PROMOTING PEER ACCEPTANCE IN THE CLASSROOM: AN EVALUATION OF A COOPERATIVE LEARNING INTERVENTION IN A MAINSTEAM PRIMARY SCHOOL

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Abstract

This study evaluates the effectiveness of a Cooperative Learning intervention upon the mean peer acceptance levels of all children (N=54) within two Year four classes in a mainstream primary school in the North-West of England.

A pre-test post-test non equivalent groups quasi-experimental design is employed, with the dependent variable, peer acceptance, measured by the 'Social Inclusion Survey' and the 'Strengths and Difficulties Questionnaire'.

Inferential analysis in the form of 'Gain Score Analysis' supports the initial hypotheses, demonstrating that children within the experimental group were, on average, significantly more accepted at post-test by both their same sex and opposite sex peers, in relation to both the 'work' and 'play' contexts, than children within the no intervention control group. Furthermore, children within the experimental group self-reported, on average, significantly greater levels of 'prosocial behaviour' and significantly reduced 'peer problems' at post-test than children in the control group.

It is concluded that the Cooperative Learning intervention employed for this study may be considered effective in enhancing mean peer acceptance levels, reducing 'peer problems' and enhancing 'prosocial behaviours' within the context in which this study was conducted.

Methodological limitations, ethical concerns and implications for future research and professional practice are also considered.

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Introduction

This study falls under the umbrella of the Development and Research Programme in Educational Psychology (D&R), a collaboration between a number of DAppEdPsy (Doctorate in Applied Educational Psychology) Training Course Directors and the National Association of Principal Educational Psychologists.

This programme aims to coordinate the doctoral research of a number of Trainee Educational Psychologists, in order to create a coherent and cumulative base of evidence to inform future practice and policy within the discipline of Educational Psychology, and to potentially impact upon a wider research community than has been apparent previously.

After extensive national consultation, the D&R Steering Group arrived at four research questions, one of which reads as follows –

> *"Under what circumstances might targeted academic interventions, social skills, self esteem or anger management groups in schools prevent [social] exclusion?"*

This question acts as the foundation for the current study, which intends to investigate the effectiveness of a Cooperative Learning (CL) intervention upon the peer acceptance of children within a mainstream classroom environment. This topic was also formulated from a combination of the current priorities of the researcher's Local Authority and the authors' own interests, as described within section 7.1.

In order to address this overarching aim, this paper will attempt to answer several research questions, which relate to evaluating the effectiveness of the CL intervention upon peer acceptance and are presented within chapter five. First, however, it is necessary to outline and define a number of key concepts crucial to this study, and provide a critical analysis of relevant empirical evidence conducted in this area.

With this in mind, the concept of social inclusion within a community context will first be considered, before drilling down to focus upon social inclusion processes in a school environment, which is often termed 'peer acceptance' within the empirical literature. Detailed discussion of this phenomenon follows in chapter two, which primarily considers definitions of peer acceptance and its polar opposite, 'peer rejection'. The importance of being accepted by peers will also be highlighted, before examining potential causes and consequences of this phenomenon. Finally, strategies through which peer acceptance may be promoted will be discussed.

In chapter three a detailed description of CL is presented, as well as an exploration of the history behind it and theories underlying it. Different models of CL are also illustrated, and research evaluating the efficacy of this intervention will be critically reviewed.

Chapter four narrows the focus, systematically reviewing empirical evidence pertaining to the research questions posed by this study, while chapter five explicitly demonstrates the rationale for conducting this project, drawing upon the evidence presented within the previous chapters. This chapter also emphasizes ways through which this study may significantly and uniquely contribute to the current body of research in this area.

The methods through which the research questions were investigated will be described in depth within chapter seven, preceded by an epistemological discussion (chapter six), which locates the design of this study within a post-positivist paradigm.

Chapter eight illustrates the outcomes of the study, with chapter nine subsequently relating these outcomes to the original research questions. Potential reasons underlying the results are also considered, in addition to the impact of methodological strengths and limitations, possible avenues of exploration for future research in this area, and professional implications of this

study upon the professional practice of Educational Psychology. Ultimately, the unique contribution made by this study is reflected upon.

Chapter 1: Social Inclusion and Social Exclusion

This chapter provides a brief overview of social inclusion and social exclusion within a community context; before narrowing the focus towards the school environment

1.1 Definitions

The terms 'social inclusion' and 'social exclusion' originated in France, evolving from a linguistic need to describe the exclusion of individuals with disabilities from full citizenship (Evans, 2000). An early definition of social exclusion was formulated within the European Green Paper 'European Social Policy Options for the Union' in 1993 (DfES, 2006, p7) –

> *"Social exclusion ... is manifest in fields such as housing, education, health and access to services. It affects not only individuals ... but social groups ... who are subject to discrimination, segregation or the weakening of traditional forms of social relations... it suggests something more than social inequality and, concomitantly, carries with it the risk of a dual or fragmented society."*

This definition reflects the multi-dimensional nature of social exclusion and highlights its' potential effect upon society as a whole; however, it does not clearly illustrate the impact of social exclusion upon the individual. This aspect is covered within the following definition (Silver, 2007, p15),

> *"Social exclusion is a multidimensional process of progressive social rupture, detaching ... individuals from social relations and institutions and preventing them from full participation in the normal, normatively prescribed activities of the society in which they live"*

This concept of preventing full participation is particularly salient, as this is the main focus of social inclusion, which is defined less often within the literature as a standalone concept, but is generally referred to with reference to social exclusion. For instance, Silver (2007, p15) describes social inclusion as,

"...affirmative action to change the circumstances and habits that lead to (or have led to) social exclusion."

Both of these terms will be used within this review, as they may be conceptualised as poles at opposite ends of the same continuum, and both are used ubiquitously within the literature. However, the term 'social inclusion' will be employed whenever possible, due to the researcher's proclivity for positive psychological concepts such as 'learned optimism' (Seligman, 1990), although the phrase 'social exclusion' will also be utilised when necessary.

1.2 The Contribution of the School

Children and young people are among those most influenced by the phenomenon of social inclusion (DfES, 2006). The role of the family is recognised as a crucial factor in this process,

"...both as creator of the conditions for later social exclusion and the means by which it can be resisted" (Brynner, 2001, p295).

Indeed, Utting (1995) argues that those children with weak or absent family relations are most vulnerable to social exclusion.

However, as highlighted within the above definitions, education is also recognised as a vital factor within the social inclusion cycle. Social control theory (Hirschi, 1969) promotes the key importance of social relationships within the school setting, leading Boxford (2006, p3) to suggest,

"...school, after the family, is probably the most important area of socialisation for the nation's young people".

Brynner (2001, p289) supports this viewpoint, believing that,

"...early experiences in the school are ... central to the process of social exclusion".

The importance of school as a contributory factor towards social inclusion is escalating (Noaks and Noaks, 2009), with children spending more time on the school site through the provision of breakfast and after-school clubs. This has meant a shift in the relative home/school balance for some pupils (Noaks and Noaks, 2009), and the quality of educational climates has thus become a priority concern for the British Government as the recognition of school as a factor potentially contributing towards social inclusion has become more apparent.

1.3 Legislative Developments

This burgeoning recognition of the importance of school as a contributory factor to social inclusion is reflected through, for instance, the promotion of pupil's social adjustment in Local Authority support plans and policies (Frederickson and Cline, 2005), and on a wider scale through the increasing trend in most Western countries to include students with a range of disabilities in mainstream education environments (Piercy et al, 2002). This movement has stemmed largely from theoretical arguments relating to social development (Harrower and Dunlap, 2001), which posit that social inclusion provides more adequate social learning opportunities for the children concerned and their peers (Jacques et al, 1998). However, empirical evidence remains equivocal (Frederickson et al, 2008).

1.4 Social Inclusion within the School Context

Exploration of the literature surrounding the topic of social inclusion within a school context, often termed 'peer acceptance' (Leets and Sunwolf, 2005), highlights the importance of pupil's relationships with peers in mediating social inclusion. The next chapter will investigate this area in greater detail; outlining the importance of the concept of peer acceptance for well-being and healthy development, contributory factors to peer acceptance, and potential methods for enhancing social inclusion within the school environment.

Chapter 2: Social Inclusion within the School Context: Peer Acceptance and Peer Rejection

This chapter considers social inclusion within educational environments, first exploring definitions of peer acceptance and peer rejection and the importance of being accepted by peers, before examining potential causes of this phenomenon. Finally, strategies through which peer acceptance may be promoted are discussed.

2.1 Initial Conceptualisations of Peer Acceptance and Peer Rejection

The issue of peer group acceptance is broad in scope and has been studied using an array of differing terminology (Leets and Sunwolf, 2005). Within the literature pertaining to childhood friendship groups, terms including 'exclusion', 'inclusion', 'isolation', 'friendship' 'relationship', 'rejection' and 'acceptance' have been used interchangeably to describe essentially the same phenomenon (Koster et al, 2009). This has led to confusion and ambiguity, as research has reported upon markedly different concepts using identical terminology and, conversely, has employed widely differing phraseology to describe the same idea (Koster et al, 2009).

This highlights the importance of defining the terms to be employed within this review explicitly at the outset. With this in mind, a working definition of these concepts for this study is taken from Bierman (2004, p7),

> *"Peer acceptance and rejection refer to the degree to which members of a particular peer group ... like or dislike a child."*

This definition has been chosen as it does not over-complicate the phenomenon, and explicitly reflects the nature of peer acceptance and

rejection as transient states, dependent upon the particular peer group surrounding the individual.

Bierman (2004, p7) goes on to define the difference between peer acceptance and friendship,

> *"...friendships are voluntary dyadic relationships, characterised by reciprocal affirmation and mutual affection. Although children who are well accepted by peers are more likely to have friends than are rejected children, some popular children do not have close friends, whereas some rejected children do."*

This is an important distinction to make at the outset, as these differing concepts of friendship and acceptance have often been utilised synonymously within the literature in this area (Koster et al, 2009).

For the purposes of this review, the terms 'peer acceptance' and 'peer rejection' will both be employed. These terms can be conceptualised as poles at opposite ends of a continuum of social inclusion within a school context, and are the most frequently employed expressions utilised within the empirical literature (Leets and Sunwolf, 2005). The term 'peer acceptance' will be employed whenever possible, due to the researcher's proclivity for positive psychological concepts such as 'learned optimism' (Seligman, 1990). However, the phrase 'peer rejection' will also be utilised when necessary.

2.2 The Importance of Peer Acceptance

This section aims to demonstrate the importance of peer acceptance by analysing the potential consequences of a lack of acceptance within the peer group.

Peer relationships provide a mechanism and context for the acquisition and development of essential social, linguistic and cognitive competencies (Vygotsky, 1978). Peers may provide stability in times of stress, and are a source of companionship and recreation (Stanley and Arora, 1998). An

individual therefore loses access to these benefits if they are excluded from the peer group.

Stanley and Arora (1998) argue that peer relationships may play an increasingly important role in modern times due to increasing fragmentation in family ties, a claim backed up by the finding that young children report worrying about peer relations more than any other issue in their lives (Ladd, 1990). The importance of this issue is also reflected in recent legislation, most notably the Special Educational Needs Code of Practice (DfES, 2001), which explicitly highlights the need for emphasising the development of children's social competence, and in acquiring the skills of positive interaction with peers and adults (DfES, 2001, 7.60).

2.2.1 The Belongingness Hypothesis

Baumeister and Leary (1995, p497) posit that the importance of being accepted by peers stems from,

> *"...a pervasive drive to form and maintain at least a minimum quantity of ...positive ... interpersonal relationships".*

They term this the *"Belongingness Hypothesis"*. This hypothesis is based upon Maslow's (1968) hierarchy of needs (see figure 3.1), as Maslow ranked 'love and belongingness needs' in the middle of his motivational hierarchy, emerging only when basic needs such as hunger are satisfied, but taking precedence over esteem and self-actualisation. The belongingness hypothesis states that humans have a need for *"frequent, affectively pleasant interactions"* (Baumeister and Leary, 1995, p497) in order to satisfy this motivational drive to belong.

These authors argue that *"belongingness can be almost as compelling a need as food"* (Baumeister and Leary, 1995, p498), citing evidence linking a lack of supportive relationships to increased levels of stress (Cohen and Wills, 1985), immune system difficulties (Kiecolt-Glaser et al, 1984) and suicide (Rothberg

and Jones, 1987). However, much of this research is correlational and as such does not necessarily infer causality. Despite this methodological shortcoming, Baumeister and Leary (1995, p520) feel that belongingness is *"beneficial to an individual in multiple ways"*, with the need to belong considered to be a *"fundamental human motivation"* (p521).

Employing this theory as a conceptual foundation, and extrapolating it's suppositions to the school context, it follows that acceptance by peers should ameliorate severe deprivation and promote resilience against a variety of ill effects. The following sections will discuss these issues.

2.2.2 The Importance of Peer Acceptance in Promoting Social and Emotional Development

Peer interactions provide critical opportunities for social development; such as the learning of prosocial behaviours through modelling processes, developing the ability to regulate aggressive affect, diminishing egocentricity (Johnson and Johnson, 1999), and promoting conflict management skills (Bierman, 2004). These opportunities may be reduced if a child is not accepted, potentially resulting in delayed or deviant social development (Ladd and Asher, 1985).

Peer interactions also enable a child to develop a sense of identity through social comparison (Barrett and Randall, 2004) and experimentation with a wide variety of social roles (Johnson and Johnson, 1999). This developmental process can again be detrimentally affected through a lack of peer group acceptance.

Peer acceptance is also associated with reduced levels of depression (Vosk et al, 1982), social anxiety (Hymel et al, 1985) and loneliness. For instance, in two studies of primary-aged children, Asher et al (1984) and Hymel (1983) found that children's self-reported loneliness and self-dissatisfaction scores were negatively correlated to peer acceptance, with correlations of -0.31 (Asher et al, 1984) and -0.33 (Hymel, 1983) respectively. However, the moderate level of

these relationships does suggest that not all less accepted children report feeling lonely, and the correlational nature of this research means that causality cannot be established.

2.2.3 The Importance of Peer Acceptance in Relation to School Achievement

Peer acceptance has also been associated with academic achievement in school (Frederickson and Cline, 2005), with empirical evidence consistently highlighting peer acceptance as positively related to academic performance (eg Austin and Draper, 1984; Li, 1985). Wentzel and Asher (1995) believe that this relationship is mediated by motivation, in that peer acceptance increases the child's motivation to participate in classroom activities, thus heightening the individual's access to learning opportunities.

Furthermore, Johnson and Johnson (1999) argue that peers strongly influence educational aspirations, a claim which is borne out through a body of research concluding that accepted children are less likely to drop out of school during the high school years (eg Parker and Asher, 1987). For instance, Barclay (1966), in a four year follow-up study of 9-13 year-old subjects, found a 14% dropout rate for low-accepted males compared to 3% for high-accepted boys. Similarly, the rates for girls were 15.5% for low-accepted and 6% for high-accepted females. However, the longitudinal nature of this paper does provide the opportunity for a plethora of confounding variables to compromise results, such as maturation effects (Robson, 2002), and more contemporary studies must be conducted due to the distinct lack of recent empirical research in this area.

Asher and Coie (1990) hypothesize that low peer acceptance may directly influence school dropout as it leads to school becoming an aversive experience for the child, thus motivating them to leave the education system. However, Kupersmidt and Coie (1985) report that aggression and excessive absence are stronger predictors of school dropout, although these factors are also both

strongly associated to a lack of peer acceptance. It may therefore be the case that peer group acceptance is a protective factor against school dropout, but other related variables, such as aggressive behaviour, may also play a part in this process.

2.2.4 The Importance of Peer Acceptance in the Long Term

Less accepted children stand a greater chance of difficulties in later life (Bierman, 2004), a premise that is widespread within the social development literature, with over 30 studies demonstrating significant links between early peer relationships and later life problems (Parker and Asher, 1987).

For instance, pertaining to mental health difficulties, Stabenau and Pollin (1970) interviewed the families of 14 pairs of monozygotic twins discordant for schizophrenia, finding that the pre-schizophrenic twin had poorer peer relationships in childhood than the other twin. Similar findings have been reported with retrospective parental interviews of schizophrenic and non-schizophrenic siblings (Asher and Coie, 1990). However, these studies are liable to the effects of distortions in memory of the interviewees, and are also less relevant to the current study than if they were conducted more recently; however, more contemporary research was not forthcoming during the literature search in this area.

Criminality has also been associated with early peer acceptance levels. Janes et al (1979) found that reduced peer acceptance in childhood was significantly related to an increased number of arrests received by a sample of 4-15 year-old boys from a child guidance clinic, when followed forward for 14 years. However, the non-random sample of participants employed for this study reduces external validity (Robson, 2002), as outcomes cannot be assumed to apply beyond this population.

Although the volume of evidence associating early peer relationship difficulties with later life problems is impressive, the quality of the evidence is *"extremely*

variable" (Erwin, 1993, p223). The research designs are often based upon retrospective accounts of involved parties or anecdotal evidence, tend to be correlational and are based upon unrepresentative clinical samples. This makes causality difficult to determine. Indeed, even the direction of causality cannot be ascertained with any degree of security, as it could be the case that early forms of, for example, a mental health disorder, could affect the child's peer relationships early in life (Parker and Asher, 1987). Nevertheless, the evidence does appear to demonstrate that a lack of early peer acceptance may be a useful indicator of some aspects of adjustment in adolescence and adulthood (Erwin, 1993).

Having discussed the importance of peer group acceptance, it is next imperative to consider potential contributory factors to peer acceptance and rejection.

2.3 What Causes Children to be Accepted or Rejected by Peers?

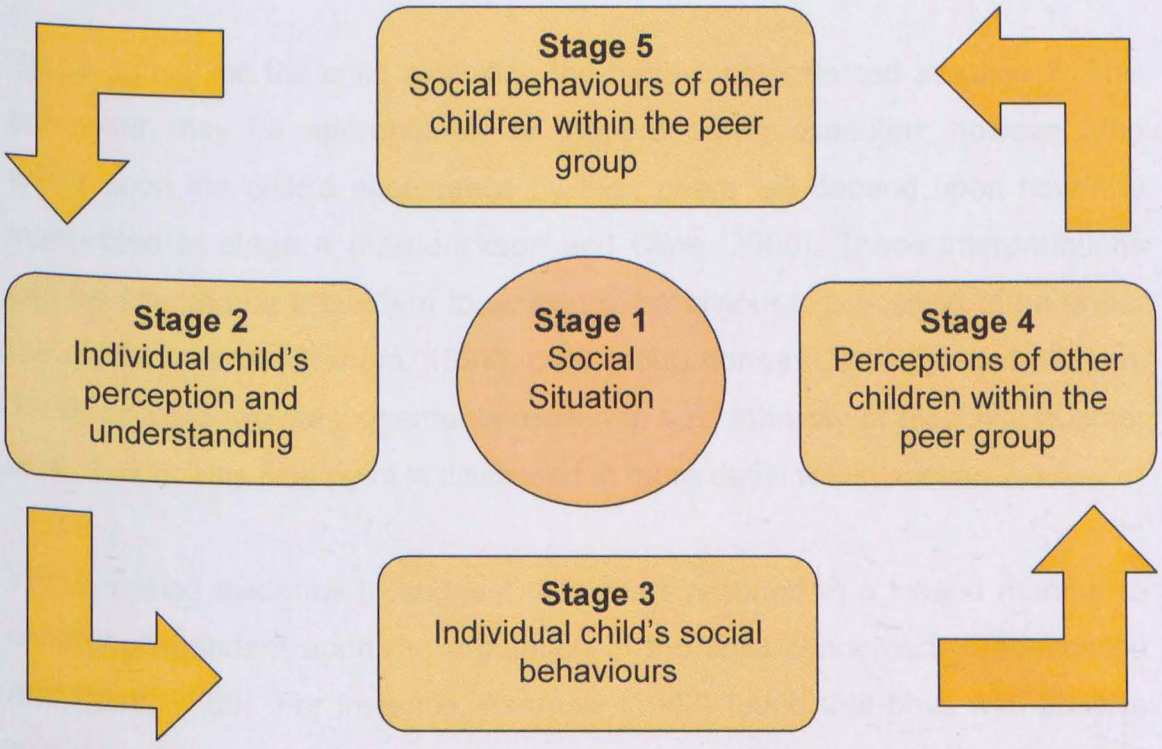
It is essential to consider potential causes of peer group acceptance and rejection if intervention strategies are to be successful (DfES, 2006). However, the literature suggests that there is no universal causal factor; in fact *"the situation appears quite complicated"* (Smith et al, 1999, p120). This section will consider contributory factors to the acceptance process; the behavioural characteristics of individual children, the role of the individual child's social perceptions, the influence of the peer group, and, finally, the contribution of developmental, gender and cultural factors.

First, however, it is vital to locate this discussion within a conceptual framework. This is introduced below.

2.3.1 A Conceptual Framework for Social Interaction

Dodge et al's (1986) 'Model of Social Interaction in Children' will be used as a foundation for discussions pertaining to possible reasons underlying peer acceptance, as it graphically demonstrates the complexity of this phenomenon. This model (figure 2.1) incorporates behavioural and cognitive perspectives and recognises the importance of environmental and interpersonal influences upon social interactions. It also demonstrates the circular causality inherent within the peer acceptance process (Frederickson and Cline, 2005).

Figure 2.1: A Model of Social Interaction in Children (adapted from Dodge et al, 1986)



Stage 1 draws attention to the importance of the social situation in influencing children's perceptions of each other's behaviour. For instance, Dodge et al (1982) found that rejected children made more social approaches in the classroom than on the playground, while the reverse was true for more accepted children, thus demonstrating the importance of the context in which social interaction takes place.

Cognitive factors are highlighted at stage 2, in terms of an individual child's perceptions and understanding of the social situation (Frederickson and Turner, 2003). In support of this factor contributing towards peer acceptance, Dodge et al (1984) discovered that accepted children aged between five and ten years were less likely to perceive hostile intent when viewing video recordings of ambiguous situations. Children's problem-solving skills may also be important at this stage (Frederickson and Cline, 2005), as Dodge et al (1986) found that accepted children were more likely to be proficient in processing information about a social situation and producing an appropriate response. These stages of processing include generating a range of possible responses and evaluating the probable reactions of others to these responses (Frederickson and Turner, 2003).

Stage 3 involves the child exhibiting the behaviours selected at stage 2. This behaviour may be appropriately or inappropriately executed; however, the effect upon the child's acceptance by their peers will depend upon how it is interpreted at stage 4 (Frederickson and Cline, 2005). These interpretations can be affected by the extent to which the behaviour is perceived to be under the child's control (Graham, 1997), peer group norms (Cartledge and Milburn, 1996) or stereotypical judgements related to sex, ethnicity or disability (Kistner et al, 1993). This final point is discussed in more detail within section 2.3.5.

There is also evidence to suggest that peers respond in a biased manner to children dependent upon the reputation of the child concerned (Frederickson and Cline, 2005). For instance, Asarnow (1983) found that boys with positive reputations received a neutral response from their peers after exhibiting negative behaviour, yet those with negative reputations received a negative response for very similar behaviours. This has implications for intervention in that it may also be necessary to focus upon the attitudes of the peer group as well as the skills of the individual focus child. This will be further discussed in section 2.4.

The final stage in this model, stage 5, involves the peers' behavioural response to the individual child. This response in turn acts as a cue for the child to interpret within the context of the ongoing social situation (Frederickson and Turner, 2003), thus demonstrating the circular nature of the social interaction process.

This model thus demonstrates the complex interactional nature of the processes underlying peer acceptance, which will be explored further below.

2.3.2 Behavioural Characteristics of Individual Children

In line with stage 3 of the Dodge et al (1986) model, children may not be accepted because their behaviours irritate others (Bierman, 2004). There is no universal profile for less accepted children; however, there are certain behaviours that act like *"social toxins"* (Bierman, 2004, p13), decreasing the likelihood of acceptance. Bierman (2004) refers to four patterns of behaviour that are associated with peer acceptance –

- Enhanced prosocial behaviours – Accepted children tend to be better communicators, have less difficulty regulating negative emotions and are more able to recognise the impact of their behaviour upon others (Bierman, 2004).
- Reduced levels of aggressive behaviour – Defined as *"intentional acts designed to cause harm or injury"* (Bierman, 2004, p20), they can be physical (eg hitting), verbal (eg threatening), social, or designed to cause embarrassment, inconvenience or loss of support (eg gossiping) (Underwood, 2003). However, some aggressive behaviours are perceived as justifiable, and do not detract from acceptance, such as defending oneself (Perry et al, 1990).
- Decreased inattentive and immature behaviours – These include distractibility, over-reliance on adult support, self-centred behaviour and low frustration tolerance (Bierman, 2004). These behaviours result in

unpredictable and non-rewarding social interactions for peers, making joint activities undesirable (Pope and Bierman, 1999).

- Lower levels of socially anxious and avoidant behaviours – Awkwardness with social interactions can create a cycle of deprivation, as the child may be ostracised from the situations that would allow them to develop their social skills and confidence (Bierman, 2004).

However, this individual deficit model, where less accepted children are assumed to possess deficiencies in social functioning and be "*the architects of their own difficulties*" (Ladd, 1985, p243), does not account for certain non-behavioural characteristics that have been associated with peer acceptance. Gender and cultural factors may also be implicated (see section 2.3.5), as well as reasons relating to physical appearance (Asher and Coie, 1990) and intellectual disability (Koster et al, 2009).

This does not infer that the individual behavioural characteristics of children do not play a part in peer acceptance, as numerous studies have reported behavioural differences between rejected and accepted children (Asher and Coie, 1990). It therefore appears that this may be a contributory factor; however, the observation that interventions purely targeting the social skills of individual children have not produced consistently positive results (Asher and Coie, 1990) suggests that other factors may also contribute, in line with the Dodge et al (1986) model.

2.3.3 The Role of the Individual Child's Perceptions

The individual child's perceptions of a social situation may also influence peer acceptance, in line with stage 2 of Dodge et al's (1986) model of social interaction. This hypothesis posits that children who have difficulties in processing social information may also find interacting socially with peers challenging (Asher and Coie, 1990).

Asher and Coie (1990) suggest three potential causal pathways through which acceptance may be reduced as a result of social information processing difficulties –

- First, the way in which the child perceives the social situation may lead them to behave in ways that make peers less likely to accept them socially.
- Second, the relinquishment of peer acceptance may lead the child to perceive social situations differently.
- Third, the child's social cognitions may serve to maintain and perpetuate their sociometric status, without necessarily having led to the acquisition of that status initially.

These causal pathways are not mutually exclusive and may operate in "*reciprocally influential ways*" (Asher and Coie, 1990, p121). It is also possible that different pathways may be associated with differing social cognitions or situations.

Empirical evidence has been supportive of this hypothesis; consistently demonstrating differences in social cognition between sociometrically accepted and rejected children, highlighting more sophisticated patterns amongst accepted individuals (Asher and Coie, 1990). More accepted children attribute intentions in less biased and inaccurate ways, display less deficits in response search, evaluation and enactment of social behaviours, and are more skilful at interpreting social cues (Asher and Coie, 1990). However, caution must be expressed when interpreting these results, as almost all of these studies are correlational, and thus causality cannot be inferred. Also, results have differed depending upon contextual factors and individual participant characteristics including age and gender (Asher and Coie, 1990), and so no firm conclusions can be drawn as yet.

When considered in isolation, this social information-processing hypothesis again supports an individual deficit model of peer acceptance; however, it

ignores the potential contribution of environmental variables such as the role played by the peer group. This will be considered subsequently.

2.3.4 The Role of the Peer Group

In line with stage 4 of the Dodge et al (1986) model, the perceptions of other children within the peer group may affect a child's sociometric status. As Harrist and Bradley (2003) argue, social inclusion is a group phenomenon, and Bierman (2004) recognises three ways through which the peer group may influence the acceptance of a classmate –

1. Peers may engage in behaviours that affect the responses of individual children, through processes of modelling and reinforcement, for example through exposure to models who demonstrate that aggressive behaviours may be successful in achieving certain goals.
2. Peers control the niches of social opportunity available to individual children, thus influencing the availability of social learning opportunities. If the peer group decides to ostracise a particular child, their opportunities for interaction are reduced and increasing delays or deviance in social development may result (Ladd and Asher, 1985).
3. Peers may develop 'reputational biases' that affect the way in which an individual child is perceived, thus influencing their responses to that child.

The reputational bias hypothesis in particular has received increasing empirical attention in recent years (Bierman, 2004), producing a growing body of evidence that an individual's social behaviour is perceived in a biased fashion by peers as a function of prior beliefs pertaining to the actor (Asher and Coie, 1990). These biases are reflected in several social perception processes, including differential evaluations of behaviour, selective recall of information and biased causal attributions (Asher and Coie, 1990). In support of this hypothesis, Dodge et al (1983) found that peers responded more favourably to accepted children's attempts to enter social situations over their less accepted counterparts; even when similar entry strategies were employed. This finding is

also supported by Asarnow's (1983) study, which was described within section 2.3.1.

2.3.5 Developmental, Gender and Cultural Considerations

Finally, developmental, gender and cultural factors must also be considered. The influence of these features upon peer acceptance is explored below.

2.3.5a Developmental Factors

Children's peer interactions increase in frequency and complexity throughout childhood (Brown et al, 2001); from 'momentary playmates' in the pre-school years, to more stable, reciprocal, trusting and cooperative relationships during primary school (Smith et al, 1999). Peer relationships are of significance even to very young children (Asher and Coie, 1990); however, they become increasingly important with age (Ellis et al, 1981). This assertion has led authors such as Killen and Stangor (2001) to posit that the importance of peer acceptance is heightened as children become older.

Furthermore, the behaviours that contribute a child being accepted or rejected by the peer group show marked changes developmentally (Erwin, 1993). For instance, Masters and Furman (1981) report that peer acceptance in four to five year-old children is associated with overall levels of giving and receiving positive, reinforcing behaviour (eg giving gifts or attention). However, by school age, acceptance is more closely allied with displays of prosocial, cooperative behaviours such as sharing (Erwin, 1993).

2.3.5b The Role of Gender

The evidence base indicates significant gender differences in several aspects of peer relations and social behaviour (Bierman, 2004). In a summary of empirical research on the subject, Bierman (2004) asserts that boys interact with peers in larger groups that emphasize competition (Bierman, 2004),

whereas girls more often interact within dyads or triadic groups. Boys behave aggressively and exhibit hyperactive behaviours more frequently (Coie et al, 1990), whereas girls use relational forms of aggression such as 'spreading gossip' to express hostility (Crick and Grotpeter, 1995), rather than physical means.

This impacts upon factors contributing towards peer acceptance, as research suggests that cooperativeness is a relevant dimension that distinguishes between accepted and rejected girls more than boys, while aggression is a more relevant dimension for males (Asher and Coie, 1990).

Following on from this, Harrist and Bradley (2003, p199) state that gender is *"especially salient"* in sociometric studies of primary aged children, reporting that children's cross-sex sociometric ratings are significantly more negative than same sex ratings within this age group. This assertion is corroborated by several observational studies that have reported increased sex segregation in school playgrounds from this age onwards (Smith et al 1999). Gender is therefore a factor that must be accounted for in any study of peer acceptance, as same-sex and opposite-sex peer groups may have to be considered as,

> *"interrelated but discrete social subsystems within the classroom"* (Frederickson and Furnham, 1998b, p930).

This has implications for the measurement instruments employed by this study, which are discussed within section 7.7.5.

2.3.5c Cultural Differences

Similarly, it cannot be assumed that factors contributing to peer acceptance are consistent across cultures, as the little research evidence available points towards the acceptability of certain behaviours varying as a function of cultural context (Osterweil and Nagano-Nakamura, 1992). For example, Chen et al (1992) found that 'shyness-sensitivity' was negatively associated with measures of peer acceptance in a Canadian sample of 8-10 year-old children,

but positively associated with peer acceptance in the corresponding Chinese sample. This is a particularly salient point in the context of interpreting the vast majority of research evidence in this area, which originates from North America and may not necessarily generalise to alternative cultural contexts. It is therefore noted by several authors (eg Frederickson and Cline, 2005) that further research needs to be conducted upon this topic before firm conclusions can be reached.

The local culture of a particular peer group can also influence peer evaluations (Bierman, 2004), for instance, Boivin et al (1995) found that in peer groups containing a high proportion of aggressive children, aggressive behaviour did not detract from peer acceptance as could have been the case in more typical settings, although further research needs to be conducted to enhance confidence in this preliminary finding.

Finally, normative biases pertaining to ethnicity may also impact upon peer sociometric ratings (Bierman, 2004). Kistner et al (1993) report that minority ethnic individuals receive fewer positive nominations than children of majority status, meaning that peer nominations may provide a less valid indication of such children's social status within the peer group.

In summary, this section has highlighted the complexity of the peer acceptance process; demonstrating that acceptance is not solely a within-child characteristic, but a social process in which peers' behaviours and perceptions also play a critical role (Bierman, 2004), as well as developmental, gender and cultural factors. This complexity must, therefore, be reflected within intervention programmes if they are to be successful in promoting peer acceptance. This topic is considered in more detail below.

2.4 Promoting Peer Acceptance

Despite the evidence presented within section 2.3, the Dodge et al (1986) model has had little impact upon the design of interventions aiming to promote peer acceptance (Frederickson and Turner, 2003), with programmes *"almost always based on a child deficit model"* (Harrist and Bradley, 2003, p186). These interventions invariably take the form of social skills training interventions, teaching the child interaction skills through direct instruction, modelling, reinforcement and feedback (Nangle et al, 2002), or social-cognitive training programmes, attempting to develop the cognitive processes underlying an individual child's behaviour (Bash and Camp, 1985).

These interventions ignore the important role of the peer group, however, and as stated in section 2.3.4, the possibility of reputational biases may mean that changing the behaviour of an individual child does not guarantee acceptance within the classroom. Interventions such as these are also ineffective for children who may be excluded for non-behavioural reasons such as gender or ethnicity (Bierman, 2004).

Alternatively, interventions that include the peer group have the potential to address possible reputational biases and enable the positive qualities of the focus child to be highlighted (Asher and Coie, 1990), while simultaneously enabling the child to learn social interaction skills such as sharing and turn-taking through interactions with more socially adept peers (Harrist and Bradley, 2003). However, implementation and empirical validation of class-wide social interventions remain rare (Harrist and Bradley, 2003), despite numerous authors (eg Bierman, 2004) and legislative documentation (eg DfES, 2006, p124) pointing out the necessity for intervention strategies to address the peer group.

These authors do also stress, however, that it is still necessary for interventions to address the individual child's social skills, a point that is empirically demonstrated by Bierman and Furman (1984), who measured peer acceptance

levels of four groups of 10-12 year-old children (who had initially low peer acceptance) before and after each group received a different form of intervention. The first group received individual coaching in conversational skills, the second received group experience with peers in working towards joint goals, the third group received both of these interventions simultaneously and the fourth group received no treatment. Only the third group significantly improved in relation to peer acceptance.

In line with the Dodge et al (1986) model (figure 2.1) it therefore appears to be the case that intervention strategies aiming to promote peer acceptance must focus upon both an individual child's social interaction skills (both behavioural and cognitive) and involve the peer group surrounding the child. As stated above, however, such interventions have been rarely implemented or validated.

One form of intervention that may have the potential to address both of these facets is Cooperative Learning (Johnson and Johnson, 1999). Discussions pertaining to this intervention strategy form the basis of discussion for the next chapter.

