AS populations, which has relied predominantly on effect sizes in

group designs, and therefore, it is not possible to directly compare the strengths of results (Parker and Brossart, 2003).

This study appears to replicate the positive findings reported by Schoenfeld and Mathur (2009); the only study found that also adopted a SCED in a special school setting and used an observation measure to evaluate the effectiveness of the FRIENDS intervention. The pattern of their SCED data suggests an improvement in behaviour through the intervention phase that continued in to the follow up phase. However they note that the behaviour being observed, academic engagement, was not selected as a behaviour directly linked to anxiety and improvement could have been achieved from other interventions. In this study, the behaviour was selected as an anxiety related behaviour specifically related to each participant, which may increase its validity and reliability as a measure of the FRIENDS intervention in particular. In the previous research question it was suggested that a delayed effect in anxiety may be due to the time taken to consolidate the skills taught in the FRIENDS program to reduce anxiety or anxiety related behaviour. If the behaviour selected by Schoenfeld and Mathur (2009) was not specifically related to anxiety the consolidation time may not have been as pertinent and may have resulted in a more immediate intervention effect observed in that study but not for three of the four participants in this study.

Due to threats to validity which the design could not account for (see section 3.6.8) there may be other possible explanations for the positive findings other than an intervention effect. As in research question one, the threats of history and maturation (Robson, 2011) remain and cannot be discounted as possible explanations of findings particularly for Matthew where there was a clear trend in the baseline phase.

In terms of construct validity, this study supposes that the behaviour observed was an objective measure of an anxiety related behaviour. However, there is a possibility that this behaviour was not measuring anxiety but demonstrating a reduction in some other unknown variable. Drawing on the knowledge of the teaching staff in identifying anxiety related behaviour means relying on their interpretation of the behaviour as

being anxiety driven. Schleismann and Gillis (2011) recognise that in exploring behaviour that has been identified as anxiety related; the behaviour may also have other functions. This study attempted to increase the construct validity of the study by:

- Sharing with the reference group selecting participants a widely accepted definition of anxiety and the associated behaviours in the form of the DSM IV and ICD 10 generalised anxiety disorder criteria;
- Triangulating the views of the staff member interviewed regarding the anxiety related behaviour with the researcher's own observations and IEP targets generated by home and school.

With any study that attempts to explore an internal state such as anxiety, construct validity remains a threat. Furthermore, Ozonoff, Goodlin-Jones and Solomon (2005) highlight that for individuals with AS, due to their social and cognitive difficulties, their presentation of anxiety symptoms may differ significantly from the anxiety symptoms of typically developing children, making identifying and defining anxiety related behaviours for this population potentially even more problematic. It also raises questions as to the validity and reliability of using DSM IV and ICD 10 criteria for an anxiety disorder in a typically developing population to guide teacher selection of participants for this study.

There are also threats to validity and reliability in terms of the methods of direct observation which may have impacted on the data collection. Though attempts were made to maintain the consistency of the context of the observations (Robson, 2011) including the time, day and content of the sessions being observed, due to this study being school-based and set in a real world context, this was not always possible. Particularly relevant here is the missing data for the majority of the intervention phase for two participants which occurred due to timetabling changes in the lead up to Christmas. Kratochwill et al (2010) state that there needs to be at least five data points in a phase to provide conclusive evidence of an effect. For Jack and Christopher this

threshold was not met (four and three data points respectively). The school staff reported on several occasions that due to activity or staffing changes it was not possible for their observations to be undertaken for the full day. Consequently it is not possible to conclude that these threats to the validity and reliability of the observations did not impact on the data collected and therefore affects the conclusions that can be drawn about the intervention.

5.2.2.3 Conclusions

It is with caution, bearing in mind the remaining threats to validity and reliability previously mentioned, that the research hypothesis is accepted for all four participants.

5.2.3 Research Question Three: Does the FRIENDS for Life intervention increase alternative replacement behaviours to the participant's anxiety related behaviour?

Research Hypothesis

The FRIENDS for Life intervention will increase the alternative replacement behaviours to the participant's anxiety related behaviour.

.

5.2.3.1 Key Findings

The graphical data showed an improvement in one replacement behaviour, *Christopher initiating an adult prompt*, from baseline to follow up phase. However

there was no change in frequency of the number of *activities Christopher began independently* during the intervention or follow up phases.

5.2.3.2 Possible explanations for findings relating to existing literature

It is possible to interpret the results for one behaviour, *Christopher initiating an adult prompt*, as demonstrating a delayed improvement on the replacement behaviour in line with a delayed reduction in the anxiety related behaviour. For the other behaviour, *beginning activities independently*, the data indicated there was no improvement as a result of the intervention. One possible explanation for the differentiated effect on these two behaviours may be through considering these behaviours in a hierarchy. It is plausible to suggest that from relying predominantly on adults to support him beginning activities independently, initiating an adult prompt to support him beginning his work may be easier to achieve than starting his work independently. Therefore success on this behaviour may pre-empt success on the other behaviour. It is also possible that these replacement behaviours are not exhaustive and there are changes in alternative behaviours that are not being captured by the observations.

In addition a severe limitation in considering the effect of the intervention on the identified replacement behaviour is the missing data in the intervention phase. Violating a key characteristic of the SCED design, repeated measures data (Barlow, Nock and Hersen, 2009), the three data points available makes it difficult for the researcher to confidently conclude the effectiveness of the intervention within that phase (Kratochwill et al, 2010).

As before, history and maturation threats to validity (Robson, 2011) and the Hawthorne Effect cannot be ruled out as possible explanations of positive findings rather than an intervention effect. As with research question two the lack of

consistency in the context of the weekly observations must also be considered as an extraneous variable.

5.2.3.3 Conclusions

In light of the remaining threats to validity and reliability, the research hypothesis will be accepted with caution for one behaviour, *the frequency of Christopher initiating an adult prompt,* but not for the second behaviour, *beginning activities independently.*

5.2.4 Research Question Four: Are the expected findings of the repeated measures reflected in pre and post intervention measures of participant anxiety by school staff?

Research Hypothesis

The FRIENDS for Life intervention will reduce school staff reports of participant anxiety.

5.2.4.1 Key Findings

Staff reports of participant anxiety illustrated no significant differences between pre, post and follow up scores for three participants. For one participant, Cameron, the Deputy Head Teacher's rating of his anxiety showed a significant reduction between pre and post intervention but this was not maintained at follow up.

5.2.4.2 Possible explanations for findings relating to existing literature

It was not the aim to establish causal relationships with this data but to use it for triangulation purposes. It appears that the findings of the single point data do not reflect the positive reduction in anxiety found on at least one of the repeated measures used in the SCED.

The numerous threats to validity and reliability for collecting data at single points recognised in the methodology and the exploration of the findings of research question one (Kazdin, 2003; Robson, 2011) may explain why the findings do not triangulate. These threats to reliability and validity may also increase the likelihood of a type II error, i.e. this data did not sufficiently capture a change that did exist and may have been captured by the main SCED findings.

It is also possible that teaching staff did not perceive a significant change in participant anxiety, which was accurately measured by the School Anxiety Form. Discussed in more detail later in the chapter, the facilitators experienced difficulty in engaging school staff in the intervention to support the generalisation of techniques across the school context deviating from the ideal described in the FRIENDS manual. This lack of engagement with the FRIENDS intervention and support for generalisation may have impacted on their report.

Interestingly, Denham (2005) has also recognised that teacher experience may impact on their ratings of pupil social and emotional competence, with more experienced teachers rating pupils competence as higher than teachers with less experience. In this study, the teaching staff who completed the questionnaire may be described as experienced, they each have over 20 years teaching experience, which may have impacted on their reporting of participant anxiety.

5.2.4.3 Conclusions

For one participant there was a significant reduction by one member of school staff in their rating of participant anxiety from pre to post intervention which was not maintained at follow up. However due to the significant threats to validity and reliability for data collected at single points for individuals, the research hypothesis cannot be confidently accepted for any of the four participants. The single point teacher report data does not triangulate the main findings of the SCED for any participant.

5.2.5 Research Question Five: Are the expected findings of the repeated measures reflected in pre and post intervention measures of participant anxiety by parents?

Research Hypothesis

The FRIENDS for Life intervention will reduce parent reports of participant anxiety

5.2.5.1 Key Findings

For the two participants whose parent completed the Spence Child Anxiety Scale at pre and post intervention there was no significant difference between their scores at each time point.

5.2.5.2 Possible explanations for findings relating to existing literature

In response to this research question, one explanation of the data is that it identifies that parents did not see a significant change in their child's anxiety following the

intervention. This may be seen in contrast to the positive effect on anxiety concluded in research question two and partially in research question one.

This conflict between parent and child reports of anxiety was also found in several studies included in the systematic review (Ooi et al, 2008; Reaven et al, 2009; Wood et al, 2009). Meehan et al (2003) and Youngstrom et al (2000) highlight a low level of agreement between child and parent report is fairly typical in the educational literature.

It is possible that the challenges faced by this study in engaging parents with the intervention may offer an explanation for this disparity in parent and child reports. It may be that this was a solely school based behaviour, and the non-significant findings may be explained by a lack of either a) sensitisation of parent's to young people's anxiety in school (Wigelsworth et al, 2010) or b) lack of generalisation. This profile of findings has been widely acknowledged across the Social and Emotional Aspects of Learning (SEAL) intervention literature too (Humphrey, Kalambouka, Wigelsworth and Lendrum, 2010), raising discussions about how to further involve parents in school interventions.

However, it is also possible that with the numerous threats to validity and reliability of collecting data at single points for individuals that the data did not accurately capture their views, and therefore, there was a type II error.

5.2.5.3 Conclusions

The data available from the parents of two participants suggests a non-significant change in scores pre to post intervention. Therefore, the research hypothesis cannot be reasonably accepted for either participant.

5.2.6 Summary

In relation to each research question, a range of possible explanations of the findings have been considered. Attempts have been made to link the current study's findings with the existing literature that has evaluated the effectiveness of the FRIENDS intervention and the use of CBT with an AS population. In doing so the author has aimed to highlight the valuable and unique contribution of this study to both evidence bases.

Focus of the discussion will now move to a review of the methods adopted in this study, originally presented in chapter three. The strengths and limitations of the methods will be discussed, with specific reference to the threats to validity that were discussed in section 3.6.8 and which, having undertaken the study, are considered to have impacted on the validity and reliability of the findings.

5.3 Review of Methods Including Strengths and Limitations

5.3.1 Design

This study conducted multiple single case experiments adopting an AB design with follow up phase to evaluate the impact of the FRIENDS intervention on the anxiety levels of four participants with AS. The researcher argued in section 3.5.1 for the adoption of this design in light of the variation in behaviour and characteristics exhibited by individuals with autism making it beneficial to personalise interventions and review them at an individual level (Jordan, Jones and Murray, 1998). However, this was at the detriment of the external validity (Barlow and Nock, 2009a). Through recognising the limitations of SCEDs it is necessary, therefore, to acknowledge the results of this study within certain parameters.

5.3.1.1 AB Design

The AB design has been widely criticised for not allowing a clear demonstration of the controlling influence of an intervention and therefore limiting the conclusions about effectiveness that can be drawn (Barlow et al, 2009; Kazdin, 2003; Kratochwill et al, 2010). Other design options were explored but considered unsuitable (see section 3.6.1). The advantages of adopting this design were that it had high ecological validity and enabled this study to evaluate more closely the time line of change that group designs may have lacked sensitivity in exploring previously.

5.3.1.2 Baseline Phase

Kratochwill et al (2010) suggest a baseline of at least five data points is required to establish a stable baseline rate. The 8-11 data points collected for each participant during the baseline phase should have been sufficient; however, in some instances it was not possible to establish a consistent pattern of performance after 11 weekly collections of data and in order to complete the intervention before the Christmas school holiday it was not possible to extend the baseline longer. This variability in the baseline is a commonly occurring difficulty in applied research (Barlow et al, 2009), which impacts on the validity of results (Kratochwill et al, 2010) as well as restricting the possible analysis techniques that can be used on the data. This instability was of particular relevance to Matthew's behaviour observation data and impacted on the confidence with which the researcher was able to conclude the existence of an intervention effect for his data.

5.3.1.3 Analysis of Data

Use of graphical descriptors (Brossart et al, 2006) and a substantial level of inter rater agreement (Landis and Koch, 1977) increased the reliability of the researcher's

conclusions from visual analysis, but the variability of behaviour (Barlow et al, 2009), the unstable baseline (Kazdin, 1982) and the sensitivity to small changes (Kazdin, 2003) made visual analysis more difficult in this study. However the researcher maintains that visual analysis was the appropriate tool for analysing this data due to the lack of a 'gold standard' of statistical analysis currently available that could account for baseline trend and autocorrelation and allow comparisons to group design statistics (Kratochwill et al, 2010).