Chapter 3: Cooperative Learning

"Two are better than one, because they have a good reward for toil. For if they fall, one will lift up his fellow; but woe to him who is alone when he falls and has not another to lift him up"
(Ecclesiastics 4:9-12)

This chapter provides a detailed account of Cooperative Learning, first focussing upon a description of what Cooperative Learning (CL) is, the history behind it and theories underlying it. Different models of CL will then be presented, and research evaluating the efficacy of this intervention strategy will be critically reviewed.

3.1 What it Cooperative Learning?

Cooperative Learning (CL) can be defined as a peer-mediated, instructional intervention involving,

> *"small groups of learners working together as a team to solve a problem, complete a task or accomplish a common goal"* (Artz and Newman, 1990, p448).

CL primarily focuses on arranging antecedent conditions to promote positive social interactions (Madden and Slavin, 1983), often incorporating elements of social skills training, while concurrently providing the opportunity for participants to develop and practice these social skills within a naturalistic environment (Nixon, 1999).

CL differs from generic group work in that it emphasises a number of vital elements in order to ensure students work interdependently, with each student contributing equally, thus avoiding problems inherent to unstructured group work such as social loafing and the tendency for certain members to dominate proceedings (Johnson and Johnson, 1989)

Brown and Thompson (2000) argue that to be considered true CL, the following elements must be present –

- Positive Interdependence – All group members participate to achieve group goals.
- Individual Accountability – Each member of the group is held responsible for his or her own learning, which in turn contributes towards group goals.
- Group and Individual Reflection – Involves analysing the achievement of the existing goals and setting new goals for learning
- Small Group Skills – Team members are explicitly taught skills such as encouragement, management, conflict control and communication.
- Face-to-face Interaction – All participants must be able to make eye contact with each other at any time, meaning that seating arrangements have to be adjusted accordingly.

Each of these elements mediates the relationship between cooperation and its outcomes (Johnson and Johnson, 1989), and all elements are interrelated. For example, using social skills only makes sense once positive interdependence is established (Johnson and Johnson, 1989). It should be noted, however, that various authors promote differing core elements, which will be discussed in more detail in section 3.4. First, however, it is important to trace the roots of Cooperative Learning from early conceptualisations to its present day format.

3.2 *A Brief History of Cooperative Learning*

> *"We know a lot about cooperation and we have known it for some time"* (Johnson and Johnson, 1999, p188)

CL is not a new idea (Marr, 1997). In the late 1700s, Joseph Lancaster brought the idea of cooperative groups to America, opening the Lancastrian School in 1806 on this premise; emphasising cooperative principles to encourage the socialisation of students from a wide variety of cultural backgrounds (Marr, 1997).

In the 1940s, Deutsch published two seminal papers on cooperation and competition (Deutsch, 1949a, 1949b), concluding,

> *"It seems evident ... that greater group or organisational productivity will result when the members ... are cooperative rather than competitive. The implications for ... small group functioning seem fairly obvious."* (p230).

It is to this strand of research on group processes that CL can trace its routes (Schmuck and Schmuck, 1997). However, several differential theoretical underpinnings have been proposed in the intervening years, and the subsequent section reviews some of these.

3.3 Theoretical Underpinnings of Cooperative Learning

CL draws extensively upon the contributions of multiple theorists (Fore III et al, 2006), with different theoretical perspectives offering different accounts of how CL facilitates learning (Jenkins and O'Connor, 2006). A selection of these will be reviewed here (for a full account see Kagan 2009).

3.3.1 Behavioural Learning Theory

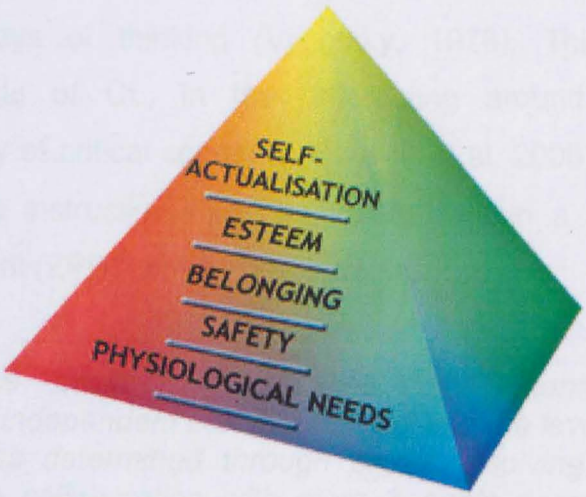
Based upon behavioural learning theory, CL enhances the immediacy, frequency and desirability of rewards, with resultant positive impacts upon the required behaviours (Kagan, 2009). Rewards are made more desirable as they are received in the form of praise from peers, which is more attractive than that received from a teacher (Kagan, 2009). Instant reinforcement is achieved as the teacher does not have to mark papers before distributing feedback to students, as feedback is provided immediately through peers.

3.3.2 Maslow's Hierarchy of Needs

Maslow (1954) hypothesised that humans attempt to fill deficiencies before attempting to meet needs to grow. Maslow's differentiated hierarchy of needs

(figure 3.1) illustrates this hypothesis, indicating that needs lower in the hierarchy need to be fulfilled before those higher up the model can be addressed.

Figure 3.1: Maslow's Hierarchy of Needs (adapted from Maslow, 1954)



Translating this theory to CL, it can be formulated that if students do not feel safe (safety) and included (belonging), their motivation may be directed to meeting these deficiencies rather than meeting the need to grow in terms of learning and developing understanding (Kagan, 2009). It is theorised that CL satisfies this need for safety through promoting small group skills, such as encouragement and communication. The need for inclusion is achieved through positive interdependence, which enables the student to fulfil a vital role as part of a team. With these needs met the group members are free to move through the latter stages of the hierarchy, striving for esteem and knowledge (Kagan, 2009).

3.3.3 Cognitive-Developmental Psychology

Piaget (Piaget and Inhelder, 1969) promotes peer-mediated instruction, such as that contained within cooperative structures, over teaching by expert adults; as children's abilities to organise patterns of thought develop more quickly when they interact with one another as opposed to adults (Biehler and Snowman,

1997). Furthermore, when students cooperate, socio-cognitive conflict occurs that creates cognitive disequilibrium (Johnson and Johnson, 1999), which in turn stimulates cognitive development.

In contrast, social constructivists emphasize how scaffolded, dialogical interactions between more and less skilled peers lead to the construction of new knowledge and ways of thinking (Vygotsky, 1978). This is one of the fundamental aspects of CL, in that interacting around tasks increases participants' mastery of critical concepts (Fore III et al, 2006). Vygotsky (1978) posits that effective instruction must be located within a student's zone of proximal development (ZPD), which is defined as,

> *"...the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers"* (Vygotsky, 1986, p25).

Slavin (1995) believes that cooperative activity promotes intellectual growth as children of similar ages are likely to be operating within one another's ZPD's. This also results in group members being exposed to more advanced behavioural models within groups than they would experience through individual assignments (Fore III, 2006).

3.3.4 Cognitive Psychology

From a cognitive perspective, a learner is required to cognitively rehearse and restructure information in order to incorporate it into existing cognitive structures and thus retain it in memory (Wittrock, 1990). One method of achieving this involves explaining the material under discussion to another group member, which is recognised as a critical element within CL, termed 'group and individual reflection' within section 3.1. Research has supported this supposition, demonstrating that as students explain the concepts being studied their understanding is enhanced (Marr, 1997). Benefits are therefore apparent for the tutor as well as the tutee (Fore III, 2002).

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3.3.5 Social Interdependence Theory

This is an extension of Deutsch's (1949a) work pertaining to cooperation and competition within groups, which was mentioned in section 3.2, and is described by Johnson and Johnson (1999, p186) as *"the most influential theorising on cooperative learning"*. This theory conceives that the way social interdependence is structured determines how individuals interact, which in turn affects outcomes (Johnson and Johnson, 1999). These authors argue that positive interdependence, one of the critical elements of CL stressed in section 3.1, results in 'promotive interaction' as group members facilitate each other's learning. Negative interdependence, typical in competitive environments, results in 'oppositional interaction', in which students obstruct each other's attempts to learn effectively. Meanwhile, an absence of interdependence, as observed in individualistic learning environments, results in 'no interaction', as individuals do not collaborate (Johnson and Johnson, 1999). Promotive interaction, as established through CL activities, leads to enhanced efforts to achieve and positive interpersonal relationships, whereas oppositional and no interaction encourage the opposite outcome (Johnson and Johnson, 1999).

3.3.6 Comparisons between Theories

These theories provide a triangulation of validation for CL (Johnson and Johnson, 1999), all predicting that CL will foster higher achievement than competitive or individualistic learning environments. However, there are some important digressions between these theoretical perspectives (Johnson and Johnson, 1999). For instance, social interdependence theory assumes that these gains arise as a result of intrinsic motivation generated through working together and joint aspirations to reach a common goal (Johnson and Johnson, 1999), whereas behavioural learning theory assumes that members within cooperative groups are motivated extrinsically by the possibility of rewards. Also, social interdependence theory is founded upon relational concepts between individuals within the group, whereas the cognitive-developmental perspectives focus upon intra-individual factors (Johnson and Johnson, 1999).

Johnson and Johnson (1999) remark that these discrepancies have yet to be resolved, and thus promote the formulation of further research to address the relative strengths and weaknesses of each theory.

It is next vital to outline various approaches to CL that are discussed within contemporary literature on the topic. Section 3.4 will explore these models in detail.

3.4 Models of Cooperative Learning

Several formats have been employed to foster cooperative groups (Dugan et al, 1995), with four major approaches arising from the literature (Putman, 1998). The contents of the models do not vary widely, although each model emphasises differing elements as being essential (Murphy et al, 2005).

3.4.1 Johnson and Johnson's 'Conceptual' or 'Learning Together' Model

Johnson and Johnson are considered to be the founders of the modern CL approach (Brown and Thompson, 2000). Theirs is a conceptually based model, not tied to a specific subject area (Murphy et al, 2005), and incorporates the five essential elements referred to in section 3.1. Johnson and Johnson (1991) posit that two of these elements, positive interdependence and individual accountability, are the most important features for effective outcomes.

3.4.2 Kagan's 'Structural' Model

Kagan's (1990) structural approach aims to systematise CL activities through the use of structures, which are defined as a *"content free way of organising social interaction in the classroom"* (Kagan, 1990, p12). Each structure essentially consists of a series of instructional steps, and is designed to assist teachers transform existing lessons into cooperative programmes in a relatively straightforward manner (Brown and Thompson, 2000).

Kagan's approach is based upon similar underlying principles to that of the conceptual approach of Johnson and Johnson, with four principles believed to be essential to effective CL. These are; 'positive interdependence' and 'individual accountability' (as defined in section 3.1), 'equal participation' among students and 'simultaneous interaction', whereby a high proportion of students are active at any one moment (Brown and Thompson, 2000). All of Kagan's structures attempt to adhere to these principles, with the first two, positive interdependence and individual accountability, viewed as most crucial, as in the conceptual approach.

3.4.3 *Slavin's 'Student Team Learning' and 'Curricular' Models*

Slavin's (1995) model involves competition amongst a number of teams (Murphy et al, 2005), thus introducing a competitive element into the cooperative format. This method incorporates the concepts of individual accountability and equal opportunity to succeed, but also includes the employment of team rewards (Brown and Thompson, 2000). These rewards are available to all team members provided the group's objectives are met by all students.

There are several approaches advocated by Slavin, including Student Teams Achievement Division (STAD) and Team-Assisted Individualisation (TAI). STAD involves initial testing on the topic area of interest for each team member individually, followed by a teamwork phase, where students attempt to learn pertinent material in groups. Credit is then awarded to the whole team if individuals are able to exceed their initial score on subsequent individual tests, which are presented in the same format as the initial examination (Brown and Thompson, 2000). TAI is a similar approach, specific to mathematics, where students help each other to learn material and group rewards are presented if individuals are successful (Murphy et al, 2005).

Drawing upon behaviourist theories, Slavin believes that rewards are necessary to maintain motivation, with competition between groups serving as a means to allocate these rewards (Brown and Thompson, 2000). However, this is not a view wholly shared by advocates of alternative models. For instance, Johnson and Johnson (1999) offer caution pertaining to the use of rewards, believing that they encourage extrinsic rather than intrinsic motivation to succeed, which may be less beneficial for students' future learning.

3.4.4 Brown and Thompson's 'Strategic' Model

This is an attempt to combine cooperative learning methodology, largely based upon the Johnson and Johnson (1991) and Kagan (1990) approaches, with a strategic model of instruction (Brown and Thompson, 2000). Brown and Thompson argue that the essential element of this approach is that the students are focussed upon the task, first by the five fundamental elements of cooperative learning presented in section 3.1, and subsequently by the particular instructional enhancement of the cognitive strategy employed. Any number of cognitive strategies can be utilised, such as graphic organisers (eg Venn Diagrams) or the 'Six Thinking Hats' (De Bono, 1985).

3.4.5 Comparison of Models

Despite their variations, two elements in particular form the central components in each model. The first of these is 'positive interdependence' (Murphy et al, 2005, p159), describing the process whereby students work together to attain a shared goal (Nixon, 1999). The second common factor is 'individual accountability' (Murphy et al 2005, p159), which involves the performance of each individual being assessed and the results returned to both the individual and the group (Johnson and Johnson, 1994).

Additional elements of CL programmes have also been identified as beneficial to its efficacy. A selection of these will be discussed in the following section.

3.5 Additional Factors Affecting the Efficacy of Cooperative Learning

The literature base pertaining to this topic identifies several aspects of CL programmes as impacting beneficially upon student outcomes, in addition to those suggested above.

3.5.1 Teaching Interaction Skills

Several authors (eg Goodwin, 1999) believe teaching social skills to be a crucial prerequisite for implementing CL successfully, as,

> *"...people do not know instinctively how to interact effectively with others. Nor do interpersonal and group skills magically appear when they are needed."* (Johnson and Johnson, 1989, p30).

Indeed, a structured versus unstructured dichotomy has arisen within the literature (not to be confused with Kagan's 'structural' approach) (Murphy et al, 2005). Structured CL incorporates the explicit teaching of interaction skills, while unstructured CL occurs when children are not specifically taught interaction strategies (Murphy et al, 2005). Johnson et al (1993a) propose a number of steps for teaching these skills –

1. The skill should be named and defined (eg giving and receiving feedback, listening, turn-taking).
2. The importance of the skill should be explained.
3. The skill should be demonstrated.
4. The children should be reminded to use the skill regularly.
5. Feedback should be presented pertaining to the children's use of the skill.
6. Children should reflect upon their own use of the skill.

The employment of social skills training for children is supported theoretically by the Dodge et al (1986) model of social interaction described in section 2.3.1, as

it addresses possible within-child deficiencies in social interaction at stages 3 and 5 directly, through the promotion of social skills for the whole peer group.

Empirically, Gillies and Ashman (2000) compared the effects of structured versus unstructured cooperative groups on the achievement of students in 25 Australian primary school classrooms. After treatment, students in the structured condition performed significantly better on an academic test than in the unstructured group, thus indicating that structured CL can be more effective than unstructured programmes (Gillies and Ashman, 2000). However, social outcomes were not included in this study, and so it cannot be assumed that the academic benefits found for structured CL would translate to social outcome measures, such as peer acceptance. Further research must be conducted to ascertain the social benefits empirically.

3.5.2 Teacher Training and Support

Another factor implicated in the efficacy of CL programmes is the extent to which implementers (invariably teachers) are supported in executing the CL strategies (Cowie et al, 1994). Indeed, Brown et al (2001, p163) identify a *"significant gap"* between,

> *"...intervention technology...and the translation of that technology into practice in natural environments (ie incongruence between "what we know" and "what we do"...)".*

This phenomenon is highlighted by research conducted by Antil et al (1998), who interviewed 21 teachers, discovering that 17 (81%) had received formal CL training in the models described in section 3.4, yet only one of these teachers reported following one of these approaches subsequently. Instead, they described personal amalgamations of selected CL features that matched their educational philosophy and setting.

In order to address this difficulty, Davison et al (2008, p315) suggest adherence to the following recommendations, based upon principle suggested by OFSTED (1993), that training should –

- Be part of a coherent programme.
- Be sufficiently extensive to allow work in schools, reflections and consolidations between sessions.
- Be followed up by some support in school.

The points raised in this section have major implications for the design of the current project, which will be discussed in the methodology section of this paper (chapter 7).

3.5.3 *Allocating Children to Groups*

The composition of cooperative groups is also considered crucial by several authors for the successful implementation of CL (eg Dugan et al, 1995). There is broad consensus within the literature that groups should be heterogeneous, becoming *"neither ability groupings ... nor a reinforcement for existing cliques"* (Vermette, 1995, p280). Groupings should promote equality and diversity by also mixing gender and ethnicity (Vermette, 1995).

In order to enable heterogeneous groupings, Brown and Thompson (2000) advocate teacher selection as the method of choice for picking groups. This may involve more thought and planning on the teacher's behalf, but the research is in favour of this grouping system, and so the benefits may outweigh the costs (Brown and Thompson, 2000). For instance, in a meta-analysis of within-class grouping effects, Lou et al (1996) found stronger achievement outcomes for both low and medium achieving students (with high achieving students performing comparably) for teacher selected, mixed-ability groupings over other grouping strategies such as random assignment, student selection and groups of convenience. Brown and Thompson (2000) support this claim,

believing that student selection can result in increased off-task behaviour and may serve to reinforce existing classroom cliques.

However, as was the case for teacher training, there appears to be a discrepancy between the approach advocated by researchers and that adopted by practitioners. Only five of Antil et al's (1998) 21 teachers mentioned in section 3.5.2 reported employing heterogeneous groupings, selected by themselves, as their dominant strategy. The majority of teachers allowed students to select their own groups, utilised random assignment or groupings of convenience. Again, this has major implications for the design of the current project, which will be discussed in the methodology section of this paper (chapter 7).

The following two sections discuss the potential benefits and pitfalls of employing Cooperative Learning, in order to establish reasons for employing CL as a strategy for promoting positive outcomes within the classroom, while remaining alert to the possible drawbacks of such methods.

3.6 Potential Benefits of Cooperative Learning

Slavin (1991, p71) points out that CL has been,

> *"...suggested as the solution for an astonishing array of array of educational problems".*

Indeed, there are myriad benefits associated with the cooperative approach to teaching, which will be discussed in this section. Empirical evidence pertaining to the outcomes discussed within this section will be critically analysed in section 3.9.

3.6.1 Dual Emphasis upon Both Academic and Social Goals

Advocates of CL have highlighted that, in contrast to many other educational instruction methods, such as Direct Instruction (Carnine et al, 2004), CL has the ability to foster beneficial outcomes for students both socially and academically (Murphy et al, 2005). Literature on this topic posits a wide range of academic advantages pertaining to –

- Student academic achievement (Lin, 2006).
- Productivity (Marr, 1997).
- Problem-solving (Hagman, 1990).
- Higher order thinking and higher quality reasoning (Marr, 1997).
- Time spent on-task (Slavin, 1990).

The research literature also associates CL with a plethora of social benefits relating to –

- Self-esteem (Goodwin, 1999).
- Social understanding and communication (Lin, 2006).
- Motivation (Slavin, 1992).
- Peer acceptance (Oortwijn et al, 2008).
- Enhanced friendships among students (Slavin, 1990).
- Acceptance of diversity (Lin, 2006).
- Liking of school and attendance (Slavin, 1990).
- Higher behaviour ratings from teachers (Slavin, 1991).

This dual emphasis upon academic and social outcomes is cited as a major advantage of CL over alternative forms of instruction (Murphy et al, 2005). Indeed, several authors take this argument a step further, positing that the skills fostered through CL stand those who engage in such activities at school in good stead for the world of professional employment. For instance, Davison et al (2008, p308), argue that CL,

"...help[s] to develop the "soft" skills which are valued by employers such as communication skills and the ability to work in teams."

This position is supported by several surveys that have gathered employer's views on the qualities they seek in their employees (Kagan, 2009). For instance, a survey conducted by the National Association of Colleges and Employees (2004) ranked such skills in order of importance, with interpersonal skills, such as those promoted through CL, dominating the top positions.

3.6.2 Promoting Peer Acceptance

Continuing this theme of potential social benefits, and with direct relevance to the current project, CL addresses several of the areas hypothesised by Dodge et al (1986) as contributing to peer acceptance, as described within section 2.3.1.

For instance, Frederickson and Cline (2005) postulate that CL is potentially beneficial for less accepted students as it addresses stage 1 of the Dodge model by providing a structured social situation for interaction. However, as noted in section 3.5.1, if CL is implemented in tandem with social skills training (a structured format) then it also has the potential to address possible within-child difficulties relating to social interaction skills at stages 3 and 5, while also influencing the social perceptions of both individual children (stage 2) and the rest of the peer group (stage 4) through adherence to core CL principles such as group and individual reflection. This potentially reduces reputational biases (see section 2.3.4) towards the less accepted child from the peer group (Bierman, 2004).

CL, therefore, supports the dominant thread in the literature pertaining to promoting peer acceptance, in that interventions must simultaneously address both the skills and cognitions of an individual less accepted child, and involve the peer group surrounding the child in order to facilitate peer acceptance (Bierman, 2004).

3.6.3 Accommodating Individual Differences

Educational inclusion continues to be a high priority among practitioners, policymakers and families in the UK (McMaster and Fuchs, 2002). Consequently, there is a need for intervention strategies that will effectively address the needs of widely differing skills and abilities between students within inclusive classrooms (Dugan et al, 1995).

CL is one such strategy that can potentially address this agenda (Dugan et al, 1995) through the peer support inherent within the model, which acts as a compensatory mechanism, enabling struggling learners to overcome difficulties they may not have been able to tackle individually (Jenkins and O'Connor, 2006). CL actively exploits individual differences in student's ability, knowledge and backgrounds in order to promote learning (Antil et al, 1998) and thus has the *"potential for accommodating individual differences in the classroom"* (Antil et al, 1998, p420). This is in contrast to many other instructional approaches, which view individual differences as a *"nuisance to be controlled through individual instruction or ability groups"* (Jenkins and O'Connor, 2006, p417).

3.6.4 Compatibility with Current Legislation

CL can also potentially make a contribution towards government targets and initiatives, for instance –

- Communication and working with others being described as key skills in 'Curriculum 2000' (DfEE, 1999).
- Contributing towards a school's 'graduated response to learning' (Davison et al, 2008).
- Assisting with outcomes relating to the Every Child Matters (DfES, 2004) agenda by encouraging children to actively participate in their own learning and through fostering academic achievement (Davison et al, 2008).

However, there is a potential drawback associated with CL, which is outlined below.

3.7 A Potential Drawback of Cooperative Learning

In an article entitled *"Cooperative Learning: Abused and Overused"* Randall (1999, p14) outlines perceived weaknesses in the CL model. Randall's main concern stems from the use of heterogeneous groups within CL programmes, arguing that higher achieving children within each group do not benefit from CL activities.

To demonstrate this point Randall (1999) cites evidence from Matthews (1992), who reports that some high-ability children interviewed complained about going over and over the same material they have already learned, as they have to repeatedly explain it to others within the group. However, the self-report measures employed for this study may be liable to social desirability effects (Cohen et al, 2007). Also, this evidence does not demonstrate that high ability children did not gain from the CL intervention, merely that they did not enjoy participating in CL activities, which are two separate phenomena. The validity of Randall's interpretation of this finding can therefore be questioned.

Nevertheless, this viewpoint is also supported by other writers on this topic (eg Willis, 1990; Hill, 1982), who believe that 'gifted' students are often exploited in cooperative groups and are hindered by the lower ability individuals within the group.

However, this stance not only contradicts the well-established cognitive theories described in sections 3.3.3 and 3.3.4, but also opposes the majority of research in the area, which generally reports positive effects of CL for high achieving students. For instance, Johnson et al (1993b) report enhanced academic self-esteem and social acceptance in the cooperative group for a sample of 34 high-ability students randomly allocated to cooperative or individualistic learning

conditions. Findings such as this lead Davison et al (2008, p308) to go one step further, offering the opinion that,

> *"...high ability students may benefit more from cooperative learning than low ability students".*

Empirical research pertaining to this topic and other concepts referred to within this chapter will now be critically analysed in order to ascertain the empirical validity of the arguments put forward so far. It is also intended that this process will highlight current issues with research conducted within this topic area, which will contribute towards the rationale for conducting the current project.

3.8 Empirical Evidence

Research into CL programmes, *"represents one of the most active and fertile areas of systematic enquiry in education"* (Antil et al, 1998, p420), with Johnson and Johnson (1992) reporting over 550 experimental and 100 correlational studies analysing the effectiveness of the approach. The overwhelming majority of these studies focus upon academic achievement, however, with relatively little research concentrating upon social outcomes, despite the importance of social benefits being highlighted by many authors within the literature (Murphy et al, 2005). The following sections will analyse the research base pertaining to CL, and subsequently outline current deficiencies within the empirical literature.

3.8.1 Cooperative Learning and Academic Achievement

"Literally hundreds of studies" have investigated the effects of CL upon the academic achievement of students (McMaster and Fuchs, 2002, p107), with positive effects noted across diverse subject areas including reading, writing, mathematics, art and foreign language learning (Marr, 1997). Beneficial outcomes have also been observed across ages (USA grade ranges 2-12), ability levels and school locations (urban, suburban and rural contexts) (Slavin, 1991).

However, a meta-analysis conducted by Tateyama-Sniezek (1990) indicated that only 50% of the studies focussing upon academic outcomes as a dependent variable showed significant positive effects for CL programmes. Upon further inspection of this review, Slavin (1991) identified that the level of effectiveness of CL with respect to academic achievement appeared to be related to two key elements, group goals (an aspect of positive interdependence) and individual accountability.

In order to evidence this assertion, Slavin (1991) analysed 67 studies measuring the effects of CL upon student achievement, finding that 37 out of the 44 studies including these two elements within their CL intervention reported significantly positive achievement effects, whereas only 4 out of the 23 papers failing to incorporate these elements showed significantly positive outcomes pertaining to student academic achievement. Similarly, McMaster and Fuchs (2002), in an update of Tateyama-Sniezek's (1990) review, found that researchers reporting the inclusion of these two elements in their interventions produced a mean effect size of 0.30, whereas authors who did not produced a mean effect size of only 0.09.

Slavin (1991) believes that group goals (positive interdependence) and individual accountability are vital to the success of CL programmes with respect to academic achievement because they motivate students to give and receive conceptual explanations, which promotes learning in line with the theories taken from cognitive psychology discussed in section 3.3.4.

3.8.2 *Cooperative Learning and Social Outcomes*

Comparatively little research has focussed upon the social outcomes of CL programmes, despite this aspect being touted within the literature as a major selling point of Cooperative programmes (Murphy et al, 2005). Indeed, one of the earliest research findings was that people who cooperate learn to like one another (Slavin, 1991), making it somewhat surprising that *"noticeably few*

studies" (Piercy et al, 2002, p352) have focussed upon this variable subsequently. This leads Dugan et al (1995, p177) to call for,

> *"...continued, careful, systematic research in these areas, including ... monitoring of ... social benefits".*

Studies that have measured social outcomes have invariably employed peer acceptance as a dependent variable, although the terminology employed varies between authors. A systematic review of research within this area is provided in chapter 4, as this is the dependent variable under investigation for the present study; however, a brief overview is also provided here, including empirical research that did not meet the inclusion criteria for the systematic element of the literature review.

For instance, Nixon (1999), found that a CL intervention failed to result in significant changes in peers' perceptions of target children, but did produce positive peer acceptance effects in the classroom overall. Nixon (1999) suggests this could have occurred due to high initial peer ratings, thus introducing the possibility of a 'ceiling effect' at post-testing, and due to the short duration of the intervention.

Overall, the small number of studies that have been conducted tend to support the view that CL can promote peer acceptance within the classroom, with Slavin (1983) reporting that 14 out of 19 studies assessing peer ratings found improvements in liking amongst children. Bierman (2004) believes that these findings are somewhat inconclusive because the type of CL programme implemented can significantly affect social outcomes. Indeed, Bierman (2004) even suggests that if group goals are not present then CL activities can affect the status of less accepted children detrimentally, as they can be perceived as hampering the efforts of members working towards individual goals.

In addition to the views espoused in section 3.6.2 concerning CL's effectiveness in promoting peer acceptance, Piercy et al (2002) believe that CL can enhance peer group acceptance due to the structure of the activities providing an opportunity for children to demonstrate their strengths, leading to them being

viewed in a more multidimensional fashion and hence becoming more likely to be accepted by their peers. However, regardless of the reasons behind the potential beneficial effects of CL upon peer relationships, it is apparent that *"further exploration of CL is warranted"* (Bierman, 2004, p248/9).

3.9 Limitations within the Current Research Literature

In addition to the deficiencies highlighted already within section 3.8, including a lack of research investigating social outcomes such as peer acceptance, there are a number of further limitations inherent to the research in this area. This is recognised by Jacobs et al (1996, p195), who state, *"The research base on cooperative learning is not without its weaknesses".*

3.9.1 Implementation Issues

Dugan et al (1995, p176) highlight *"implementation issues"* relating to CL interventions, and make the case for future research to include the accurate specification of implementation procedures. The means through which CL procedures have been employed *"vary enormously"* between studies (Murphy et al, 2005, p163), a particularly important area for CL interventions, as research pertaining to the benefits of CL has consistently suggested that the manner in which it is implemented has a major impact upon the success of the programme (Jenkins and O'Connor, 2006). This has led to difficulties in drawing firm conclusions regarding the efficacy of CL (Murphy et al, 2005).

For instance, the majority of empirical research does not sufficiently describe the type of CL intervention employed (Murphy et al, 2005). Indeed, in their meta-analysis of CL research, McMaster and Fuchs (2002, p114) report that this deficiency was so chronic that,

> *"...it was occasionally difficult to determine whether a CL strategy had been implemented or not!"*

Furthermore, Putnam et al (1996) report that most of the CL interventions described within empirical studies are of insufficient duration, lasting between three and ten weeks. For instance, Grey et al's (2007) CL intervention consisted of only seven cooperative lessons.

Finally, as discussed in section 3.5.2, the training provided for those required to implement cooperative interventions, typically class teachers, is particularly important to their success (Murphy et al, 2005), as it becomes impossible to determine the efficacy of a CL programme if the technique has not been implemented correctly in the first place (Murphy et al, 2005). This is another chronic problem with the research to date, as the overwhelming majority of papers accessed for this review failed to incorporate any details of teacher training methods.

3.9.2 Additional Limitations within the Empirical Literature

There are also a number of difficulties within the research literature pertaining to CL that are not directly associated with the implementation of the intervention, but still have the potential to reduce the validity of any conclusions reached in relation to the current project.

First, there have been a distinct lack of intervention studies conducted that employ populations representative of mainstream educational settings. The vast majority of the studies perused for the purposes of this paper focussed upon children with learning difficulties (eg Piercy et al, 2002; O'Connor and Jenkins, 1996; Jacques et al, 1998) or other 'special' populations, such as children with an Autistic Spectrum Disorder (eg Grey et al, 2007; Dugan et al, 1995; Kamps et al 1995) or 'high achievers' (eg Johnson et al, 1993b). Just two studies were discovered that could be considered to have employed a population representative of a mainstream educational environment, Jacobs et al (1996) and Oortwijn et al (2008), both of which are evaluated in chapter 4.

Furthermore, the overwhelming majority of intervention research to date has been conducted in the USA, with some empirical studies also conducted in Australasia and the Netherlands; however, not a single intervention study evaluating the effectiveness of CL could be located that had been conducted in the UK. Therefore, it cannot be validly assumed that any results from this previous research would necessarily translate to a British context.

These shortcomings mean that firm conclusions pertaining to the effectiveness of CL cannot be validly drawn (Murphy et al, 2005). Dugan et al (1995, p185) support this assertion, remarking,

> *"...the research for ... Cooperative Learning ... is suggestive rather than conclusive".*

These factors must be addressed if future research is to accurately validate the effectiveness of CL interventions. Much of the rationale for the current project stems from these deficiencies, and will be explained fully in chapter 5.

The next chapter will systematically drill down to review research evaluating the effectiveness of CL in promoting peer acceptance, as this most accurately reflects the research questions being addressed by the current project, which are presented in chapter 5.

Chapter 4: Cooperative Learning and Peer Acceptance: A Systematic Review

This chapter systematically reviews empirical evidence pertaining to the research questions posed by this study, which are presented in chapter 5.

Systematic literature reviews attempt to identify, appraise and synthesize all relevant studies in a particular area, aiming to address a specific question (Petticrew and Roberts, 2008), *"differentiating between the boggy areas ... and the higher ground..."* (p9). This review will adhere to these principles through explicitly outlining all search strategies, identifying and critiquing relevant empirical research evidence and finally synthesising the designs, procedures and outcomes of these studies.

4.1 Systematic Search Strategy

The search was initiated through the University of Nottingham Information Gateway (www.nottingham.ac.uk/is). First, the 'eLibrary Gateway' search option was selected. The 'find database' screen appeared and 'education' under the 'subject' heading, and 'general' from the 'sub-category' heading were chosen. This produced a list of 32 databases. The 'ERIC' and 'PsychInfo' databases were employed from this list.

4.1.1 Education Resource Information Clearinghouse (ERIC)

The first electronic database selected was 'ERIC' (www-uk1.csa.com), as this database, *"provides extensive access to education-related literature"* (www.metalib.library.nottingham.ac.uk). An 'advanced search' was performed (11:00 GMT, 3/7/09), searching for 'Cooperative' OR 'Co-operative' (title and abstract) AND 'Learning' (title and abstract). Further 'advanced' searches were also performed with synonyms of 'cooperative' identified within the literature. This included the terms 'collaborative' and 'teamwork'.

The search was not limited to the dependent variable 'peer acceptance' at this stage, as a wide variety of terms have been employed by different authors to describe this variable, as highlighted in section 2.1, and it was felt that limiting the search at this stage, even if using a number of different search terms, would be likely to overlook some relevant articles. This meant trawling through many irrelevant studies; however, this was preferable to missing a single relevant piece of research.

Several options available on the database search page were also selected, thus forming the initial inclusion criteria (figure 4.1) –

Figure 4.1: Initial Inclusion Criteria

1. *Publication dates between 1990-2009* –

   This date approximates the time at which Kagan's structural model of CL was formally operationalised (see section 3.4.2), and, as this is the major approach upon which the intervention in this study is based, this was felt to be an appropriate cut-off date for this review.

2. *English language articles only* –

   Non-English language articles were discarded, as no translation service was available to access these studies.

This search returned 1103 articles. The additional criteria 'peer reviewed journal articles only' was subsequently selected. This criterion was employed in order to promote the quality of studies reviewed, with articles that were not published within peer-reviewed journals being removed, such as conference proceedings and dissertation abstracts. This reduced the total number of articles returned to 695.

The titles of articles presented within this list were then scrutinized, and papers were removed according to the secondary inclusion criteria presented below (figure 4.2). The abstracts of articles were also perused if the relevance of the

study could not be determined from reading the title alone. This process reduced the number of potentially relevant studies to 61.

Figure 4.2: Secondary Inclusion Criteria

1. *Participants* -

   Studies that employed participants above the age of 16 were discarded, as the results of these studies were considered to be non-generalisable to children, and thus irrelevant to the current project.

2. *Outcome Measure* –

   Studies that did not employ peer acceptance (or a similar construct eg social inclusion) as an outcome measure were removed, as these papers were considered to be irrelevant to the topic under investigation.

The abstracts of all 61 studies were subsequently analysed, and 56 articles were rejected in line with the tertiary inclusion criteria presented below (figure 4.3).