5.3.1.4 Internal Validity

In adopting a post positivist epistemology it is important to acknowledge any biases that could have affected research outcomes (see reliability and validity section 3.6.8). Kratochwill (1992) highlighted several strategies that could be adopted to improve the validity and reliability of SCEDs, which this study was successfully able to apply:

- Research based on observational data;
- Repeated measurements taken over all phases;
- A study based on direct intervention;
- Multiple cases with participants displaying a range of needs;
- The intervention procedure was standardised, formalised and recorded;
- Multiple outcomes measures were used.

However, as with other fixed designs, SCEDs are open to a variety of threats to internal validity (Cook and Campbell, 1979). Particularly relevant to this design were the threats of history and maturation. The researcher attempted to control for such threats by stating from the outset that children could not begin other interventions whilst taking part in the study. However, the study could not sufficiently control for other changes in the environmental context, e.g. school holidays, becoming more familiar with the classroom context over the academic year or growth, change or development in participants unrelated to the intervention. Along with the possibility

178

that any positive effects may be due to an intervention effect but not specifically the FRIENDS program (Hawthorne Effect; Landsberger, 1958), these threats remain relevant to SCEDs and needed to be considered when drawing conclusions from the data.

Despite these parameters and limitations section 3.5.1 clearly identified the rationale for using this design particularly with this target population. A range of evidence has highlighted the social significance (Horner et al, 2005), validity and reliability of the data collected at the individual level (Barlow et al, 2009; Robson, 2011) to draw conclusions about the causal relationship between variables (Cohen, Manion and Morrison, 2009).

5.3.2 Defining and Measuring Anxiety

For studies such as this one exploring internal constructs such as anxiety, threats to validity in defining the anxiety construct and measuring it are of particular relevance. Earlier in the chapter, threats to validity related to defining and measuring anxiety were explored in relation to the specific research findings and existing literature (please refer to section 5.2.1 and 5.2.2). The focus of this section is a review of the methods; how the design attempted to control for threats to validity and reliability in relation to the measures selected, rather than the outcomes.

5.3.2.1 Child Self-Report Measures

In exploring the threats to validity of the findings for research question one, the researcher acknowledged the limitations of the use of self-report measures, particularly the potential influence of social desirability (Wigelsworth et al, 2010). In an attempt to reduce this participant bias the researcher highlighted to the participants each week that there was no right or wrong answer. However as part of the informed

consent, they were aware of the primary aim of the study which could have impacted upon their responses.

5.3.2.2 Observation Measures

Kratochwill (1992) suggests that measures of direct observation may increase the validity of a SCED, but for the observation measure in this study to be reliable and valid the design needed to account for a range of possible sources of participant and observer error and bias (see section 3.6.8.5.1). To reduce the participant error in this study, observations where possible were undertaken on the same day and approximately same time each week, a Thursday morning (Cameron and Matthew) or all day Friday (Christopher and Jack). However as acknowledged when exploring interpretations of the data for research question two (section 5.2.2), this was not possible at all times due to school timetable conflicts and staffing changes which limits the validity and reliability of any conclusions that can be drawn about the effect of the intervention.

Horner et al (2005) highlights that an observable behaviour needs to be operationally defined, measured repeatedly, assessed for consistency (through such methods as inter rater agreement) and be of social significance for the participant to increase the validity of the measure. In this study 20% of the observations undertaken by the researcher were undertaken jointly and Cohen's kappa indicated a good level of inter rater agreement, which increased the reliability and validity of the observation data (Robson, 2011). For the two participants who were observed over a day long period by school staff, the use of two members of staff was an attempt to reduce the observer bias and increase the reliability of the observational data. However this study would have benefitted from formal inter rater checks by an external observer to increase the reliability and validity of this data.

5.3.3 Intervention

5.3.3.1 School Context

One of the reasons the school approached to be involved in this study was selected was because of their particular interest and focus on developing the emotional literacy of their pupils, which the researcher felt could be complemented by the FRIENDS program thereby increasing the social validity of the intervention. However, there was also an increased history threat to validity as a result of this selection process; previous involvement with interventions focusing on developing similar skills to the FRIENDS program as well as any on-going skills development as part of the school curriculum may have impacted on the findings. It makes it difficult to isolate the impact of the FRIENDS intervention, as well as increasing the likelihood of a ceiling effect on any positive progress.

The FRIENDS manual recommends the intervention as part of a whole school approach. As detailed in section 3.6.6 it had originally been intended for the Deputy Head Teacher to be involved in each of the FRIENDS sessions to support the generalisation of techniques to the classroom in between sessions. However, after week one it was decided that the intensity of the participant: adult ratio made this inappropriate. Though attempts were made to share the content of the sessions with school staff in light of the decision to not have a representative in each session, it is possible that this deviation from the ideal context outlined in the manual may have impacted on the successful generalisation of techniques and therefore the impact of the intervention.

5.3.3.2 Parent Involvement

The anxiety literature identifies, strong parent and family support as protective factors for a child, reducing the likelihood of developing a psychiatric disorder (Donovan and

Spence, 2000) in addition to the benefits when involving parents in anxiety interventions (Bernstein et al, 2005; Sofronoff et al, 2005). The FRIENDS manual also clearly outlines the importance of and ways to involve parents in the process. The distance participants lived from the special school setting made engaging parents in the intervention difficult. The facilitators made on-going attempts to share the content of the weekly sessions with parents through the home books as well as regular communication via letters outlining future dates and contact details if parents wished to discuss the intervention further (no parents made contact). It was decided that as only one parent attended the first of two parent sessions, held after week three, that the second session would not be run. Home activities, though set each week, were rarely returned. Deviation from the ideal in terms of parent involvement outlined in the FRIENDS manual, may have impacted on the success of the intervention in this study.

5.3.3.3 Intervention Integrity

The delivery of the FRIENDS intervention adhered to the guidance in the 5th Edition manual (Barrett, 2010) and, within that, allowed for creativity and flexibility in presentation and recording of ideas. The adaptations the facilitators made to the program in this study retained the structure and sequence of objectives but altered the presentation in light of the theoretical and research literature available about the special educational needs of individuals with AS. However, with the focus of this experimental study being on outcomes, it is not possible to determine how the presentation of tasks may have impacted on the effectiveness of the intervention delivered.

Twice during the intervention period, the sessions were observed by an independent observer who confirmed the sessions were following the objectives outlined in the manual. The self-report intervention integrity checks completed for the other eight weeks, though useful particularly as a reflection tool for the facilitators, have

questionable validity. More regular independent treatment fidelity checks would have enhanced the reliability and validity of the study.

5.3.4 Researcher Role

A researcher adopting a post-positivist perspective strives for objectivity, therefore it may be concluded that the study might have been improved if the researcher had adopted a more 'neutral' role. Steps were taken to reduce the researcher bias (illustrated in section 3.6.9), however, had all data been collected by school staff and/or school staff had facilitated the intervention the validity and reliability of results may have been improved, and been more closely in line with the post-positivist paradigm.

5.3.5 Summary

The methods adopted in this study have been reviewed considering the potential impact they may have had on the effectiveness of the intervention as well as the validity and reliability of the findings. Focus will now turn to the implications of the study's findings for future research.

5.4 Implications of the Findings and Future Research

Several questions have emerged from the current study that may warrant further investigation. This section considers some of these areas for future research and possible methods for exploring them.

Firstly this was a pioneering study. The researcher understands it to have been the first of its kind to evaluate the FRIENDS intervention solely with an AS population in a British special school setting. This study has highlighted potential benefits for the four participants in this specific context, but would warrant further replication in other contexts due to the weak external validity of this design. The gains in this study were primarily reported in the follow up phase. Future research would benefit from a longer follow up phase to further consider a delayed effect on anxiety.

Six of the 15 studies considered as part of the systematic review of current literature evaluating CBT with an AS population implemented the intervention as part of a group (three to eight participants). The DfES (2002) highlights the importance of including social interactions when devising interventions for children with autism, but also to ensure that they are able to access a curriculum that is not reliant on social skills. The FRIENDS manual highlights the role of peer learning in the program and describes how the program may be delivered in a group or whole class in a school setting, but also at an individual level in a clinical setting. With the widely acknowledged social difficulties faced by individuals with AS, future research may want to consider the effectiveness of the FRIENDS intervention delivered individually compared to a group format.

This study also involved the completion of two booster sessions during the follow up phase which may have contributed to the positive effect during this phase. Briesch et al (2010) highlighted the inconsistent application of the booster sessions in their review of the FRIENDS literature and the potential impact on the maintenance of effects. Future research would benefit from isolating the contribution of these booster sessions, possibly through a comparison design that compared maintenance of effects with and without the booster sessions.

As recommended by all of the evaluation studies included in the systematic review in chapter two, the delivery of the FRIENDS program was adapted by the facilitators in order to better meet the needs of the participants with their diagnoses of AS. These adaptations were described in more detail in section 3.6.6.1. Consideration of how

these adaptations may have impacted on the effectiveness of the intervention was not undertaken in this or previous research in the area and may be a point for future investigation.

This study faced challenges in supporting the generalisation of techniques taught in the sessions across the school setting and home context. Future researchers should consider closely the ways in which they can meet the ideals described in the manual in light of the context of their study. In addition further studies isolating the contribution of parent involvement, following the protocol outlined in the manual, would also be useful.

Within the climate of evidence based practice, the researcher chose to adopt a post positivist epistemology focusing on establishing a causal relationship between variables and therefore evaluating the effectiveness of the FRIENDS intervention with an AS population. Having established potential benefits of this intervention for this population, adoption of qualitative methods within a constructivist paradigm may offer insight into the potential mechanisms/components of change, if any, that are most effective in reducing participant anxiety.

Having considered possible directions for future research based on the findings of this study, consideration will now be given to the role of the EP in supporting mental health interventions, such as the FRIENDS program, in schools.

5.5 Implications for EP Practice

In chapter two the potential role of the EP in supporting schools in implementing mental health initiatives was discussed. The researcher endorses the idea that there may be a valuable contribution for EPs in the school context utilising their unique working knowledge of school systems and how they may influence behaviour (Squires, 2010).

Specific to the FRIENDS literature, reviews have identified an effect size of more than twice (ES= 0.56) for interventions implemented by trained practitioners compared to teachers or school staff alone (Briesch et al, 2010). EPs may offer a unique contribution in that they bring knowledge of the psychological underpinnings of CBT as well as utilising their consultative skills in accessing appropriate support networks to deliver an effective and ethical intervention (Squires, 2010). In this study, the researcher worked closely with the school setting drawing on support from her university and placement supervisor and EP colleague as co-facilitator. This support was invaluable in an exploratory study such as this, focusing on potentially sensitive outcomes.

The outcomes of this study suggest an EP led, FRIENDS intervention may have a positive effect on the anxiety of individuals' with AS in a special school setting. This study offers a starting point from which the effectiveness of the intervention can be explored further, as highlighted in the previous section. The SCED design of this study enabled the intervention to be evaluated at an individual level and highlights the possible utility of the SCED in illuminating and evaluating EP practice more generally at the individual level.

The starting point for this study was the opportunity to contribute to evidence based practice in the educational provision for young people with AS needs. Evidence based practice is underpinned by a positivist view of reality and knowledge i.e. using reliable and valid methods, research can identify a real and objective truth and attempt to establish causal relationships between variables (Fox, 2002). The researcher was also employed as a trainee educational psychologist during this study, in a local authority adopting a consultative model of practice. This model of practice may be more closely aligned with the constructionist paradigm focusing on personal constructs of a reality, though this is recognised as having limited value within the evidence based paradigm (Fox, 2002). This presented the research-practitioner with a challenge in terms of balancing the expectations of adopting a scientific method for research, within a real world context and employment as part of a consultative service. Showing some flexibility in the methods adopted and working with primary stakeholders, in particular

the school, to recognise their needs and expectations for the study supported the researcher in meeting this challenge.

Several other challenges emerged in the implementation of this research, particularly in relation to engagement of stakeholders and generalisation of the intervention across contexts. It is important to address these challenges and consider the implications for EP practice. Earlier in the discussion, the difficulties in engaging parents in the intervention were discussed, the distance participants lived from the special school setting being a particularly influential factor in this. The anxiety literature recognises the importance of involving parents in interventions (Bernstein et al, 2005; Sofronoff et al, 2005), yet the SEAL intervention literature has also highlighted the notorious difficulty in engaging parents in these interventions (Humphrey, Kalambouka, Wigelsworth and Lendrum, 2010), raising discussions about how to further involve parents in school interventions. The facilitators made on-going attempts to share the content of the weekly sessions with parents through the home books as well as regular communication via letters outlining future dates and contact details if parents wished to discuss the intervention further. On reflection, offering home visits may have been an additional method through which to engage parents in the intervention. It may have also been beneficial to highlight the benefits of parent contribution to the intervention and explain more fully the intentions of the home books in involving parents in the intervention, at the initial information sharing evening where parents gave informed consent, as three of the four parents were in attendance at that meeting.

One of the reasons the school approached to be involved in this study was selected was because of their particular interest and focus on developing the emotional literacy of their pupils. During the initial discussion meeting with the school where they expressed their interest in the intervention and consented to involvement in the research project, the school expressed their intention to become trained facilitators and to continue to deliver the intervention once formal support/expectation of the research project was complete. This has implications for EP practice in that it leads to a

consideration of how an intervention led by an external facilitator, such as an EP, may be embedded in to the school curriculum for its on-going delivery by the school. Offerings from an organisational psychology perspective, in particular Lewin's Cycle of Change (1951), recognises that human systems, in this case the school system, tend towards maintaining a stable equilibrium. A new, potentially external force, is required to interject to challenge the equilibrium of an organisation for change to occur. Applied to this study and generalised to EP practice more widely, providing feedback to staff evaluating intervention may be the new, external force through which the current ways of working may be challenged and new ways of working considered. In this study, the researcher has planned to provide feedback to relevant stakeholders regarding the positive outcomes of the study which will include planning for future delivery of the intervention in school. In addition to recognising the importance of reviewing interventions with relevant stakeholders as part of this research project, the TEP will continue to emphasise the review process as part of her professional practice in applying to individual casework.

EP work at an organisational level may also be through the delivery of interventions underpinned by CBT principles to staff in addition to pupils. CBT interventions may be used to develop adult skills in managing their own emotions when working in challenging school contexts (Rait et al, 2010). Therefore it may be appropriate for an EP to use their interpersonal skills and knowledge of CBT models and techniques to support both pupil and staff mental health.

5.6 Conclusion

5.6.1 Main Findings

This study evaluated the effectiveness of the FRIENDS intervention on the anxiety levels of four participants with AS accessing special school provision. Outcomes from the SCED showed that for all four pupils there was a significant decrease in anxiety from baseline to follow up on at least one measure of anxiety.

A pattern emerging in the data was that of a delayed effect on anxiety, with a reduction in anxiety between baseline and follow up being seen for all participants on the observational data. For two participants on the self-report data there was also an initial increase in anxiety during the intervention phase, which Neil and Christensen (2009) suggest illustrates a period of elevated risk prior to a reduction in anxiety.

The parent, child and teacher report triangulation measures suggest there was no significant change in anxiety as a result of the intervention. However the numerous threats to validity and reliability of single point data for individuals severely limits the causal conclusions that can be drawn from the findings, which is why the purpose of these measures was to triangulate the SCED data rather than be analysed in isolation. The discussion highlighted the lack of generalisation and sensitisation to young people's anxiety outside of the FRIENDS sessions as possible contributors to the disparity in parent and teacher report and the SCED findings.

When considering outcomes, several key limitations to the study's design and implementation must be considered in any interpretation of the findings. Particularly relevant to this study design was the internal validity threats of history and maturation and the missing data in the intervention phase for Christopher and Jack. In terms of intervention implementation, the difficulty in generalising skills to the more general school setting and home context were key factors.

Despite the limitations, this study clearly illustrates a potential positive impact on participant anxiety as a result of the FRIENDS intervention and warrants further investigation of the use of CBT interventions in schools with an AS population. Further exploration of specific components of the intervention such as booster sessions and parent involvement may provide further insight into the mechanisms of change in the intervention.

5.6.2 Unique Contribution

This study has described an evaluation of the FRIENDS intervention and has highlighted its potential contribution to two specific evidence bases. The FRIENDS intervention has been widely evaluated earning recognition from the World Health Organisation (WHO, 2004) as an effective intervention for reducing participant anxiety. However, this research literature is primarily limited to the Australian context involving the intervention developer. Within the British context the published literature is much more sparse with existing studies also having several methodological weaknesses (Stallard et al; 2005, 2007, 2008). The evidence base for the use of CBT with an AS population is newly emerging and the majority of the research literature has been undertaken in a clinical rather than a school setting. Preliminary findings however suggest that CBT may be an effective intervention in reducing anxiety for this population.

Therefore, this study has offered a unique contribution in that to the researcher's knowledge there are no previous evaluations of the FRIENDS intervention that have been undertaken solely with an AS population. In addition, the existing literature implementing CBT for children with AS in a school setting is also very limited.

A final unique contribution of the study has been to the researcher's personal development as a research practitioner and EP. Over her doctoral study the researcher has been on a challenging yet rewarding journey in her attempt to design and

implement an evaluation study within a real word context. The skills developed particularly in building and maintaining relationships with relevant stakeholders have been extremely valuable and will remain so as the researcher continues on her research and professional journey.

6. References

6.1 References

Agnostinis, Morley and Dowzer (2008) *University of Leeds Reliable Change Indicator Calculator.* http://www.leeds.ac.uk/lihs/psychiatry/dclin/rcic.html

Adamson, P., Bradshaw, J., Hoelscher, P. and Richardson, D. (2007) *Child Poverty in Perspective: An overview of child well-being in rich countries,* Innocenti Report Card, vol. 7, Unicef Innocenti Research Centre, Florence, Italy.

Ali, S., and Frederickson, N. (2006) Investigating the evidence base for Social Stories, *Educational Psychology in Practice,* 22:4, 355-77.

American Psychiatric Association (1994) *Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV).* American Psychiatric Association, Washington, DC.

Anderson, S., and Morris, J. (2006) Cognitive Behaviour Therapy for People with Asperger Syndrome. *Behavioural and Cognitive Psychotherapy.* 34:3, 293-303.

Attwood, T. (2004) Cognitive Behaviour Therapy for Children and Adults with Asperger's Syndrome. *Behaviour Change.* 21: 3, 147-161.

Barlow, D., and Nock, M. (2009a) Why Can't We Be More Idiographic In Our Research? *Perspectives on Psychological Science,* 4:1, 19-21.

Barlow, D., Nock, M., & Hersen, M. (2009). Single Case Experimental Designs: Strategies for studying behaviour change (3rd Ed.). Boston, MA: Allyn and Bacon.

Barrett, P.M. (2008) *FUN FRIENDS A facilitator's guide for building resilience in 4 to 7 year old children through play.* Brisbane, Australia: Pathways Health and Research Centre.

Barrett, P. M. (2010) 5th Ed. *FRIENDS for Life for Children group leaders' manual.* Brisbane, Australia: Pathways Health and Research Centre.

Barrett, P.M. (2011) *My Little FUN FRIENDS Book.* Brisbane, Austrailia: Pathways Health and Research Centre.

Barrett, P,M., Farrell, L,J.,Ollendick, T, H., and Dadds, M. (2006) Long term outcomes of an Australian universal prevention trial of anxiety and depression symptoms in children and youth: An evaluation of the FRIENDS program. *Journal of Clinical Child and Adolescent Psychology*, 35, 403-311.

Barrett, P.M., Lock, S. and Farrell, L. (2005) Developmental differences in universal preventative intervention for child anxiety. *Clinical Child Psychology and Psychiatry*, 10, 539- 555.

Barrett, P.M. and Pahl, K.M. (2006) School-based intervention: Examining a universal approach to anxiety management, *Australian Journal of Guidance and Counselling*, 16, 55-75.

Barrett, P.M., Sonderegger, R., and Sonderegger, S.L. (2001) Evaluation of an anxiety-prevention and positive-coping program (FRIENDS) for children and adolescents of non-English speaking backgrounds, *Behaviour Change*, 18, 78-91.

Barrett,P, M., Sonderegger, R., and Xenos, S. (2003) Using FRIENDS to combat anxiety and adjustment problems among young migrants to Australia: A national trial, *Clinical Child Psychology and Psychiatry*, 8, 241-260.

Barrett, P.M. and Turner, C.M. (2001) Prevention of anxiety symptoms in primary school children: Preliminary results from a universal school-based trial. *British Journal of Clinical Psychology*, 40, 399-410.

Barrett, P,M., Webster, H., and Turner, C. (2000) *FRIENDS prevention of anxiety and depression for children group leader's manual.* Bowen Hills, Australia: Australian Academic Press.

Bellini, S.(2004) Social skills deficits and anxiety in high-functioning adolescents with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, 19, 78-86.

Bernstein, G. A., Layne, A. E., Egan, E. A., &Tennison, D. M. (2005). School-based interventions for anxious children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 44: 11, 1118–1127.

Bienvenu, O.J., and Ginsburg, G.S. (2007) Prevention of anxiety disorders. *International Reviews of Psychiatry*, 19, 647-654.

Birmaher, B., Brent, D., Chiapetta, L., Bridge, J., Monga, S., and Baugher, M. (1999) Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED), Journal of the *American Academy of Child and Adolescent Psychiatry*, 38, 1230-1236.

Briere, J. (1996) *Trauma scales for children and adolescents.* (TSCC) Lutz, FL: Psychological Assessment Resources (PAR).

Briesch,A,M., Hagermoser Sanetti, L, M., and Briesch, J, M. (2010) Reducing the prevalence of anxiety in children and adolescents: an evaluation of the evidence base for the FRIENDS for Life program, *School Mental Health*, 2, 155-165.

British Psychological Society (2009) *Code of Ethics and Conduct. Guidance published by the ethics committee of the British Psychological Society.* Leicester: BPS.

Brossart, D.F., Parker, R.I., Olson, E., and Mahadevan, L. (2006) The relationship between visual analysis and five statistical analyses in a simple AB single case research design. *Behavior Modification*, 30, 531-563.

Busk, P. L., & Serlin, R. C. (1992). Meta-analysis for single-case research. In T. R. Kratochwill, R. Thomas, and J. R. Levin (Eds.). *Single-case research design and analysis: New directions for psychology and education.* (pp. 187-212). England: Lawrence Earlbaum Associates.

Campbell, J.M (2004) Statistical comparison of four effect sizes for single-subject designs. *Behaviour Modification*, 28, 234-246.

Cardaciotto, L., and Herbert, J. (2004) Cognitive behaviour therapy for social anxiety disorder in the context of Asperger's syndrome: a single subject report, *Cognitive and Behavioural Practice*, 11, 75-81.

Castellanos, N., and Conrad, P. (2006) Brief interventions targeting personality risk factors for adolescent substance misuse reduce depression, panic and risk-taking behaviours, *Journal of Mental Health*, 15, 645- 658.

Chalfant, A, M., Rapee, R. and Carroll, L. (2007) Treating anxiety disorders in children with high functioning autism spectrum disorders: a controlled trial, *Journal of Autism and Developmental Disorders*, 37, 1842-1857.

Clarke, V. (2011) *A Randomised Control Trial of the 'FRIENDS for Life' Program: Evaluating the Impact on Children's Anxiety, Resilience and Behaviour.* Doctoral Thesis, University of Nottingham.

Cohen J.(1960) A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20, 37-46.

Cohen, L., Manion, L., & Morrison, K. (2009). *Research methods in education* (6th Ed.). Oxon: Routledge.

Cook, T.D. and Campbell, D.T. (1979). *Quasi-experimentation: Design and Analysis for Field Settings.* Chicago: Rand McNally.

Cooley,M.R., Boyd, R, C. and Grados, J,J. (2004) Feasibility of an anxiety preventative intervention for community violence of exposed African American children, *Journal of Primary Prevention*, 25, 105-123.

Dadds, M.R., Holland, D.E., Laurens, K.R., Mullins, M., Barrett, P.M., and Spence, S.H. (1999) Early intervention and prevention of anxiety disorders in children: Results at 2 year follow up. *Journal of Consulting and Clinical Psychology*, 67, 145-150.

Dadds, M.R., Spence, S.H., Holland, D.E., Barrett, P.M., Laurens, K.R. (1997) Prevention and early intervention for anxiety disorders: a controlled trial. *Journal of Consulting and Clinical Psychology*, 65, 627-635.

Denham, S.A.(2005) *Assessing social-emotional development in children from a longitudinal perspective for the National Children's Study*. Battelle Memorial Institute, Columbus, OH.

Department for Education and Skills (DfES) (2001) *Promoting children's mental health within early years and school settings*. London: DfES.

Department for Education and Skills (DfES) (2002) *Autism Spectrum Disorders; Good Practice Guidance*. Nottingham: DfES. www.teachernet.gov.uk/management/sen.

Department for Education and Skills (DfES) (2004) *Removing Barriers to Achievement: The Government's Strategy for SEN*. London: DfES.

Department for Education and Skills (DfES) (2005) *Excellence and Enjoyment: Social and Emotional Aspects for Learning*. Nottingham: DfES Publications.

Department for Education and Skills (DfES) (2007) *Social and Emotional Aspects of Learning (SEAL) for Secondary Schools*. Nottingham: DfES Publications.

Department of Health (2004) National Service Framework for Children, Young People and Maternity Services Change for Children- Every Child Matters. *In The Mental Health*

and Psychological Wellbeing of Children and Young People (3779, pp. 3-48). London: Department of Health, department for Education and Skills.