Figure 4.3: Tertiary Inclusion Criteria

1. *Design of study* -

   Only intervention studies that included both pre- and post-measures were included, as a lack of pre-measures does not allow for an effectiveness check pertaining to random allocation of participants to groups, and does not enable pre-post test comparisons between groups to be made, meaning that the effectiveness of the intervention cannot be ascertained (Robson, 2002).

2. *Intervention is Cooperative Learning* –

   The intervention described had to be CL, although this could be structured or unstructured, and subscribe to any of the models described within chapter 3. Studies that did not offer a description of the type of CL employed were also retained, as discarding these would have further limited the already small number of studies retained.

There were also several inclusion criteria that were not employed, as it was felt that their utilisation would have limited the already small number of studies too greatly. These criteria were –

- *Participant characteristics* – Studies analysing 'special' populations, for instance children with an ASD or learning difficulties, were not discarded.
- *Geographical Location* – Studies conducted outside the UK context were retained.
- *Educational Context* – Research produced outside mainstream settings was not removed.
- *Further Design Criteria* – Papers that did not contain a control group were retained.

Five articles remained after exposure to all of these inclusion criteria. These were –

1. Oortwijn et al (2008)
2. Gillies (2004)
3. Piercy et al (2002)
4. Putnam et al (1996)
5. Jacobs et al (1996)

4.1.2 *American Psychological Association Database (PsychInfo)*

A further literature search was then conducted on PsychInfo (www.ovidsp.uk.ovid.com), as this includes,

> *"...material of relevance to psychologists and professionals in related fields such as ... education"* (www.metalib.library.nottingham.ac.uk).

The initial search was performed in an identical fashion to the ERIC search described above, using the 'advanced OVID search' (13:00 GMT, 4/7/09).

Articles were discarded or selected based on the same exclusion criteria as before, as highlighted in figures 4.1-4.3.

This strategy produced one study (Jacques et al 1998) that fulfilled all of the inclusion criteria and was not a duplicate of the five studies already identified in section 4.1.1. A large number of duplications indicated the consistency of the search strategy across databases.

Six articles were thus retained after searching both databases. These were –

1. Oortwijn et al (2008)
2. Gillies (2004)
3. Piercy et al (2002)
4. Putnam et al (1996)
5. Jacobs et al (1996)
6. Jacques et al (1998)

4.1.3 Reference Chase and Final Selection of Articles

The reference lists of the six articles returned from the electronic database searches were then scrutinised. All articles that could potentially be included were then further investigated through perusal of their abstracts, which were accessed electronically. Articles were then selected based upon their adherence to the inclusion criteria specified in figures 4.1-4.3.

This method produced two further articles, Gillies and Ashman (2000) and Johnson et al (1993b).

A total of 8 articles were thus selected –

1. Oortwijn et al (2008)
2. Gillies (2004)
3. Piercy et al (2002)

4. Putnam et al (1996)
5. Jacobs et al (1996)
6. Jacques et al (1998)
7. Gillies and Ashman (2000)
8. Johnson et al (1993b)

Finally, these eight articles were analysed further, through perusal of the full article, to ascertain their suitability for review. This process resulted in three articles being discarded, Johnson et al, (1993b), Gillies and Ashman (2000) and Gillies (2004). These studies were all removed because, despite the abstracts making reference to a peer acceptance-related variable, this outcome was not empirically measured within the study.

A flow chart summarising the entire selection process can be viewed in figure 4.4, and the final selection of five articles is presented in figure 4.5.

It should also be noted that another systematic search was conducted in May 2010 to ensure the inclusion of any studies conducted between the time at which the initial search was conducted and the time of completion of this project. This search discovered no further studies.

4.1.4 Limitations of the Search Strategy

Finally, it is necessary to allude to the limitations of this review –

- Terms were searched for within the title and abstract only, not the full article, as this would have returned a very large number of irrelevant results. However, this meant that some relevant studies could have been overlooked.
- The abstracts provided by the ERIC and Psychinfo databases were, on occasion, only abridged versions of the full abstract given by the authors. This meant that potentially useful articles could have been overlooked,

although this difficulty was ameliorated somewhat through the reference chase and use of multiple databases.

- All possible databases were not utilised, for example Google Scholar, which may have yielded additional studies.

Figure 4.4: Flow Chart of Systematic Search Strategy

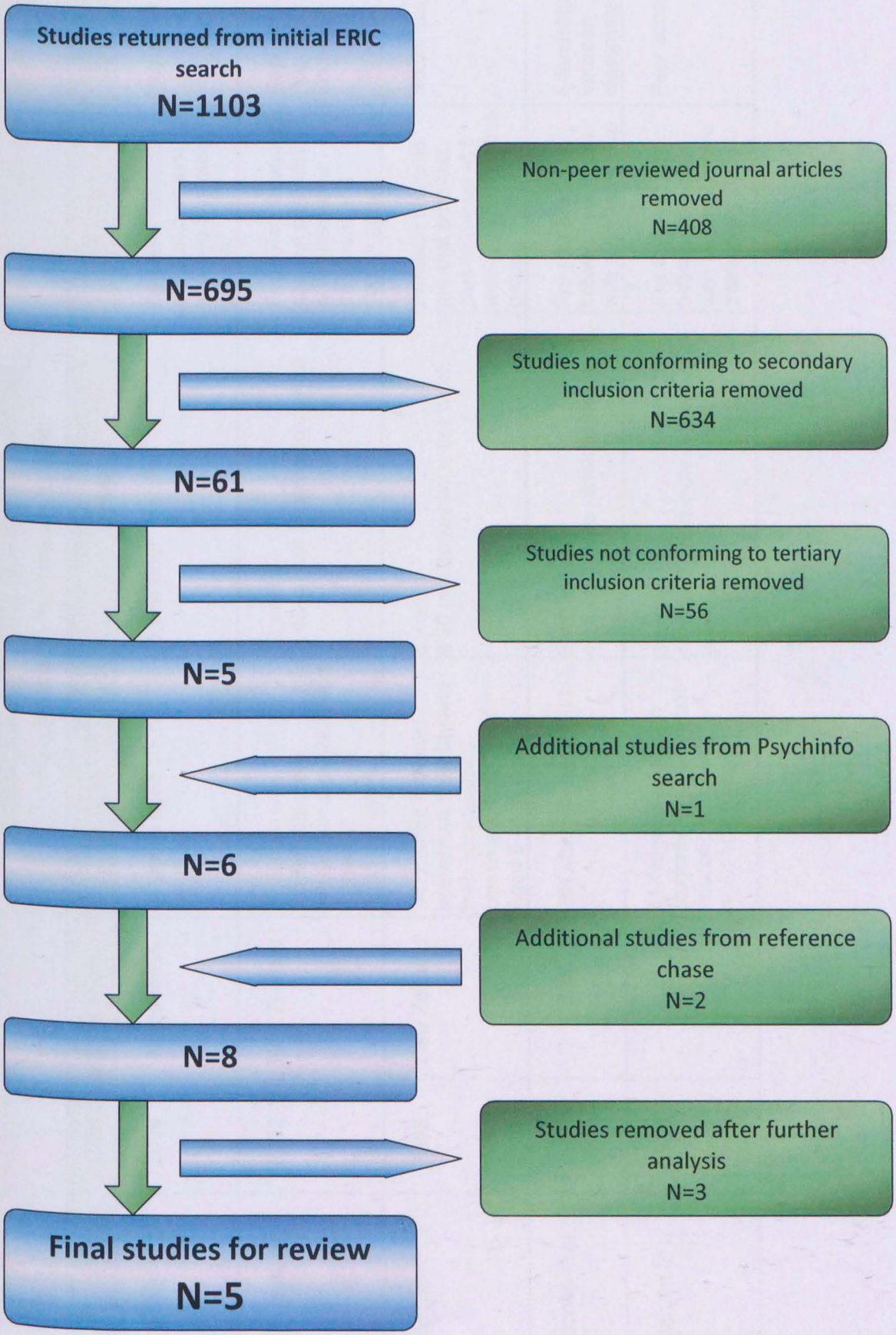


Figure 4.5: Summary of Selected Studies

* quoted directly from research paper

Author(s)	Date	Location	Participants*	Intervention Duration and Intensity	Design	Dependent Variable(s)*
Oortwijn et al	2008	Netherlands	94 pupils aged 10-12 years	11 one-hour lessons	Between subjects pre-test post-test with two treatment groups.	Popularity
Piercy et al	2002	New Zealand	6 children with moderate/severe intellectual disabilities and 45 peers* Aged 6-8 years	10 weeks 2 40-minute sessions per week	Repeated measures pre-test post-test with alternative treatment and control group	Peer acceptance Popularity Social distance
Jacques et al	1998	New Zealand	24 children with mild intellectual disability and their non-disabled classmates* Aged 9-11 years	6 weeks 4 30 minute sessions per week	Between subjects pre-test post-test plus follow-up at 5 weeks with a control group	Social acceptance
Jacobs et al	1996	USA	264 students aged 8-11 (3^{rd} – 5^{th} grades)	9 weeks 4 15-20 minute sessions per week	Pre-test post-test between subjects with a control group	Friendships between classmates
Putnam et al	1996	USA	417 regular education students and 41 special-education students* Aged 10-15 years	8 months At least 2 45-minute sessions per week*	Pre-test post-test between subjects with two alternative treatment groups.	Peer acceptance

4.2 Critical Analysis of Relevant Empirical Research

This section critically analyses the five articles selected through the systematic search strategy. These articles are summarized, and the major strengths and limitations of each are highlighted.

4.2.1 Oortwijn et al (2008)

Figure 4.6: Summary of Oortwijn et al (2008)

"Cooperative Learning and Peer Acceptance of Students with Learning Difficulties"

Oortwijn et al evaluated the effectiveness of a structured CL intervention on the 'popularity' of 94 pupils (aged 10-12 years) in five primary schools in the Netherlands. A between subjects pre-post measures design was employed across the two treatment groups. The two groups were distinguished by being made up of either ethnically homogenous or ethnically heterogeneous members.

A social status questionnaire was employed to ascertain pupils' perceptions of their peers before and after the intervention.

The results indicated that pupils in both groups rated their fellow team members as more popular after the CL intervention; however, the popularity ratings within ethnically heterogeneous teams were higher on average than those in the homogenous teams.

Strengths and Limitations of Design, Procedures and the CL Intervention Employed

External validity is promoted through the utilisation of a relatively large sample size across five locations, and the incorporation of treatment integrity observations encourages content validity (Cohen et al, 2007). However, the lack of a control group infers that extraneous variables such as classroom teaching practices and maturation effects could confound results (Robson, 2002).

Positive aspects of Oortwijn et al's (2008) CL intervention include the employment of a structured format, incorporating social skills training at the outset. However, the specific model of CL and teacher training methods are not specified, heterogeneous groupings are not employed and the intervention is of relatively short duration. These points will be discussed further within section 4.3

4.2.2 Piercy et al (2002)

Figure 4.7: Summary of Piercy et al (2002)

"Promoting the Social Acceptance of Young Children with Moderate-Severe Intellectual Disabilities Using Cooperative Learning Techniques"

Piercy et al (2002) evaluated the effectiveness of a CL programme upon the social acceptance of 6 children with moderate/severe intellectual difficulties and 45 peers (aged 6-8 years) in New Zealand. A repeated measures pre-post test design was employed across the treatment (CL programme), alternative treatment (social contact programme) and control (no classroom contact) groups.

Three measures were employed to ascertain pupils' perceptions of their peers before and after the intervention; a peer acceptance measure, a popularity index and a social distance scale.

Results indicated that children without disabilities in the cooperative group gave the 6 focal children significantly higher peer acceptance ratings, increased popularity indices and lower social distance ratings. These changes were not apparent in either of the other two conditions.

Strengths and Limitations of Design, Procedures and the CL Intervention Employed

Internal validity is promoted through the employment of a control group and the random allocation of participants to groups (Cohen et al, 2007). Also, the utilisation of multiple measurement instruments encourages concurrent reliability through enabling results to be triangulated (Cohen et al, 2007). However, external validity is compromised due to a small sample size, and a

lack of treatment integrity measurements may reduce content validity. Furthermore, the repeated measures design could introduce order effects (Robson, 2002), thus limiting internal validity.

Positive aspects of Piercy et al's (2002) CL intervention include the employment of a structured format, incorporating social skills training at the outset, and the specification of the model of CL used, which is the Johnson and Johnson 'conceptual' model (see section 3.4.1). However, the teacher training methods and make-up of the cooperative groups are not specified, and the intervention is of relatively short duration. These points will be discussed further within section 4.3

4.2.3 Jacques et al (1998)

Figure 4.8: Summary of Jacques et al (1998)

"Cooperative Learning and Social Acceptance of Children with Mild Intellectual Disability"

Jacques et al (1998) employed a between subjects pre-test post-test design (with a follow-up) in order to investigate the effects of the participation of 'non-disabled' children in a Cooperative Learning programme on their social acceptance of 24 peers with mild intellectual disability. The children were all within the 9-11 age range, and the study was conducted in New Zealand.

'Non-disabled' children in the experimental (CL programme) classes showed significant increases in their social acceptance (measured by sociometric ratings) of the children with mild intellectual disability, both immediately following the programme and after a 5-week interval. No such increases were evident for the children in the control classrooms.

Strengths and Limitations of Design, Procedures and the CL Intervention Employed

Internal validity is promoted through the employment of a control group and the random allocation of participants to groups (Cohen et al, 2007). Also, the incorporation of follow-up measures enables the establishment of maintenance effects, and the number of settings in which the intervention was implemented

(n=21) promotes the generalisability of the results obtained (Robson, 2002). However, treatment integrity measurements remain unspecified and thus content validity is limited. Furthermore, as the focus children are selected according to a specific criterion (mild intellectual disability) it is not possible to generalise outcomes beyond this client group.

Positive aspects of Jacques et al's (1998) CL intervention include the employment of heterogeneous groupings, and the specification of the model of CL used, which is the Slavin model (see section 3.4.3). However, the teacher training methods and the incorporation of social skills training are not specified, and the intervention is of relatively short duration. These points will be discussed further within section 4.3

4.2.4 Jacobs et al (1996)

Figure 4.9: Summary of Jacobs et al (1996)

"Effects of a Cooperative Learning Method on Mathematics Achievement and Affective Outcomes of Students in a Private Elementary School"

Jacobs et al (1996) compared the 'friendship' of students taught under Cooperative Learning methods (n=133) to those taught under 'traditional instruction' (n=131) in a large private elementary school in the USA.

A pre-test post-test, between subjects, control group design was employed. All students were aged between 8 and 11 years old (USA grades 3-5).

Results indicated that friendship ratings were significantly inflated for the treatment group in the grade 4 (age 9-10) classes. However, no significant differences were apparent between control and intervention groups at grade 3 and grade 5 levels.

Strengths and Limitations of Design, Procedures and the CL Intervention Employed

Internal validity is promoted through the employment of a control group, and the relatively large sample size (n=264) promotes the generalisability of the results

obtained (Robson, 2002). However, treatment integrity measurements are not conducted and thus content validity may be reduced. Furthermore, this study was conducted within a single setting and so findings cannot be validly generalised beyond this context (Cohen et al, 2007), and the employment of unstandardised measurement instruments potentially limits the reliability of findings.

Positive aspects of Jacobs et al's (1996) CL intervention include the employment of heterogeneous groupings, and the specification of the model of CL used, which is the Slavin STAD model (see section 3.4.3). Also, teacher training and support mechanisms are described in detail. However, the incorporation of social skills training remains unspecified, and the intervention is of relatively short duration. These points will be discussed further within section 4.3

4.2.5 Putnam et al (1996)

Figure 4.10: Summary of Putnam et al (1996)

"Cooperative Learning and Peer Acceptance of Students with Learning Disabilities"

This study examined the effects of CL on 417 regular-education students' acceptance of 41 of their special-education classmates. Participants were in Grades 5-8 (aged 10-15) in 21 classes across 2 schools in the USA.

A pre-test post-test between subjects design was employed, with a treatment group (Cooperative Learning) and two comparison groups (both competitive learning). The two comparison groups differed in that one was taught by the same teachers as in the cooperative condition, while the other was taught by a random sample of teachers.

The 'regular education' students rated each of their classmate's desirability as a work partner, with results indicating significantly more positive changes in peer ratings for both types of classmates in the cooperative condition than in the competitive conditions.

Strengths and Limitations of Design, Procedures and the CL Intervention Employed

The relatively large sample size (n=458) promotes the generalisability of the results obtained, and the incorporation of treatment integrity measurements potentially enhances content validity (Cohen et al, 2007). However, the lack of a control group detracts from this study's internal validity, and external validity may be compromised due to the focus upon only a specific population (children with intellectual difficulties) (Robson 2002). Furthermore, the 'naturalistic' sampling method utilised may increase this studies' susceptibility to bias, and threaten validity through the introduction of potentially unequal groups (Robson, 2002).

Positive aspects of Putnam et al's (1996) CL intervention include the specification of the model of CL used, which is the Johnson and Johnson 'conceptual' model (see section 3.4.1). Also, teacher training and support is rigorously conducted, and the intervention is of longer duration than the other studies reviewed. However, the incorporation of social skills training remains unspecified, as does the grouping strategy for the CL activities. These points will be discussed further within section 4.3

4.3 Synthesis of Studies

Finally, it is necessary to synthesize the strengths and limitations of the design and procedures utilised within the five selected studies, as well as the types of CL interventions employed and the outcomes produced. This information is summarized below (figure 4.11), and covered in more detail overleaf.

Figure 4.11: Synthesis of Selected Studies

	Factor	Oortwijn et al (2008)	Piercy et al (2002)	Jacques et al (1998)	Jacobs et al (1996)	Putnam et al (1996)
DESIGN & PROCEDURES	Pre-post measures	✓	✓	✓	✓	✓
	Control group employed	✗	✓	✓	✓	✗
	Context	5 schools (Neth'lands)	N/a New Zealand	21 schools New Zealand	1 school USA	2 schools USA
	Inclusion criteria	All children included	Intellectual disability	Intellectual disability	All children included	Intellectual disability
	Dependent variable	Popularity	3 variables - See fig 4.6	Social acceptance	Friendship	Peer acceptance
	Random allocation	✗	✓	✓	✓	✗
	Sample size and age	94 10-12 years	51 6-8 years	24 9-11 years	264 8-11 years	417 10-15 years
	Treatment integrity	✓	✗	✓	✗	✓
INTERVENTION	Structured format	✓	✗	✗	✗	✗
	Model of CL employed	✗	Johnson and Johnson	Slavin	Slavin	Johnson and Johnson
	Duration (hours)	11	13	9	9-12	54
	Heterogeneous groups	✗	✗	✓	✓	✗
	Teacher training	2 hours	✗	✗	Initial training + support	34 hours total
CONCLUSIONS	Limitations discussed	✓	✓	✗	✓	✗
	Professional Practice	✗	✗	✗	✗	✗
	Future Research	✗	✓	✗	✗	✗
	Ethics discussed	✗	✗	✓	✗	✗

4.3.1 Synthesis of Strengths and Limitations of the Research Designs and Procedures Employed

First, it should be noted that all of these studies were conducted in 'real-world' settings, which lowers the amount of control the researcher has over variables such as treatment fidelity (McMaster and Fuchs, 2002). However, this does make participants less prone to demand characteristics, and promotes external validity for an intervention that is intended to be implemented in such settings (Robson, 2002).

A relative strength of all five studies concerns their employment of both pre- and post- measures, which enables determination of the intervention's effectiveness through analysis of differences between pre- and post-test scores (Robson, 2002). However, only three papers incorporated a control group and random allocation within their design, with two studies (Oortwijn et al (2008) and Putnam et al (1996)) accounting for neither factor. This infers that extraneous variables such as history and maturation effects could have confounded the results of these two studies, making any findings more susceptible to bias, as it is difficult to be sure whether any outcomes are due to the intervention alone (Petticrew and Roberts, 2008). Furthermore, a failure to randomly allocate participants to groups may threaten the validity of these two studies through the introduction of potentially unequal groups (Robson, 2002).

Sample sizes were relatively small in two of the papers reviewed (Piercy et al (2002) and Jacques et al (1998)) thus limiting external validity as the results may not be generalised beyond these populations. Similarly, three studies employed participants according to a specific inclusion criterion (children with 'learning disabilities') and thus outcomes from these papers cannot be assumed to generalise beyond these populations (Cohen et al, 2007).

Finally, treatment integrity was not accounted for in two of the five papers (Piercy et al (2002) and Jacobs et al (1996)), meaning that the intervention

could have been administered inconsistently by different implementers, which could impair the reliability of results (Robson, 2002).

Overall, this synthesis has highlighted a number of methodological flaws present in all of the five studies reviewed, which threaten the validity and reliability of the results produced, meaning that outcomes from all of the papers must be interpreted with caution.

4.3.2 Synthesis of Strengths and Limitations of the Cooperative Learning Interventions Employed

There are also several limitations associated with the implementation of the CL programmes conducted within these research articles. This is a particularly important area for CL interventions, as research pertaining to the benefits of CL has consistently suggested that the manner in which it is implemented has a major impact upon the success of the programme (Jenkins and O'Connor, 2006), as suggested within sections 3.5 and 3.9.

First, only one of the studies (Oortwijn et al, 2008) utilised a structured format, incorporating social skills training at the outset of the intervention, which is an approach advocated within the research literature. as stated within section 3.5.1. Also, intervention duration was relatively short in four of the studies accessed. The validity of measuring variables relating to peer acceptance over such a short duration has been questioned by several authors in the field (eg Murphy et al, 2005).

Furthermore, heterogeneous groupings, a factor that is considered crucial by several authors for the successful implementation of CL (eg Dugan et al, 1995), were employed by just two papers (Jacques et al (1998) and Jacobs et al (1996)), thus potentially compromising the effectiveness of the remaining three interventions.

Finally, the incorporation of teacher training for implementers was present in only three pieces of research (Oortwijn et al (2008), Jacobs et al (1996) and Putnam et al (1996)). The training provided for those required to implement cooperative interventions is particularly important to outcomes (Murphy et al, 2005), as it becomes impossible to determine the efficacy of a CL programme if the technique has not been implemented correctly in the first place.

One positive aspect, however, in contrast to the bulk of research on CL in general, as presented within section 3.9, was that four of these studies described the model of CL employed, which is a vital factor in determining the outcome of a CL programme (Murphy et al, 2005). However, overall, none of the five studies fulfilled all the criteria highlighted within chapter 3 as being necessary for a CL intervention to be implemented appropriately.

4.3.3 Synthesis of Outcomes

Overall, the small number of studies that have been reviewed support the conclusion that Cooperative Learning can promote peer acceptance within the classroom. This has been shown to occur across participant groups (children with and without intellectual difficulties), age of participants (6-15 years), geographical locations (USA, New Zealand and the Netherlands), and educational settings. Four of the five studies reviewed reported significantly enhanced peer acceptance for the CL treatment group over control or comparison alternatives, with only one study (Jacobs et al, 1996) reporting mixed findings.

Finally, conclusion sections were relatively brief in all five studies, with limitations explored in three articles, future research and ethics discussed in only one study, and implications for professional practice not being considered in any papers.

Overall, despite the consistency in terms of positive outcomes, the shortcomings associated to design and procedural flaws and implementation of

the CL programmes mean that firm conclusions regarding the efficacy of CL upon peer acceptance cannot be drawn from these studies, as all outcomes must be treated with caution.

Aspects of the rationale for conducting the current project stem from these deficiencies, and will be explained fully in the next chapter.

Chapter 5: Rationale

This chapter draws out the rationale for this study from the concepts discussed within the literature review thus far, demonstrating the importance of conducting the current study and how it will contribute to the current body of research. Subsequently, the research questions and hypotheses to be employed for this study will be highlighted, having arisen from limitations within the current body of literature.

5.1 The Potential of Cooperative Learning to Promote Peer Acceptance

One of the factors contributing to the rationale for this project is the importance of promoting peer acceptance. This was highlighted in chapter two, which referred to peer acceptance as being associated with social and emotional development (Bierman, 2004), increased school achievement (Frederickson and Cline, 2005) and a lower incidence of several long-term consequences including mental health difficulties and criminality (Parker and Asher, 1997).

It is, therefore, vital that interventions potentially promoting peer acceptance, such as Cooperative Learning, are empirically validated. If shown to be successful, the intervention can then be implemented on a wider scale; if not, alternative strategies can be investigated.

This aspect is made doubly important by the view within the literature that current intervention programmes aimed at promoting peer acceptance are *"almost always based on a child deficit model"* (Harrist and Bradley, 2003, p186), thus ignoring the important role of the peer group, as described within section 2.4.

CL interventions have the potential to concurrently address all of these areas, thus supporting the dominant thread in the literature pertaining to promoting

peer acceptance, which is that interventions must simultaneously address both the skills and cognitions of the individual child, and involve the peer group surrounding the child in order to facilitate positive outcomes (Bierman, 2004).

It is crucial for intervention strategies, such as CL, that have the potential to address all of the contributory factors to peer acceptance, to be empirically studied. Validation of the effectiveness of such programmes has been rare (Harrist and Bradley, 2003), however, which is why the current project is considered a vital step in contributing to an important factor in promoting positive outcomes for children.

5.2 Insufficient Empirical Evidence

Very little previous research has investigated the effectiveness of CL with respect to peer acceptance. Indeed, chapter four illustrated only five pertinent studies in a systematic search of this topic, despite social outcomes being touted within the literature as a major selling point of cooperative programmes (Murphy et al, 2005). These limitations have also been recognised by contributors within the empirical literature on this subject, for example Dugan et al (1995, p185) remark, *"the research for ... Cooperative Learning ... is suggestive rather than conclusive"*, and Bierman (2004, p248/9) states that *"further exploration of CL is warranted"*. Conducting this study is, therefore, imperative in order to establish a more comprehensive evidence base.

Furthermore, not one of these studies were conducted in the United Kingdom, and the majority did not employ populations representative of mainstream educational settings, instead focussing upon specific groups of children, such as those with learning difficulties (eg Piercy et al, 2002). This creates further emphasis upon the importance of conducting the present study, as previous research cannot be validly generalised to a UK, mainstream educational context.

5.3 Limitations of the Research Body

In addition to the small amount of relevant research indicated above, there are several shortcomings within the literature on this topic. This further contributes towards the rationale for conducting this research, as these factors must be addressed if the effectiveness of CL in promoting peer acceptance is to be ascertained reliably.

The five studies reviewed in chapter 4 do support the notion that CL is an effective strategy for promoting peer acceptance; however, these results cannot be considered conclusive due to several limitations within their designs. It would have been desirable for these studies to –

- Incorporate a control group.
- Focus upon client groups other than children with 'intellectual disabilities'.
- Randomly allocate participants to treatment or control groups.
- Account for potential confounds relating to treatment integrity.

The manner in which the CL interventions were implemented in these papers also impacts negatively upon the confidence with which outcomes can be reported. Potential improvements to the implementation of the CL interventions could include –

- Social skills training at the outset (structured format).
- Employing heterogeneous groupings within CL procedures.
- Increasing the duration of the CL intervention.
- Enhanced teacher training.

Finally, only a minority of these studies discussed ethical considerations and implications for future research and professional practice, all of which will be addressed by the current study.

5.4 Making a Significant and Original Contribution

It is felt, therefore, that this study can make a significant and original contribution to the knowledge base in this area by evaluating the effectiveness of an intervention that has the potential to produce positive social outcomes for children, but has received little previous empirical attention, particularly in the UK. This study will also contribute to the knowledge base through overcoming many of the methodological shortcomings and difficulties pertaining to the CL interventions employed by previous research in the area.

This study also aims to make a significant contribution to the professional practice of Educational Psychologists through demonstrating the effective role an EP may fulfil through working as a research practitioner, and, perhaps most importantly, by influencing the way in which EP's might promote peer acceptance within schools in their Local Authority. This point is discussed further in chapter 9.

This original contribution intends to be made by addressing the research questions proposed below.

5.5 Research Questions and Hypotheses

The overarching aim of this project is to evaluate the effectiveness of a Cooperative Learning intervention in enhancing peer acceptance in a mainstream primary school. In order to achieve this aim, it is necessary to address a number of research questions.

First, it is first important to account for the two major contexts within which social interactions occur within the school environment, the 'work' and 'play' contexts (Frederickson and Furnham, 1998a), and so the research questions reflect this. Also, as described within section 2.3.5b, opposite sex classmates may regard each other significantly more negatively than their same sex counterparts in the 8-12 year age group (Bukowski et al, 1993); thus potentially

invalidating any attempts to consider the class group as a whole. The research questions must, therefore, echo this phenomenon by regarding same-sex and opposite-sex peer groups as,

> *"interrelated but discrete social subsystems within the classroom"* (Frederickson and Furnham, 1998b, p930).

The four research questions are presented below –

1. ***Does Cooperative Learning enhance peer acceptance between same-sex peers in the work context?***

2. ***Does Cooperative Learning enhance peer acceptance between opposite-sex peers in the work context?***

3. ***Does Cooperative Learning enhance peer acceptance between same-sex peers in the play context?***

4. ***Does Cooperative Learning enhance peer acceptance between opposite-sex peers in the play context?***

However, as a structured format of CL is to be employed for this project, as described within section 7.6.5, which incorporates social skills training at the outset, a further salient research question arises -

5. ***Does Cooperative Learning increase self-reported 'prosocial behaviours'?***

Finally, the employment of the Strengths and Difficulties Questionnaire (Goodman 1997), as discussed within section 7.7.6, provides a second avenue for investigating the overarching aim of this project, and conjures the final research question -

6. ***Does Cooperative Learning decrease self-reported 'peer problems'?***

It is also crucial to formulate a hypothesis related to each research question. These are posited below –

1. ***Cooperative Learning will enhance peer acceptance between same-sex peers in the work context.***

2. ***Cooperative Learning will enhance peer acceptance between opposite-sex peers in the work context.***

3. ***Cooperative Learning will enhance peer acceptance between same-sex peers in the play context.***

4. ***Cooperative Learning will enhance peer acceptance between opposite-sex peers in the play context***

5. ***Cooperative Learning will increase self-reported 'prosocial behaviours'.***

6. ***Cooperative Learning will decrease self-reported 'peer problems'.***

The null hypothesis is stated below –

Cooperative Learning will not enhance peer acceptance between same-sex or opposite-sex peers, within either the work or play contexts. Cooperative Learning will not increase self-reported 'prosocial behaviours' or decrease self-reported 'peer problems'.

Ways through which these research questions and hypotheses will be addressed are described within the next two chapters.

Chapter 6: Epistemology and Design

This chapter first locates the researcher's epistemological stance, before drilling down to consider the research design within which this project operates.

6.1 The Nature of Research

Cohen et al (2007, p6) outline three distinctive characteristics of research –

- Research is systematic and controlled.
- Research is empirical. Objective facts and tests are preferred to subjective, personal beliefs.
- Research is self-correcting. Procedures and results are open to public scrutiny by fellow professionals, with incorrect results being revised or discarded over time.

However, research can be conceptualised within a number of different paradigms, a selection of which are considered subsequently.

6.2 Research Paradigms

Several competing research paradigms coexist within psychological and educational research (Cohen et al, 2007). These range from the *"traditional"* positivist view to the *"alternative"* interpretive conceptualisation (Cohen et al, 2007, p9), to several others including *"critical theory", "feminist theory"* and *"complexity theory"* (Robson, 2002, p16). This section will describe some of these major paradigms, before outlining the stance adopted by the researcher for the current study.

6.2.1 Positivistic and Naturalistic Paradigms

Positivism adopts the methods of natural science as the paradigm of human knowledge (Lunt, 1998), striving for,

> *"...objectivity, measurability, controllability, the construction of laws and rules of behaviour, and the ascription of causality"* (Cohen et al, 2007, p26).

The researcher is conceptualised as an observer of social reality, whose role is to analyse and interpret their subject matter (Cohen et al, 2007).

Conversely, *"naturalistic"* or *"interpretive"* (Cohen et al, 2007, p9) approaches to research (*referred to by Robson (2002, p16) as 'relativism' or 'constructionism'*) posit that human behaviour cannot be governed by universal laws and is not characterised by underlying regularities (Cohen et al, 2007). This paradigm, while sharing the same goal as positivistic approaches to describe and explain human behaviour, strives to understand the world in terms of its conscious, purposive actors (Cohen et al, 2007). Research is thus conceptualised as a subjective undertaking concerned with the direct experiences of participants within specific contexts.

However, several authors (eg Robson, 2002) suggest that positivism is overly dependent on operationalism, leads to determinism and reductionism, and ignores the complexity of human behaviour (Lunt, 1998), thus reducing behaviour to technicism and neglecting to account for individual differences (Cohen et al, 2007). Indeed, the dominance of the positivist model has diminished as these criticisms have gathered support (Norwich, 1998).

Naturalistic approaches also have their critics (eg Fletcher, 1996), however, who believe that proponents of this anti-positivist view have gone too far in relegating scientific procedures of verification. It is argued that such paradigms reduce any chance of discovering potentially useful generalisations pertaining to human behaviour (Cohen et al, 2007), and neglect the influence of external forces to shape behaviour. This potentially runs the risk of placing artificial boundaries around participant's behaviours,

as any events observed are believed to be isolated from the outside world (Cohen et al 2007).

6.2.2 New Research Paradigms

In recent years a number of research paradigms have evolved in response to the criticisms of positivist and interpretive viewpoints espoused above (Bentz and Shapiro, 1998). One such paradigm, which resonates with the epistemological stance adopted by the researcher for the current study, is defined by Lunt (1998) as 'post-positivism'.

Post-positivism recognises and accepts that the experiences and values of the researcher can influence what is observed and reported (Reichardt and Rallis, 1994), yet retains a commitment to objectivity which is understood through the recognition of these potential confounds (Robson, 2002).

Rather than subscribing to the positivist notion that one true reality exists, with the researcher's role being to discover what this is, post-positivists believe that reality can only be known imperfectly due to the inherent limitations and biases present within the researcher (Lunt, 1998).

Adherence to this paradigm is reflected in the current study through the employment of quantitative methodology and detailed procedural descriptions, typical of the positivist paradigm, but with a simultaneous recognition of the importance of contextual variables and the potential impact of these upon the generalisability of outcomes, as discussed in chapter 9.

6.2.3 The Relationship between Epistemology and Research Design

Epistemology and design are intrinsically linked (Robson, 2002), with quantitative approaches often associated to the positivist stance and

qualitative designs more generally paired with paradigms at the naturalistic end of the epistemological spectrum (Cohen et al, 2007).

In 'traditional' quantitative, positivist research variables are isolated, controlled and manipulated in contrived settings (Cohen et al, 2007), whereas qualitative, naturalistic study demands a deliberate lack of variable manipulation in a naturally occurring environment (Cohen et al, 2007). Indeed, the choice of research questions, the characterisation of participants, the types of data sought and the methodologies employed are all influenced by the stance espoused by the researcher (Cohen et al, 2007).

The current study attempts to control extraneous variables and manipulate the independent variable; but is conducted within a naturalistic school environment, which further supports the notion that this study can be most accurately conceptualised within the post-positivist paradigm, as a commitment to objectivity is promoted, yet the influence of potential biases introduced through the naturalistic setting are duly recognised.

The post-positivist stance adopted by the researcher also indicates that the design for this study will follow a quantitative format, which forms the subject matter for the next section.

6.3 Quantitative Designs

An overview of experimental designs is presented below, before narrowing the focus to quasi-experimental designs, as these are most salient for the current project.

6.3.1 Experimental Designs

Robson (2002) outlines several features common to experimental designs –

- The manipulation of one or more variables by the researcher.

- The control of all other variables.
- Allocation of participants to either an experimental or a control group.