DeProspero, A. and Cohen, S.(1979) Inconsistent visual analysis of intrasubject data. *Journal of Applied Behavior Analysis*, 12, 573-579.

Dockrell, J., Lewis, A & Lindsay, G. (2000). Researching Children's Perspectives: a psychological dimension. In A. Lewis & G. Lindsay. *Researching Children's Perspectives.* Buckingham: Open University Press.

Dollaghan, C (2004, April 13th) Evidence Based Practice: Myths and Realities. *The ASHA Leader.* Retrieved from
http://www.asha.org/publications/leader/2004/040413/f040413a1.htm

Donovan, C., and Spence, S. (2000) Prevention of Childhood Anxiety Disorders, *Clinical Psychology Review*, 20:4, 509-531.

Donovan, C., and Spence, S. (2001) Anxiety Disorder in Children, *International Encyclopedia of the Social and Behavioral Sciences*, 570-576.

Essau, C.A., Conradt, J., Sasagawa, S., and Ollendick, T.H. (2012) Prevention of anxiety symptoms in children: results from a universal school-based trial, *Behaviour Therapy*, 43:2, 450-464.

Everitt, A. & Hariker, P. (1996). *Evaluating for good practice*. BASW/Macmillan: London.

Farrell, L., and Barrett, P. (2007) Prevention of childhood emotional disorders: Reducing the burden of suffering associated with anxiety and depression, *Child and Adolescent Mental Health*, 12:2, 58-65.

Fombonne, E., Simmons, H., Ford, T., Meltzer, H. & Goodman, R. (2001) Prevalence of pervasive developmental disorders in the British Nationwide Survey of Child Mental

Health. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 820–827

Fonagy, P., Target, M., Cottrell, D., Phillips, J., and Kurtz, Z. (2005) *What works for whom? A critical review of treatments for children and adolescents*. Hove; The Guilford Press.

Fox, M (2002) The education of children with special educational needs: evidence or value driven? *Educational and Child Psychology, 19:3, 42-53.*

Frederickson, N. (2002). Evidence-based practice and educational psychology. *Educational and Child Psychology, 19*:3, 96-111.

Frederickson, N., and Cline, T. (2009) 2nd Ed. *Special Educational Needs, Inclusion and Diversity*. Maidenhead: Open University Press

Gallegos, J. (2000). *FRIENDS for Life Treatment Integrity Scales*. Monterrey: University of Monterrey.

Ghaziuddin, M. (2005) *Mental Health Aspects of Autism and Asperger Syndrome*. London: Jessica Kingsley Publishers.

Gillham, J.E., Reivich, K.J., Freres, D.R., Lascher, M., Litzinger, S., Shatte, A., et al (2006) School-based prevention of anxiety and depressive symptoms in early adolescence: a pilot of a parent intervention component. *School Psychology Quarterly*, 21, 323-348.

Ginsburg, G., and Drake, K. (2002) School-based treatment for anxious African-American adolescents: A controlled pilot study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 768-775.

Goodman, R. (1997) The strengths and difficulties questionnaire; a research note. *Journal of Child Psychology and Psychiatry*, 38, 581-586.

Goodman, W.K., Price, L.H., Rasmussen, S.A., Riddle, M.A., and Rapoport, J.L.(1991) *Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS)*. New Haven, CT: Clinical Neuroscience Research Unit, Connecticut Mental Health Centre.

Graham, P. (2004) *Cognitive Behaviour Therapy for Children and Families*. Cambridge: Cambridge University Press.

Graham, P. (2005) Jack Tizard Lecture: Cognitive behaviour therapies for children: Passing fashion or here to stay? *Child and Adolescent Mental Health*, 10:2, 57-62.

Green, H., McGinnity, A., Meltzer, H., Ford, T., and Goodman, R. (2005) *Mental Health of Children and Young People in Great Britain*, 2004. Norwich: HMSO.

Greig, A., and Mackay, T. (2005) Asperger's syndrome and cognitive behaviour therapy: new applications for educational psychologists. *Educational and Child Psychology*, 22, 4-15.

Gutkin, T.B. (1993) Conducting consultation research. In J.E.Zins, T.R. Hagiwara, T. and Myles, B.S. (1999) A multimedia social story intervention: teaching skills to children with autism. *Focus on Autism and Other Developmental Disabilities*, 14:2, 82-95.

Harbst,K., Ottenbacher,K. and Harris,S. (1991) Research Report. Interrater Reliability of Therapists' Judgments of Graphed Data. *Physical Therapy*, 71:2, 32-40.

Harrington, R. (2001). Commentary: Evidence-based child and adolescent mental health services. *Child Psychology and Psychiatry Review, 6*, 65.

Hojem, M.A., and Ottenbacher, K.J.(1988) Empirical investigation of visual inspection versus trend line analysis of single subject data. *Journal of the American Physical Therapy Association*, 68, 983-988.

Horner, R., Carr, E., Halle, J., McGee, G., Odom, S., and Wolery, M. (2005) The use of single-subject research to identify evidence-based practice in special education, *Exceptional Children*, 71: 2, 165-179.

Humphrey, N., Kalambouka, A., Wigelsworth, M., and Lendrum, A. (2010) *Going for Goals: An Evaluation of a Short, Social-Emotional Intervention for Primary School Children*. School Psychology International, 31, 250- 270.

Ialongo, N., Edelsohn, G., Werthemar-Larsson, L., Crockett, L., and Kellam, S. (1994) The significance of self-reported anxious symptoms in first grade children. *Journal of Abnormal Child Psychology*, 22, 441-455.

Jacobson N.S., and Truax P (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology* 59, 12–19.

James, A., Soler, A., and Weatherall, R. (2009) Cognitive Behaviour Therapy for Anxiety Disorders in Children and Adolescents. *The Cochrane Collaboration*, New Jersey; John Wiley and Sons.

Jordan, R., Jones, G., and Murray, D (1998) *Educational Interventions for Children With Autism: A Literature Review of Recent And Current Research*. Research Report 77. Department for Education and Employment.

Kazdin, A. E. (1982). *Single-case research designs: Methods for clinical and applied settings*. New York: Oxford University Press.

Kazdin. A. (1996) Dropping out of child psychotherapy; issues for research and implications for practice. *Clinical Child Psychology and Psychiatry,* 1, 133-156.

Kazdin, A. (2003). *Research design in clinical psychology* (4th Edition ed.). Boston, MA: Allyn and Bacon.

Kendall, P, C. (1994) Treating anxiety disorders in children: Results of a randomized clinical trial, *Journal of Consulting and Clinical Psychology*, 62, 100-110.

Kiselica, M.S., Baker, S.B., Thomas, R.N. and Reedy, S. (1994) Effects of stress inoculation training on anxiety, stress, and academic performance among adolescents. *Journal of Counselling Psychology*, 41, 335-342.

Kratochwill, T., Alden, K., Demuth, D., Dawson, D., Panicucci, C., Arntson, P.et al (1974) A further consideration in the applications of an analysis of variance model for the intrasubject replication design. *Journal of Applied Behavior Analysis*, 7, 629-633.

Kratochwill, T.R. (1992) Single-case research design and analysis: An overview. In Kratochwill, TR., and Levin, JR. (eds) *Single-case research design and analysis*. Lawrence Erlbaum, Hillsdale, NJ.

Kratochwill, T., Hitchcock, J., Horner, R., Levin, J., Odom, S., Rindskopf, D., Shadish, W. (2010) Single-case designs technical documentation. Retrieved from What Works Clearinghouse website: http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf.

Landis, J.R., and Koch, G.G. (1977) The measurement of observer agreement for categorical data. *Biometrics*, 33, 159-74.

Landsberger, H.A. (1958) *Hawthorne Revisited: Management and the worker: It's critics and developments in human relations in industry*. New York: Ithaca.

Lang, R., Regester, A., Lauderdale, S., Ashbaugh, K, and Haring, A. (2010) Treatment of anxiety in autism spectrum disorders using cognitive behaviour therapy: a systematic review, *Developmental Neurorehabilitation*, 13:1, 53-63.

Lehmkuhl, H., Storch, E., Bodfish, J., and Geffken, G. (2008) Brief report: Exposure and response prevention for obsessive compulsive disorder in a 12-year-old with autism. *Journal of Autism and Developmental Disorders*. 38:5, 977-981.

Lewis, J. (1998). Building an evidence-based approach to social interventions. *Children and Society, 12*:2, 136–140.

Lewis, A. & Lindsay, G. (2000). *Researching Children's Perspectives.* Buckingham: Open University Press.

Liddle, L. and Macmillian, S. (2010) Evaluating the FRIENDS program in a Scottish setting, *Educational Psychology in Practice,* 26, 53-67.

Lincoln, Y.S. and Guba, E.G. (2000) Paradigmatic controversies, contradictions, and emerging confluences. In N.K Densin and Y.S Lincoln (Eds). *Handbook of qualitative research* (2nd ed, pp. 163-188). Thousand Oaks, CA: Sage.

Limbers, C., Newman, D., and Varni, J. (2008) Factorial Invariance of Child Self-report Across Healthy and Chronic Health Condition Groups: A Confirmatory Factor Analysis Utilizing the Peds QL 4.0 Generic Core Scales. *Journal of Pediatric Psychology,* 33(6), 630-639.

Lock, S., and Barrett, P,M. (2003) A longitudinal study of developmental differences in universal preventative intervention for child anxiety, *Behaviour Change,* 20, 183-199.

Lowry-Webster, H., Barrett, P., and Dadds, M (2001) A universal prevention trial of anxiety and depressive symptomology in childhood: Preliminary data from an Australian study, *Behaviour Change,* 18, 36-50.

Lowry-Webster, H., Barrett, P., and Lock, S. (2003) A universal prevention trial of anxiety symptomology during childhood; Results at 1 year follow up. *Behaviour Change,* 20, 25-43.

Lyneham, H., Street, A., Abbott, M. and Rapee, R. (2008) Psychometric properties of the school anxiety scale—Teacher report (SAS-TR), *Journal of Anxiety Disorders,* 22, 292–300.

Maggin, D., and Chafouleas, S. (2013). Introduction to the special series: Issues and advances of synthesizing single-case research. *Remedial and Special Education*, 34:3.

Malgady, R.G., Rogler, L.H., and Constantino, G. (1990) Hero/Heroine modelling for Puerto Rican adolescents: a preventative mental health intervention. *Journal of Consulting and Clinical Psychology*, 58, 469-474.

Manolov, R., and Solanas, A. (2008) Comparing n=1 effect size indices in presence of autocorrelation. *Behavior Modification*, 32:6, 860-875.

March, J.S. (1998) *Multidimensional Anxiety Scale for Children (MASC)*. North Tonawanda, NY: Multi-Health Systems.

Matyas, T.A and Greenwood, K.M. (1990) Visual analysis of single-case time series: Effects of variability, serial dependence, and magnitude of intervention effects. *Journal of Applied Behavior Analysis*, 23:3. 341.

Medical Research Council (2001) *MRC Review of Autism Research Epidemiology and Causes*. London: Medical Research Council, http://www.mrc.ac.uk

Meehan, B.T., Hughes, J.N., Cavell, T.A. (2003) Teacher-student relationship as compensatory resources for aggressive children. *Child Development*, 74:1145-57.

Mertens, D. (2005) 2nd Ed. *Research and Evaluation in Education and Psychology. Integrating Diversity with Quantitative, Qualitative and Mixed Methods*. London: Sage Publications.

Miller, A., and Todd, Z. (2002) Educational psychology and difficult behaviour in schools: Conceptual and methodological challenges for an evidence-based profession. *Educational and Child Psychology*, 19:3, 82-95.

Misfud, C. and Rapee, R.M. (2005) Early intervention for childhood anxiety in a school setting: outcomes for an economically disadvantaged population. *Journal of the American Academy of Child and Adolescent Psychiatry*, 44, 996-1004.

Mostert, J., and Loxton,H. (2008) Exploring the effectiveness of the FRIENDS program in reducing anxiety symptoms among South African children, *Behaviour Change*, 25, 85-96.

Mrazek, P., and Haggerty, R. (Eds) (1994) *Reducing the risks of mental disorders: Frontiers for preventative intervention research*. Washington, DC; National Academy Press

National Institute for Mental Health (1970) CGI: Clinical global impressions. In W, guy, and R.R. Bonato (Eds) *Manual for the ECDEU assessment battery*. 2nd Rev. ed. Chevy Chase, MD: National Institute of Mental Health, 12-1-12-6.

Neil, A., and Christensen, H. (2009) Efficacy and effectiveness of school-based prevention and early intervention programs for anxiety, *Clinical Psychology Review*, 29, 208-215.

Nauta, M.H. (2005) *Anxiety Disorders in Children and Adolescents: assessment, cognitive behavioural therapy, and predictors of treatment outcome.[electronic source]*

Nauta, M. H., Scholing, A., Rapee, R., Abbott, M., Spence, S., & Waters, A. (2004). A parent-report measure of children's anxiety: Psychometric properties and comparison with child report in a clinic and normal sample. *Behaviour Research and Therapy, 42,* 813-839.

Nevo, I. and Slonim-Nevo, V. (2011) The Myth of Evidence-Based Practice: Towards Evidence-Informed Practice, *British Journal of Social Work*, 41, 1176-1197.

O'Connor, S., Carney, T., House, E., Ferguson, E., Caldwell, F., and O'Connor, R. (2010) *Paediatric Index of Emotional Distress* (PI-ED). London: GL assessment LTD.

Odom, S., Brown, W., Frey, T.,Karasu, N., Smith-Canter, L., and Strain, P. (2003) Evidence-Based Practices for Young Children with Autism: Contributions for Single-Subject Design Research , *Focus on autism and other developmental disabilities*, 18:3, 166–175

Ollendick, T.H. (1983) Reliability and validity of the Revised Fear Survey Schedule for Children (FFSC-R). *Behaviour Research Therapy*, 21, 685-692.

Ooi, Y., Lam, C., Sung, M., Tan, W., Goh, T., Fung, D., Pathy, P., Ang, R., and Chua, A. (2008) Effects of cognitive-behavioural therapy on anxiety for children with high-functioning autistic spectrum disorders, *Singapore Medical Journal*, 49:3, 215-220.

Ozonoff, S., Goodlin-Jones, B.L., and Solomon, M. (2005) Evidence-based assessment of autism spectrum disorders in children and adolescents. *Journal of Clinical Child and Adolescent Psychology*, 34, 523-540.

Ozsivadijian, A., and Knott, F. (2011) Anxiety problems in young people with autism spectrum disorder: A case series. *Clinical Child Psychology and Psychiatry*.16:2, 203-214.

Pardini, M., Elia, M., Garaci, F., Guida, S., Coniglione, F., Krueger, F., Benassi, F., Emberti Gialloreti, L., (2012) Long-term cognitive and behavioral therapies, combined with augmentative communication, are related to uncinate fasciculus integrity in autism. *Journal of Autism and Developmental Disorders*. 42: 4, 585-592.

Parker, R. and Brossart, D (2003) Evaluating Single-Case Research Data: A Comparison of Seven Statistical Methods, *Behavior Therapy*, 34, 189-211.

Paul, J. (2011) *Evaluating the impact of a universal FRIENDS for Life programme on emotional distress and academic self-perceptions*, Doctoral Thesis, University of Nottingham.

Piacentini, J., Bergman, R.L., Keller, M., and McCracken, J. (2003) Functional impairment in children and adolescents with obsessive-compulsive disorder (COIS). *Journal of Child and Adolescent Psychopharmacology*, 13S-1, S61-S69.

Punch, S. (2002) 'Research with Children: The Same or Different from Research with Adults?' *Childhood*, 9:3, 321-341.

Rait, S., Monsen, J., and Squires, G. (2010) Cognitive Behaviour Therapies and their implications for applied educational psychology practice, *Educational Psychology in Practice: theory, research and practice in educational psychology*, 26:2, 105-122.

Ramchandani, P., Joughin, C. & Zwi, M. (2001). Evidence-based child and adolescent mental health services: Oxymoron or brave new dawn? *Child Psychology and Psychiatry Review, 6*, 59–64.

Reaven, J., Blakeley-Smith, A., Culhane-Shelburne, K., Hepburn, S. (2012) Group cognitive behavior therapy for children with high-functioning autism spectrum disorders and anxiety: A randomized trial. *Journal of Child Psychology and Psychiatry*. 53: 4, 410-419.

Reaven, J., Blakeley-Smith, A., Nichols, S., Dasari, M., Flanigan, E., and Hepburn, S. (2009) Cognitive behavioural group treatment for anxiety symptoms in children with high functioning autism spectrum disorders: a pilot study, *Focus on Autism and Other Developmental Disabilities,24*, 27-37.

Reaven, J., and Hepburn, S. (2003) Cognitive-behavioural treatment of obsessive-compulsive disorder in a child with Asperger syndrome: A case report, *Autism*, 7, 145-164.

Reivich, K., and Gillham, J., Chaplin, T., and Seligman, M. (2005) From helplessness to optimism: the role of resilience in treating and preventing depression in youth. In S.Goldstein and R.B.Brooks (Eds) *Handbook of resilience in children* (pp. 223-237). New York: Kluwer Academic/Plenum Publishers.

Reynolds, C.R. and Richmond, B.O. (1978) What I think and feel: a Revised measure of child's manifest anxiety (RCMAS). *Journal of Abnormal Child Psychology*, 52, 125-129.

Roberts,C., Kane, R., Bishop,B., Matthews, H. and Thomson, H. (2004) The prevention of depression symptoms in rural school children: a follow up study. *International Journal of Mental Health Promotion*, 6, 4-16.

Roberts, C., Kane, R., Thomson, H., Bishop, B., and Hart, B (2003) The prevention of depressive symptoms in rural school children: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 71, 622-628.

Robson, C. (2011). *Real World Research*. 3rd Edition. Oxford: Blackwell.

Rose, H., Miller, L., and Martinez, Y. (2009) FRIENDS for life: The results of a resilience-building, anxiety prevention program in a Canadian elementary school, *Professional School Counselling*, 12, 400-407.

Ross, S.G. (2012) *Measuring response to intervention: comparing three effect size calculation techniques for single case design analysis*. Dissertation: North Carolina State University.

Roth, A. and Fonagy, P. (1996). *What works for whom: A critical review of psychotherapy research*. London: Guilford.

Rotheram-Fuller, E., Kasari, C., Chamberlain, B., and Locke, J.(2010) Social involvement of children with autism spectrum disorders in elementary school classrooms, *Journal of Child Psychology and Psychiatry*, 51:11, 1227-1234.

Rotheram-Fuller, E., and MacMullen, L. (2011) Cognitive-behavioural therapy for children with autism spectrum disorders, *Psychology in Schools*, 48:3, 263-271.

Scarpa, A., and Reyes, N.M. (2011) Improving emotion regulation with CBT in young children with high functioning autism spectrum disorders: A pilot study. *Behavioural and Cognitive Psychotherapy,* 39: 4, 495-500.

Schleismann, K., and Gillis, J. (2011)The treatment of social phobia in a young boy with Asperger's disorder. *Cognitive and Behavioral Practice.* 18: 4, 515-529.

Schniering, C.A., and Rapee, R.M. (2002) Development and validation of a measure of children's automatic thoughts: The children's automatic thoughts scale (CATS). *Behaviour Research and Therapy.* 40, 1091-1109.

Schoenfeld, N.A. and Mathur, S.R. (2009). Effects of cognitive-behavioural intervention on the school performance of students with emotional or behavioural disorders and anxiety. *Behavioural Disorders,* 34, 4, 184-195.

Seigel, S., and Castellan, N.J.Jr (1988) *Nonparametric statistics for the behavioural sciences.* New York: McGraw-Hill.

Shadish, W.R. and Rindskopf, D.M. (2007) Methods for evidence-based practice: Quantitative synthesis of single-subject designs. *New Directions for Evaluation,* 113, 95-109.

Shadish, W.R., Rindskopf, D.M. and Hedges, L.V. (2008) The state of the science in the meta-analysis of single case experimental designs. *Evidence-based communication assessment and intervention,* 2:3, 188-196.

Shortt, A,L., Barrett, P,M., and Fox, T, L. (2001) Evaluating the FRIENDS program: a cognitive behavioural group treatment for anxious children and their parents. *Journal of Clinical Child Psychology,* 30, 525-535.

Silverman, W.K., and Albano, A.M. (1996) *The Anxiety Disorders Interview Schedule for DSM-IV Child and Parent Versions(ADIS).* San Antonio, TX: Graywind.

Sinclair, R (1998). Developing evidence-based policy and practice in social interventions with children and families. *International Journal of Social Research Methodologies, 1*(2), 169–176.

Sofronoff, K., Attwood, T., Hinton, S. (2005) A randomized controlled trial of a CBT intervention for anxiety in children with Asperger syndrome, *Journal of Child Psychology and Psychiatry*, 46, 1152-1160.

Speer, D. C. (1992). Clinically significant change: Jacobson and Truax (1991) revisited. *Journal of Consulting and Clinical Psychology, 60,* 402–408.

Speer, D. C., & Greenbaum, P. E. (1995). Five methods for computing significant individual client change and improvement rates: Support for an individual growth curve approach. *Journal of Consulting and Clinical Psychology, 63,* 1044–1048.

Spence, S.H. (1995) *The Social Worries Questionnaire, Social Skills Training: Enhancing Social Competence with Children and Adolescents (SWQ).* Windsor: NFER-Nelson.

Spence, S.H. (1997). The Spence Children's Anxiety Scale (SCAS). In I. Sclare (Ed.), *Child Psychology Portfolio.* Windsor, UK: NFER-Nelson.

Spence, S. H. (1999). *Spence Children's Anxiety Scale- Parent Version.* Brisbane, QLD, Australia: University of Queensland.

Spence, S.H., Barrett, P.M., & Turner, C.M. (2003). Psychometric properties of the Spence Children's Anxiety Scale with young adolescents. *Journal of Anxiety Disorders, 17*:6, 605-625

Squires, G. (2010). Countering the argument that educational psychologists need specific training to use cognitive behavioural therapy. *Emotional and Behavioural Difficulties* 15:4, 279-294.

Stallard, P., Simpson, N., Anderson, S., Carter, T., Osborn, C. and Bush, S. (2005) An evaluation of the FRIENDS program: A cognitive behaviour therapy intervention to promote emotional resilience, *Archives of Disease in Childhood*, 90, 1016-1019.

Stallard, P., Simpson, N., Anderson, S., Hibbert, S., and Osborn, C.(2007) The FRIENDS emotional health program: Initial findings from a school-based project. *Child and Adolescent Mental Health*, 12, 32-37.

Stallard, P., Simpson, N., Anderson, S., and Goddard, M. (2008) The FRIENDS emotional health prevention programme: 12 month follow up of a universal UK school based trial, European *Journal of Child and Adolescent Psychiatry*, 17, 283-289.

Statistics Package for Social Sciences (SPSS) (2009). *Version 18.0.* Chicago: SPSS Inc.

Stoiber K.C., and Waas, G.A. (2002) A contextual and methodological perspective on the evidence-based movement within school psychology in the United States, *Educational and Child Psychology*, 19:3, 7-21.

Sukhodolsky, D.G., Scahill, L., Gadow, K.D., Arnold, L.E., Aman, M.G., McDougle, C.J., et al (2008) Parent rated anxiety symptoms in children with pervasive developmental disorders: frequency and association with core autism symptoms and cognitive functioning (CASI). *Journal of Abnormal Child Psychology*, 36, 117-128.

Sung, M., Ooi, Y., Phaik, G., Tze, J., Pathy, P., Fung, D., Ang, R., Chua, A., Lam, C.M. (2011) Effects of cognitive-behavioral therapy on anxiety in children with autism spectrum disorders: A randomized controlled trial. *Child Psychiatry and Human Development.* 42: 6, 634-649.

Sze, K., M., and Wood, J,J. (2007) Cognitive behavioural treatment of comorbid anxiety disorders and social difficulties in children with high functioning autism; a case report, *Journal of Contemporary Psychotherapy*, 37, 133-143.

Sze, K., M. and Wood, J, J. (2008) Enhancing CBT for the treatment of autism spectrum disorders and concurrent anxiety, *Behavioural and Cognitive Psychotherapy*, 36, 403-409.

Tew, J. (2005) *Social perspectives in mental health: developing social models to understand and work with mental distress*. London: Jessica Kingsley.

Thornbery, E. (2012) Research in Brief: The impact of the FRIENDS program on anxiety and coping strategies in children, *Debate 145, The British Psychological Society*, 27-30.

Todman, J. and Dugard, P(2001) *Single case and small n experimental designs: a practical guide to randomization tests*. Mahwah, NJ: Erlbaum.

University of Nottingham (Version 4, March 2013) *University of Nottingham Code of Research Conduct and Research Ethics*. Retrieved from http://www.nottingham.ac.uk/fabs/rgs/documents/code-of-research-conduct-and-research-ethics-approved-january-2010.pdf

Watson, W. (2005). Rethinking the mood and anxiety disorders: a quantitative hierarchical model for DSM-V. *Journal of Abnormal Psychology*, 114, 522-536.

Weare, K., and Gray, G. (2003) *What works in developing children's emotional and social competence and wellbeing?* London; DfES.

Webster, A., Webster, V., and Feiler, A. (2002) Research evidence, polemic and evangelism: How decisions are made on early intervention on autistic spectrum disorder, *Educational and Child Psychology*, 19:3, 54-67.