Cohen et al (2007) draw attention to two major strands within experimental design –

- The 'controlled' or 'true' experiment; conducted within a laboratory environment in order to gain maximum control over variables.
- The 'field' or 'quasi-experiment', conducted in a natural setting, such as a school, but with variables still isolated, controlled and manipulated.

In addition to environmental discrepancies, the major difference between these two designs pertains to the random allocation of participants to the control or experimental groups. True experimental designs prescribe participants to either experimental or control groups randomly, quasi-experimental studies do not. This, and further aspects of quasi-experimental research designs are discussed below.

6.3.2 Designing the Current Study: Quasi-Experimental Design

Specifying the design of this study is vitally important, as judgements pertaining to the reliability and validity of outcomes cannot be made confidently otherwise, and accurate replication cannot be attempted.

The overarching methodology employed by the current project is 'quasi-experimental', which is defined as,

> *"...a research design involving an experimental approach but where random assignment to treatment and comparison groups has not been used"* (Robson, 2002, p133).

The type of quasi-experimental design utilised is a ***"pre-test post-test non equivalent groups design"*** (Robson, 2002, p138). This involves first setting up the experimental and control groups on a basis other than random

assignment. For the purposes of this study the whole-class groupings utilised for experimental and control conditions had been devised previously on a non-random basis by the school to reflect a balance of gender and educational attainment levels within each class. Both groups are then pre-tested. The experimental group then receives the intervention, while the comparison group receive no special treatment. Finally, post-tests are administered to each group concurrently. This design is reflected through the procedures adopted in the current study, described within chapter 7.

6.3.3 Rationale for the Design Employed

Random allocation to control and experimental groups was not possible, due to the necessity of administering the intervention to whole class groups. Therefore, a true experimental design could not be employed, necessitating the utilisation of the quasi-experimental design described above.

However, despite the assertion of most writers on the topic (eg Scott et al's *'hierarchy of evidence'* (2001)) that quasi-experiments are a fallback choice to consider only when random allocation is not possible (Robson, 2002), this design was not adopted purely out of necessity. There are many features that make quasi-experimentation a desirable design for this study –

- Non-random allocation is deemed appropriate by the researcher as the school had kept these classes substantially intact from year to year, and thus children within each class could be expected to know each other relatively well. Therefore, any pre to post-test discrepancies in peer acceptance could be more attributable to the intervention than to a factor relating merely to the children getting to know each other better, as may have been the case if they were randomly allocated and thus more unfamiliar at the outset.

- It is vital to match the methodology employed to the research questions under investigation (Lindsay, 1998), with Harrington (2001) drawing a distinction between the research questions 'Does it work?' and 'Can it

work?'. The question 'Does it work?' concerns effectiveness, thus requiring the utilisation of a study that replicates practice conditions (Frederickson, 2002). This study addresses such research questions, as presented in chapter 5, which are thus best served by a quasi-experimental design conducted within a practice setting.

- Quasi-experimental designs emphasise the importance of contextual factors upon the effectiveness of an intervention, essentially addressing the question *"what works, for whom, and in what circumstances?"* (Robson, 2002, p139). This correlates strongly with the emphasis on rich contextual description advocated by the Development and Research Programme in Educational Psychology, under whose umbrella this study is conducted. A detailed contextual description is presented within chapter 7.

- Quasi-experimental designs possess greater external validity than true experiments due to their location within practice settings rather than within laboratory environments. Results produced can thus be considered more compatible with practice (Frederickson, 2002).

- Quasi-experiments share several of the positive features associated with true experimentation (Cohen at el, 2007), including dealing with threats to validity (covered in detail within section 7.8.2), and transcending individual differences, thus potentially identifying processes that can be linked to social structures and group features (Robson, 2002).

There are also strengths specific to the *"pre-test post-test non equivalent groups design"* (Robson, 2002, p138) utilised for this research –

- Pre-testing enables for direct checking upon the equivalency of groups before the intervention commences (Robson, 2002), and also allows for pre-post test differences to be calculated in order to assess the effectiveness of the treatment (Robson, 2002).

- The employment of a control group assists in more reliable determination of causality through controlling for extraneous variables (Petticrew and Roberts, 2008). This enhances the studies' resilience to the 'maturation' and 'testing' threats to validity (Robson, 2002), as described within section 7.8.2a.

However, it is also imperative to acknowledge the limitations inherent within this design –

- Quasi-experiments are susceptible to some of the limitations present within true experimentation, such as experimenter effects and demand characteristics, which could threaten the reliability of outcome data (Cohen et al, 2007).

- A failure to randomly allocate participants can threaten internal validity through the introduction of potentially unequal groups (Franklin et al, 2008).

- Conducting this study within a practice setting may enhance external validity; however, it is more difficult to control extraneous variables in such environments (Frederickson, 2002). This means that interpretations pertaining to the effectiveness of the intervention must be offered more cautiously as these potential confounds may impact upon the results obtained.

Having discussed epistemological considerations and the design of the current study, chapter 7 will consider the methods and procedures employed by this project.

Chapter 7: Research Procedures and Methods

"The aim of methodology is to help us to understand ... not the products of scientific enquiry but the process itself" (Cohen et al, 2007, p47)

The Development and Research Programme in Educational Psychology (D&R) demands a systematic framework for study description, in order that a high level of quality and consistency can be achieved between participating projects. For this reason, and also to demonstrate how the research questions were addressed and to promote replicability, this chapter will adhere to these guidelines (Nottingham University, 2009). This will be achieved through the provision of detailed information pertaining to –

- The research participants.
- The systemic context within which this research was conducted.
- The intervention.
- Pupil outcomes.

Detailed discussions pertaining to validity and reliability, and salient ethical issues will also be presented. However, this chapter will not consider the relative strengths and limitations of the methodologies employed for this study. This topic will be continued within chapter 9.

All methodological considerations will be described with reference to an overarching procedural framework, which is presented in appendix 7.1.

7.1 Initial Decisions

Cooperative Learning was initially encountered by the researcher during the observation of a training session run by a colleague in September 2008. Exploratory research upon this intervention had previously been published

by a member of the researcher's Educational Psychology Service (Davison et al, 2008), and so it was felt that further research pertaining to the effectiveness of Cooperative Learning could build upon this work, while simultaneously fitting closely within service priorities promoting inclusive practice and social development. Evaluating the effectiveness of a Cooperative Learning intervention also satisfied the criteria of the D&R programme outlined in the introduction section of this study, and would potentially promote positive outcomes for children within the Local Authority.

Originally, this study had intended to focus upon the social inclusion of children with Autistic Spectrum Disorder within a mainstream environment; however, it was soon understood that this would prove logistically impossible as the CL intervention necessitated participant involvement at a whole class level. It was anticipated that there would be very few focus participants per class, meaning that a very large number of pupil participants would need to be involved to gain data upon the necessary amount of focus children. This level of participation would have been beyond the resources of the current study. This remains a topic for future research, however, as discussed within section 9.4.2c.

It was subsequently decided to focus upon social inclusion for children 'at risk of exclusion from school'; however, after initial reading upon Cooperative Learning the researcher finally opted to focus upon all children within the class groups, as the literature suggested that peer group rejection can be detrimental not only for individual children who are not readily accepted by the peer group, but also for their peers (Sunwolf & Leets, 2004) and those instigating the rejection (Wheeler, 2004).

Furthermore, the systematic literature review presented in chapter 4 identified that little previous research focussing upon social outcomes, conducted within the UK or internationally, had employed populations representative of mainstream educational settings, instead focussing upon specific groups of children, such as those with learning difficulties (eg Piercy et al, 2002). This CL intervention was thus employed on a whole-class basis,

as it could potentially produce positive outcomes for all children within the class, while simultaneously contributing originally to research in this area.

7.2 Sampling

It is imperative to highlight how participants came to be involved in this study, in order that consumers of this research can ascertain the validity and reliability of the sampling methods employed, and thus the outcomes achieved.

7.2.1 Participant Selection

An initial Cooperative Learning training session (section 7.5.1) was conducted in April 2009 by the researcher and a colleague from the Educational Psychology Service. During this session a brief outline of this research project was presented (appendix 7.3).

Seven attendees expressed interest in participating in the current study after this presentation, two of whom were selected as they worked in schools that fulfilled the initial inclusion criteria outlined within section 7.2.2.

It was recognised that this non-probabilistic, volunteer sampling strategy (Cohen et al, 2007) limited the sampling frame to teachers attending the initial training session, thus impacting negatively upon the final number of participants. However, there was no viable alternative, as it was essential for teachers participating in the study to have attended the training, which had been organised prior to the commencement of this project. Further limitations of this strategy will be considered in chapter 9.

It soon became readily apparent that it would not be possible for one of the selected implementers to conduct the intervention, as all teachers within this school would be implementing Cooperative Learning strategies from September 2009. Therefore, it would not be possible to employ a control

group in this setting (a vital design feature for this study, as highlighted within chapter 6), and so data from this school could not be incorporated into the analysis. The project did continue as planned in this school; however, it was employed as a contingency in case of project termination in the other setting.

Therefore, one teacher implemented the CL intervention with one class, with the second form in this year group participating as a control class. The control class would receive the CL intervention at a later date, as described within section 7.6.9. All children within the selected class groupings participated due to the nature of the intervention, making further sampling within the selected school unnecessary.

7.2.2 Inclusion Criteria

In order to be considered for this study, settings had to conform to the following criteria –

- Mainstream Primary School within the researcher's Local Authority.
- Two form entry or greater.
- Cooperative Learning techniques must not have been employed since the current pupil participants have attended the school (4 years).

To run the intervention group, teacher participants had to conform to these criteria –

- None, or very little, experience of Cooperative Learning structures. This was ascertained through an audit conducted during the initial training session (appendix 7.4), which indicated that the intervention group implementer had very little prior exposure to Cooperative Learning structures or principles.
- Must have attended the initial training session in April 2009.

To run the control group, teacher participants had to conform to the following criteria –

- None, or very little, experience of Cooperative Learning structures. This was ascertained through the audit (appendix 7.4), which indicated that the control group implementer had very little prior formal experience of Cooperative Learning structures or principles.
- Must not have attended the initial training session in April 2009.

No pre-intervention exclusion criteria were employed for pupil participants, as the intervention was employed on a whole-class basis, for the reasons described within section 7.1. However, a post-intervention exclusion criterion was implemented in relation to absence. Pupil participants had to be present for at least 80% of the CL sessions, as a figure lower than this could have impacted upon the effectiveness of the intervention for any particular child.

Absenteeism was monitored through an 'intervention diary' (appendix 7.5), in which the teacher noted the names of absentees from each individual CL session. This gave a more accurate record than the daily school register, as some children may have been present in school but not completed the CL session due to, for example, wave three interventions. This diary indicated that no children in either group fell below the 80% attendance level.

7.3 Participant Information

It is also essential to provide a rich description of the participants involved in this project, in order to aid replication and assist with the aggregation of findings for the overarching D & R project, a major focus of which is to ascertain the populations for which interventions are effective, addressing the question "*what works, for whom, and in what circumstances?*" (Robson, 2002, p139).

7.3.1 Total Number of Participants

Participants are illustrated in table 7.1 below –

Table 7.1 Number of Participants Involved in this Study

Participant	Number (N=)
Class Teacher (intervention group)	1
Class Teacher (control group)	1
Pupils (intervention group)	27
Pupils (control group)	27

Cohen et al (2007) posit that, as a *"rule of thumb"* (p101), a sample size above thirty is necessary for statistical analysis. This sample of 54 children in total can thus be deemed adequate for the statistical procedures utilised within chapter 8 to be performed.

7.3.2 Participant Characteristics

Characteristics of the pupil participants are detailed in table 7.2 below –

Table 7.2 Characteristics of Pupil Participants

Characteristic	Description
Age (*on 31/12/2009*)	Year: 4 (100%) Age Range: 8 years 4 months – 9 years 3 months Mean Age: 8 years 9 months
Gender	Male: 31 (57%) Female: 23 (43%)
Ethnicity	White British: 50 (93%) Chinese: 1 (2%) Any Other White Background: 1 (2%) Any Other Mixed Background: 2 (4%)
Free School Meal Entitlement	5 (9%)

Table 7.2 highlights a slightly larger number of males than females, a preponderance of White British participants over other ethnic backgrounds, and a relatively low proportion of children entitled to free school meals in comparison to the 2008 national average of 15.9% (bbc.co.uk).

7.4 Information about the Context

The systematic literature search did not unearth any previous research evaluating the effectiveness of CL upon peer acceptance conducted within the United Kingdom since 1990. This formed an important aspect of the rationale for the current study, as findings from international research may not necessarily generalise to a UK context. An accurate description of the

context in which this study was conducted is therefore imperative, and so a description of salient contextual features is provided within this section.

Contextual features relating to the school in which this project was conducted are illustrated within table 7.3 below.

Table 7.3 Features of the School Environment

(www.dcsf.gov.uk & www.ofsted.gov.uk)

Feature	Description
Location of School	Suburban setting within five miles of a large conurbation in North-West England
Type of School	Local Authority Maintained Community School
Size of School	463 pupils* Two form entry for each year group
Pupil Characteristics	Age range 3-11 Mixed gender Number of pupils with a statement or on School Action Plus = 26 (6%)* Number of pupils on School Action = 44 (9.5%)* Percentage absence = 2.8%*
Performance Indicators	Average points score per pupil for Key Stage 2 tests = 30.4* Key Stage 2 test results* – English - Level 4 or above = 94%, Level 5 = 44% Maths - Level 4 or above = 98%, Level 5 = 68% Science - Level 4 or above = 100%, Level 5 = 64% Unable to access KS2 tests = 0% (all subjects) KS1-KS2 value added score = 101.2
OFSTED (July 2009)	Overall effectiveness = Good (2)

*all figures relate to the 2008/2009 academic year

Table 7.3 highlights that this study was conducted within a suburban mainstream primary school in which the pupils,

> *"... are virtually all of White British heritage, with approximately half living within the immediate residential area ... they represent a variety of social and economic backgrounds. The proportion of pupils eligible for free school meals is below average, as is the proportion of pupils with learning difficulties and/or disabilities. The overall attainment of pupils is high."* (www.ofsted.gov.uk)

Finally, in terms of the human features of the context, it is noted that the motivation and engagement levels of management level staff within the school, and of the experimental group implementer, were high throughout the research process. Also, CL had been implemented previously at a whole school level in a nearby school, and so was familiar to several staff within the research context.

7.5 Training and Support for Implementers

Limitations pertaining to teacher training and support were highlighted within the literature review as a major shortcoming of the research body to date, as the majority of studies accessed for the review failed to incorporate any details relating to this, as highlighted in section 4.3.2. Training and support, therefore, is a particularly pertinent aspect of the rationale for the current study.

In order to address this point, the following overarching principles were adhered to, as suggested by (Davison et al, 2008). The training programme employed for this study was -

- Part of a coherent programme.
- Sufficiently extensive to allow work in schools, reflections and consolidations between sessions.
- Followed up by some support in school.

Methods through which these guidelines were incorporated into the training programme are described below.

7.5.1 Initial Training Session

This was a full day training session (9am-3:30pm) conducted in April 2009 at a primary school within close proximity to the intervention school, in which the curriculum is primarily taught using Cooperative Learning structures.

The training was led by the researcher's colleague from the Psychology Service, utilising materials already available within the service, as this complemented previous and future training to be conducted within the Local Authority on this topic.

Eight teaching staff from within the Local Authority attended, one of whom became the intervention implementer for the current study.

It is not possible to present the full training session due to publishing constraints; however, further information can be requested through the contact details provided within appendix 7.2. An overview of the content of this session is provided below –

- Introduction to Cooperative Learning principles.
- Teaching social skills.
- Benefits of Cooperative Learning.
- Cooperative Learning structures – The Doughnut, Think-Par-Share, The Grid, Numbered Heads Together.
- Ensuring CL principles are embedded within structures.
- Structuring Cooperative groups.
- Incorporating Cooperative Learning structures within lesson plans.
- Further practical considerations.

The content described above was complemented by several practical activities, in which all trainees participated in each CL structure introduced in the session.

Finally, the location of the training session also enabled all trainees to observe CL structures being implemented by experienced practitioners on two occasions during the day.

7.5.2 Support during the Summer Term 2009

In line with the third training principle described in section 7.5, resources containing detailed instructions for each of the four CL structures (appendix 7.6) were provided to the implementer by the researcher, alongside weekly electronic mail and telephone support.

During this time the implementer was encouraged to practise the four CL structures outlined in the initial training session with her current class, who would not be present during the intervention itself. This meant that the participants who would be exposed to the intervention in the autumn term 2009 were not involved prior to this time, while still enabling the implementer to familiarize herself with the structures before conducting the research intervention.

7.5.3 Second Training Session

A follow-up training session was conducted in September 2009, in line with the second training principle described in section 7.5. This was also a full day training session (9am-3:30pm) conducted in the same location as the initial training.

Again, the training was led by the researcher's colleague from the Psychology Service, utilising materials already available within the service. The same teaching staff attended as before.

As with the initial training session, it is not possible to present full details due to publishing constraints; however, further information can be requested

through the contact details provided within appendix 7.7. A summary of the most salient content from this session is outlined below –

- Consolidation of information from the initial training session.
- Reflections upon practice since the initial training.
- Structuring cooperative groups.
- Class building.
- Teaching social skills.
- Roles within cooperative groups.

The content of this session was again supplemented by a number of practical activities and observations of CL structures being implemented by experienced practitioners within the school.

7.5.4 Support during the Intervention

Formal feedback upon performance was offered to the implementer on three occasions by the researcher, immediately after each treatment integrity observation (see section 7.6.11). This feedback was based upon the criteria outlined within an observation checklist developed by the researcher (appendix 7.8), which in turn was based upon criteria suggested by Furtwengler (1992). These observations are also presented in appendix 7.8.

Informal support was provided throughout the intervention via weekly electronic mail or telephone contact.

7.5.5 Support following the Intervention

At the time of writing, ongoing support continues to be offered to the implementer by the researcher, in line with the third training principle outlined within section 7.5. Training for the control group implementer and all

teachers within the school will be conducted during the next academic year (2010/11).

7.6 Information about the Intervention

Research pertaining to the benefits of CL has consistently suggested that the manner in which it is implemented has a major impact upon the effectiveness of the programme (Jenkins and O'Connor, 2006). This section will, therefore, provide a detailed description of the intervention employed for this study.

7.6.1 Type of Programme

This intervention is a universal prevention programme as it is based upon the premise that all children will benefit from participation.

7.6.2 Theoretical Underpinnings of Intervention

CL draws extensively upon the contributions of multiple theorists (Fore III et al, 2006), with various theoretical perspectives offering different accounts of how CL facilitates learning (Jenkins and O'Connor, 2006). A selection of these underpinnings were reviewed in section 3.3.

7.6.3 Site of Implementation

The intervention was delivered within the participants' regular classroom environment, within a community primary school in the North West of England. Support sessions for implementers were also delivered in this location. A detailed contextual description is provided within section 7.4.

Training sessions took place in another community primary school in North-West England, within close proximity to the intervention setting.

7.6.4 The Independent Variable

The independent variable for this study was the method of teaching employed by the implementers. This consisted of two levels –

I. Intervention group - Initial social skills training followed by Cooperative Learning structures being employed within a number of lessons.

II. Control group - Identical lesson content to the intervention group for all lessons, but taught in a non-cooperative manner ie not specifically adhering to cooperative principles or employing CL structures. This control group condition is further discussed within section 7.6.9.

The methods through which this independent variable was manipulated for the purposes of this study are described within the subsequent sections.

7.6.5 Social Skills Training

A 'structured' approach was adopted, which incorporated social skills training for the pupil participants in the experimental group at the beginning of the intervention (Murphy et al, 2005), as this format is supported empirically (Gillies and Ashman, 2000) and is in line with the Dodge et al (1986) model of social interaction that underpins this study, as described in section 2.3.1.

The social skills training focussed upon the development of the children's listening skills, as these are considered to be a prerequisite for the successful implementation of Cooperative Learning structures (Aronson and Patnoe, 1997). However, several other skills were also introduced by the implementer. A list of these is presented in appendix 7.9.

All social skills were taught in the following format, based upon elements outlined by Johnson et al (1993a) and Davison et al (2008) –

i. New skill named and defined.

ii. Importance of skill explained.

iii. Skill demonstrated by adults (positive example and negative example) through role play.

iv. Children regularly reminded to use skill.

v. Regular feedback and reinforcement of skill from adults.

vi. Pupil reflection and self-monitoring.

vii. Skill displayed visually in classroom and referred to regularly.

viii. Regular practice of skill.

The implementer employed identical CL structures to teach the social skills as would be employed for the intervention itself, which had the additional benefit of familiarising participants with the structures before the CL aspect of the intervention began. The control group did not receive the social skills training, a point further discussed in section 7.6.9.

7.6.6 Model of Cooperative Learning Employed

The model of CL employed was based upon Kagan's (1990) 'structural' format (not to be confused with the 'structured' approach described above), which systematises CL activities through the use of structures, which are defined as a *"content free way of organising social interaction in the classroom"* (Kagan, 1990, p12), with each structure essentially consisting of a series of instructional steps.

This model was employed as it is one of the most widely used within the literature to date (Grey et al, 2007), thus allowing enhanced comparability with empirical literature in the area.

Also, this model enabled the implementer to incorporate CL activities within existing lesson plans in a relatively straightforward manner (Brown and Thompson, 2000), without having to design tailored activities. This aimed to encourage participation at the outset as lesson plans only had to be amended, not rewritten

Furthermore, this structural approach enabled the teaching of cooperative principles to be embedded across the curriculum, as this intervention was delivered through lesson process (the *"Hidden Curriculum"* (Davison et al, 2008, p309)) rather than lesson content (the *"Taught Curriculum"* (Davison et al, 2008, p309)). The aim of this was to highlight the potential of CL as a cross-subject intervention, in order to broaden future employment beyond its traditional location within only the PHSE curriculum. The 'intervention diary' (appendix 7.5) illustrates that CL activities were incorporated across several curriculum areas, including literacy, numeracy, science, history and PHSE.

7.6.7 Structures Utilised

Kagan (2009) lists over 200 structures; however, several authors in the area (eg Goodwin (1999), Marr (1997)) recommend employing a small number of simpler structures initially, only introducing more complex structures as the children and teachers refine their cooperative skills.

With this in mind, four structures were employed by the implementer. These were –

1. Think-Pair-Share (Lyman, 2006).
2. The Doughnut (Brown and Thompson, 2000).
3. Numbered Heads Together (Kagan, 2009).
4. The Grid (Brown and Thompson, 2000).

The 'intervention diary' (appendix 7.5) shows that the implementer employed all four structures, using 'Think Pair Share' on 16 occasions, 'The Doughnut'

11 times, 'Numbered Heads Together' 5 times, and 'The Grid' on 2 occasions.

Detailed descriptions of each of these structures are presented in appendix 7.6.

7.6.8 Make-up of the Cooperative Groups

Section 3.5.3 highlighted a broad consensus within the literature that cooperative groups should be heterogeneous in terms of academic and social ability and gender (Vermette, 1995). In order to ensure heterogeneous groupings, Brown and Thompson (2000) advocate teacher selection over other strategies such as student selection or groups of convenience. They cite that if student selection is adopted existing cliques within the classroom may be reinforced, thus discouraging peer acceptance.

Therefore, the implementer in this study employed teacher-selected heterogeneous groupings for all CL activities. These groups were reformulated every two weeks to ensure all participants worked with each other at some stage during the intervention.

During CL sessions, children were also given roles within the group, examples of which can be viewed in appendix 7.10, in order to further enhance individual accountability and positive interdependence (Kagan, 2009), both essential elements of CL (Murphy et al, 2005).

7.6.9 Type of Programme Received by the Control Group

A delayed intervention will be delivered to the control group. Contact between the researcher and this group during the intervention was thus limited to gaining consent, pre- and post-testing and treatment integrity observations. This approach was adopted on ethical grounds, in order to stop the denial of a potentially beneficial intervention to this group.

The control group received identical lesson content to the intervention group, which was made possible by the intervention and control group implementers formulating lesson plans jointly. The control group were taught by the control group implementer in a non-cooperative manner ie not specifically adhering to cooperative principles or employing CL structures.

The control group implementer did not receive any of the training received by the intervention group implementer, although training will be conducted after the termination of the current project.

The control group did not receive the initial week of social skills training, as this was considered to form part of the CL intervention itself. This approach is advocated by Johnson et al (1993a) and Kagan (2009).

7.6.10 Duration and Intensity of Intervention

The intervention consisted of one week of social skills training activities during the second week of the Autumn term 2009, followed immediately by ten weeks of incorporating CL structures across the curriculum. Thirty-four CL activities were conducted within this period, totalling 437 minutes (7 hours 17 minutes), with the average duration of a CL activity being 13 minutes. The duration of CL sessions ranged between 2 minutes and 30 minutes. This information was collected through the 'intervention diary' (appendix 7.5).

Ideally, the intervention would have been conducted for a longer duration and with increased intensity; however, this was not possible due to limitations relating to the timescale imposed upon this project and further commitments of the implementers.

7.6.11 Integrity of the Implementation Process

Section 4.3.1 highlighted that a significant proportion of the research reviewed failed to account for treatment integrity. This is a vital consideration, as, "*fidelity can clearly moderate the effectiveness of an intervention*" (Harrist and Bradley, 2003, p198) as it cannot be assumed that implementers will administer interventions flawlessly (Robson, 2002). A failure to measure treatment integrity can, therefore, limit the reliability of results. With this in mind, measuring treatment integrity became a central consideration for the current project.

The implementation process was monitored through a series of three structured observations of both conditions of the independent variable (appendix 7.8), conducted by the researcher during weeks one, six and eight of the ten-week CL intervention. During these observations the researcher saw a CL activity in the intervention condition, and also observed identical lesson content delivered in a non-CL manner in the control group. The aim of this was to ensure that CL was delivered as desired in the intervention condition, while also ensuring that CL principles were not employed within the control group.

A structured observation checklist (appendix 7.8) was devised by the researcher, developed from guidelines suggested by Furtwengler (1992). This incorporated criteria pertaining to –

- Group variables.
- Environmental variables.
- Staff variables.
- Task variables.
- Child variables.

The checklist was also employed to structure feedback to the implementer immediately after each observation session. Results from these observations indicated that the CL intervention was administered appropriately for the

experimental group and that the control group teacher did not employ any aspects of CL during any of the observations.

7.7 Pupil Outcomes

A major focus of the D & R Programme centres on pupil outcomes, making a discussion of methodological considerations pertaining to the dependent variable and ways through which it was measured a vital aspect of this study.

7.7.1 The Dependent Variable

The dependent variable for this study is termed 'peer acceptance', as defined in section 2.1, as this is a term widely used within the literature, thus promoting enhanced comparability with previous empirical research within this area. Peer acceptance is also felt by the researcher to be an important factor in promoting positive outcomes for children and young people, as highlighted within chapter 2.

Additional dependent variables, such as 'level of social skills', were considered; however, these were rejected as the researcher believed the data collection would have been too onerous for implementers and pupil participants, and would have reduced the focus upon outcomes relating to peer acceptance.

7.7.2 Measuring the Dependent Variable: The Social Inclusion Survey (SIS)

The instrument employed to measure peer acceptance was the Social Inclusion Survey (SIS) (Frederickson and Furnham, 1998a). The subsequent paragraphs provide a description of the SIS, details pertaining to

administration and scoring procedures and the rationale for the utilisation of this instrument. Limitations are discussed in chapter 9.

The SIS is a forced-choice measure adapted from the 'How I Feel Towards Others' questionnaire (Agard et al, 1978). It is intended for use with pupils between eight and twelve years old, and indicates to what extent a pupil is accepted by their peers within their school class (Frederickson and Furnham, 1998a). Acceptance is measured across two dimensions, *'Like to Work'* and *'Like to Play'* (Frederickson and Furnham, 1998a, p16), with one questionnaire focussing upon each of these elements.

Each of the two questionnaires consists of a list of all of the participants' names, beside each of which is four circles, one containing a question mark and the others containing a smiling, a sad and a neutral schematic face (Frederickson and Furnham, 1998a). On the 'Like to Work' questionnaire pupils tick the face which shows how much they like to work with each of their peers. The smiling face indicates peers with whom they like to work, the neutral face specifies peers with whom they do not mind working, and the sad face indicates those with whom they prefer not to work (Frederickson and Furnham, 1998a). The question mark designates peers the child does not know well enough to decide how much they like to work with them (Frederickson and Furnham, 1998a). The *'Like to Play'* questionnaire is identical in format, the only discrepancy being that the acceptance criterion utilised is 'play with' rather than 'work with' (Frederickson and Furnham, 1998a). Copies of each of these questionnaires are presented in appendix 7.11.

7.7.3 Rationale for Employing the Social Inclusion Survey

The Social Inclusion Survey was utilised as its format most accurately mirrored the concept of peer acceptance promoted within the research questions for this study, supporting the Dodge et al (1986) model of social

interaction underpinning this study by recognising the influence of the peer group upon peer acceptance.

The SIS also measures peer acceptance pertaining to both 'Work' and 'Play' contexts, which enhances content validity by sampling the major contexts within which interaction occurs in the school environment (Frederickson and Furnham, 1998a). This point is further supported by Hallinan (1981), who questions the validity of sociometric assessment instruments employing a single-choice criterion to assess acceptance.

Furthermore, in a comparative investigation of twelve sociometric classification methods, Frederickson and Furnham (1998b) report that the SIS performed at least as well as the other techniques analysed in terms of reliability and validity, and presented one of the best test-retest reliability scores, reporting a figure of 0.78 over five weeks. This is a particularly important feature for this method of measurement, as

> "*...the stability figures for many of these methods are not overwhelmingly impressive*" (Bukowski and Hoza, 1989, p28).

7.7.4 Administration of the Social Inclusion Survey

The pre-intervention SIS was administered on a whole-class basis by the researcher in September 2009, one week before the CL intervention commenced. It was delivered first to the intervention group, then immediately afterwards to the control group. An identical protocol was followed for both groups.

After first ensuring that the classroom setup promoted individual completion of test materials, with children sat far away enough from each other to inhibit discussion or copying answers, an initial presentation was given by the researcher (appendix 7.12). In line with guidelines suggested by Frederickson and Furnham (1998b), this conveyed the following information to the participants –

- Description of the researcher's role.
- Brief overview of the project – 'about how children of your age get along with each other at school'.
- There are no right or wrong answers.
- Importance of honesty and confidentiality

The SIS administration script (appendix 7.11) was then read to the participants in its entirety, with the researcher further emphasising the importance of honesty and confidentiality. The participants then completed the questionnaire in silence, with the researcher providing assistance to individual pupils if necessary. There was no time limit, and participants turned their questionnaires over and engaged in silent reading once they had completed the exercise, until every child had completed the questionnaire.

An identical procedure was followed for the post-intervention administration, which occurred during the week following the termination of the CL intervention in December 2009. The only difference was that the initial presentation was shortened as the researcher did not have to repeat the introduction to the project.

There were no absences during the pre-measure administration, whereas there was one absence during the post-measures. This absentee completed the SIS individually upon their return to school two days later.

7.7.5 Scoring the Social Inclusion Survey

In order to score the SIS, the questionnaires for each class were sorted according to the sex of participants, as the SIS regards same-sex and opposite-sex peer groups as *"interrelated but discrete social subsystems within the classroom"* (Frederickson and Furnham, 1998b, p930), as children's cross-sex sociometric ratings are significantly more negative than same sex ratings within the primary school age group (Harrist and Bradley, 2003), as discussed within section 2.3.5b.

The number of smiling, sad and neutral faces for each participant were thus tallied separately for same-sex and opposite-sex peer ratings, in line with Frederickson and Furnham's (1998a) instructions. This procedure was followed for both 'work' and 'play' questionnaires.

However, Frederickson and Furnham's (1998a) guidelines were not followed after this point, as their system of categorising pupils as 'rejected, average or popular' is designed for use in practice settings, and was considered by the researcher to be inappropriate in an empirical context as it would produce only ordinal level data.

Therefore, for the purposes of this study, a 'weighted score' was produced for each participant for both same-sex and opposite-sex ratings. This was calculated by adding the total number of smiling faces ticked for the participant and subtracting the number of sad faces ticked. Neutral faces and spoiled responses were counted as zero, thus not affecting the overall weighted score.

This enabled interval level data to be produced, thus allowing more sophisticated statistical analyses to be utilised. It also introduced finer measurement relating to the *degree* to which a participant was accepted within their class grouping, rather than potentially placing children with discrepant acceptance levels within the same category. The weighted scoring system also corresponds more closely with the researcher's conceptualisation of peer acceptance as a continuum upon which all children can be located, rather than creating arbitrary distinctions between sub-groups of children.

7.7.6 Measuring the Dependent Variable: The Strengths and Difficulties Questionnaire

A second instrument was also employed, the Strengths and Difficulties Questionnaire (Goodman, 1997). Subsequent paragraphs provide a description of the SDQ, details pertaining to administration and scoring

procedures and the rationale for the utilisation of this instrument. Limitations are discussed in chapter 9.

The SDQ is a brief behavioural screening questionnaire that considers 25 attributes, some positive and some negative (Goodman and Scott, 1999). Respondents utilise a three point Likert scale, consisting of *"not true, somewhat true and certainly true"* (Goodman, 1997, p585), to indicate their response for each item (Goodman, 2001).The 25 items are divided equally between five scales –

- Conduct problems.
- Inattention-hyperactivity.
- Emotional symptoms.
- Peer problems.
- Prosocial behaviour.

All but the last scale are totalled to indicate a "*Total Difficulties*" score (Goodman, 2001, p1337).

Three almost identical questionnaires are available, two for completion by the parents/guardians or teachers of 4-16 year olds (Goodman, 1997) and a self-report version for 11-16 year olds. However, evidence from Muris et al (2004) suggests that the self-report version can be reliably employed with children as young as eight, dependent upon their level of understanding and literacy. A copy of the self-report SDQ is presented in appendix 7.13.

The parent/guardian and teacher versions of the SDQ were not employed for this study, as at the time of administering pre-measures teacher participants had taught the pupil participants for less than a week, thus potentially invalidating results due to a lack of knowledge relating to their pupils. It was therefore also felt that any pre-post test discrepancies could be caused simply by the teacher participants gaining more knowledge relating to each pupil, rather than demonstrating the effectiveness of the intervention. This is an approach further supported by Parker and Asher (1987, p359), who recommend the employment of pupil self-assessment, arguing that,

"The validity of teacher estimates of acceptance is susceptible to a number of threats. Teachers may be heavily influenced by ...the child's academic success...or...the child's sex and social class".

The parent/guardian version of the SDQ was not employed as the CL intervention focussed upon peer acceptance within the classroom environment, thus invalidating parent reports that would, by definition, be based upon information gained from the pupil participant's behaviour within the home context.

7.7.7 Rationale for Employing the Strengths and Difficulties Questionnaire

The SDQ was employed initially as a requirement of the D & R programme (a stakeholder in this project) in order to assist with the aggregation of results from a large number of disparate studies through the provision of a common denominational measure for pupil outcomes.

However, this was by no means the only reason for utilising this measure. Two of the SDQ scales, 'peer problems' and 'prosocial behaviour', were seen as highly relevant to the peer acceptance variable under investigation in the current study. Therefore, the incorporation of SDQ data from these two scales supplemented data collected from the Social Inclusion Survey, promoting a triangulated analysis.

Furthermore, the SDQ is a widely used tool within epidemiological, developmental and clinical research (Garralda et al, 2000), as well as in routine clinical and educational practice (Goodman and Scott, 1999). This promotes comparability with a large body of research across many subject areas and enhances relevance to contemporary professional practice in several domains.