White, S., Ollendick, T., Scahill, L., Oswald, D., Albano, A. (2009) Preliminary efficacy of a cognitive-behavioral treatment program for anxious youth with autism spectrum disorders. *Journal of Autism and Developmental Disorders*. 39: 12, 1652-1662.

Widgit (2011) *Communicate: In Print* (Version 2.80.670) [Software] Leamington Spa: Widgit Software.

Wigelsworth, M., Humphrey, N., Kalambouka, A. & Lendrum, A. (2010). A review of key issues in the measurement of children's social and emotional skills. *Educational Psychology in Practice* 26:2, 173-186.

Williams, S.L. (2005). Anxiety Disorders in J.E. Maddux & B.A. Winstead, Psychopathology: *Foundations for a Contemporary Understanding*. NJ: Lawrence Erlbaum.

Wing, L., and Gould, J. (1979) Severe impairments of social interaction and associated abnormalities in children epidemiology and classification, *Journal of Autism and Childhood Schizophrenia*, 9,11-29.

Wing, L. and Potter, D. (2002) The epidemiology of autism: is the prevalence rising? *Mental Retardation and Developmental Disabilities Research Reviews*, 8: 151-161.

Wise, E. (2004) Methods for Analyzing Psychotherapy Outcomes: A Review of Clinical Significance, Reliable Change, and Recommendations for Future Directions. *Journal of Personality Assessment*, 82:1, 50-59.

Wolpert, M., Fuggle, P., Cottrell, D., Fonagy, P., Phillips, J., Pilling, S., Stein, S., and Target, M. (2006) 2nd Ed. *Drawing on the Evidence: Advice for mental health professionals working with children and adolescents*. London: CAMHS Publications[electronic source]

Wood, J,J., Drahota, A., Sze, K, M., Har, K., Chiu, A and Langer, D,A. (2009) Cognitive behavioural therapy for anxiety in children with autism spectrum disorders: a randomized controlled trial, *Journal of Child Psychology and Psychiatry*, 50, 224-234.

World Health Organisation. (WHO, 1992). *ICD-10 Classifications of Mental and Behavioural Disorder: Clinical Descriptions and Diagnostic Guidelines.* Geneva. World Health Organisation

World Health Organisation (WHO, 2004) *Prevention of Mental Disorders. Effective Interventions and Policy Options. A Summary Report.* Geneva: World Health Organisation

Youngstrom, E.A., Loeber, R., Stouthamer-Loeber, M (2000) Patterns and correlates of agreement between parent, teacher and male youth behaviour ratings. *Journal of Consultant Clinical Psychology,* 68, 1038-50.

6.2 Secondary References

Koh, J.B.K., Chang, W.C., Fung, D.S.S., Kee, C.H.Y., Woo, B.S.C. (2002) Validation of a culturally appropriate anxiety scale for Singaporean children. Paper presented at the 49th Annual Meeting of the American Academy Child and Adolescent Psychiatry, San Francisco, California: USA. **Cited in** Ooi, Y., Lam, C., Sung, M., Tan, W., Goh, T., Fung, D., Pathy, P., Ang, R., and Chua, A. (2008) Effects of cognitive-behavioural therapy on anxiety for children with high-functioning autistic spectrum disorders, *Singapore Medical Journal*, 49:3, 215-220.

Nunnally, J.C. (1978). Psychometric Theory, (2nd edition). McGraw-Hili, New York. **Cited in** S. O'Connor, T. Carney, E. House, E. Ferguson and R. O'Connor., (2010). *PI-ED: The Paediatric Index* of *Emotional Distress Manual*. London: GL Assessment Ltd.

Scott, A., Shaw, M., & Joughin, C. (2001). *Finding the evidence: A gateway to the literature in child and adolescent mental health* (2nd ed.). London: Gaskell (Royal College of Psychiatrists). **Cited in** Frederickson, N.(2002) Evidence-based practice and educational psychology, *Educational and Child Psychology*, 19:3, 96-112.

Skinner, B, F. (1974) About Behaviourism. London: Cape. **Cited in** Robson, C. (2011) *Real World Research*. 3rd Edition. Oxford: Blackwell.

Taylor, G. & Burden, B. (2000). *The positive power of friendship: An illuminative evaluation of the circle of friends approach within the primary and secondary school phases.* Unpublished. Calouste Gulbenkian Foundation. **Cited in** N. Frederickson (2002) Evidence-based practice and educational psychology, Educational and Child Psychology, 19:3, 96-111.

7. Appendices

7.1 Appendix One: Electronic copy of the adapted home book and activity book for the FRIENDS for Life intervention

Refer to CD on back page.

7.2 Appendix Two: Discussion record form from initial meeting with prospective school

ISSUES	AGREED ACTION
→ provides overview of friends programme. - history - CBT - different age group / materials - timeline of intervention - adaptation of materials Emotional Literacy Focus Whole school as well as group sessions. outlined arrangements in terms of research proposals. Suggestions: > 6 case studies details of nesses/liaising with parents. Staff Media to anxieties Scale / Emotional measures	

CC:School ☐ Home ☐ LSS ☐ EBSS ☐ SIS ☐ EYSS ☐ SaLT ☐ File ☐ Other: _____

| Educational Psychologist | Date: 23 11 11 | ① |

ISSUES	AGREED ACTION

Baseline → Intervention
→ Follow-through for
a further 6 weeks
Considered as a single
case study of 6
(ie for research purposes
would give more qualitative
information).
 	
Criteria for selection
→ Autism Spectrum
     diagnosis
→ Key Stage 2 Years 4/5
→ Concerns about
     anxiety - including
     difficult feeling
     anxiety may be
     an issue
→ Verbal skills need
     to be at a level
     that enables
     access to materials	

Educational Psychologist	Date: 23·11·11

②

ISSUES	AGREED ACTION
Adaptation of materials descriptive cards for pupils will be used Involvement of parents → discussion/input about the programme ① >1 "/100 questionnaire Weekly questionnaire ② Observation of pupils → trigger points for anxiety → how the child presents (objective views) January 2012 → Focus Group for pupil selection Parent evening - discuss options for flexibility in terms of engagement Pilot measures - including questionnaires → to validate/checkout questions	

CC:School: ☐ Home: ☐ LSS: ☐ EBSS: ☐ SIS ☐ EYSS: ☐ SaLT: ☐ File ☐ Other: _____

Educational Psychologist	Date: 23.11.11 ③

ISSUES	AGREED ACTION
Research proposal is due to be submitted 2.12.11	Research report to forward to [Laura?]
Timeline for research discussed.	
Intervention — ~~the~~ Autumn 2012	
Baseline - Summer Term and first two weeks of the Autumn Term 2012	
Use of ?sources - pupils, parents, staff in addition to adapted questionnaire	
January 2012 - a focus group to meet to explain materials, intervention and pupil selection → adaptation of materials	
Focused on the involvement of Speech & Language	

CC: School ☐ Home ☐ LSS ☐ EBSS ☐ SIS ☐ EYSS ☐ SaLT ☐ File ☐ Other: _____

Educational Psychologist	Date 23.11.11 (4)

ISSUES	AGREED ACTION
Therapist	to explore possible involvement in group
	to consider pupil selection based on criteria detailed on p2. Principal has agreed
works for Monday·Tuesday·Wednesday	
Focus Group Meeting for school staff (Ed Psych) (Trainee Ed Psych)	3 30pm Tuesday 17th January 2012 • Overview of Programme • Time line of activities • pupil selection

CC: School: ☐ Home: ☐ LSS: ☐ EBSS: ☐ SIS: ☐ EYSS: ☐ SaLT: ☐ File: ☐ Other: _____

Educational Psychologist _____   Date: 23.11.11   ⑤

220

7.3 Appendix Three: Information shared at initial meeting with reference group to inform participant selection

<u>**Meeting with Reference Group- 17/1/2011 3.30-4.30**</u>

Purposes of todays meeting:

- For the group to have a clear understanding of the FRIENDS intervention, the research project and their involvement
- Ask any questions
- Understand the sample description for selection
- Come to a consensus about the 6 children to be involved

By the end of the session it is hoped that:

- 6 children will have been chosen to participate that meet the sample description
- Possible parents information evening dates will have been discussed.

FRIENDS For Life intervention:

- CBT intervention to reduce anxiety
- Universal and selective intervention, evidence based
- 10 week, approx 1 hour sessions- may run to 12 weeks. Recommended 2 booster sessions.
- Sessions to be ran by GS and SM, with LG in attendance representing school
- Specific objectives for each week- teaching maybe adapted
- Optional homework activities
- Recommended 2 parent sessions
- Uniqueness of this study- children with Autism

- Its applicability for children with Autism

Research project:

- Timeline- **baseline phase**- second half of summer term, and 2 weeks in sept for continuity.

  - **intervention phase**- sept to dec 2012

  - **follow up**- jan to feb half term 2013, including 1 booster session

- Single case design- measuring as individuals rather than a group

- Measures- weekly measures

  -**PI-ED**- short questionnaire for child to complete, measure of anxiety (support staff to take)

  -**Observations**- target behaviour and target situation specific to each pupil (support staff to take)

- Pre and post measures- parent views (SPENCE), child views (SPENCE) and teacher views (SAS-TR)- examples provided

Sample description:

- N=6/7

- AS diagnosis

- Anxiety related behaviours- FRIENDS definition and ICD-10 and DSM-IV criteria (see attached materials)

- Age- between 8-11 (years 4,5,6)

- Ability to respond to teaching model used in the intervention- Peer learning and experiential learning (see attached materials)

Reference group involvement:

- Participant selection

- Information to provide a descriptive profile of the children involved

- Adapting the materials to better meet the needs of participants

Researcher's intended plans for next half term:

- Parent information evening-gain consent

- Semi structured interview with staff- anxiety related behaviour

- Completion of SPENCE (parent and pupil) and SAS-TR (teacher)

Preliminary date for group to meet again regarding adaptations to FRIENDS materials, beginning of summer term?.............................

The Teaching Philosophy of the FRIENDS Program (pg. 9, Barrett, 2010)

Peer learning model:

- The intervention is designed to be implemented for a group of participants of similar ages

- Peer group training is effective because people learn best by observing and helping others, especially in real-life situations

- Learning in a context with peers provides opportunities for participants to practise newly learnt skills in a safe environment.

Experiential Learning:

- The majority of the activities outlined in the FRIENDS program are based on experiential learning. Specifically, the program encourages participants to learn from their own experiences.

- The FRIENDS program encourages group participants to play an active role in learning. The group leader and assistant group leader actively involve participants in the group process by encouraging them to brainstorm ideas, learn from new experiences and build upon past experiences.

- The FRIENDS program emphasises that both group leaders and participants possess valuable knowledge and experiences that they bring to the group. This philosophy aims to empower participants and build their self confidence.

The children selected must be able to access, with support, these models of learning in order to access the intervention.

They do not need to be able to record their ideas but need to be able with encouragement to share ideas and participate in the group.

<u>**Defining anxiety and anxiety related behaviours**</u>

Descriptions of anxiety from the FRIENDS for Life Manual (Barrett, 2010):

"At some stage in our lives we will all feel anxious when faced with a difficult situation. The anxiety response includes physiological symptoms (e.g. sweating, increased heart rate, butterflies in the stomach), cognitive symptoms (e.g. self talk such as "I can't cope") and behaviour (usually avoidance of the anxiety-provoking situation)." (pg. 3, Barrett, 2010)

Responses are considered to be out of proportion to situation and are age dependent (Barrett, 2010)

"When the level of anxiety has lasted at least 6 months and impacts on a child's life, then a child may warrant an Anxiety Disorder diagnosis," (pg.3, Barrett, 2010).

Anxiety difficulties manifest in different forms: generalised anxiety disorder, separation anxiety disorder, specific phobia, post-traumatic stress disorder, agoraphobia, social phobia, obsessive-compulsive disorder and a panic attack (Barrett, 2010).