The SDQ also possesses established reliability and validity, with, for example, Goodman (2001) reporting an internal consistency level of 0.73

and a retest stability of 0.62 after a period of 4-6 months across a sample of 10,438 British children aged between five and fifteen years old.

7.7.8 Administration of the SDQ

The pre-intervention SDQ was administered on a whole-class basis by the researcher in September 2009, one week before the CL intervention commenced, during the same session employed for the SIS administration. It was delivered first to the intervention group, then immediately afterwards to the control group, with an identical protocol followed for both groups.

The same procedures were employed as described above for the SIS in terms of classroom layout, emphasising honesty and confidentiality and dealing with absenteeism.

The pupil participants were not left to complete the SDQ individually. Instead, with consideration for the age of the participating pupils, the researcher administered each question verbally to reinforce comprehension of each item. Each question was read aloud and then repeated twice, with a comprehension check following each reading. Vocabulary with which any children were unfamiliar was explained in simpler terms.

An identical procedure was followed for the post-intervention administration, which occurred during the week following the termination of the CL intervention in December 2009, again alongside the SIS administration.

7.7.9 Scoring the SDQ

Each participant's data was inputted online (www.sdqscore.net), generating a score for each of the five scales described in section 7.7.6 and a *"Total Difficulties"* score (Goodman, 2001, p1337). This online scoring system automatically prorated missing values (Goodman, 2001).

7.8 Establishing Trustworthiness: Reliability and Validity

The fundamental purpose of this study is to establish the effectiveness of the CL intervention. A vital component within this is establishing the trustworthiness of any results obtained, as judgements pertaining to effectiveness cannot be confidently made otherwise (Cohen et al, 2007). Therefore, ways through which this study attempted to promote reliability and validity are discussed within this section (Robson, 2002).

It must also be acknowledged, however, that due to the context within which this study was conducted not all variables could be fully controlled. This section also recognises these limitations, in order that the reader can determine the confidence with which any conclusions pertaining to the effectiveness of the intervention can be reached. These limitations, and potential solutions, are considered further in chapter 9.

7.8.1 Validity

Validity is,

> *"...concerned with whether the findings are "really" about what they appear to be about"* (Robson, 2002, p93).

Several authors stress the key importance of validity, for instance, Cohen et al (2007, p134) state,

> *"...validity is the touchstone of all types of educational research".*

Validity can take many forms (Cohen et al, 2007) the most salient of which for the current study are presented below –

- *Internal Validity* – Seeks to demonstrate that the explanation of a particular outcome can actually be sustained by the data (Cohen et al, 2007).

- *External Validity* – Refers to the extent to which any findings from the research are applicable outside the specific context of the study (Robson, 2002). Also referred to as 'generalisability' (Robson, 2002).

- *Content Validity* – Specifically refers to the instruments employed to measure outcomes, addressing whether the instrument comprehensively covers the domain that it purports to cover (Cohen et al, 2007).

- *Concurrent Validity* – A form of criterion-related validity that endeavours to relate the results of one measurement instrument to another (Cohen et al, 2007).

7.8.2 Addressing Threats to Validity

Threats to validity are phenomena that may obscure possible relationships between the variables under investigation (Robson, 2002), and cannot be erased completely from any study (Cohen et al, 2007). Hence, validity should be seen as a matter of degree rather than an absolute state (Gronlund, 1981). This section will describe ways through which such threats were attenuated in this study, while acknowledging that some threats may still remain.

7.8.2a Addressing Threats to Internal Validity

Robson (2002) presents twelve potential threats to internal validity, only a proportion of which are relevant to the current project. Each is summarised below, also incorporating a description of how each threat relates to this study –

- *History* – Refers to any events other than the experimental intervention that occur between pre- and post-testing (Cohen et al, 2007). Such events can produce effects that could mistakenly be attributed to the

intervention. It was not possible to rule out this threat completely for each participant in the current study; however, discussions with the implementer of the intervention highlighted no significant concurrent interventions or events occurring at the same time as the intervention.

- *Testing* – Pre-testing can produce effects other than those due to the experimental treatments (Cohen et al, 2007), for instance, through sensitising participants to the purposes of the experiment. This is a threat that is highly relevant to the current study as completing the Social Inclusion Survey (Frederickson and Furnham, 1998a) could have led participants to focus upon their peer relationships in the intervening time before post-test administration. This threat was addressed somewhat through the employment of a control group.

- *Instrumentation* – Changes in the administration methods employed during pre- and post-testing may compromise validity (Robson, 2002), as may the use of unreliable testing instruments (Cohen et al, 2007). In the current study, both measurement instruments possessed established reliability indices, as covered in sections 7.7.3 and 7.7.7, and identical administration protocols were employed at pre- and post-testing for both experimental and control groups. For instance, variables including the test administrator, the testing environment, time of day and duration of administration were consciously controlled.

- *Mortality* – Participants dropping out of the study may confound results (Robson, 2002); however, during this study no students dropped out. An attendance level of 80% was required for a participant's data to be included within the analysis, and all participants exceeded this level (appendix 7.5).

- *Maturation* – Subjects may change in a variety of ways between pre- and post-testing, producing differences independent of the experimental intervention (Cohen et al, 2007). This is a particularly salient consideration in educational research due to the potentially increased maturation rate of younger participants. However, the

employment of a control group lessened the effect of this threat, as any changes linked to maturation would likely be similar for both experimental and control groups, thus negating their effect upon outcomes. Also, the relatively brief duration of the intervention (approximately 11 weeks between pre- and post-testing) attenuated this threat to some extent, as only a limited level of maturation could occur within this time frame.

- *Selection* – Internal validity may be reduced as a result of non-random allocation to control or experimental groups (Robson, 2002), such as in the quasi-experimental design employed in this study. This could result in initial differences between groups that could affect their sensitivity to the intervention under investigation (Cohen et al, 2007). This threat was attenuated through the employment of the statistical procedures described within section 8.2; however, the threat still remains that groups could differ significantly in relation to another unidentified variable that could correlate with those under investigation.

- *Diffusion of Treatments* – This refers to instances whereby the control group inadvertently receives aspects of an intervention intended only for the experimental group (Robson, 2002). Again, this threat was particularly salient for the current study due to the experimental and control groups consisting of two classes within the same school. There was, therefore, a real danger of the skills developed by the intervention group transferring to students within the control condition, thus potentially contaminating results. This skill transmission could also have occurred between the teachers implementing the intervention in each condition. Treatment diffusion between teachers was attenuated through the researcher conducting the treatment integrity observations described within section 7.6.11 in the control condition to ensure that elements of the intervention were not being transmitted to the control group through teaching methods. However, it was not possible to measure diffusion effects between pupil participants.

7.8.2b Addressing Threats to External Validity

Threats to external validity limit the extent to which the results of a study can be generalised to alternative populations or settings (Cohen et al, 2007). Potential threats to the external validity of the current research are outlined below –

- *Representativeness of sample and setting* – Findings may only be specific to the group being studied or context in which the study took place (Robson, 2002). The non-probabilistic volunteer sampling strategy adopted for participant selection in this study, described in section 7.2, resulted in a small number of participants from a single contextual setting, beyond which it is not possible to validly generalise results (Cohen et al, 2007). However, the rich description of participant characteristics and environmental details provided within this chapter enables the reader to make judgements pertaining to the relevance of the outcomes of this study to other participant groups and contexts.

- *History* – Historical experiences of participants may invalidate outcomes (Robson, 2002). It was not feasible to ascertain whether previous experience may have affected outcomes for all participants; however, the inclusion of an initial audit of the implementers' previous experience relating to CL (appendix 7.4) highlighted that both implementers had very little previous exposure to CL structures, attenuating this threat to some extent.

7.8.2c Addressing Threats to Content and Concurrent Validity

Threats to content and concurrent validity were also encountered –

- *Content Validity* – The Social Inclusion Survey (SIS) (Frederickson and Furnham, 1998a) employed for the current study measures peer acceptance pertaining to both 'Work' and 'Play' contexts, enhancing content validity over single-choice criterion sociometric instruments by

sampling the major contexts within which interaction occurs in the school environment (Frederickson and Furnham, 1998a). Also, the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) possesses established content validity (Goodman, 2001).

- *Concurrent Validity* - The employment of multiple measures (SIS and SDQ) to gather data potentially enhanced concurrent validity, as similar patterns of findings from discrepant data collection instruments can indicate more valid results (Cohen et al, 2007). Multiple methods, however, *"do not constitute a panacea for all methodological ills"* (Robson, 2002, p103), and so even if these different instruments do yield similar outcomes, results must still be interpreted cautiously.

Section 7.8.3 explores the related concept of reliability, describing relevant aspects of this with reference to the current study.

7.8.3 Reliability

For research to be reliable it must demonstrate that similar results would be produced if it were to be carried out again with similar participants in a comparable context (Cohen et al, 2007). Indeed,

> "*Reliability ... is essentially a synonym for dependability, consistency and replicability over time, over instruments and over groups of respondents*" (Cohen et al, 2007, p146).

Cohen et al (2007) refer to three main types of reliability; stability, equivalence and internal consistency, all of which are explored within this section. Akin to validity, many potential threats to reliability exist, which cannot be erased completely from any study (Cohen et al, 2007). This section will, therefore, illustrate how such threats were attenuated within the current project, also acknowledging limitations where necessary. Further discussion pertaining to limitations is conducted within chapter 9.

7.8.3a Reliability as Stability

In this form reliability is conceptualised as a measure of consistency over time, referring to the ability of a particular measure to yield similar data from comparable participants over a specified time period (Cohen et al, 2007). Both measurement instruments employed to measure outcomes in the current study possess established test-retest reliability quotients, as highlighted in sections 7.7.3 and 7.7.7. Indeed, these relatively high levels of stability formed a major aspect of the rationale for utilising these instruments.

7.8.3b Reliability as Equivalence

This aspect of reliability can be established through two methods. First, *equivalent forms reliability* concerns the employment of an additional, alternate form of the measurement instrument (Cohen et al, 2007). However, neither the SIS nor the SDQ possess an alternate format, meaning that this form of reliability could not be established using this method.

Second, reliability as equivalence can be achieved through *inter-rater reliability* (Cohen et al, 2007), whereby the measurements of all researchers taking part in measuring outcomes are compared and agreement levels ascertained (Robson, 2002). This was not possible to achieve for the SIS and SDQ, as they are both self-report questionnaires. This form of reliability is, however, particularly pertinent to structured observations such as those conducted by the researcher to measure treatment integrity (appendix 7.8). Calculating inter-rater reliability for this instrument would have potentially enhanced reliability for this measure through addressing the potential threat of observer bias (Robson, 2002). However, these measurements were not conducted due to resource limitations, and this is acknowledged within chapter 9 as a shortcoming of the current project.

7.8.3c Reliability as Internal Consistency

Demonstrating internal consistency demands that the measurement instruments be split in half and each section compared (Cohen et al, 2007). This is not relevant to the SIS due to its sociometric nature, with each item essentially measuring a different construct; each participant's acceptance of a particular individual. However, the SDQ addresses this threat through possessing a relatively high internal consistency level of 0.73 (Goodman, 2001).

Further exploration of the concepts of reliability and validity in relation to the current project will be conducted in chapter 9.

7.9 Ethical Considerations

Finally, ethical practice was a major consideration throughout the implementation of this study. This section outlines ways through which the 'British Psychological Society Ethical Principles for Conducting Research with Human Participants' (BPS, 2007) and the 'University of Nottingham Code of Research Conduct and Research Ethics' (University of Nottingham, 2009) were adhered to.

7.9.1 Informed Consent

Consent to conduct the research was sought initially from the Head Teacher and implementers in the intervention school through reiterating the presentation conducted by the researcher in June 2009 (appendix 7.3).

A consent form (appendix 7.14) was distributed at the end of this presentation, and two copies were signed by the Head Teacher and each of the two implementers. Each participant retained one copy, with the researcher keeping the other. The researcher also signed each consent

form. These forms stressed the participants' right to withdraw and ensured the confidentiality of any information provided.

In terms of parental consent, the BPS professional practice guidelines (2007) state,

> "*...parental permission may not be necessary where the independent variable is a legitimate modification of the normal function of a school or institution.*" (p18).

This infers that parental consent may not have been strictly necessary for this study, as the CL intervention could be considered as a legitimate manipulation of the curriculum. However, it was felt by the researcher that not gaining explicit written consent from parents of children in both the intervention and control groups would have demonstrated unethical practice. Therefore, a consent letter (appendix 7.15) was distributed to the parents of all potential participants in September 2009, which required a signature from the parents or guardians of each pupil participant in order to enable them to take part in the study.

This consent letter outlined the role of the researcher, provided a brief summary of the project itself, considered ethical issues such as the right to withdraw and confidentiality, and provided an opportunity for parents to contact the researcher if desired. Forms were distributed, collected and retained by the school.

A contingency plan was drawn up in case of non-consent from any parents, which would enable such children to be supported elsewhere by a Teaching Assistant during CL activities. However, all guardians consented to their children participating in the study.

7.9.2 Right to Withdraw

It was made explicit to the Head Teacher and intervention implementers when gaining consent from the school that they had the right to withdraw from the research at any time during the study. This was also written within the school consent form (appendix 7.14). It was also made clear that the school could withdraw consent retrospectively, and may request any data concerning themselves to be destroyed.

Parents were informed of this consideration within the consent letter (appendix 7.15), and pupil participants were informed during the pre-measure presentation conducted by the researcher (appendix 7.12). Informing pupils of their right to withdraw was a particularly important consideration for this study in light of comments made by Barrett and Randall (2004, p355), who posit that,

> *"Interventions that aim to improve opportunities for friendship development must recognise the child's right to choose to be alone so that the qualities of being a loner should come from a position of choice, not from fear or extreme discouragement".*

7.9.3 Confidentiality

Wherever possible personal information was not recorded; however, any identifying information regarding the school and any persons from the school involved in the research (eg Social Inclusion Survey Questionnaires) was anonymised and stored securely in a locked filing cabinet. Any personal data inputted electronically was stored on an encrypted memory stick. Pupil participants were informed of this consideration on several occasions during the pre-measure presentation (appendix 7.12), with parents and staff participants being informed through their respective consent letters (appendices 7.14 and 7.15). Personal data was not viewed by anybody but the researcher.

7.9.4 Deception

All participants, including the parents of pupil participants, were informed of the nature and purpose of this study before participating. This information was conveyed when initially gaining consent from the staff participants and Head Teacher (appendix 7.3) and to pupil participants during the pre-measure presentation (appendix 7.12). Information pertaining to this subject was also included within the consent letter sent to parents (appendix 7.15).

7.9.5 Debriefing

Pupil participants were debriefed upon completion of the post-measure tests. This involved thanking them for their involvement, relaying information as to the future use of Cooperative Learning within the school, and ensuring that any further questions were tackled. The researcher's contact details were also left with the school so that any questions arising at a later date could be addressed.

This information was also given to the intervention and control group implementers, and the provision of ongoing support and future developments were also confirmed.

Information was also provided pertaining to how personal data would be used. Feedback concerning outcomes will be provided to the school in a summary format during Summer 2010. All data displayed within this report will be fully anonymised before distribution.

7.9.6 Fair Treatment of Participants

All participants within the intervention and control groups will receive the intervention; however, an ethical issue did arise in the form of delaying the treatment for the control group (Frederickson, 2002). This was unavoidable

according to the design for this study, but was not hypothesised as being detrimental to the control group as they are due to receive the intervention in the near future. Furthermore, continuing support has been offered by the researcher to all involved in the project.

7.9.7 Risk

Participants were not induced to take any risks greater than those they would encounter in life outside the research. To support this, the researcher's contact details were left with the school in case any participants wished for further support or debriefing following participation in the study.

7.9.8 Measuring Peer Acceptance

An ethical consideration specific to this study arose due to the dependent variable under investigation being 'peer acceptance', as measured by the Social Inclusion Survey (Frederickson and Furnham, 1998a). Smith et al (1999) suggest that sociometric forms of measurement such as the SIS may bring about increased negative behaviour towards disliked peers, although this assertion has not been backed up empirically (Frederickson and Furnham, 1998a).

Nevertheless, as suggested by Frederickson and Furnham (1998a), the researcher supported confidentiality between participants through explicitly and repeatedly stating the importance of pupil participants not discussing answers with peers during the pre-measures presentation (appendix 7.12). Logistical considerations also supported this concept through seating participants so that they could not view another individual's paper and by ensuring pupils turned over their questionnaires as soon as they were completed.

Also, details pertaining to an individual's level of peer acceptance within the classroom were viewed only by the researcher. This was made explicit to participants.

Having provided a detailed commentary upon the research methods and procedures employed for the current study, it is next essential to analyse the data obtained in order to ultimately ascertain the effectiveness of the CL intervention. This is considered within the next chapter.

Chapter 8: Results

This chapter presents a descriptive and inferential analysis of the data collected from participants at pre-test and post-test, in order to ultimately establish the significance of any discrepancies in performance at post-testing between the control and experimental groups. This enables the researcher to address the research questions posed in chapter 5.

The Social Inclusion Survey (SIS) is analysed across both 'work' and 'play' dimensions, and within each of these conditions, scores are split into 'same sex' and 'opposite sex' variables. The reasoning behind this method of analysis is explained within section 7.7.5.

The Strengths and Difficulties Questionnaire (SDQ) is analysed across all participants for two measures, 'prosocial behaviour' and 'peer problems', as these are the both relevant measures to peer acceptance, the dependent variable under investigation.

8.1Descriptive Analysis

First, in order to illustrate the distribution and spread of data for each dependent variable, descriptive statistics are presented below. Table 8.1 presents descriptive data for the Social Inclusion Survey, with table 8.2 highlighting similar data for the Strengths and Difficulties Questionnaire. Pertinent SPSS (Statistical Package for the Social Sciences) (spss.com) output is presented in appendix 8.1.

Table 8.1 A table to Show the Distribution and Spread of Data for the Social Inclusion Survey

Pre/Post -Test	Work/ Play	Variable	Group	N	Mean	St. Dev.
Pre-test	Work	Same Sex	Control	27	6.96	4.51
			Exp	27	6.48	4.35
		Opposite Sex	Control	27	-3.00	2.97
			Exp	27	-1.56	4.81
	Play	Same Sex	Control	27	6.76	4.21
			Exp	27	6.30	3.90
		Opposite Sex	Control	27	-5.40	2.92
			Exp	27	-4.26	4.90
Post-test	Work	Same Sex	Control	27	6.24	5.13
			Exp	27	9.11	4.34
		Opposite Sex	Control	27	-2.96	4.63
			Exp	27	1.15	4.29
	Play	Same Sex	Control	27	6.04	4.49
			Exp	27	8.52	3.92
		Opposite Sex	Control	27	-5.80	3.81
			Exp	27	-1.59	4.53

Table 8.1 highlights several general trends in the distribution and spread of data –

- There appears to be only a relatively small difference between experimental and control group pre-test mean scores upon each dependent variable.
- There appears to be only a relatively small difference between pre-test and post-test mean values within the control group for each dependent variable.
- There appears to be a large difference between pre-test and post-test mean values within the experimental group for each dependent variable.
- There appears to be a relatively large difference between experimental and control group post-test mean scores upon each dependent variable.
- Standard deviation values indicate that the spread of data is relatively stable within and between groups for each measure of the SIS.

- For all SIS dependent variables, mean same sex peer acceptance ratings are higher than their equivalent opposite sex mean values. This indicates that, on average, participants voted more favourably for same sex peers than their opposite sex classmates. This provides support for the scoring mechanism employed for the Social Inclusion Survey described in section 7.7.5, with same sex and opposite sex peer groups considered as "*discrete social subsystems within the classroom*" (Frederickson and Furnham, 1998b, p930).

The significance of these relationships is investigated through an inferential analysis conducted within section 8.2. However, first, comparisons between mean peer acceptance values for both experimental and control groups on all SIS measures at pre-test and post-test are presented graphically below. Each graph employs an identical scale in order to assist comparisons between variables.

Figure 8.1 A Graph to Display Mean Peer Acceptance Values at Pre- and Post-test for Control and Experimental Groups on the Same Sex (Work) Measure of the SIS

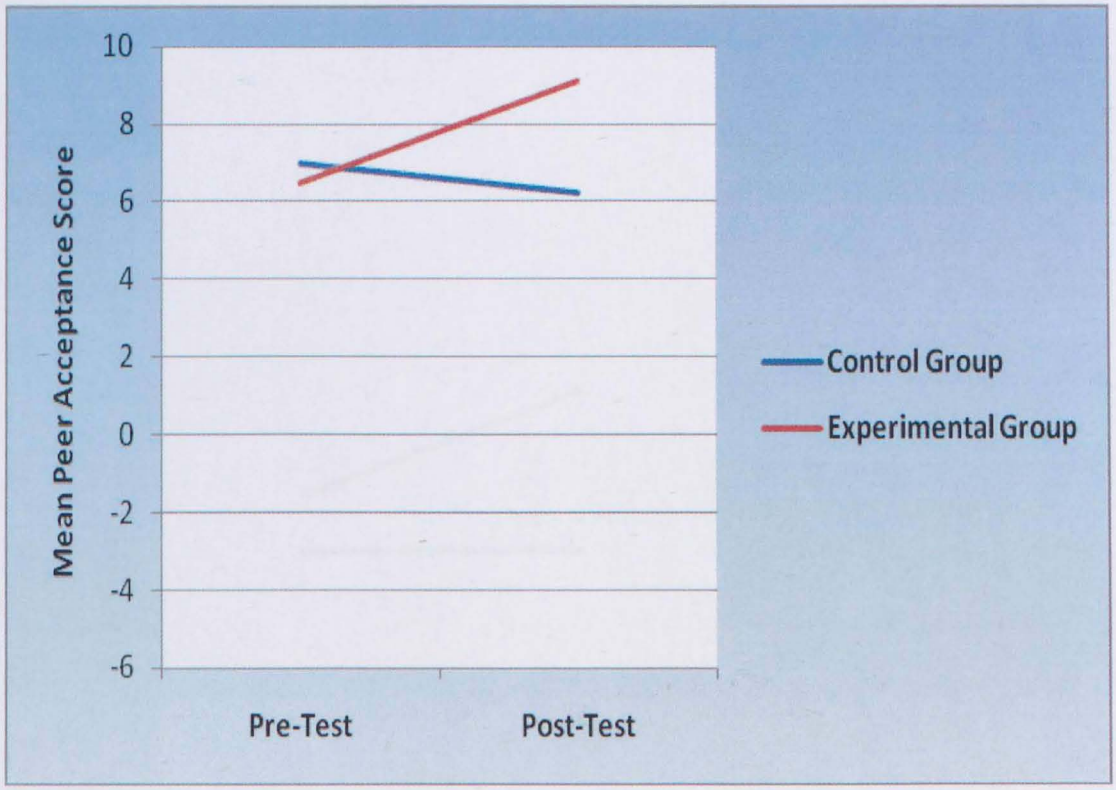


Figure 8.1 graphically illustrates that mean peer acceptance scores for the same sex (work) measure of the SIS increased between pre- and post-test for the experimental group, as indicated by the gradient of the red line, but decreased for the control group over the same period, as indicated by the gradient of the blue line. This relationship will be further analysed within section 8.2.

Figure 8.2 A Graph to Display Mean Peer Acceptance Values at Pre- and Post-test for Both Control and Experimental Groups for the Opposite Sex (Work) Measure of the SIS

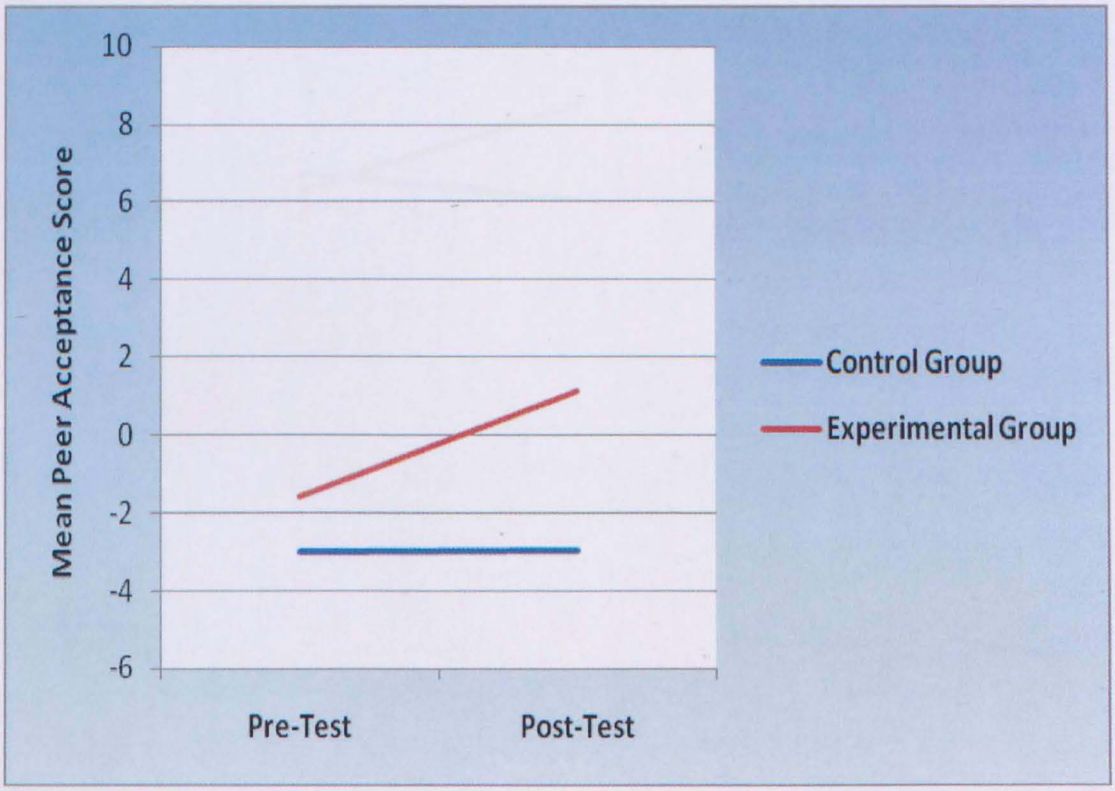


Figure 8.2 graphically illustrates that mean peer acceptance scores for the opposite sex (work) measure of the SIS increased between pre- and post-test for the experimental group, as indicated by the gradient of the red line, but remained almost constant for the control group over the same period, as indicated by the gradient of the blue line. This relationship will be further analysed within section 8.2.

Figure 8.3 A Graph to Display Mean Peer Acceptance Values at Pre- and Post-test for Both Control and Experimental Groups for the Same Sex (Play) Measure of the SIS

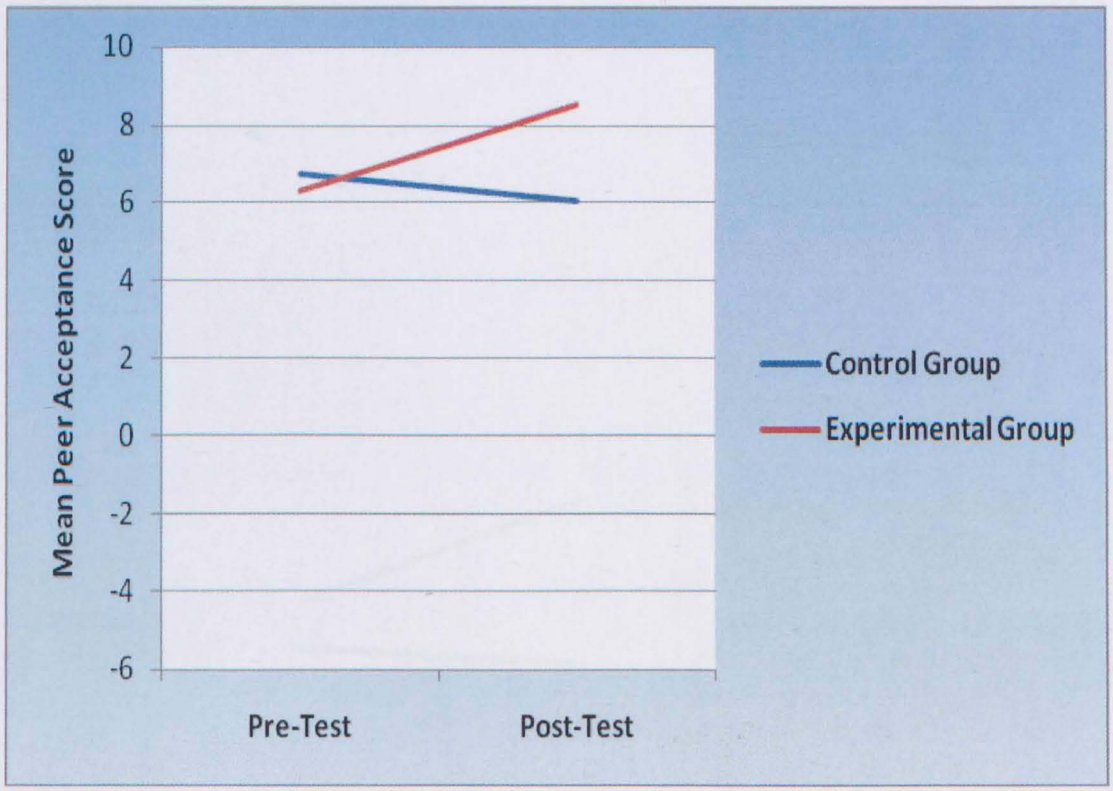


Figure 8.3 graphically illustrates that mean peer acceptance scores for the same sex (play) measure of the SIS increased between pre- and post-test for the experimental group, as indicated by the gradient of the red line, but decreased for the control group over the same period, as indicated by the gradient of the blue line. This relationship will be further analysed within section 8.2.

Figure 8.4 A Graph to Display Mean Peer Acceptance Values at Pre- and Post-test for Both Control and Experimental Groups for the Opposite Sex (Play) Measure of the SIS

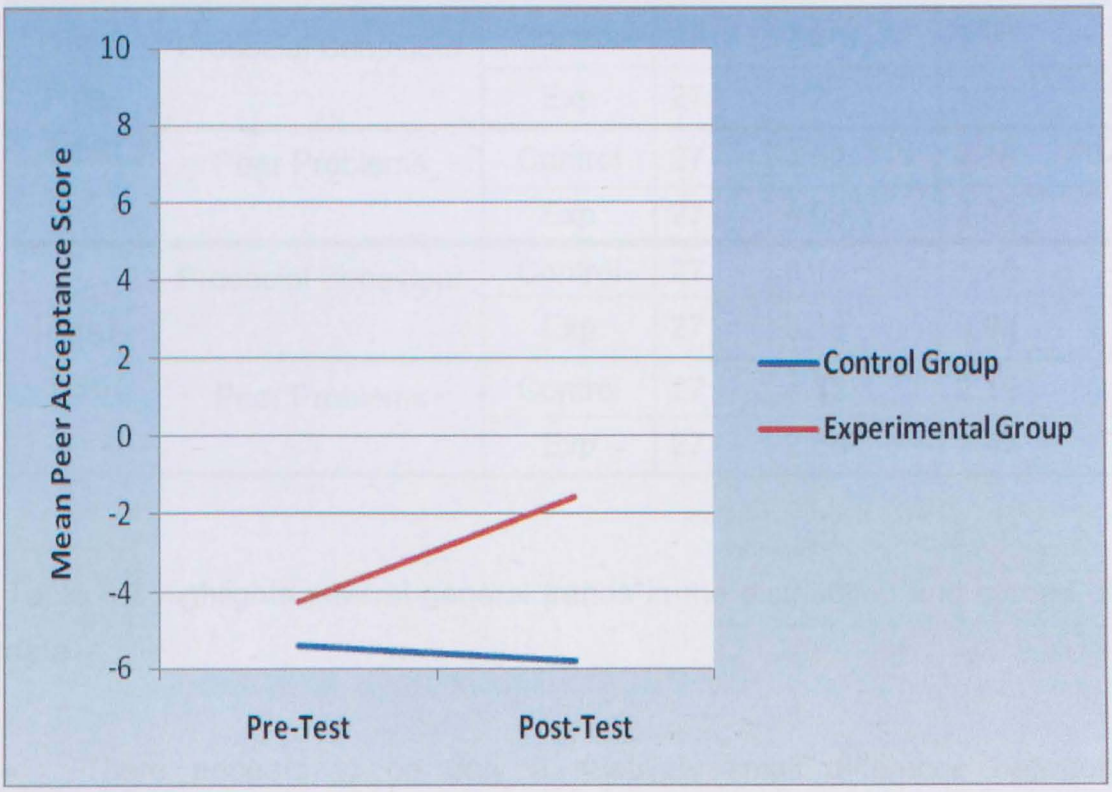


Figure 8.4 graphically illustrates that mean peer acceptance scores for the opposite sex (play) measure of the SIS increased between pre- and post-test for the experimental group, as indicated by the gradient of the red line, but decreased for the control group over the same period, as indicated by the gradient of the blue line. This relationship will be further analysed within section 8.2.

Table 8.2 A table to Show the Distribution and Spread of Data for the Strengths and Difficulties Questionnaire

Pre/ Post	Variable	Group	N	Mean	St. Dev.
Pre-Test	Prosocial Behaviour	Control	27	7.88	1.90
		Exp	27	7.22	1.58
	Peer Problems	Control	27	4.52	2.18
		Exp	27	4.59	2.02
Post-Test	Prosocial Behaviour	Control	27	8.16	1.70
		Exp	27	9.19	0.96
	Peer Problems	Control	27	4.32	2.19
		Exp	27	2.56	2.47

Table 8.2 highlights several general trends in the distribution and spread of data –

- There appears to be only a relatively small difference between experimental and control group pre-test mean scores upon both dependent variables.
- There appears to be only a relatively small difference between pre-test and post-test mean values within the control group for both dependent variables.
- There appears to be a relatively large difference between pre-test and post-test mean values within the experimental group for both dependent variables.
- There appears to be a relatively large difference between experimental and control group post-test mean scores for both dependent variables.
- Standard deviation values indicate that the spread of data is relatively stable within and between groups for each measure of the SDQ.

The significance of these relationships is investigated through an inferential analysis conducted within section 8.2. However, first, comparisons between

mean values for each group on both SDQ measures at pre-test and post-test are presented graphically below. Each graph employs an identical scale in order to assist comparisons between variables.

Figure 8.5 A Graph to Display Mean 'Prosocial Behaviour' Scores at Pre- and Post-test for Both Control and Experimental Groups as Measured by the SDQ

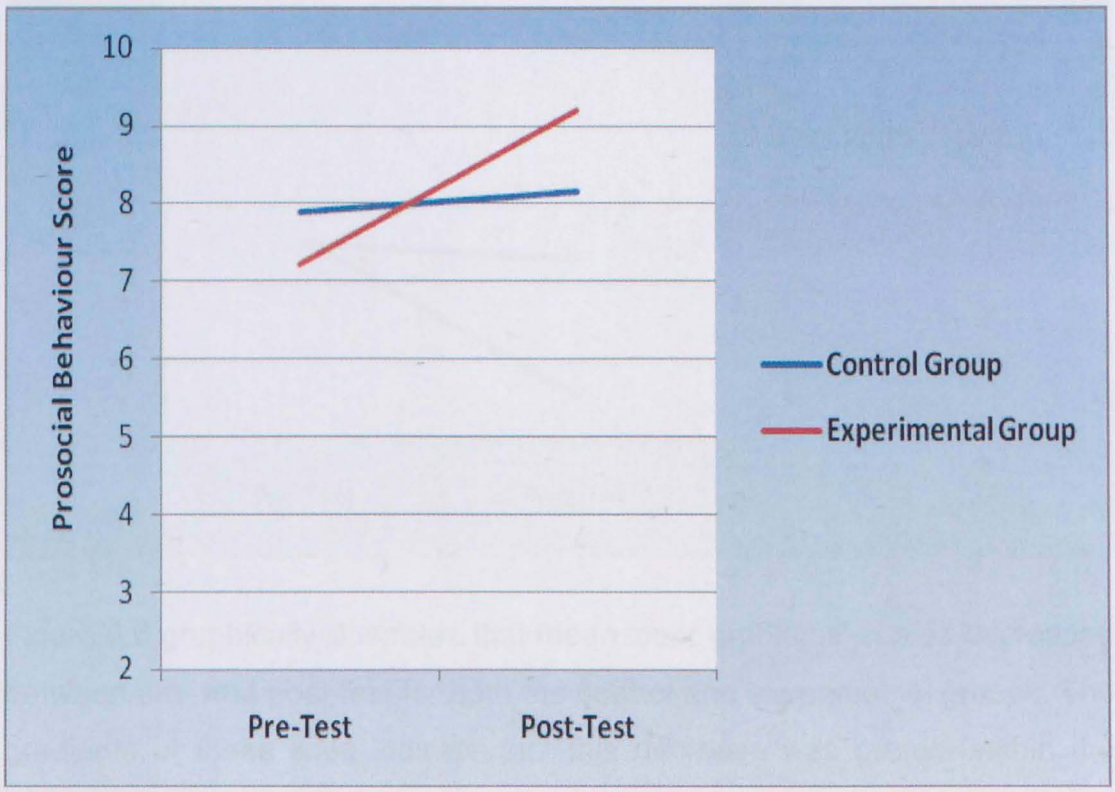


Figure 8.5 graphically illustrates that mean 'prosocial behaviour' scores increased between pre- and post-test for both the control and experimental groups. The gradients of these lines indicate that this increase was greater for the experimental group. This relationship will be further analysed within section 8.2.

Figure 8.6 A Graph to Display Mean 'Peer Problems' Scores at Pre- and Post-test for Both Control and Experimental Groups as Measured by the SDQ

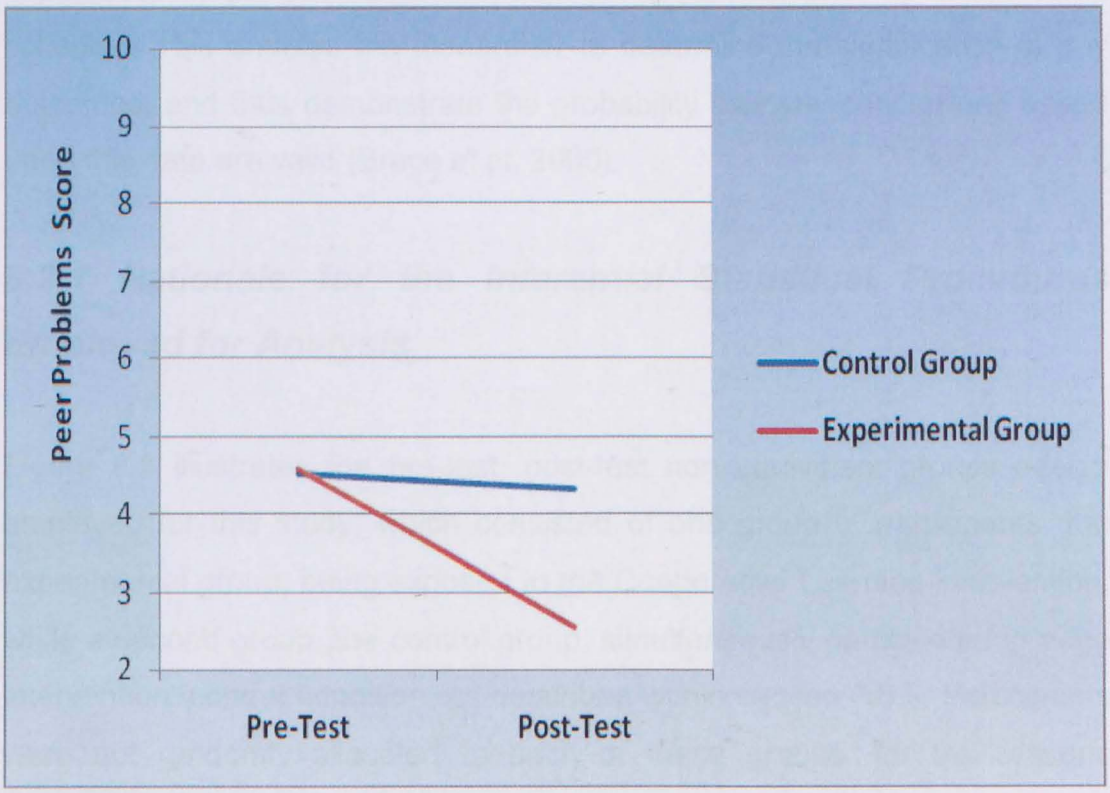


Figure 8.6 graphically illustrates that mean 'peer problems' scores decreased between pre- and post-test for both the control and experimental groups. The gradients of these lines indicate that this decrease was greater within the experimental group. This relationship will be further analysed within section 8.2.

In order to further investigate these data trends, and ultimately determine the effectiveness of the Cooperative Learning intervention, inferential analysis is conducted within the subsequent section.

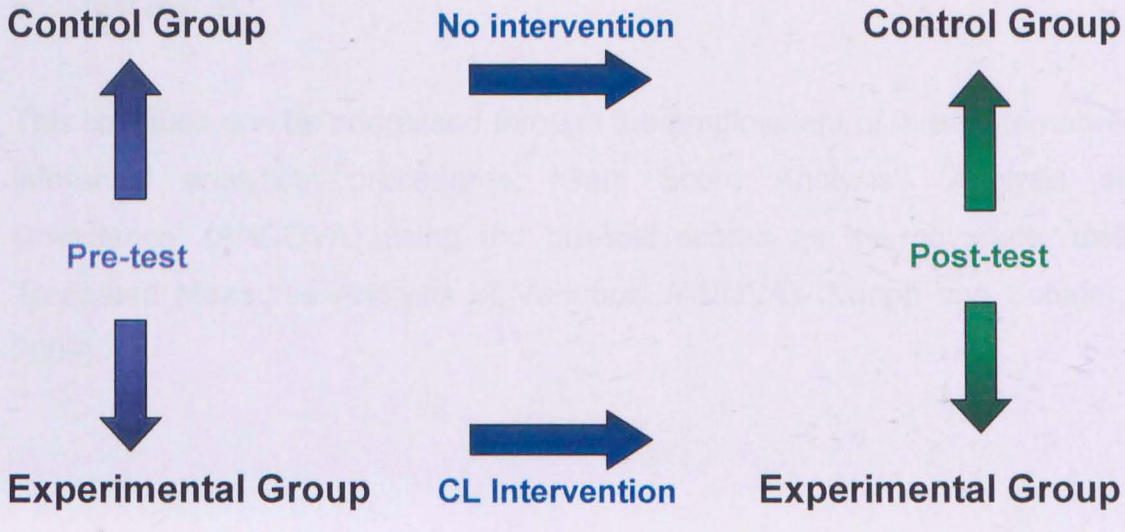
8.2 Inferential Analysis

In order to address the research questions posed within chapter 5, it is imperative to perform an inferential statistical analysis upon the data collected. This enables the researcher to determine the significance of any outcomes, and thus demonstrate the probability that any conclusions based upon this data are valid (Brace et al, 2000).

8.2.1 Rationale for the Inferential Statistical Procedures Employed for Analysis

Figure 8.7 illustrates the pre-test, post-test non equivalent groups design employed for this study, which consisted of one group of participants, the experimental group, being exposed to the Cooperative Learning intervention; while a second group, the control group, simultaneously participated in a 'no intervention' control condition, as described within section 7.6.9. Participants were not randomly allocated to each of these groups, for the reasons discussed within chapter 6. Both groups were tested with the SIS and SDQ immediately before and after the experimental group received the intervention.

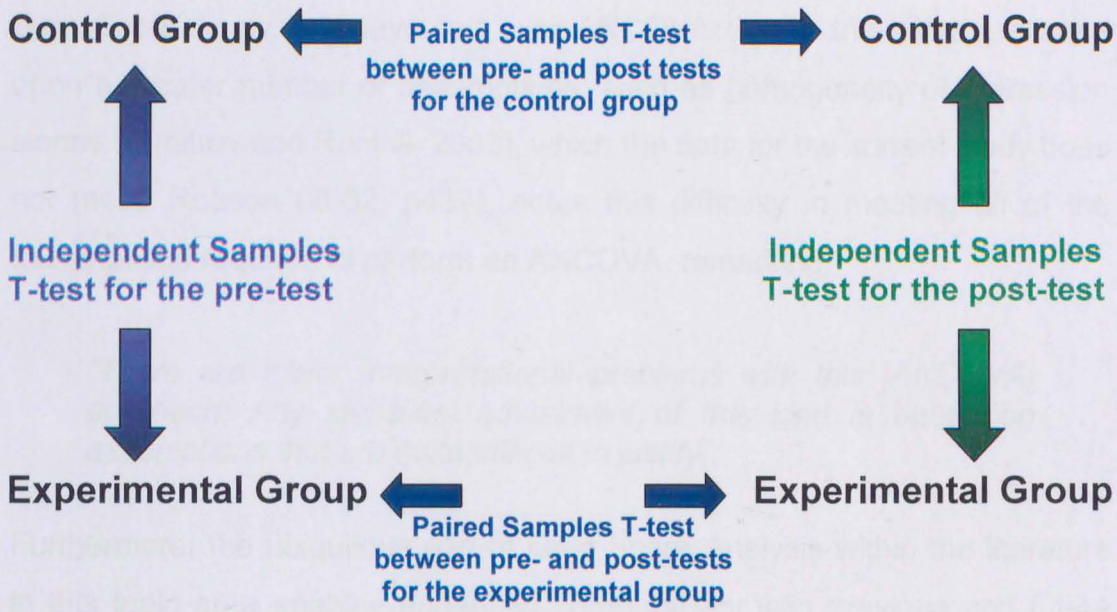
Figure 8.7 The Pre-test Post-test Non-Equivalent Groups Design Employed for this Study



Cohen et al (2007) suggest the method of analysis presented within figure 8.8 for use with designs of this nature -

Figure 8.8 Model of Inferential Statistical Analysis Suggested by Cohen et al (2007) to Establish the Effectiveness of an Intervention

(adapted from Cohen et al, 2007, p587)



This technique is able to establish the significance of any between group differences at pre-testing and post-testing, and also ascertain the significance of any within group differences present between pre- and post-testing. However, this model is not able to account for the effect that any pre-test differences between the experimental and control groups may have upon post-test results.

This limitation can be addressed through the employment of three alternative inferential analytical procedures; 'Gain Score Analysis', 'Analysis of Covariance' (ANCOVA) using the pre-test scores as the covariate, and 'Repeated Measures Analysis of Variance' (ANOVA) (Knapp and Schafer, 2009).

This study employs 'Gain Score Analysis' to determine the effectiveness of the CL intervention, which involves first calculating the change in score (the gain score) between pre- and post-testing for each participant in both groups on all dependent variables. An independent samples t-test (between the experimental and control groups) is then conducted on the gain scores for each dependent variable to establish the significance of any differences between the experimental and control groups at post-testing.

Gain Score Analysis is favoured over ANCOVA due to the latter's reliance upon a greater number of assumptions, such as homogeneity of regression slopes (Dimitrov and Rumrill, 2003), which the data for the current study does not meet. Robson (2002, p437), notes this difficulty in meeting all of the assumptions required to perform an ANCOVA, remarking,

> *"There are major interpretational problems with this [ANCOVA] approach. Any statistical adjustment of this kind is based on assumptions that are quite difficult to justify".*

Furthermore, the ubiquitous use of Gain Score Analysis within the literature in this topic area enables enhanced comparability with previous and future empirical research (Knapp and Schafer, 2009).

It is also worth mentioning that some methodologists advocate the use of repeated measures ANOVAs (Knapp and Schafer, 2009) for this experimental design, however, the statistical results yielded by this type of analysis can easily be misinterpreted, as the '*F* value' for the treatment main effect (which is of primary interest) is highly conservative as the pre-test scores are not affected by the treatment (Dimitrov and Rumrill, 2003), inferring that potentially significant results could be overlooked.

8.2.2 Parametric versus Non-Parametric Procedures

However, before commencing the gain score analysis, it is essential to determine whether the data collected for the gain scores is parametric, as this influences the statistical procedures that can be employed. In order to be

considered parametric, the data has to conform to several assumptions (Cohen et al, 2007). Data must be -

- Interval or ratio level (the most important criterion according to several authors (eg Robson (2002) and Cohen et al (2007).
- Of equal variance (homogenous).
- Normally distributed.

The first criterion is satisfied as data for the gain scores relating to each dependent variables is interval in nature, and the second assumption is addressed through incorporating Levene's test for equality of variances (Robson, 2002) within the statistical analysis procedures.

However, the third criterion, normality, has to be ascertained through investigating several factors. Myriad techniques for ascertaining normality are suggested within the literature, with differing techniques suggested by different authors. The techniques employed for this study are shown below –

- Visual analysis of normality plots for each dependent variable (Robson, 2002).
- Interpretation of *"skewness"* values (Robson, 2002, p415), thus providing a measure of how far the data is asymmetrical in relation to the standard normal curve (Cohen et al, 2007).
- Comparing mean and median values for each set of gain scores (Robson, 2002).

This analysis, an example of which is presented in appendix 8.3, suggests that the data for gain scores pertaining to all of the dependent variables can be considered normally distributed, and thus parametric statistics (independent samples T-tests) can be employed for the remainder of the inferential analysis. It is also worth noting that, even if deviation from normality had been observed, parametric statistics may still have be appropriate, as Robson (2002, p415) points out,

> *"...these tests are robust in the sense that deviations from normality do not appear to have much effect on the outcome of the test".*

The employment of parametric statistical tests is advantageous as they are approximately five percent more powerful than their non-parametric equivalents (Brace et al, 2000), thus enabling significant differences to be recognised within a smaller sample size (Robson, 2002). Parametric tests also enable effect sizes to be calculated (Cohen et al, 2007), the advantages of which are discussed within section 8.2.4.

The inferential analysis employed for this study, utilising an independent samples t-test between the control and experimental groups upon gain scores for each dependent variable, is presented below.

8.2.3 Independent Samples T-tests upon Gain Scores

This analysis is conducted in order to establish the significance of any post-test differences in mean gain scores between the experimental and control groups for all dependent variables. Outcomes of this analysis are shown within tables 8.3 and 8.4 below. SPSS output for these t-tests is presented in appendix 8.2.

Table 8.3 A Table to Show the Outcomes of Independent Samples T-tests Conducted upon Pre- to Post-test Gain Scores for all Dependent Variables Relating to the Social Inclusion Survey

Measure	Variable		Control Group Mean Gain Score	Exp. Group Mean Gain Score	t	Df	Sig.
SIS	Work	Same Sex	-0.59	2.63	4.375	46	0.000
		Opp. Sex	0.22	2.70	2.753	52	0.008
	Play	Same Sex	-0.37	2.22	3.720	52	0.000
		Opp. Sex	-0.26	2.67	3.314	52	0.002

Table 8.3 indicates that mean gain scores relating to same sex peer acceptance levels are significantly higher for the experimental group than the control group within both the work (*t=4.375, df=46, p<0.0005*) and play (*t=3.720, df=52, p<0.0005*) contexts. Opposite sex mean gain scores in peer acceptance are also significantly higher for the experimental group for both the work (*t=2.753, df=52, p<0.01*) and play (*t=3.314, df=52, p<0.005*) contexts.

The mean gain score difference for 'opposite sex (work)' is statistically significant at the p=0.01 level. The mean gain score difference for 'opposite sex (play)' is statistically significant at the p=0.005 level, and the mean gain score differences for 'same sex (work)' and 'same sex (play)' are statistically significant at the p=0.0005 level.

These findings indicate that children in the experimental group were, on average, significantly more accepted at post-test by both their same sex and opposite sex peers, and within both the 'work' and 'play' contexts, than those within the control group. This supports all of the first four hypotheses stated within section 5.5.

Table 8.4 A Table to Show the Outcomes of Independent Samples T-tests Conducted upon Pre- to Post-test Gain Scores for all Dependent Variables Relating to the Strengths and Difficulties Questionnaire

Measure	Variable	Control Group Mean Gain Score	Exp. Group Mean Gain Score	t	Df	Sig.
SDQ	Prosocial Behaviour	0.28	1.96	3.961	42	0.000
	Peer Problems	-0.20	-2.04	-3.207	50	0.002

Table 8.4 indicates that participants within the experimental group reported significantly higher mean gain scores for *'prosocial behaviour'* than control group participants ($t=3.961$, $df=42$, $p<0.0005$). However, experimental group participants noted significantly lower mean gain scores relating to *'peer problems'* ($t=-3.207$, $df=50$, $p<0.005$) than their control group counterparts.

These discrepancies in mean gain scores achieve statistical significance at the p=0.0005 level for *'prosocial behaviour'* and at the p=0.005 level for the *'peer problems'* element of the SDQ.

These findings indicate that participants within the experimental group self-reported, on average, significantly greater levels of *'prosocial behaviour'* and significantly reduced levels of *'peer problems'* at post-test than children in the no intervention control group. This supports hypotheses five and six, as stated within section 5.5.

8.2.4 Statistical Significance and Effect Size

Statistical significance describes,

> *"...how likely it would be that you would get the difference you did, by chance alone, if there really is no difference, in the population from which you drew your sample, between the categories represented by your groups"* (Robson, 2002, p400-401).

Indeed, until this point, this study has employed statistical significance as an indication of the intervention's effectiveness. However, criticisms of this concept are ubiquitous within the literature, with several authors (e.g. Robson, 2002) asserting that statistical significance is not related to the size of the effect it describes, as it is influenced by the size of the sample employed; the chance of achieving significance increasing as the sample size increases (Robson, 2002). Cohen et al (2007, p520) go as far as stating that,

> "*...statistical significance on its own has come to be seen as an unacceptable index of effect*".

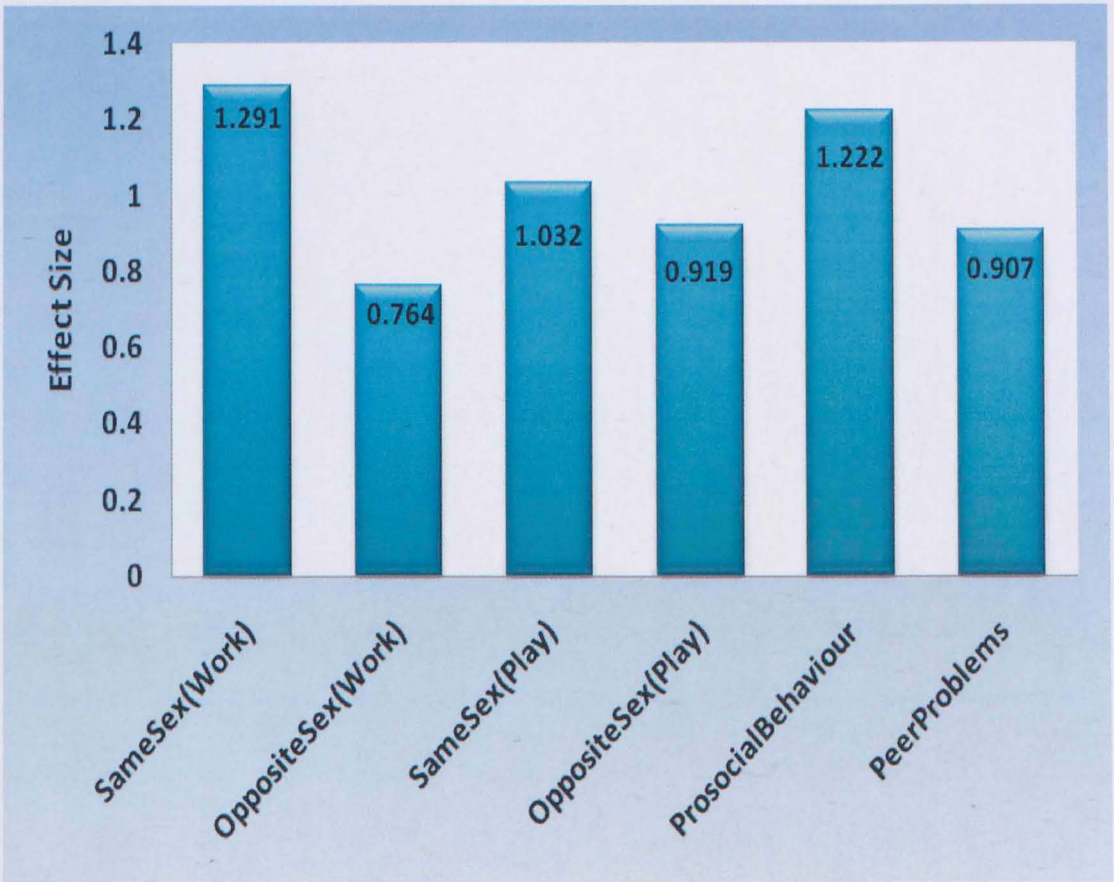
One method of addressing these criticisms involves reporting the size of the effect of the independent variable upon each dependent variable (Cohen et al, 2007). This study will thus calculate effect sizes in addition to the statistical significance values stated above, as "*the effect size is a measure of the effectiveness of the treatment*" (Coe, 2000, p1), thus directly addressing the ultimate intention of this research project.

There are several possible techniques used within the literature to calculate effect size; however, for the purposes of this study, *'Cohen's d'* will be employed as this is the most widely employed method within the empirical literature (Cohen et al, 2007), thus providing enhanced comparability between previous and future research and the current study.

Effect size values are presented below in figure 8.9 for each dependent variable that was shown by tables 8.3 and 8.4 to relate to significantly

discrepant mean gain score values between the control and experimental groups.

Figure 8.9 A Graph to Illustrate Effect Sizes in Mean Gain Scores of the Experimental Group Relative to the Control Group for Each Dependent Variable



Cohen et al (2007) term a '*Cohen's d*' effect size between 0-0.2 'small', between 0.21-0.5 'modest', between 0.51-1.0 'moderate', and greater than 1 'large'. Adhering to these guidelines, figure 8.9 highlights the presence of 'moderate' effect sizes in mean gain score of the experimental group relative to the control group for opposite sex peer acceptance ratings in both the work and play contexts, and 'large' effect sizes for mean gain scores of the experimental group relative to the control group for same sex ratings in both work and play contexts. A 'large' effect size is observed pertaining to mean gain scores of the experimental group relative to the control group for

'prosocial behaviour', whereas the mean gain score of the experimental group relative to the control group for 'peer problems' is 'moderate' in nature.

These findings, in addition to those presented throughout this chapter, are summarised and discussed further within chapter 9.

Chapter 9: Discussion

This chapter first outlines the major outcomes of this study in relation to the research questions posed within chapter 5, before discussing potential reasons underlying these findings. The impact of methodological strengths and limitations are considered, as well as possible avenues of exploration for future research in this area. Subsequently, professional implications of this study upon the professional practice of Educational Psychology are deliberated upon, before ultimately outlining the original contribution made by this study.

9.1 Does Cooperative Learning Effectively Enhance Peer Acceptance?

In order to attend to the overarching aim of this project, six research questions were addressed. Outcomes are summarised below with reference to each of these questions.

9.1.1 Addressing the Research Questions

1. ***Does Cooperative Learning enhance peer acceptance between same-sex peers in the work context?***

   Participants within the experimental group were, on average, significantly more accepted at post-test by same sex peers in the work context than those within the control group. This difference between groups was significant at the p=0.0005 level and the size of this effect, as described within section 8.2.4, was 'large'.

2. ***Does Cooperative Learning enhance peer acceptance between opposite-sex peers in the work context?***

Participants within the experimental group were, on average, significantly more accepted at post-test by opposite sex peers in the work context than those within the control group. This difference between groups was significant at the p=0.01 level and the size of this effect was 'moderate'.

3. ***Does Cooperative Learning enhance peer acceptance between same-sex peers in the play context?***

   Participants within the experimental group were, on average, significantly more accepted at post-test by same sex peers in the play context than those within the control group. This difference between groups was significant at the p=0.0005 level and the size of this effect was 'large'.

4. ***Does Cooperative Learning enhance peer acceptance between opposite-sex peers in the play context?***

   Participants within the experimental group were, on average, significantly more accepted at post-test by opposite sex peers in the play context than those within the control group. This difference between groups was significant at the p=0.005 level and the size of this effect was 'moderate'.

5. ***Does Cooperative Learning increase self-reported 'prosocial behaviour'?***

   Participants within the experimental group self-reported, on average, significantly greater levels of 'prosocial behaviour' at post-test than participants in the control group. This difference between groups was significant at the p=0.0005 level. The size of this effect was 'large'.

6. ***Does Cooperative Learning decrease self-reported 'peer problems'?***

   Participants within the experimental group self-reported, on average, significantly lower levels of 'peer problems' at post-test than participants in the control group. This difference between groups was significant at the p=0.005 level. The size of this effect was 'moderate'.

9.1.2 Additional Findings

It is also worth noting that the descriptive data analysis in section 8.1 illustrated that mean same sex peer acceptance ratings were higher than their equivalent opposite sex values for all measures of the SIS. This indicates that, on average, participants voted more favourably for same sex peers than their opposite sex classmates, thus supporting Harrist and Bradley's (2003, p199) assertion that gender is *"especially salient"* in sociometric studies of primary aged children, as discussed within section 2.3.5b.

This finding also provides support for the scoring mechanism employed for the Social Inclusion Survey, with same sex and opposite sex peer groups considered as *"discrete social subsystems within the classroom"* (Frederickson and Furnham, 1998b, p930).

9.1.3 Summary of Outcomes

Overall, it can thus be concluded that the CL intervention could be considered effective in enhancing peer acceptance levels (as measured by the SIS), thus supporting the conclusions of the majority of previous empirical research conducted on this topic, which was reviewed within chapter 4. Mean peer acceptance significantly increased for the experimental group in comparison to the control group between both same sex and opposite sex peers, a rise that permeated into both the 'work' and 'play' dimensions.

It can also be concluded from the answers to research questions 5 and 6 that CL may also be considered effective in terms of increasing self-reported levels of 'prosocial behaviour' and decreasing self-reported levels of 'peer problems', as measured by the SDQ.

Therefore, the hypotheses (see section 5.5) relating to all of the research questions were supported, and the null hypotheses were rejected. Potential reasons underlying these outcomes are considered below.

9.2 Why Might the Cooperative Learning Intervention be Considered Effective?

Hughes (2000) posits that an understanding of the potential mechanisms involved in effecting change is imperative for any intervention, as it enables professionals to judge the applicability of the intervention to individual practice settings. With this in mind, this section explores potential reasons underlying the perceived effectiveness of the CL intervention in enhancing both same sex and opposite sex peer acceptance, increasing self-reported levels of prosocial behaviour and reducing self-reported peer problems. Both theoretical and procedural factors are considered.

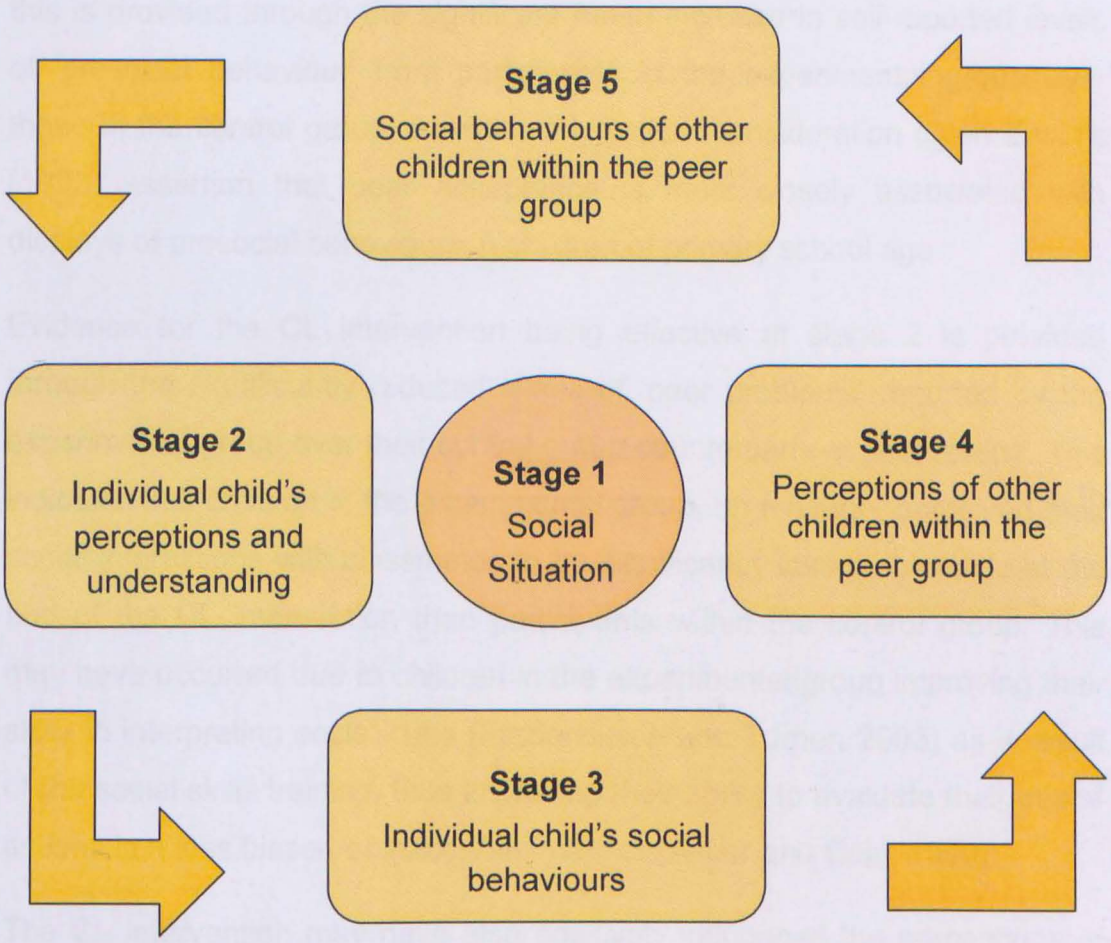
9.2.1 Theoretical Considerations

> *"Theory is to practice what soil is to plants. If the soil is appropriate, the plants will grow and flourish. If the theory is appropriate, the practice will grow and continuously improve."* (Johnson and Johnson, 1999, p186)

The effectiveness of the CL intervention may be best conceptualised through referring back to the Dodge et al (1986) model of social interaction first introduced in chapter 2. This model, illustrated below (figure 9.1), incorporates behavioural and cognitive perspectives and recognises the importance of environmental and interpersonal influences upon social interactions. It also demonstrates the circular causality inherent within the peer acceptance process (Frederickson and Cline, 2005).

Figure 9.1: A Model of Social Interaction in Children

(adapted from Dodge et al, 1986)



It is argued below that CL may have been effective in enhancing peer acceptance as it addresses all stages of this model.

At stage 1, the CL intervention potentially promoted regular high quality opportunities for social interaction through the structured activities employed (Frederickson and Cline, 2005), thus enabling the positive qualities of all children to be highlighted, as suggested by Asher and Coie (1990). These structured opportunities may have also enabled the participants to learn social skills through interactions with socially adept peers (Harrist and Bradley, 2003), thus addressing stages 3 and 5 of the model.

Stages 3 and 5 could have been directly addressed through the social skills training element of the CL intervention employed for this study (see section

7.6.5). This may have tackled within-child difficulties relating to social interaction skills, thus providing participants with the ability to interact more fruitfully once the CL activities were implemented. Supporting evidence for this is provided through the significant mean increase in self-reported levels of 'prosocial behaviour' from participants in the experimental group over those in the control group, a particularly salient consideration given Erwin's (1993) assertion that peer acceptance is most closely associated with displays of prosocial behaviours in children of primary school age.

Evidence for the CL intervention being effective at stage 2 is provided through the significantly reduced levels of 'peer problems' reported by the experimental group over their control group counterparts at post-testing. This indicates that children in the experimental group, on average, perceived their social interactions with classmates to be significantly less problematic at the end of the CL intervention than participants within the control group. This may have occurred due to children in the experimental group improving their skills in interpreting social cues (Frederickson and Turner, 2003) as a result of the social skills training, thus improving their ability to evaluate their peers' actions in a less biased or inaccurate manner (Asher and Coie, 1990).

The CL intervention may have also positively influenced the perceptions of the peer group upon their individual classmates, as mean peer acceptance levels, measured through each participant indicating their acceptance of each one of their peers, between both same sex and opposite sex participants, were significantly higher for the experimental group than in the control group at post-testing. This evidence suggests that stage 4 of the Dodge et al (1986) model might also have been influenced by the intervention.

It is suggested by the researcher that this may have occurred due to a reduction in 'reputational biases' (Bierman, 2004) between peers due to the CL intervention providing participants with more opportunities to interact with a wider variety of their classmates than may otherwise be the case, potentially enabling them to see some peers in a more positive light. This in turn may have led to a reduction in differential evaluations of behaviour and biased causal attributions (Asher and Coie, 1990), thus promoting peer

acceptance across the entire peer group. Furthermore, as initially posited by Piercy et al (2002), CL may also have enhanced peer acceptance relating to stage 4 of the Dodge et al (1986) model due to the structure of the activities providing an opportunity for children to demonstrate their strengths, leading to them being viewed in a more multidimensional fashion and hence becoming more likely to be accepted by their peers.

A final point worth making is that the circular nature of the Dodge et al (1986) model infers that the five stages are interlinked, and thus changes within one level may impact upon several others. For instance, an alteration in the social situation (stage 1) may influence the way in which an individual child behaves (stage 2) and thus how they are perceived by their peers at stage 4, which in turn could affect the social behaviours exhibited by the peer group at stage 5 and thus the way in which the peer group behaviours are interpreted by the child at stage 2, and so on. This, in the researcher's opinion, may be the reason underlying the highly significant outcomes produced by this study in relation to peer acceptance, as each change the intervention may have influenced at any one of the stages could have also impacted upon several other levels of the social interaction cycle.

It may be concluded, therefore, that the outcomes produced by the current CL intervention support the dominant thread within the literature, as covered within section 2.4, that peer acceptance may be promoted through simultaneously addressing both the social interaction skills and perceptions of the individual child (stages 2 and 3), the social interaction skills and perceptions of the peer group (stages 4 and 5), and through also providing the opportunities for these new skills and perceptions to be implemented (stage 1).

There are also several procedural conditions that may have influenced the increases in peer acceptance within the experimental group observed in this study. These are discussed below.

9.2.2 Procedural Considerations

Training and support for implementers was highlighted within chapter 3 as an important factor in contributing towards the efficacy of any CL programme (Murphy et al, 2005). Paradoxically, however, insufficient support was also identified as a chronic deficiency within the body of empirical studies accessed for the literature review (see section 3.9.1), and thus formed a major aspect of the rationale for conducting the current study.