Diagnostic criteria for generalised anxiety disorder:

DSM-IV TR	ICD 10
Excessive anxiety and worry (apprehensive expectation) occurring more days than not for 6 months about a number of events or activities (such as school or work performance)	The essential feature is anxiety, which generalised and persistent but not to any particular environmental circumstance. The dominant symptoms are highly variable but complaints of feelings of nervousness, trembling, tension, sweating, light-headedness, palpitations are common. Fears that the sufferer or a relative will shortly be in or have an accident are often expressed together with a variety of other thoughts and forebodings.
The person finds it difficult to control their worry	The sufferer must have the primary symptoms for most days, several times. Symptoms should usually involve elements of: - apprehension (worry about future misfortune, feeling on edge, difficulty in concentrating) - motor tension (restless fidgeting, headaches, trembling, inability to relax) - automatic over-activity (light headedness, sweating, tachycardia, tachypnoea, dizziness, dry mouth)
The anxiety or worry is associated with 3 of the following in adults or 1 of the following in children for more days than not in the past 6 months: - restlessness or feeling keyed-up or on edge - being easily fatigued - difficulty concentrating or mind going blank - irritability - muscle tension - sleep disturbance	In children frequent need for reassurance and recurrent somatic complaints may be prominent
Focus of the anxiety or worry is not confined to features of an axis I disorder; such as gaining weight	

The anxiety or physical symptoms cause clinically significant distress or impairment in social, occupational, school and other important areas of functioning	
The disturbance is not due to the direct physiological effect of a substance	

7.4 Appendix Four: Invite to parent information afternoon (written on school headed paper) and information shared at the meeting

Dear Parent/Guardian,

I am a Trainee Educational Psychologist undertaking a Doctorate in Applied Educational Psychology at the University of Nottingham. As part of the doctoral course I am undertaking supervised research, the focus of which is an evaluation of the effectiveness of the FRIENDS for Life programme in reducing anxiety levels of children diagnosed with autism spectrum.

The FRIENDS programme is a 10 week cognitive behavioural therapy programme which has been widely used and evaluated across the world as an effective intervention for reducing anxiety. It involves 1 hour weekly sessions which will be completed in school, run by myself and an EP colleague, with optional additional homework activities. It is intended that a member of school staff will also attend the sessions. Two parent sessions will also be offered during the time the programme is running. The FRIENDS programme is one that ██████████████ School hopes to continue to run after my project is complete as part of their support for emotional literacy.

██

████ 1.30-2.30, at ████████████ School where I will be providing more information about the programme and the aims of my study. There will be an opportunity for you to ask any questions you may have, before being asked to provide consent for your child to be involved in this programme aimed at reducing their anxiety levels. By attending the information afternoon you are not committing to your child participating in the study. If you permit your child to participate you still have the right to withdraw them from the study at any point without having to give a reason. That is, even if you sign the consent form and the study has started you may withdraw your child at any point.

Please may you complete the consent form below outlining if you are able to attend the information afternoon being held on 29th February.

If you are unable to attend the information afternoon but are still interested in your child participating in the study please indicate below and I or the school can contact you to offer an alternative time and means by which to share the information.

I look forward to meeting you on 29th February.

Yours sincerely,

Gemma Slack

Trainee Educational Psychologist

I am/am not able to attend the Friends for Life open evening on 29th February 2012.

If unable to attend:

I am interested/not interested in my child participating in the study and do/do not wish to be contacted to arrange another time to discuss the study.

Signed:

Date:

7.5 Appendix Five: Information shared at parent information afternoon

Slide 1

Friends for Life Intervention

Gemma Slack (TEP)
............EP
............Deputy HT

Slide 2

Aims of presentation

- Provide information about the intervention and the research
- Opportunity and means to ask any questions
- Informed Consent

Slide 3

Friends Intervention

- Friends for life intervention to reduce anxiety
- Strong evidence base across the world
- Will be adapted for children with Autism
- Supports existing work in school
- Has been used for all children as well those that are anxious

Slide 4

Content of intervention

- Intervention emphasises having worries is normal, but we can all learn ways of feeling confident and brave even when difficult things happen.
- Focus on understanding feelings in self and others
- Recognising body clues and strategies to cope when feeling anxious
- Recognising helpful and unhelpful thoughts

Slide 5

Intervention in school

- 10 weekly sessions, 1 hr- starting in September
- Run jointly by TEP, EP supported by Deputy HT
- Specific objectives for each week- but teaching strategies will be adapted
- Optional homework activities
- Recommended parent sessions

Slide 6

Research

- Evaluate effectiveness with children with Autism
- School chose children they thought would most benefit- coping strategies
- Hoping to collect data before and after intervention to highlight progress
- Would like to gain views of parents, teachers and child before and after intervention
- Weekly measures- short questionnaire (adapted for child to understand) and short unobtrusive observation by TA

7.6 Appendix Six: Example page of the adapted PI-ED

I like to play sports

Not at all   Sometimes   A lot of the time   Always

7.7 Appendix Seven: Semi-structured interview schedule for identifying anxiety related behaviour

<u>Semi Structured Interview Schedule</u>

Staff Member's :Name: ....

Staff Member's Role: ....

Child Discussing: ....

Child's Class: ....

<u>Introduction (to be spoken by interviewer/researcher)</u>

Hi, my name is Gemma Slack and I am a Trainee Educational Psychologist currently employed 3 days a week by ███████████████████ whilst completing my Doctorate at the University of Nottingham. As part of my university research I am hoping to set up and run a research project around the Friends for Life intervention in your school. 4 children have already been chosen to take part as they meet specific inclusion criteria: namely they have a diagnosis of AS and they display anxiety related behaviours. Previous research has found the Friends intervention to be an effective intervention in reducing anxiety in a typically developing population and I am hoping to make adaptations to the programme and measure its effectiveness within an AS population.

I am planning to measure the effectiveness of the intervention using a weekly questionnaire measure and observation measure. On initially seeking the involvement of your school at a meeting with the Deputy Head Teacher and Head Teacher, I mentioned to them about how I hoped the measures could be taken by a member of

school staff for efficiency and consistency. As the child..........'s teaching assistant/teacher it was felt that you would be the ideal person to do this. The measures aim to be short and straight forward to undertake and I will be in school every week where possible if you wish to ask any questions or require help. Do you have any other questions? Do you agree to take part?

The purpose of this interview is to gather information about child........., specifically around their anxiety related behaviour, in order for me to create an individual observation schedule for each child around a specific target behaviour. I plan to triangulate the information you give, with my own observations and information gathered from school documentation and held by the Educational Psychology Service. As child's......TA I would really value your contribution not only in taking the observation measures, but also because I am aware you know child......really well, working with them every day and will have valuable insight into their educational needs.

For guidance, here is some information about the definition of anxiety and anxiety related behaviours (see attached sheet).

Interview Questions

1) How would you know child....... was anxious? What anxiety related behaviours does he/she display? Can you describe the behaviour in detail?

....

....

....

....

2) When do these anxiety related behaviours most often occur in at school?

....

....

....

....

....

3) What is the typical frequency of the behaviour?

....

....

....

....

4) How would you know if there was a reduction in anxiety?

....

....

....

....

5) What strategies do the school currently use?

....

....

....

....

....

Do you have anything further to add that you think may be relevant? Do you have any other questions?

Interviewer to feedback a summary of the information that has been provided and check with the interviewee that they have understood what they have said correctly.

I would like to visit the school again next week to share the developed observation schedule with you and get your opinion on its suitability, and then to run a pilot study for 2 weeks to see how you get on doing the observations. Does that sound reasonable to you? When would be the best time to meet next Thursday or Friday?

Next meeting date and time:

7.8 Appendix Eight: Observation schedules for four participants

7.8.1 Christopher

<u>Observation Schedule</u>

Child's name: Christopher   **Year Group:** Year 5/6

Description of behaviour to be observed:

Beginning an individual task- frequency count

Independent activity- when instructions are given he starts the task independently

Adult initiated- wait for an adult to help him or use non-verbal cues to signal to an adult he needs help

Child initiated- he asks the adult for help in starting the activity

Help during the activity does not count as the target behaviour, it is when initially starting an <u>individual</u> activity.

Day and time to be observed each week: Friday, all day

Observer's name: ....

Date of observation	Adult initiated	Child initiated	Began independently

7.8.2 Jack

Child's name: Jack   **Year Group**: Year 5/6

Description of behaviour to be observed:

The number of times Jack tells an adult about a 'small problem.' That is something that is happening in the classroom that is not related to what Jack is working on e.g. something that someone else in the class is doing that is not related to the task that Jack has been set. Jack's questions related to the task or statements about activities related to him are not included.

J.A's questions related to the task or statements about activities related to him e.g. someone is poking me should not be counted.

Day and time to be observed each week: Friday, all day

Observer's name: ....

Date of observation	Tally/frequency of behaviour

7.8.3 Cameron

Child's Name: Cameron　　　　　　Year: 4/5

Description of behaviour to be observed:

On task- working on the task that has been set or listening to teacher

On task seeking teacher or peer- Whilst working on task independently Cameron seeks reassurance or assistance about his work from a peer or adult by either asking a question about the task or checking out what he is doing is right.

Off task (peer)- Cameron is engaging in off task behaviour, not following instructions whether that be to listen or work independently. Instead he is interacting with other children in the class, not related to his task e.g. what are you doing?, or looking at others work to see what they are doing.

Off task (not peer)- not doing as been asked whether that be listening or doing a task. Off task behaviour that does not involve peers e.g. looking out window, moving around the classroom. If moving around the classroom speaking to other children or attempting to, that would be peer related.

Adult support- when he is working on an independent or group task with adult support. Does not include listening to adult instructions given to whole class but does include listening to adult instructions given specifically to him.

Observation day: Thursday morning　　　Observer: Researcher

Begin: ………….　　　End: ……………　　　Length of interval: every 10 seconds for 15 minutes

General observations

☑	On task independent
☑O	On task seeking teacher or peer
XX	Off task (peer)
X	Off task (not peer)
O	Working with adult

5 mins

General observations

Key

√   On task independent

√ O   On task seeking teacher or peer

XX   Off task (peer)

X   Off task (not peer)

O   Working with adult

10 mins

General observations

√   On task independent

√O   On task seeking teacher or peer

XX   Off task (peer)

X   Off task (not peer)

O   Working with adult

15 mins

7.8.4 Matthew

Observation Schedule

Child's name: Matthew   **Year Group:** Year 4/5

Description of behaviour to be observed:

Target behaviour- Matthew is chewing, putting something in his mouth or touching mouth. This may involve one or both hands, maybe inside or touching mouth and includes behaviour such as nail biting. It also includes chewing objects such as a pen, inserting object into mouth, or touching mouth with object.

Hands resting- Hands are not moving or involved in an activity e,g, hands maybe down by side or resting on table while he listens to the teacher.

Physical activity- hands are being used as part of the activity e.g. writing but the target behaviour is not occurring.

Day and time to be observed each week: Thursday morning   **Observer's name:** Researcher

Time begin: .... **Time end:** .... **Length of interval:** every 20 seconds for 10 minutes

Circle dominant behaviour- either more chewing or more writing. Over 50% is dominant. Pen in and out of mouth= 1 second. If both co-existing e.g. chewing jumper sleeve whilst writing, neither is dominant.

Target behaviour	Physical activity	Hands resting	General observations	Circle dominant category

5 mins

10 mins

242

7.9 Appendix Nine: Example of material adaptations using widgit symbols

Today we are learning:

To recognise green thoughts are helpful

and red thoughts are unhelpful

7.10 Appendix Ten: Photograph of room layout

7.11 Appendix Eleven: Intervention integrity measure

Treatment Integrity Re: FRIENDS Program Structure
(adapted from Gallegos, 2000)

Please note: treatment integrity measures aim to
determine how well the aims of the overall program are
met, as well as how well the aims of each activity are met.
As long as the essential aims for each activity are covered,
the group leader has the freedom to be creative in their
presentation as they would like. The content of each
activity is provided by the participants. These questions
therefore do not assess group leader's strict adherence to
the format of each activity, but rather whether the group
leader has met the aims of each activity.

1. Review Session 2, Group Charter and Home
Activity
Aim: to briefly review the content covered in
session 1 and review the home activity.

How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all
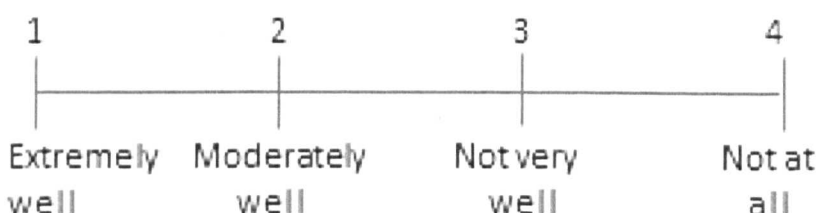
2. Reminder of Step One of the FRIENDS plan

Aim: to introduce participants to the symbolism of FRIENDS. To introduce participants to the first step of the FRIENDS plan (F).

How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all
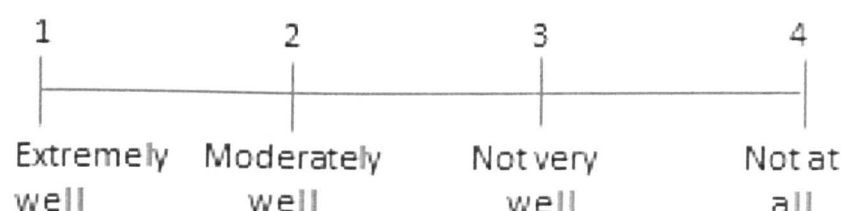
3. Group Activities

- To help participants recognise the different kinds of behaviour associated with different feelings
- To introduce participants to the idea that people may express the same emotions in different ways
- To help participants develop empathy and sensitivity to others' feelings.