As described within section 7.5, a coherent and extensive training package was offered to the class teacher implementing the intervention for this project, with ongoing support and feedback provided by the researcher throughout the intervention itself. Multiple training sessions enabled the implementer to consolidate, practice and reflect upon her skills before beginning the CL intervention itself, with the observation and feedback sessions conducted by the researcher during the intervention helping to ascertain the effectiveness of the training schedule. These observations highlighted that the implementer conducted the intervention proficiently, as described within section 7.6.11 and appendix 7.8. This, therefore, is suggested as a major factor in the success of the current intervention in promoting peer acceptance.

Second, the model of CL employed for this study, Kagan's (1990) 'structural' approach (see section 3.4.2 and 7.6), may also have been implicated in producing positive outcomes upon peer acceptance. This model enabled the implementer to transform existing lesson plans into cooperative activities in a relatively straightforward manner, thus enabling participants to be exposed to the four major principles of CL as advocated by Kagan (2009) (positive interdependence, individual accountability, equal participation among students and simultaneous interaction) from the outset of the intervention, with no need for additional preparation and planning on the implementer's behalf. This was particularly important due to the relatively short duration of this project.

Within this structural model two other factors may also have assisted in promoting peer acceptance. The first of these, employing heterogeneous groupings for CL activities, was highlighted within section 3.5.3 as a vital aspect of successful CL programmes (Vermette, 1995), yet was an aspect of CL interventions consistently overlooked by empirical studies on the topic (Antil et al, 1998). This study thus demanded the provision of teacher-selected heterogeneous groups for all CL activities, which were re-established at regular intervals (see section 7.6.8). This ensured that existing classroom cliques were not reinforced (Brown and Thompson, 2000), and certified that children within the experimental group were presented with opportunities to work cooperatively with peers they may not normally interact with. As described within section 9.2.1, this may have provided more opportunities for the positive qualities of children to be viewed by a wider selection of peers, potentially reducing reputational biases (Bierman, 2004) and thus impacting positively upon peer acceptance levels.

The second factor within the structural model, allocating roles to each child within the cooperative groups, may also have benefited peer acceptance levels through enhancing individual accountability and positive interdependence (Kagan, 2009); two of the main principles of CL associated with improving social outcomes.

The final procedural aspect of this study that, in the researcher's opinion, may have improved peer acceptance within the experimental group was the incorporation of social skills training at the outset of the intervention. As described within section 9.2.1, this may have directly addressed potential within-child difficulties at stages 3 and 5 of the Dodge et al (1986) model of social interaction, while also potentially influencing the perceptions of individual children (stage 2) and the rest of the peer group (stage 4). It was not just the incorporation of social skills training that was beneficial; however, the methods through which these skills were taught to the children was also a vital factor. An initial focus upon listening skills (Aronson and Patnoe, 1997) and a defined procedure for teaching and reinforcing each new skill, as described within section 7.6.5, could also have been salient contributory

factors to the success of the overall intervention in promoting peer acceptance.

This section has suggested explanations for the outcomes of this study in relation to the research questions. However, before drawing any firm conclusions, it is imperative to consider the validity and reliability of these findings through a detailed discussion of pertinent methodological strengths and limitations. This discussion is presented within the next section.

9.3 Methodological Strengths and Limitations

This section considers the impact of the methodology and procedures employed upon the validity and reliability of the results produced from this study. This is a vital consideration as it directly influences the confidence with which outcomes can be interpreted (Robson, 2002).

9.3.1 Methodological Strengths

Certain aspects of the design and procedures utilised within this project promoted the reliability and validity of the results obtained. Several of these factors are also discussed within section 7.8, and are thus only briefly summarised here.

9.3.1a Promoting Internal Validity

Ways through which this study addressed potential threats to internal validity are summarised below.

History

Discussions conducted with the experimental and control group implementers highlighted no exposure of the participants to any concurrent

interventions or events that could have impacted upon the effectiveness of the CL intervention.

Instrumentation

Both measurement instruments employed for this study possessed established reliability indices, and identical administration protocols were employed at pre- and post-testing for both experimental and control groups, as described in section 7.7. Extraneous variables including the test administrator, the testing environment, time of day and duration of administration were also consciously controlled. Furthermore, relating to the CL intervention itself, lesson content was identical for both control and experimental groups, which was made possible by the intervention and control group implementers formulating lesson plans jointly, as stated in section 7.6.9.

Mortality

An inclusion criteria demanding an attendance level of 80% was required for a participant's data to be included within the analysis, as it was felt that attendance below this level could potentially have confounded results pertaining to the effectiveness of the intervention.

Maturation

The employment of a control group lessened the effect of this threat through the attenuation of extraneous variables linked to maturation, thus potentially reducing their effect upon outcomes (Petticrew and Roberts, 2008).

Diffusion of Treatments

Treatment diffusion between teachers was monitored through treatment integrity observations (see section 7.6.11) in both the experimental and control conditions to ensure that elements of the intervention were not being transmitted to the control group. These observations indicated that treatment diffusion between teachers was not apparent, as the control group teacher did not employ any aspects of CL during any of the observations. These observations can be viewed in appendix 7.8.

9.3.1b – Promoting External Validity

Ways through which this study addressed potential threats to external validity are summarised below.

Representativeness of sample and setting

The rich methodological and procedural description provided within chapter 7 enables the reader to make judgements pertaining to generalisations to other participant groups and contexts, and will also promote accurate replications. Furthermore, the location of this study within a practice setting, rather than within a laboratory environment, means that outcomes are potentially more applicable to other practice contexts (Frederickson, 2002).

History

The inclusion of an initial audit of the implementers' previous experience relating to the intervention (appendix 7.4) highlighted that both implementers had very little previous exposure to CL structures, attenuating this threat to some extent.

9.3.1c Promoting Content and Concurrent Validity –

Ways through which this study addressed potential threats to content and concurrent validity are summarised below.

Content Validity

First, in terms of the content validity of the measurement instruments, the Social Inclusion Survey (SIS) (Frederickson and Furnham, 1998a) employed for the current study measured peer acceptance pertaining to both 'Work' and 'Play' contexts, enhancing content validity over single-choice criterion sociometric instruments by sampling the major contexts within which interaction occurs in the school environment (Frederickson and Furnham, 1998a). Also, the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) possesses established content validity (Goodman, 2001).

Second, pertaining to the CL intervention, content validity was promoted through the employment of treatment integrity observations (appendix 7.8). Conducting these observations enabled the researcher to conclude that the CL intervention was administered appropriately for the experimental group, and that CL principles were not transmitted to the control group, as discussed in see section 7.6.11.

Concurrent Validity

The employment of multiple measures (SIS and SDQ) to gather data potentially enhanced concurrent validity, as similar patterns of findings from discrepant data collection instruments can indicate more valid results (Cohen et al, 2007). For instance, in this study the effect of the CL intervention upon the 'peer problems' measure of the SDQ supported the findings from the SIS. Multiple methods, however, *"do not constitute a panacea for all methodological ills"* (Robson, 2002, p103), and so even though these different instruments yielded similar outcomes, validity cannot be guaranteed.

9.3.1d – Promoting Reliability

Ways through which this study addressed potential threats to reliability are summarised below.

Reliability as Stability

Both measurement instruments employed to measure outcomes in the current study posses established test-retest reliability quotients; 0.78 over five weeks for the SIS (Frederickson and Furnham, 1998b) and 0.62 over 4-6 months for the SDQ (Goodman, 2001). Indeed, these relatively high levels of stability formed a major aspect of the rationale for utilising these instruments.

Reliability as Internal Consistency

The SDQ addressed this threat through possessing a relatively high internal consistency level of 0.73 (Goodman, 2001).

9.3.2 Methodological Limitations

Certain aspects of the design and procedures utilised within this project may have compromised the reliability and validity of the results obtained. Several of these factors have been discussed previously in detail within section 7.8, and are thus only briefly summarised here.

9.3.2a Compromises to Internal Validity

Potential confounds pertaining to internal validity are summarised below -

Testing

This threat was highly relevant to the current study, as completing the Social Inclusion Survey (Frederickson and Furnham, 1998a) may have led participants to focus upon their relationships with their peers in the intervening time before post-test administration, thus influencing the results obtained at post-testing. This threat was addressed somewhat through the employment of a control group; however, it is felt by the researcher that this threat could have still influenced results. Future methodological improvements relating to this limitation are discussed in section 9.4.1a.

Selection

Internal validity could also have been compromised as a result of the non-random allocation of participants to the control and experimental groups. This could have resulted in initial differences between groups that could have affected their sensitivity to the intervention under investigation (Cohen et al, 2007). This threat was attenuated through the employment of inferential statistical procedures that addressed this factor (see section 8.2.1); however, the threat still remains that the groups could have differed significantly in relation to additional unidentified variables that could correlate with those under investigation.

Diffusion of Treatments

This threat was particularly salient for the current study due to the experimental and control groups consisting of two classes within the same school. There was, therefore, a real danger of the skills developed by the intervention group being transmitted to students in the control condition, thus potentially contaminating results. An alternative design was considered in which the control group would have been located within a different school to reduce diffusion effects; however, this was believed by the researcher to be less desirable as it would have introduced a host of potentially confounding contextual variables.

Instrumentation

There were several limitations pertaining to the measurement instruments employed for this study. First, both the SDQ and SIS are self-report measures, which are susceptible to social desirability biases and defensive responses, particularly for sensitive topics such as peer acceptance (Leets and Sunwolf, 2005). Such responses could have led to the underreporting of feelings, thoughts and behaviours that might have reflected negatively on the individual concerned (Asher and Coie, 1990). The researcher attempted to minimise this threat through promoting the notion of confidentiality of responses throughout the administration procedure; however, the threat remains.

Furthermore, in terms of limitations pertaining to the treatment integrity observations, only three of the four CL structures were observed, which is acknowledged as a limitation of this project. Further improvements to this measure are discussed within section 9.4.1a.

9.3.2b – Compromises to External Validity

Potential confounds pertaining to external validity are summarised below.

Representativeness of sample and setting

The non-probabilistic volunteer sampling strategy adopted for participant selection in this study, described within section 7.2, means that outcomes cannot be assumed to represent the wider population (Cohen et al, 2007). This strategy also resulted in the intervention being implemented by just one teacher to one class of children within a single contextual setting, severely compromising external validity (Leets and Sunwolf, 2005) as it is not possible to validly generalise results beyond this context or to other populations. This is a limitation that must be addressed through further research.

The fact that the CL intervention was conducted by just one implementer also opens this study up to a further potentially crucial confounding factor relating to implementer characteristics, as variables associated to this factor could have influenced outcomes. For instance, the teaching style adopted outside the CL activities by the experimental group teacher could have encouraged peer acceptance within the experimental group more readily than the approach adopted by the control group implementer, or vice-versa. This could have led to outcomes that exaggerated or under-represented the effectiveness of the CL intervention. This is a major shortcoming associated to this project and must be attenuated through future empirical studies. Methods of addressing this limitation are discussed within section 9.4.1b.

9.3.2c Compromises to Content Validity

Potential confounds pertaining to content validity are summarised below -

There are two main limitations relating to content validity. First, the employment of a structured approach to CL involved social skills training for the experimental group at the beginning of the CL intervention (see section 7.6.5). This meant that it was not possible to determine the impact of the CL structures alone, as the social skills training may have enhanced peer

acceptance levels and prosocial behaviours within the experimental group. Future research should address this position, as considered in section 9.4.2b.

The second potential limitation pertains to the duration of the CL intervention implemented for this study. Chandler et al (1992) posit that longer interventions are more likely to be successful, a viewpoint seconded by Murphy et al (2005, p160), who state,

> "*...measuring peer acceptance over a short period of time can be questioned*".

This was identified as a shortcoming of previous research in chapter 4, and indeed formed one aspect of the rationale for the current study outlined in chapter 5. However, this limitation was not overcome by this project, as the CL intervention was conducted over a 10 week period due to limitations imposed upon the time available for this project and further commitments of the implementer.

Furthermore, the participants only engaged in CL activities for a relatively minor proportion of the timetable (see section 7.6.10), therefore other activities, which were not monitored, could have influenced outcomes. Potential solutions to these difficulties are suggested in section 9.4.1c.

9.3.2d Compromises to Reliability

Ways through which this study was susceptible to threats to reliability are summarised below.

Reliability as equivalence

Inter-rater reliability is particularly pertinent to structured observations such as those conducted by the researcher to measure treatment integrity (appendix 7.8), particularly as this was an unstandardised instrument designed by the researcher. Calculating inter-rater reliability for this schedule would have potentially enhanced reliability for this measure through addressing the potential threat of observer bias (Robson, 2002). However,

these measurements were not conducted; therefore this is also acknowledged as a limitation of the current project.

9.3.3 Summary of Methodological Strengths and Limitations

Section 9.3 has highlighted a number of factors that may have promoted reliability and validity for the outcomes achieved by this study. These include design considerations such as this study's location within a practice setting and the use of multiple methods of measuring the dependent variables, with instruments possessing established reliability and validity. Controlling a number of extraneous variables, such as testing procedures and lesson content between the experimental and control groups may have also contributed towards valid and reliable outcomes.

However, as with much research of this scale, major limitations have also been identified. Certain factors associated with the design of this study potentially detract from the validity and reliability of outcomes, including the non-random allocation of participants to experimental or control groups and the self-report nature of the data collected. The major aspect of this study that compromises results, however, relates to the small sample size produced by the non-probabilistic volunteer sampling technique employed. This sampling strategy resulted in the intervention being implemented by just one teacher to one class of children within a single contextual setting, thus severely compromising external validity beyond this context (Leets and Sunwolf, 2005). This limitation also suggests that any differences in implementer characteristics between the control group and experimental group teachers could have had a greater impact upon results than if a larger sample had been utilised.

Overall, these limitations indicate that any interpretations pertaining to the effectiveness of the CL intervention employed within the current project must be offered cautiously, as these potential confounds may have impacted negatively upon the validity and reliability of the results obtained. With this in mind, it is vital to suggest methods through which the design and procedures

adopted within this study might be improved upon for future work in this area. This topic will be considered within section 9.4.

9.4 Future Research

This study has demonstrated that CL may effectively enhance mean same-sex and opposite-sex peer acceptance levels within a mainstream primary school. However, this conclusion must be offered cautiously due to the methodological limitations outlined within section 9.3.2. Therefore, before any future research attempts to explore the effectiveness of CL, the shortcomings inherent within this study must be tackled. Section 9.4.1 considers these future improvements.

9.4.1 Overcoming the Limitations of the Current Study

Potential solutions to limitations pertaining to several different forms of validity and reliability are espoused below.

9.4.1a Overcoming Limitations to Internal Validity

To lessen the 'history' threat to internal validity, more detailed data collection relating to the exposure of participants to concurrent or previous interventions must be collected, as this study relied upon anecdotal discussions with implementers, who may not necessarily have had access to all of the necessary information. This data could be collected through a questionnaire distributed to teachers, parents and the children themselves, or through conducting interviews with participants.

Future research could further reduce the 'testing' threat to internal validity through the utilisation of an alternative design in which two control groups would be employed, with one of the control groups not participating in pre-testing and thus not potentially being sensitised to the purposes of the

research by these tests (Robson, 2002). This design was not feasible for the current study as the school in which the project was conducted was two-form entry, meaning that one of the groups would have to have been located in a different setting or consist of participants from a different age grouping. Both of these options were felt by the researcher to be less desirable as they would introduce a host of potentially confounding contextual variables. Future replication attempts could address this difficulty through conducting the research in schools with at least three forms in each year group.

The 'selection' threat to internal validity could be lessened through randomly assigning participants to control or experimental groups, thus decreasing the possibility of initial differences between the groups affecting their sensitivity to the intervention under investigation (Cohen et al, 2007). However, this would be difficult to achieve within a school environment and could also be detrimental to external validity as intact class groups would not be present.

Finally, the 'instrumentation' threat to internal validity could be overcome in subsequent replication attempts through the employment of additional non-self-report measures such as structured observations of participants' behaviours in both the work and play contexts. This could decrease the study's susceptibility to social desirability biases and defensive responses (Leets and Sunwolf, 2005). Also, additional treatment integrity observations should be conducted in future, with each CL structure being observed at least once. The collection of data pertaining to participants' views of the effectiveness of the CL structures employed could also enhance this aspect of internal validity.

9.4.1b Overcoming Limitations to External Validity

The foremost limitation of this study pertains to the sample size employed, which compromises the generalisability of the findings beyond the current context. This shortcoming can be traced back to the non-probabilistic volunteer sampling strategy utilised to select participants, which was described in section 7.2. Future replications must, therefore, employ more

externally valid probabilistic sampling methods, such as random or systematic sampling (Cohen et al, 2007), thus enabling outcomes to more accurately reflect the wider population. These sampling techniques may also enable a larger sample to be employed, which could enable the researcher to generalise findings to a greater number of contexts and participant groups.

Furthermore, employing a larger sample could reduce the impact of implementer variables, such as teaching style, upon peer acceptance levels, which was perceived to be the most salient shortcoming of the current project. Merely increasing the sample size would, however, be an overly simplistic solution to this difficulty, and so further steps would have to be taken to ensure implementer variables are accounted for. This could involve monitoring implementer characteristics through structured classroom observations or through qualitative methods such as detailed interviews with the implementers themselves.

It is important to mention, however, that a larger sample size could adversely affect treatment integrity as a larger number of implementers would be more likely to conduct the intervention discrepantly. This would heighten the importance of teacher training sessions and treatment integrity observations, which would need to be conducted in a highly rigorous manner.

9.4.1c Overcoming Limitations to Content Validity

In order to overcome the limitations to content validity suggested in section 9.3.2c, future replication efforts should conduct the CL intervention over a longer period of time, perhaps over an entire academic year. The intensity of the CL intervention could also be increased from that of the current project, possibly by employing CL structures across the entire curriculum. This could reduce the impact of confounding variables associated with non-CL activities engaged in by participants.

9.4.1d Overcoming Limitations to Reliability

Utilising multiple observers to calculate inter-rater reliability for the treatment integrity observation schedule could enhance reliability for this measure through addressing the potential threat of observer bias (Robson, 2002). This would necessitate the training of several observers in order that they would be able to complete the schedule accurately and consistently.

9.4.1e Further Methodological Enhancements

Finally, there are three further areas in which future research may wish to enhance the design employed for this study, but which do not associate to a specific aspect of reliability or validity.

First, future studies could conduct maintenance measurements in order to establish whether any effects are maintained over a period of time, a vital component of any intervention's effectiveness (Petticrew and Roberts, 2008).

Second, future researchers should determine the effectiveness of CL through comparison with alternative treatment conditions, not just against the performance of a control group as was the case in this study (McMaster and Fuchs, 2002). Comparisons with other peer-mediated interventions, such as 'peer tutoring' (Simmons et al, 1994) may provide one fruitful avenue for exploration. Contrasting outcomes against other interventions specifically designed to promote peer acceptance, such as the 'Circle of Friends' approach (Newton et al, 1996) and other social skills group interventions, would also warrant further investigation. This would enable the relative effectiveness of CL to be established with reference to other readily available interventions.

Third, future research should collect data relating to the implementers' perceptions of the benefits and drawbacks of the intervention, particularly relating to issues around practicability, as the potential of CL to benefit students may also depend upon the teachers' receptivity to its benefits and willingness to adopt it (Jenkins and O'Connor, 2006). This is a particularly

salient consideration as Leyden (1996) points out a general reluctance of teachers to implement approaches of this kind.

9.4.2 Further Investigations

Section 9.4 has, thus far, considered ways through which future replication attempts may enhance the validity and reliability of outcomes. This initial phase of replication is vital, as very little previous research has evaluated CL in a UK context, as highlighted in section 5.2.

However, if these replications can establish a firm evidence base for CL's effectiveness across numerous locations; and across different groups of participants, then there are several potentially fruitful avenues for exploration through further empirical research. This section illuminates some of the more exciting opportunities that might be investigated.

9.4.2a 'Delving Deeper'

The current study highlights the potential effectiveness of CL upon **mean** peer acceptance levels. This gives an indication that, on average, peer acceptance increased for participants in the experimental group in comparison to those in the control group; however, this is a relatively crude measure, as it does not account for the more subtle changes in acceptance levels that may have occurred within the group.

Future research must 'delve deeper' into the effects of CL, which can be achieved by addressing three potential research questions -

1. *For **Whom** Might Cooperative Learning Most Effectively Enhance Peer Acceptance?*

This study presents outcomes in terms of mean peer acceptance levels for same sex and opposite sex groups. However, this gives no indication as to the impact upon individuals within these groups. It could have been the case that some individuals benefited significantly differently from others dependent upon certain characteristics.

One particularly salient characteristic could be the initial peer acceptance levels of participants; therefore, future research could investigate whether there are significant differences in the effectiveness of the CL intervention upon peer acceptance between participants with initially discrepant acceptance levels. This is a particularly important investigation to consider due to the potentially profound consequences of peer rejection outlined within chapter 2, and could contribute uniquely to the research in this area, as,

> *"...the value of Cooperative Learning for peer rejected children has not been examined empirically"* (Bierman, 2004, p248).

Data could be analysed with reference to each participants' initial peer acceptance status, thus enabling the researcher to establish the effectiveness of CL for children with initially lower peer acceptance levels. It was not possible to investigate this phenomenon in the current study due to the small sample size employed, which did not allow the participants to be split into sub groups, as these smaller groups would have contained too few participants for valid statistical analyses to be conducted.

2. ***How** Might Cooperative Learning Affect Peer Acceptance Between Individuals?*

The measurement instruments employed for the current study did not provide information relating to **how** relationships between peers changed. This is an important factor for consideration through future research as, for instance, a child whose overall acceptance remained relatively constant may actually have been accepted by a wholly different set of peers at post-testing. This question could be addressed through the employment of more detailed

sociometric methods such as peer nomination sociograms (see Kosir and Pecjak (2005) for a review of such techniques) or structured behavioural observations.

*3. **Why** Might Cooperative Learning Affect Peer Acceptance Levels?*

The results of this study suggest that CL may be an effective intervention for enhancing peer acceptance; however, it does not provide an insight into **why** the intervention may have been successful. Theoretical and procedural explanations are provided within section 9.2; however, the majority of these are based upon the researcher's suppositions and thus require further exploration.

Future research must, therefore, 'delve deeper' and investigate **why** CL might influence peer acceptance levels. This could be achieved through conducting research exploring the extent to which CL addresses each stage of the Dodge et al (1986) model of social interaction. So, for example, do participants become more accepting of other's behaviours (stage 4), or do participant's social behaviours actually become more acceptable (stages 3 and 5), or is it a combination of the two?

The employment of the 'prosocial behaviour' scale of the SDQ addressed this point to some extent, suggesting that CL can enhance prosocial behaviours of individuals, thus addressing stages 3 and 5 of the Dodge et al (1986) model, although future research must explore this further.

9.4.2b Isolating the 'Active Ingredients'

It is imperative for future research to attempt to identify the components of CL that contribute most to enhancing peer acceptance. In order to do this it will be necessary to compare the effects of differing forms of CL interventions. This future exploration could involve evaluating the effectiveness of interventions that differ along the dimensions referred to within chapter 3 as potentially influencing outcomes, namely –

- Contrasting different models of CL (section 3.4).
- Evaluating the impact of various forms of teacher training (section 3.5.2).
- Comparing different CL grouping strategies (section 3.5.3).
- Assessing the effectiveness of structured versus unstructured CL interventions (section 3.5.1), which would enable the relative impact of the CL and social skills training elements of the intervention to be isolated.

If the most important elements along each dimension could be identified then these could be promoted and other, less influential aspects could be disregarded, thus eventually producing the most effective CL intervention possible.

9.4.2c 'Broadening Horizons'

It is also vital for future research to investigate the effectiveness of CL upon other dependent variables and populations.

Section 3.8.1 highlighted that much previous research has suggested the potential of CL in improving academic outcomes for students, an assertion supported through the theories espoused within section 3.3. However, as with the literature relating to social outcomes such as peer acceptance, this research body is confounded by methodological limitations (see section 3.9) and a lack of research conducted within a UK context. Therefore, investigating the effectiveness of CL upon dependent variables associated to academic achievement would be a particularly beneficial line of enquiry, as the establishment of an intervention that could foster beneficial outcomes for students both socially and academically would set CL apart from the vast majority of contemporary educational instruction methods (Murphy et al, 2005).

Furthermore, the effectiveness of CL upon additional social variables should be explored through further empirical study, as section 3.6.1 outlined myriad

social factors for which some research evidence exists, including self-esteem (Goodwin, 1999), motivation (Slavin, 1992), behaviour ratings (Slavin, 1991) and social communication (Lin, 2006); however, further research must be conducted within a UK context to establish the effectiveness of CL with respect to these variables.

Finally, as initially referred to within section 7.1, an exciting opportunity pertains to the potential benefits of CL for children with an Autistic Spectrum Disorder. As alluded to above, previous research has highlighted the potential of CL in promoting social communication skills (Lin, 2006), and this study has demonstrated CL's potential effectiveness in promoting peer acceptance. Bearing these dual benefits in mind, the potential for this intervention to promote the educational experiences of this participant group could be highly important. Some empirical studies have specifically investigated this area previously, for instance, Dugan et al (1995) observed a greater number of social interactions for two autistic students during a CL intervention than during a baseline control period; however, the benefits of CL *"remain relatively explored within the context of autism"* (Grey et al, 2007, p318) and so this could be a particularly salient focus for future study.

The next section considers the impact that this study could have upon the professional practice of Educational Psychology.

9.5 Professional Implications

Having considered the implications of this study for further research, it is also imperative to discuss the impact that it could have upon the professional practice of Educational Psychology.

9.5.1 The Role of the EP in Promoting Peer Acceptance

First and foremost, this study illustrates how Educational Psychologists might contribute towards the promotion of peer acceptance.

A large body of theoretical and empirical evidence suggests the need to focus upon the peer group as well as the individual child experiencing difficulties in order to effectively promote peer acceptance, as considered within section 2.4.

Some contemporary interventions are indeed based upon this premise, for example, Frederickson (Frederickson et al, 2005; Frederickson and Turner, 2003) cites the effectiveness of the 'Circle of Friends' intervention, an approach involving peer support towards a focus child through weekly whole-class meetings, upon the social inclusion (Frederickson et al, 2005) and social acceptance (Frederickson and Turner, 2003) of the focus child.

The majority of interventions in this area, however, remain, *"almost always based on a child deficit model"* (Harrist and Bradley, 2003, p186), invariably taking the form of social skills training interventions (Nangle et al, 2002), or social-cognitive training programmes (Bash and Camp, 1985), thus ignoring the important role that the peer group may play in peer acceptance.

In line with Frederickson's work, this study has demonstrated the effectiveness of an intervention that also includes the peer group, thus addressing all stages of the Dodge et al (1986) model of social interaction, as discussed within section 9.2.1. This has major implications for professional practice in this area, as it empirically supports the notion that EPs conducting interventions to promote peer acceptance should not focus their efforts entirely upon the child experiencing difficulties, but must also direct attention

towards the peer group. Currently, the implementation and empirical validation of class-wide social interventions such as CL and 'Circle of Friends' remains rare (Harrist and Bradley, 2003); however, it is hoped that this study will influence professional practice by encouraging EPs to implement interventions, such as CL, that encompass the whole peer group, and also through promoting further empirical validation of CL in different contexts and with various participant groups, thus strengthening the evidence-base for this intervention.

9.5.2 The Role of the EP in Promoting Positive Outcomes at a Systemic Level

Broadening this section's outlook to consider the role of the EP in a wider sense, this study may also have implications upon the role of the EP as a 'systemic agent of change'.

In recent years, increasing emphasis has been placed upon the impact that Educational Psychologists might make through working at a systemic level. Solity (2000), promotes this notion, proposing a model of Educational Psychology practice in which psychologists advise, train and support teachers on the implementation of psychological principles of, for example, teaching, learning and curriculum design across the whole school. Solity (2000) argues that this model would lead EP practice away from the traditional special educational needs arena, and would allow EPs to have a positive impact upon a much larger number of children within a Local Authority.

The espousal of viewpoints such as Solity's do appear to have had some effect upon the professional practice of Educational Psychologists within the UK, demonstrated through an increased number of articles in recent years relating to systemic aspects of practice published within one of the profession's most influential journals, Educational Psychology in Practice. These articles have incorporated topics as diverse as whole school literacy interventions (Roberts and Norwich, 2010), restorative practice (Macready,

2009) and social inclusion (Davison et al, 2008), amongst others. A discursive thread explicitly relating to the systemic role of the EP also weaves its way through recent issues of this peer-reviewed journal (e.g. Fallon et al, 2010; Fox, 2009; Gersch, 2009; Boyle and Lauchlan, 2009; Boyle and MacKay, 2007), indicating that this remains a highly pertinent topic within contemporary professional practice.

Furthermore, within the author's own recent experience, systemic elements of practice form a major component of the current professional training model at Nottingham University, with entire modules considering systemic elements of EP work in great depth, such as consultative practice, critical incident work and psychological tools for facilitating organisational change; facets of knowledge that have translated directly into the author's professional practice within a Local Authority.

As highlighted above, however, the perpetual discussion within professional publications regarding this topic illustrates that the role of the EP at a systemic level is still a matter for much debate. Some authors (e.g. Boyle and Lauchlan, 2009) continue to advocate the merits of individual casework; meanwhile others, such as Leyden (1999), posit that although many Educational Psychologists have embraced the formulation of systemic work originally expressed within Gillham's (1978) seminal work *'Reconstructing Educational Psychology'*, the profession still struggles to implement sufficient systemic practice within the school context. Feedback from contributors to the Farrell report (DfES, 2006, p72) further reinforce this claim, as the following quote illustrates –

> *"...school-based respondents were much less likely to have experience of EP's systems/organisational work"*

The current study may thus influence professional practice through explicitly highlighting the potentially beneficial impact that Educational Psychologists can encourage through working at a systemic level, through training and supporting teachers to deliver educational innovations; thus promoting the

systemic aspect of professional practice and potentially producing positive outcomes for a larger number of children and young people, not just those with special educational needs.

9.5.3 The Role of the EP as a Research Practitioner: Promoting Evidence-Based Practice

Continuing the theme of this study's impact upon the wider role of the EP, there are also implications pertaining to the conceptualisation of the EP as a research practitioner.

Educational Psychologists have had a continuing interest in researching dating back to the early work of Cyril Burt (Norwich, 1998), and are trained extensively in research techniques during professional training courses (Lindsay, 1998). However, research continues to constitute only a marginal aspect of most EP's professional work (Norwich, 1998), often due to LA pressures of a short term nature (Lunt, 1998). In support of this point, Frederickson (2002, p109) argues that evaluating the effectiveness of interventions through empirical research, *"which is at the core of evidence-based practice"*, has been regarded by EPs as less urgent than activities such as assessment.

Frederickson (2002) goes on to posit that the profession must now start affording the time necessary to conduct research activities, as performing research to establish the effectiveness of interventions can encourage a professional paradigm shift towards evidence-based practice, an area that has been assuming increasing importance across all areas of social policy (Frederickson, 2002), due in part to an enhanced expectation of professional accountability (Stoiber and Kratochwill, 2000).

This study has demonstrated how the research skills taught to EP's during professional training, in tandem with the regular access to myriad educational contexts afforded by the EP role, might be utilised to conduct rigorous empirical research that can establish, albeit cautiously in this case, the effectiveness of an intervention. It is anticipated, therefore, that through the

consumption of this study, EPs could be encouraged to subscribe to an evidence-based model of professional practice. Furthermore, it is hoped that consumers of this study may be inspired to conduct their own research, and thus further promote the notion of evidence-based practice advocated by Frederickson (2002).

9.5.4 Local Level Implications

Finally, it is worth drawing attention to the implications of this project upon schools within the Local Authority in which it was conducted. At the time of writing, the CL intervention employed for this study continues to be implemented by the intervention teacher, and in the academic year 2010/2011 training will be conducted collaboratively by this teacher and the researcher in order that CL structures might be employed by all staff within this designated school. Eventually, it is intended that a significant proportion of the curriculum in this school will be taught through Cooperative structures, as is the case already within another school in the Local Authority (see Davison et al (2008) for details of this project). The long-term aim for the researcher is to then adopt the model employed for this study to embed a curriculum based around CL principles within other schools in the locality. This study has provided valuable empirical evidence to support this long-term project's continuation within the authority.

The following section of this chapter will draw this project to a close.

9.6 Conclusions

This concluding section summarises the current research through reflecting upon this study's effectiveness in meeting the initial aims, and by considering the originality and importance of the contribution made to the knowledge base within this topic area.

9.6.1 Did this Study Achieve its Aims?

This study set out to investigate the effectiveness of a CL intervention upon the peer acceptance of children within a mainstream classroom environment. This aim was fulfilled, as demonstrated by the outcomes, which showed that peer acceptance levels significantly increased in the group exposed to CL in comparison to the no intervention control group. This significant difference was apparent between both same sex and opposite sex peers, and permeated into both the 'work' and 'play' environments. It can thus be concluded that CL may be considered effective in enhancing peer acceptance within a mainstream classroom environment. Furthermore, it can also be concluded, from the answers to research questions 5 and 6 respectively (see section 9.1.1), that CL may also be effective in terms of increasing self-reported levels of 'prosocial behaviour' and decreasing self-reported levels of 'peer problems'.

However, the confidence with which these conclusions can be espoused must be considered with reference to the validity and reliability of the outcomes achieved. Several factors that could enhance validity and reliability were identified within section 9.3.1, including the employment of a control group, the established reliability and validity of the instrumentation devices utilised and the employment of treatment integrity observations, amongst others. However, within section 9.3.2, several potentially confounding variables were recognised, which have the potential to compromise the validity and reliability of outcomes. The most salient of these were associated to the small sample size employed for this study and the impact of implementer characteristics upon the results obtained. With this in mind, the conclusions asserted above may only be offered cautiously, and section 9.4.1 suggests that further empirical research must be conducted in order to address these methodological shortcomings and thus provide a firmer base from which to establish the effectiveness of this CL intervention upon peer acceptance.

9.6.2 Did this Study Make an Original and Significant Contribution?

As Davison et al (2008, p307) posits, CL,

> *"...is an area...which seems to have received little attention from Educational Psychologists".*

Indeed, this formed a major aspect of the rationale for conducting this study, as the literature review identified a paucity of empirical studies conducted upon mainstream populations within the UK. Also, little previous research focussed upon the social outcomes of CL programmes (Murphy et al, 2005), despite this aspect being touted within the literature as a major selling point of Cooperative programmes.

Furthermore, in addition to the lack of relevant research indicated above, several chronic deficiencies within the small amount of literature on this topic that had been conducted were also discovered during the systematic literature review (chapter 4). These inadequacies included design limitations, such as the failure to employ a control group and a lack of consideration of treatment integrity, and also shortcomings pertaining to the manner in which CL was implemented, including –

- A lack of initial social skills training.
- Failure to employ heterogeneous groupings for CL activities.
- Insufficient duration of CL interventions.
- Inadequate teacher training.

These limitations have also been recognised by contributors within the empirical literature on this subject, for example Dugan et al (1995, p185) remark, *"the research for ... Cooperative Learning ... is suggestive rather than conclusive"*, and Bierman (2004, p248/9) makes it apparent that *"further exploration of CL is warranted"*.

This study, therefore, has attempted to make a significant and original contribution through the provision of empirical evidence in an area in which little previous research exists, through the employment of a mainstream

population within a UK context, and by focussing upon peer acceptance as a dependent variable. Furthermore, this study might also be considered significant as it overcame many of the methodological and implementation issues of the previous research body, through, for example, the provision of a control group, conducting treatment integrity observations, utilising heterogeneous groupings for CL activities and providing a comprehensive training and support package for the implementer of the intervention.