How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all
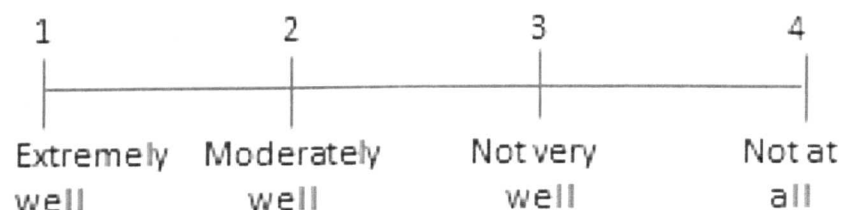
4. Home Activity

Aim: to explain to participants the homework task and ensure they understand what is required of them.

How well was this aim achieved?

```
1              2              3              4
|              |              |              |
+--------------+--------------+--------------+

Extremely   Moderately    Not very       Not at
well           well          well          all
```
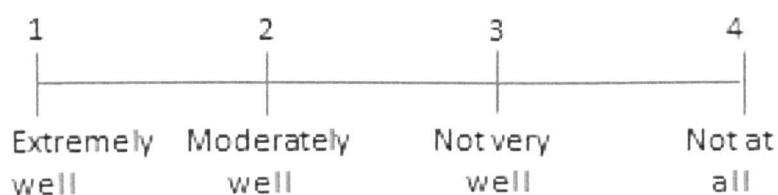
7.12 Appendix Twelve: Ethics Committee Acceptance Letter

The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

AS/hcf
Ref: 177

+44 (0)115 951 5306

Monday, February 27, 2012

School of Psychology

University Park
Nottingham
NG7 2RD

t +44 (0)115 951 2401
f +44 (0)115 951 5324

Head of School
Professor Paul V McGraw
Alan Sander Chair in Visual Neuroscience

Dear Gemma Slack,

Ethics Committee Review

Thank you for submitting an account of your proposed research 'An Evaluation of the Friends for Life Intervention with an Autistic Spectrum Population: Evaluating the Impact on Children's Anxiety'.

That research has now been reviewed by the Ethics Committee and I am pleased to tell you that your submission has met with the committee's approval.

Final responsibility for ethical conduct of your research rests with you or your supervisor. The Codes of Practice setting out these responsibilities have been published by the British Psychological Society and the University Research Ethics Committee. If you have any concerns whatever during the conduct of your research then you should consult those Codes of Practice.

Independently of the Ethics Committee procedures, supervisors also have responsibilities for the risk assessment of projects as detailed in the safety pages of the University web site. Ethics Committee approval does not alter, replace, or remove those responsibilities, nor does it certify that they have been met.

Yours sincerely

Dr Alan Sunderland
Chair, Ethics Committee

7.13 Appendix Thirteen: Parent Consent Form (written on Local Authority headed paper)

An Evaluation of the FRIENDS for Life Intervention with an Autism Spectrum Population: Evaluating the Impact on Children's Anxiety
Investigators: Gemma Slack, supervised by Anthea Gulliford

The parent/guardian should complete the whole of this sheet himself/herself. Please cross out as necessary:

Have you received information about the study?   YES/NO

Have you had the opportunity to ask questions and discuss the study? YES/NO

Have all the questions been answered satisfactorily?   YES/NO

Do you understand that you are free to withdraw your child from the study:
- at any time?   YES/NO
- without having to give a reason?   YES/NO

Do you agree for your child to take part in the study?   YES/NO

"This study has been explained to me to my satisfaction, and I agree for my child to take part. I understand that I am free to withdraw them at any time."

Signature of the parent/guardian: Date:

Name (in block capitals)

I have explained the study to the above parent/guardian and he/she has agreed for their child to take part.

Signature of researcher: Date:

7.14 Appendix Fourteen: Participant Consent Letter (written on Local Authority headed paper)

<u>An Evaluation of the FRIENDS for Life Intervention with an Autism Spectrum Population: Evaluating the Impact on Children's Anxiety</u>
Investigators: Gemma Slack, supervised by Anthea Gulliford

The participant should complete the whole of this sheet himself/herself. Please cross out as necessary.

Have you understood the participant information given?	YES/NO
Have you had the opportunity to ask questions and discuss the study?	YES/NO
Have all the questions been answered satisfactorily?	YES/NO
Have you received information about the study?	YES/NO

Do you understand that you are free to withdraw from the study:
- at any time?   YES/NO
- without having to give a reason?   YES/NO

Do you agree to take part in the study?   YES/NO

"This study has been explained to me to my satisfaction, and I agree to take part. I understand that I am free to withdraw at any time."

Signature of the participant: Date:

Name (in block capitals)

I have explained the study to the above participant and he/she has agreed to take part.

Signature of researcher: Date:

7.15 Appendix Fifteen: Visual analysis inter rater agreement

Inter Rater Agreement

The table below describes the quantitative measures used to visually analyse the graphs.

Characteristic	Description of How it is to be Computed in this Study
Changes in Means and Mean Shift	The average will be calculated for each phase and then the mean shift will be calculated by dividing the difference between phases by the first phase. A positive value indicates an increase in mean shift between phases.
Changes in Level	The change between the last data point in one phase and the first data point in the next phase. A negative score indicates a decrease in score.
Changes in Trend	In this study the trend lines for each phase will be computed by the linear regression line in Excel 2010. The difference between trend lines in each phase will be calculated to provide a measure of the magnitude of change.
Changes in Variability	Both the range and standard deviation will be reported in this study as measures of variability.
Overlap of data points between phases	The number of data points in one phase that fall within the data range of the comparing phase will be calculated as a percentage of all the data points in that phase (Harbst et al, 1991).

Please look at each of the graphs and the corresponding visual analysis and complete on the accompanying record sheet your responses to the following question:

"How certain or convinced are you that the child's responses underwent a practical and significant improvement during each of the phases?"

The record sheet requires you to consider the change between the baseline and intervention, the intervention and follow up and the baseline and follow up:

A= change between baseline and intervention

B= change between intervention and follow up

C= change between baseline and follow up

The arrow next to the measure of the dependent variable indicates the direction of change showing an improvement.

Please mark your response on the rating scale from 1(not at all convinced) to 5 (very convinced), 3 times (for each phase change) for each graph. You can return to previous graphs and adjust your responses if appropriate.

"How certain or convinced are you that the child's responses underwent a practical and significant improvement during each of the phases?"

		1-not at all	2-unsure	3-it is possible	4-reasonably certain	5-very certain
Christopher	PI- ED					
	Observation- Christopher initiating an adult prompt					
	Observation- adult prompt					
	Observation- began independently					
Jack	PI-ED					

	Observation ⬇					
Cameron	PI-ED ⬇					
	Observation-seeking reassurance ⬇					
	Observation- off task peer Related ⬇					
Matthew	PI-ED ⬇					
	Observation-presence of target behaviour ⬇					
	Observation-dominance of target behaviour ⬇					

# 7.16 Appendix Sixteen: PI-ED integrity measure

<u>PI-ED Integrity Measure</u>

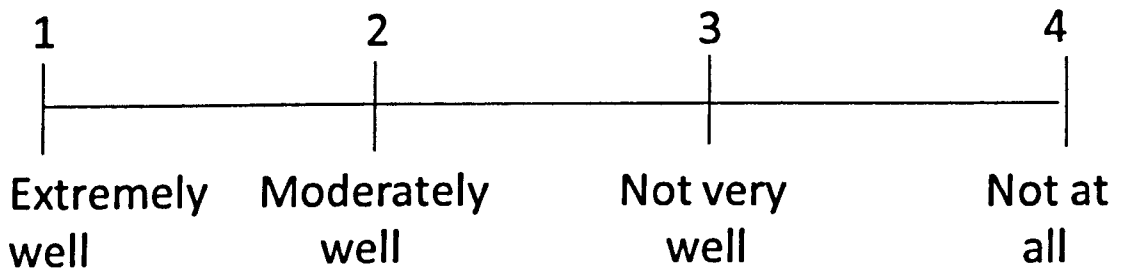Information taken from The Paediatric Index of Emotional Distress (PI-ED) manual:

"Ideally, the PI-ED should be administered in a quiet place where the respondent can be sure that their responses are not going to be overseen by their peers or parents. Prior to administration of the PI-ED, the respondent should be told that they are going to be asked to take a few minutes of their time to answer some questions about how they have been feeling over the last week (including today). Respondents should be advised that there are no right or wrong answers, and that their responses will help others to understand how they have been feeling. They should be encouraged to give the responses that comes to mind first (i.e. not to think about their answer for too long),a dn to make sure that they answer every question. Respondents should be asked to read the introductory text on the first page of the record form and to complete the example item. This to ensure that they understand the task and can read the items. Once the example item has been satisfactorily completed, turn the record form over and fold under the two flaps that show the scores on either side. It is important that the respondent does not see these scores. Make sure that the respondent's details (name, age, date and gender) are entered at the top of the form. The respondent should be asked to tick one box in response to each of the 14 items on the page. If the respondent becomes upset while completing the PI-ED, the administrator should be available to discuss the source of the distress and take further action as appropriate. " (pg. 8-9, O'Connor, Carney, House, Ferguson and O'Connor, 2010)

Please complete the integrity measure below, in line with the recommendations made in the PI-ED manual.

1) Aim: to provide a quiet setting where responses will not be overseen.
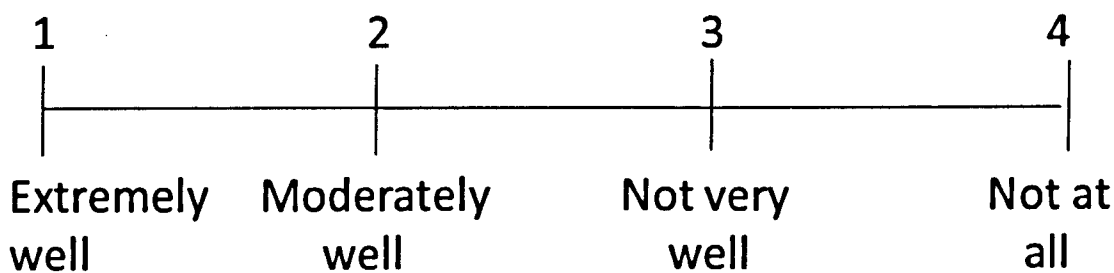How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all
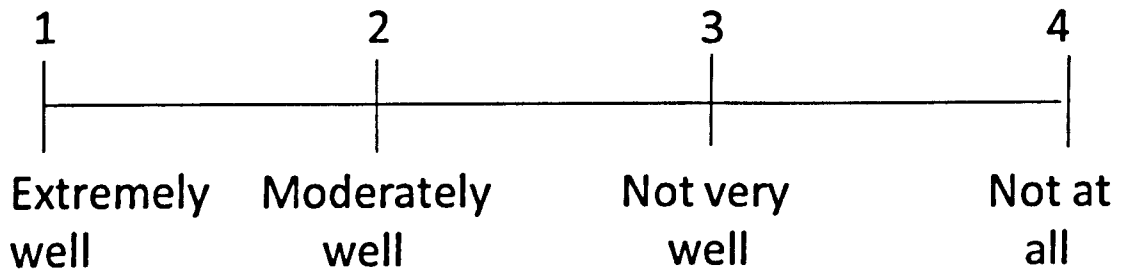
2) Aim: To explain the instructions for completing the PI-ED clearly
How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all

3) Aim: For participants to understand how the test will be administered using the practice example
How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all
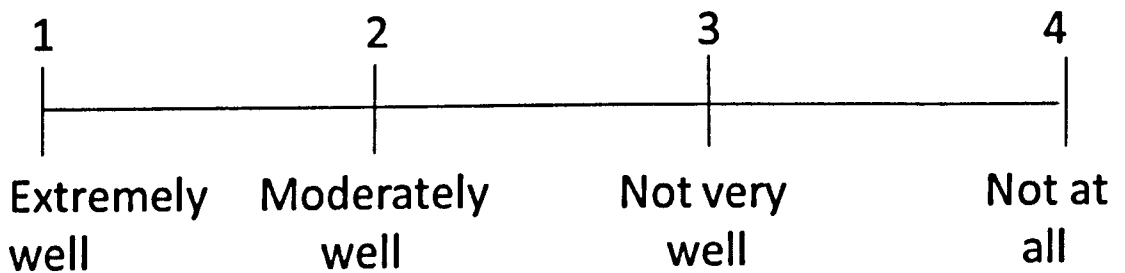
4) Aim: To ensure the participant's scores on each item are not seen by him
How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all

5) Aim: to stop administration if the child becomes distressed and to take further action as appropriate.

How well was this aim achieved?

1	2	3	4
Extremely well	Moderately well	Not very well	Not at all