This is not the end of the story, however, as this study might also have made a significant contribution through providing a platform for future research, as discussed in section 9.4.2, which could 'delve deeper' to explore research questions such as, 'For whom is CL most effective in promoting peer acceptance?'. The impact of CL upon other outcomes such as academic achievement may also be a fruitful avenue for future investigations.

It is also anticipated that this study could also make a significant contribution through influencing the future professional practice of Educational Psychologists. This project has demonstrated the effective role that an EP can fulfil in working at a systemic level and through functioning as a research practitioner, and could thus influence consumers of this research to adopt these professional roles more readily.

Finally, and perhaps most importantly, this project may significantly contribute towards the future professional practice of EPs in promoting peer acceptance. The value of promoting peer acceptance cannot be underestimated, with a lack of acceptance potentially impacting aversely upon social and emotional development (Johnson and Johnson, 1999), school achievement (Frederickson and Cline, 2005), and long-term consequences including mental health difficulties and criminality (Parker and Asher, 1987), as discussed within section 2.2. This importance is also reflected in legislation, most notably the Special Educational Needs Code of Practice (DfES, 2001, 7.60), which explicitly highlights the need to emphasise the development of all children's social competence, and in acquiring the skills of positive interaction with peers and adults.

This project could, therefore, make a particularly significant contribution through demonstrating the role of the EP in promoting peer acceptance. This could influence EP's to recognise the importance of their involvement in this area and adopt interventions such as CL, which focus upon the entire peer group, not just on the child experiencing difficulties, in order to promote maximally positive outcomes for children and thus avoid the potential detrimental effects of a lack of peer acceptance.

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Appendices

Appendix 7.1	Procedural Timeline
Appendix 7.2	Initial Cooperative Learning Training Session Materials
Appendix 7.3	**(a)** Initial Project Presentation Slides **(b)** Initial Project Presentation Notes
Appendix 7.4	**(a)** Audit of Experimental Group Implementer's Experience of Cooperative Learning **(b)** Audit of Control Group Implementer's Experience of Cooperative Learning
Appendix 7.5	Intervention Diary
Appendix 7.6	Instructions for Cooperative Learning Structures
Appendix 7.7	Second Cooperative Learning Training Session Materials
Appendix 7.8	**(a)** Treatment Integrity Observation Checklist and Feedback Sheet (Blank) **(b)** Treatment Integrity Observation Checklists (Week 1) **(c)** Treatment Integrity Observation Checklists (Week 6) **(d)** Treatment Integrity Observation Checklists (Week 8)
Appendix 7.9	List of Social Skills Introduced by the Implementer

Appendix 7.1: Procedural Timeline

A broad outline of the procedural design is presented over the next three pages, the aim being to provide the reader with an overarching conceptualisation of the current study. This timeline is to be considered alongside the methodological features discussed within chapter 7.

Pre-Intervention Stage Timeline

Date	**September 2008**	**October 2008**	**November 2008**	**December 2008 → March 2009**
Action	Decision made to focus upon Cooperative Learning.	Focus of study decided upon as 'social inclusion of children with ASD'.	Focus changed to 'social inclusion of all children'.	Development and selection of training materials, measurement instruments and intervention materials.

Date	**April 2009**	**May 2009 → July 2009**
Action	i) First training session. ii) Participant selection. iii) Audit of participant's previous experience of CL.	Access and consent obtained from school participants. Implementer practice of CL intervention structures with support from researcher.

Intervention Stage Timeline

Date	Autumn Term 2009						
Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Action	Parental consent gained. Second training session. Pre-measure administration.	Social skills training for intervention group	CL intervention for intervention group. Ongoing support for implementer. Treatment integrity observations and formal feedback for implementer.				

Date	Autumn Term 2009						
Week	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Action	Treatment integrity observations and formal feedback for implementer.		Treatment integrity observations and formal feedback for implementer.			Post-measure administration.	

Post-Intervention Stage Timeline

Date	**January 2010** → **July 2010**	**Academic Year 2010/2011**
Action	Continuing support for intervention group implementer. →	Training and support for control group implementer. Implementation of CL intervention with control group. Whole school training and ongoing support.

Appendix 7.2: Initial Cooperative Learning Training Session Materials

Due to publishing constraints, it is not possible to reproduce the full training schedule from this session. However, further details can be ascertained through contacting –

Les Davison

Lead Educational Psychologist

Sefton Educational Psychology and Portage Service (SEPPS)

Ainsdale Hope Centre

Sandringham Road

Ainsdale

Southport

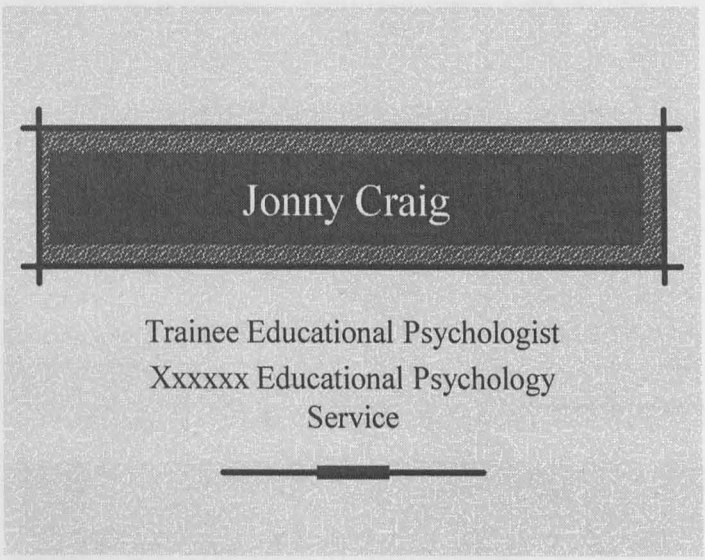
PR8 2PJ

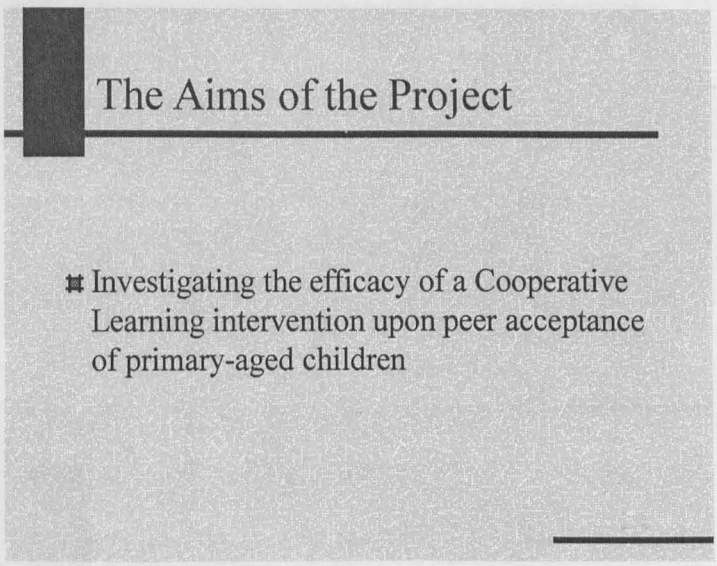
Tel: 01704 882038

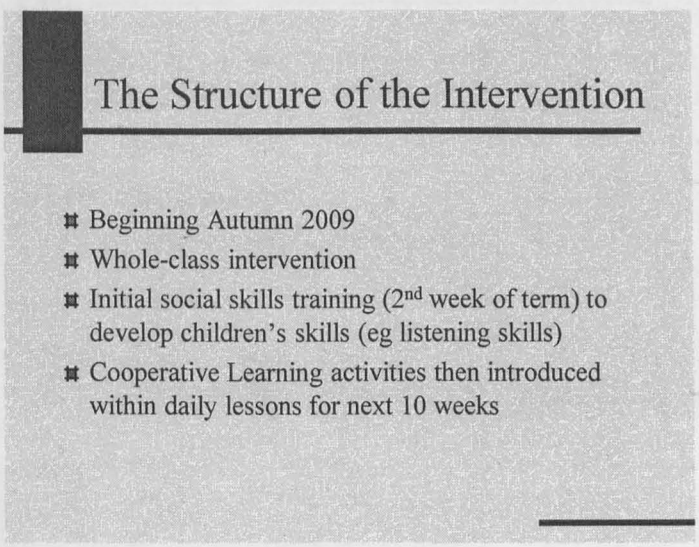
Fax: 01704 882039

Email: sepps.ainsdale@cs.sefton.gov.uk

Appendix 7.3(a): Initial Project Presentation Slides







The Commitment Required

- Not too labour intensive!
- Short extra training session
- Running the intervention in the classroom

Benefits of Participating

For children –

- ✓ Academic Achievement
- ✓ Social Skills
- ✓ Self-esteem
- ✓ Social inclusion/Peer acceptance

Benefits of Participating

For Teachers –

- ✓ Access to additional training
- ✓ Ongoing support
- ✓ Impacting upon future practice

Benefits of Participating

For the school –

✓ Recognition within the local authority

✓ Development of staff skills

✓ Tailored report of research findings

Ethics

- Subscribing to British Psychological Society guidelines
- Avoidance of Deception
- Informed Consent
- Right to Withdraw
- Confidentiality and Anonymity

What Next?

If you are interested in participating –

- Please leave your details on the sheets provided
- I'll be in touch soon
- Don't be shy!

Or contact me directly –

- XXXXXX XXXXX
- xxxxxxxxxxxxxxxxxxxxxxx

Appendix 7.3(b): Initial Project Presentation Notes

Intro

Thanks Xxxxx - Hi

For those of you I haven't had a chance to chat to so far today – my name's Jonny Craig and I'm a trainee educational psychologist currently working for Xxxxxxxxx Psychology Service.

This means that for 3 days a week I work as an EP in Xxxxxxxxx, with my own patch of schools, and attend university in Nottingham on the other two days – which means a lot of travelling but it'll hopefully be worth it in the end!

As part of my University studies I am conducting a research project within Xxxxxxxxxxx that is aiming to evaluate the effectiveness of a Cooperative Learning intervention incorporating the sorts of activities that we've been working on today.

And that's why I'm here – to briefly introduce my project and its potential benefits to you - and hopefully to interest some of you enough to consider participating with me in this project.

Please feel free to ask any questions whenever you like; there will also be a chance to ask questions at the end too.

The Project

My study aims to investigate the efficacy of Cooperative Learning upon peer acceptance of primary aged children.

In order to do this I aim to introduce CL on a whole-class basis in several schools within Xxxxxxxxxx during the 2009 autumn term. This will involve social skills training sessions for all the children involved, probably in the second week of term – in order that they can be familiarised with the sorts of skills necessary to participate in Cooperative Learning activities most successfully, such as listening skills, giving and receiving feedback and information sharing.

After this the intervention proper will run until a couple of weeks before the end of term, and will involve Cooperative activities, such as those demonstrated today, being incorporated within daily lessons.

The Commitment Required

Obviously a certain level of commitment will be required by those of you who might wish to participate – so I thought I'd make this explicit at the outset so there's no nasty surprises later!

It won't be too labour intensive, however – there will be an additional training session for participating teachers prior to commencing the project – just to help with the initial implementation of the intervention and so I can answer any queries you might have.

Then there's running the intervention itself, although I'll be available for ongoing support.

You may also wish to practice with the CL materials during the summer term, and I'll be on hand to offer support then too if required.

The Benefits

There are many potential benefits to participation in this study, for the children taking part, for you, and for the school as a whole.

In terms of benefiting the participating children – CL has been shown by previous research to positively impact upon academic achievement, social skills and self-esteem, as well as potentially enhancing the social inclusion of vulnerable groups of children such as those with ASD.

The fact that the intervention is aimed at all children in the class means that these potential benefits cold impact on all children within the group.

Benefits for the teacher – I'm guessing that the very fact that you are here today indicates an interest in CL, and possibly a desire to implement it within your classroom anyway. By participating in this project you can access additional training, ongoing support and feedback, through my regular visits to the school, without it coming out of the school's EP time allocation.

You also get to have your say at the end of the project, giving your views and potentially having an impact upon how this type of intervention is developed and implemented in the future.

In terms of benefiting the whole school – The school will be participating in a pioneering project – which entails the possibility of being recognised within Xxxxxxxx as such.

Also, if the project is successful, the school will already have an experienced member of staff to provide support to others if CL is adopted on a more widespread basis throughout the school.

I will also be pleased to provide the school with a detailed account of the findings after the completion of the project – either in written form or through a presentation to staff.

Ethics

Finally – I'd better mention ethics – it wouldn't be a psychologist's presentation without a bit about ethics – needless to say though it's a very important area.

The project will be conducted within BPS ethical parameters – so – for instance –

- In order to avoid deception - All staff and children will be fully informed of the nature and purpose of the study before participating
- Consent to conduct the research will be sought from the head teacher and all participants.
- The school will have the right to withdraw from the research at any time during the study. The school can withdraw consent retrospectively, and may request any data concerning themselves to be destroyed. Individual participants also have the right to withdraw at any time.
- Any identifying information regarding the school and any persons from the school involved in the research will be made anonymous and stored confidentially and securely.

What Next

So – what next – there's a couple of sheets being passed around at the moment – and if you're interested in participating I'd be really grateful if you could leave details including your name, school and the year group you teach in - and I'll get in touch within the next few weeks to discuss the project further, and address any questions you may have. Writing your name down does not mean you are committed to participate in the study – it's just an initial expression of interest – you are free to say no at any time in the future - so please don't be shy!

Final Comments

Finally – I'd just like to say thanks to Xxxxx for his ongoing support and for giving me the opportunity to speak to you today. And for running such an interesting and informative training session today.

So if you are interested in participating please leave your details on the sheets being passed around and I'll contact you within the next few weeks

Or come and have a chat with me in a minute – and you can also contact me on the details provided within the handout in the meantime if so desire.

Does anybody have any more questions before I hand back to Xxxxxxx?

Ok - great thanks for your time. I really look forward to working alongside some of you soon.

Appendix 7.4(a): Audit of Experimental Group Implementer's Experience of Cooperative Learning

Initial Audit of Use of Cooperative Learning Structures

How often have you used the following Cooperative Learning Structures?

1 = Every day
2 = More than once a week
3 = Once a week
4 = Once a fortnight
5 = Less than once a fortnight
6 = Never

Think Pair Share
5

Doughnut
5

Numbered Heads Together
3

The Grid
6

Line-ups
6

Cooperative Squares
6

Have you employed any other Cooperative activities previously? If so please explain below
Active Listening

Print Name: [redacted]
Signature: [redacted]
Date: [redacted]

Appendix 7.4(b): Audit of Control Group Implementer's Experience of Cooperative Learning

Initial Audit of Use of Cooperative Learning Structures

How often have you used the following Cooperative Learning Structures?

1 = Every day
2 = More than once a week
3 = Once a week
4 = Once a fortnight
5 = Less than once a fortnight
6 = Never

Think Pair Share

.....4.....

Doughnut

.....6.....

Numbered Heads Together

.....6.....

The Grid

.....6.....

Line-ups

.....6.....

Cooperative Squares

.....6.....

Have you employed any other Cooperative activities previously? If so please explain below

Print Name: [redacted]

Signature: [redacted]

Date: [redacted]

Appendix 7.5: Intervention Diary

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
Mon 28th Sept	The Doughnut	15 mins	[redacted]	as part of weekend news. Structure taught today
Tue 29th Sept	Line Ups	10 mins		introduced silent month ordering!
Wed 30th Sept	Numbered Heads + Active Listening	2 mins		as part of a group work lesson designing an A.L. display.
Thurs 1st Oct	/	/		/
Fri 2nd Oct	Numbered Heads	10 mins		literacy gp work.

Print na[redacted]

Signatu[redacted]

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
5th Oct	Doughnut	10 mins	[redacted]	weekend news.
6th Oct	n/a	/		/
7th Oct	n/a	/		/
8th Oct	Line Ups	10 mins		science knowledge
8th Oct	Think-Pair-Share	5 mins		literacy assessment for learning task
9th Oct	Line Ups + Numbered Heads	15 mins		silent tic up task

Print nam[redacted]

Signatur[redacted]

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
12th Oct 09	The + Numbered Heads Doughnut	10 mins	[redacted]	weekend news.
13th Oct 09	// (no NAT)	//	//	//
14th Oct 09	// (no NAT)	//	//	//
15th Oct 09	Think, Pair, Share.	5 mins	//	as part of english lesson
16th Oct 09	Think, Pair, Share	5 minutes	//	as part of maths lesson.

Print na[redacted]

Signatu[redacted]

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
19th Oct 09	Doughnut	15 mins	[redacted]	weekend news
20th Oct 09	Think, Pair Share	15 mins	n/a	history - The Aztecs
21st Oct 09	Think, Pair Share	20 mins	n/a.	literacy
22nd Oct 09	/	/	/	/
23rd Oct 09	INSET			

Print name: [redacted]

Signature:

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
2nd Nov	Line Ups / Doughnut	10 mins	[redacted]	Weekend News
3rd Nov	Think Pair Share	10 mins	n/a	Literacy - discussing 'culture'
4th Nov	n/a			
5th Nov	Numbered Heads Think Pair Share	20 mins	n/a	Literacy - Firework Safety
6th Nov	Doughnut	10 mins	n/a	as above

Print name: [redacted]

Signature:

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
9th Nov 09	Think Pair Share	20 mins	[redacted]	weekend news.
10th Nov 09	Think Pair Share	10 mins	n/a	literacy.
11th Nov	n/a			
12th Nov	n/a			
13th Nov	Think Pair Share	10 mins	[redacted]	literacy.

Print name: [redacted]

Signature:

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
16th Nov 09	Line ups	10 mins	[redacted]	silent challenge
17th Nov 09	Line ups	10 mins		opinions
18th Nov 09	Think Pair Share	10 mins		related to multi-cultural issues
19th Nov 09	"			
20th Nov 09	"			

Print name: [redacted]

Signature:

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
23rd NOV	The Doughnut	18/20 mins	[redacted]	weekend news
24th NOV	The Grid	30 mins		consolidation of features of literacy text.
25th NOV	n/a			
26th NOV	n/a			
27th NOV	Think, Pair, Share,	10 mins	n/a	Feelings regulator

Print name: [redacted]

Signature:

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
30th Nov	The Doughnut	20 mins	[redacted]	weekend news
1st Dec	nla			
2nd Dec	nla			
3rd Dec	The Grid	10 mins	[redacted]	as part of a punctuation warm up
4th Dec	Think Pair Share	15 mins		feelings register

Print name: [redacted]

Signature:

Cooperative Learning Diary and Register

Date	Structure Employed	Duration	Absences (children not participating in Co-op session)	Additional Comments
7th Dec	The Doughnut	10 mins	[redacted]	weekend news
8th Dec	nla			
9th Dec	nla			
10th Dec	nla			
11th Dec	Think Pair Share	15 mins	[redacted]	feelings register

Print name: [redacted]

Signature:

Appendix 7.6: Instructions for CL Structures

Think Pair Share

(adapted from Kagan 2009)

Relevant Skills

Information sharing,
Listening,
Asking questions,
Summarising other's ideas,
Paraphrasing.

Implementation

1. Randomly allocate children to pairs (be creative!!).
2. Pose an open ended question.
3. Allow the children individual 'think time' - directing them to think about the question.
4. Instruct children to face their learning partners and work. together, sharing ideas, discussing, clarifying and challenging.
5. Each pair then shares their ideas with another pair, or with the whole class. It is important that each child is able to share their partner's ideas as well as their own

PIES

Positive Interdependence - The children are able to learn from each other

Individual Accountability - Children are accountable to each other for sharing ideas, and may be required to share their partner's ideas to another pair or the whole group

Equal Participation - Each student has an equal opportunity (time) to share their ideas. This can be monitored by the teacher

Small Group Skills - At any one moment each student will be involved in either purposeful speaking or listening.

The Doughnut

(adapted from Kagan 2009)

Relevant Skills

Information sharing,
Listening,
Asking questions,
Summarising other's ideas,
Paraphrasing,
Helping others,
Talking quietly,
Moving for a purpose

Implementation

1. Students are allocated randomly to a 'circle', inner or outer
2. Children stand in two concentric circles facing each other.
3. Facing their partner they take it in turns to share information and ideas or ask each other questions.
4. At a given signal from the teacher the outside circle moves a specified number of places clockwise.
5. Children now give feedback on what was said between themselves and their previous partner.
6. Steps 3 to 5 can be repeated several times if desired.

PIES

Positive Interdependence - Children depend upon each other to share ideas, ask questions and remember what has been said previously

Individual Accountability - Each child must share information and ideas, they will need to ask questions and be able to repeat or summarise what has been said

Equal Participation - Each student has an equal opportunity to share their ideas. This can be monitored by the teacher.

Small Group Skills - At any one moment each student will be involved in either purposeful speaking or listening.

Numbered Heads Together

(adapted from Kagan 2009)

Relevant Skills

Information sharing, Listening, Asking questions, Summarising other's ideas, Talking quietly

Implementation

1. Split the group into groups of four, allocating a number (1, 2, 3 or 4) to each child within the group. Kagan (2009) suggests 1 'higher ability' student, 1 'medium high', 1 'medium low' and 1 'lower ability'. If one group is smaller than the others have number 3 answer for number 4 as well.
2. The teacher asks a question or sets a problem to solve, stressing that everyone in the group must be able to participate and answer the question by the end of the task. Teachers may phrase questions by beginning 'put your heads together and ...' or 'make sure you can all ...'. The teacher must ensure that enough 'wait time' is given for the group to complete the task. There is an expectation that everybody within the group will be able to answer the question following the discussion.
3. The students wok together, quite literally 'putting their heads together' in order to solve the problem and ensure that everyone in the group can answer the question if called upon.
4. The teacher now asks for an answer by calling a number (called at random or initially decided upon by the teacher to ensure the process is successful). The students with the number called then take it in turns to answer to the whole class, either verbally or through other means (eg whiteboard to show group work). If there are not enough students ready to respond the teacher may judge that more time is needed or extra support required.

PIES

Positive Interdependence - The students are able to learn from each other. They must also work together to ensure there is one product to their learning. They must check that everyone can understand and answer the question.

Individual Accountability - Students are accountable to each other for sharing ideas. Children may also be required to share the group's ideas to the whole class, or another group. Every student must be able to give the group's response to the question.

Equal Participation - Each student within the group has an equal opportunity to share their ideas. It is possible; however, that one student may attempt to dominate. This can be monitored by the teacher to ensure it does not happen.

Small Group Skills - At any one moment each student will be involved in either purposeful speaking or listening.

The Grid

(adapted from Brown and Thompson, 2000)

Relevant Skills

Approaching others,
Initiating interactions,
Asking questions,
Listening to others,
Helping others,
Talking quietly,
Moving for a purpose

Example of a Grid

	My Column	Other People	Other People
What I learned			
What I didn't understand			
What I found interesting			

Implementation

1. Prepare a four by three grid for each student, as shown above (or students can copy from the whiteboard).
2. Label the rows as desired (see e.g.).
3. Give time for each student to fill in the first column with their own ideas.
4. Give the timeframe for the activity. Then signal for the students to get up and begin moving around the classroom.
5. Students move around the classroom 'surveying' each other for ideas. They can only collect one idea from each person, recording their ideas in the appropriate box on their grid.

6. At the end of the allotted time the teacher collects in the completed forms or the students return to their groups to discuss results.

PIES

Positive Interdependence - The students need to help each other in order to ensure that all the cells within their grid are filled. The task cannot be completed individually. It is possible for the teacher to enhance positive interdependence through asking students who finish quickly to assist others.

Individual Accountability - Students are required to fill in the first column individually and discuss these ideas with peers.

Equal Participation - Each student within the group has an equal opportunity to share their ideas. This can be monitored by the teacher.

Small Group Skills - At any one moment each student will be involved in either purposeful speaking or listening.

Appendix 7.7: Second Cooperative Learning Training Session Materials

Due to publishing constraints, it is not possible to reproduce the full training schedule from this session. However, further details can be ascertained through contacting –

Les Davison

Lead Educational Psychologist

Sefton Educational Psychology and Portage Service (SEPPS)

Ainsdale Hope Centre

Sandringham Road

Ainsdale

Southport

PR8 2PJ

Tel: 01704 882038

Fax: 01704 882039

Email: sepps.ainsdale@cs.sefton.gov.uk

Appendix 7.8(a): Treatment Integrity Observation Checklist and Feedback Sheet (Blank)

Cooperative Learning Observation Checklist

Date:
Time:
Location:
Staff:
Number of children:
CL structure employed:

Group variables:

Group size:			
Appropriate for task:		YES	NO
Are roles designated:		YES	NO
Are groups heterogeneous:		YES	NO
How are groups selected:	RANDOM	TEACHER	STUDENT

Environmental variables:

Can all group members see each other:	YES	NO
Does each group have sufficient space:	YES	NO
Are all necessary materials readily available:	YES	NO

Staff variables:

Is the task clearly explained at the outset:	YES	NO
Are the goals/objectives explicitly defined:	YES	NO
Are the small group skills necessary described:	YES	NO
Post-task reflection on performance:	YES	NO
Do staff intervene/assist during task:	YES	NO

Task variables:

Are the instructions followed accurately:	YES	NO
Is positive interdependence present:	YES	NO
Is individual accountability present:	YES	NO
Is equal participation present:	YES	NO
Which small group skills are present:		
Explicit reflection upon small group skills:	YES	NO

Child variables:

Do the children engage with the task:	YES	NO
Do they follow the instructions accurately:	YES	NO
Do they solve conflict independently:	YES	NO

Comments for Feedback

Group Variables:
Areas of good practice -

Areas for development -

Environmental Variables:
Areas of good practice -

Areas for development -

Staff Variables:
Areas of good practice -

Areas for development -

Task Variables:
Areas of good practice -

Areas for development -

Evidence of positive interdependence:

Evidence of individual accountability:

Evidence of equal participation:

Evidence of small group skills:

Child Variables:
Areas of good practice -

Areas for development -

Appendix 7.8(b.i): Experimental Group Treatment Integrity Observation Checklist (Week 1)

Cooperative Learning Observation Checklist

Date: 30/9/09
Time: 11:20 → 11:55
Location: [redacted]
Staff: [redacted]
Number of children: ~~20~~
CL structure employed: Num. Heads Together

Group variables:
Group size: 4 + 2 grps of 3
Appropriate for task: YES / NO
Are roles designated: YES / NO - Role cards
Are groups heterogeneous: YES / NO ?
How are groups selected: RANDOM / TEACHER / STUDENT

Environmental variables:
Can all group members see each other: YES / NO - across table
Does each group have sufficient space: YES / NO - large tables of 4
Are all necessary materials readily available: YES / NO - large sheet of paper + card

Staff variables:
Is the task clearly explained at the outset: YES / NO - NHT etc
Are the goals/objectives explicitly defined: YES / NO - to create an AL display
Are the small group skills necessary described: YES / NO - AL @ outset (see prev. obs sheet)
Is reflection on performance engaged in post-task: YES / NO
Do staff intervene/assist during task: YES / NO - check u-standing, monitor progress, recog. AL skills + write on board.
(carpet time @ end)
+ during eg to - effective use leaders etc?

Task variables:
Are the instructions followed accurately: YES / NO - see NHT sheet
Is positive interdependence present: YES / NO - see NHT sheet
Is individual accountability present: YES / NO - see NHT sheet
Is equal participation present: YES / NO - through role allocation + explicitly defined + stated by teach
Which small group skills are present: managing conflict AL (see prev. obs. sheet)
Are these small group skills explicitly reflected upon: YES / NO - feedback on how groups store roles
↳ during + after eg recog. of good AL skills

Child variables:
Do the children engage with the task: YES / NO
Do they follow the instructions accurately: YES / NO
Do they solve conflict independently: YES / NO

Appendix 7.8(b.ii): Control Group Treatment Integrity Observation Checklist (Week 1)

Cooperative Learning Observation Checklist

Date: 30/9/09
Time: 10:30 → 11:15
Locatic [redacted]
Staff:
Number of children: 26
CL structure employed: n/a

Group variables:

Group size:			
Appropriate for task:		(YES)	NO
Are roles designated:		YES	(NO)
Are groups heterogeneous:		YES	(NO)
How are groups selected:	RANDOM	TEACHER	(STUDENT)

Environmental variables:

Can all group members see each other:	YES	(NO)
Does each group have sufficient space:	(YES)	NO
Are all necessary materials readily available:	(YES)	NO

Staff variables:

Is the task clearly explained at the outset:	YES	(NO)
Are the goals/objectives explicitly defined:	YES	(NO)
Are the small group skills necessary described:	YES	(NO)
Is reflection on performance engaged in post-task:	YES	(NO)
Do staff intervene/assist during task:	(YES)	NO

Task variables:

Are the instructions followed accurately:	YES	(NO)
Is positive interdependence present:	YES	(NO)
Is individual accountability present:	YES	(NO)
Is equal participation present:	YES	(NO)
Which small group skills are present:		
Are these small group skills explicitly reflected upon:	YES	(NO)

Child variables:

Do the children engage with the task:	YES	(NO)
Do they follow the instructions accurately:	YES	(NO)
Do they solve conflict independently:	YES	(NO) n/a

Appendix 7.8(c.i): Experimental Group Treatment Integrity Observation Checklist (Week 6)

Cooperative Learning Observation Checklist

Date: 13/11/09
Time: 10:30 → 11:30
Location: [redacted]
Staff:
Number of children: 26
CL structure employed: TPS

Group variables:
Group size: 2
Appropriate for task: YES NO
Are roles designated: YES NO
Are groups heterogeneous: YES NO
How are groups selected: RANDOM TEACHER STUDENT

Environmental variables:
Can all group members see each other: YES NO
Does each group have sufficient space: YES NO
Are all necessary materials readily available: YES NO

Staff variables:
Is the task clearly explained at the outset: YES NO
Are the goals/objectives explicitly defined: YES NO
Are the small group skills necessary described: YES NO
Is reflection on performance engaged in post-task: YES NO
Do staff intervene/assist during task: YES NO

explicitly focusing on AL skills eg eye contact

to reinforce AL skills – picking out positive eg's

Task variables:
Are the instructions followed accurately: YES NO
Is positive interdependence present: YES NO
Is individual accountability present: YES NO
Is equal participation present: YES NO
Which small group skills are present: info. sharing, AL, Questioning, Summarising other's ideas, Paraphrasing

Are these small group skills explicitly reflected upon: YES NO

Child variables:
Do the children engage with the task: YES NO
Do they follow the instructions accurately: YES NO
Do they solve conflict independently: YES NO n/a

Appendix 7.8(c.ii): Control Group Treatment Integrity Observation Checklist (Week 6)

Cooperative Learning Observation Checklist

Date: 13/11/09
Time: 9:15 → 10:15
Location: [redacted]
Staff:
Number of children: 24
CL structure employed: none

Group variables:

Group size:			
Appropriate for task:		YES	NO
Are roles designated:		YES	NO
Are groups heterogeneous:		YES	NO
How are groups selected:	RANDOM	TEACHER	STUDENT

Environmental variables:

Can all group members see each other:	YES	NO
Does each group have sufficient space:	YES	NO
Are all necessary materials readily available:	YES	NO

Staff variables:

Is the task clearly explained at the outset:	YES	NO
Are the goals/objectives explicitly defined:	YES	NO
Are the small group skills necessary described:	YES	NO
Is reflection on performance engaged in post-task:	YES	NO
Do staff intervene/assist during task:	YES	NO

Task variables:

Are the instructions followed accurately:	YES	NO
Is positive interdependence present:	YES	NO
Is individual accountability present:	YES	NO
Is equal participation present:	YES	NO
Which small group skills are present:	active listening, discussion skills	
Are these small group skills explicitly reflected upon:	YES	NO

Child variables:

Do the children engage with the task:	YES	NO
Do they follow the instructions accurately:	YES	NO
Do they solve conflict independently:	YES	NO n/a

Appendix 7.8(d.i): Experimental Group Treatment Integrity Observation Checklist (Week 8)

'Active Listening Board' made in-class, wall display.

Cooperative Learning Observation Checklist

Date: 24/11/09
Time: 9:15 → 10:30
Locatio [redacted]
Staff: [redacted]
Number of children: 25
CL structure employed: Maths, x table tank, ~~TPS~~ Doughnut

Group variables:			
Group size:			
Appropriate for task:		YES	NO - but not necessary
Are roles designated:		YES	NO - mixed ability
Are groups heterogeneous:		YES	NO
How are groups selected:	RANDOM	TEACHER	STUDENT
Environmental variables:			
Can all group members see each other:		YES	NO
Does each group have sufficient space:		YES	NO
Are all necessary materials readily available:		YES	NO
Staff variables:			
Is the task clearly explained at the outset:		YES	NO
Are the goals/objectives explicitly defined:		YES	NO
Are the small group skills necessary described:		YES	NO
Is reflection on performance engaged in post-task:		YES	NO
Do staff intervene/assist during task:		YES	NO - appropriately
Task variables:			
Are the instructions followed accurately:		YES	NO
Is positive interdependence present:		YES	NO
Is individual accountability present:		YES	NO - as about answers as a group @ end.
Is equal participation present:		YES	NO
Which small group skills are present: see TPS + WHIT sheets			
Are these small group skills explicitly reflected upon:		YES	NO
Child variables:			
Do the children engage with the task:		YES	NO
Do they follow the instructions accurately:		YES	NO
Do they solve conflict independently:		YES	NO n/a

Appendix 7.8(d.ii): Control Group Treatment Integrity Observation Checklist (Week 8)

Cooperative Learning Observation Checklist

Date: 24/11/09
Time: 10:30 - 11:30
Location: [redacted]
Staff: [redacted]
Number of children: 26
CL structure employed: n/a - [redacted]

Group variables:

Group size: 1				
Appropriate for task:		(YES)	NO	
Are roles designated:		YES	NO	n/a
Are groups heterogeneous:		YES	NO	n/a
How are groups selected:	RANDOM	TEACHER	STUDENT	n/a

Environmental variables:

Can all group members see each other:	YES	NO	n/a
Does each group have sufficient space:	YES	NO	n/a
Are all necessary materials readily available:	(YES)	NO	

Staff variables:

Is the task clearly explained at the outset:	(YES)	NO
Are the goals/objectives explicitly defined:	YES	(NO)
Are the small group skills necessary described:	YES	(NO)
Is reflection on performance engaged in post-task:	YES	(NO)
Do staff intervene/assist during task:	YES	(NO)

Task variables:

Are the instructions followed accurately:	YES	(NO)
Is positive interdependence present:	YES	(NO)
Is individual accountability present:	(YES)	NO
Is equal participation present:	YES	(NO)
Which small group skills are present:		
Are these small group skills explicitly reflected upon:	YES	(NO)

Child variables:

Do the children engage with the task:	YES	(NO)
Do they follow the instructions accurately:	YES	(NO)
Do they solve conflict independently:	YES	NO n/a

Appendix 7.9: List of Social Skills Introduced by the Implementer

(adapted from Kagan, 2009)

- **Active Listening Skills**
- Information sharing
- Asking questions
- Summarising other's ideas
- Initiating interactions
- Talking quietly
- Asking for help
- Complimenting
- Criticising an idea, not a person
- Decision making
- Disagreeing appropriately
- Sharing
- Taking turns

Appendix 7.10: Examples of Roles Allocated to Participants during CL Tasks

(adapted from Kagan, 2009)

Organiser

- Keeps teams together.
- Keeps everybody on task.
- Keeps an eye on the time.

Participation Checker/Gatekeeper

- Helps others to join in.
- Ensures everybody has a turn.
- Makes sure that everybody understands and is able to give feedback.

Noise Controller

- Controls the general volume level of the group.
- Ensures that only one person is speaking at a time.

Quality Checker

- Proof reads and checks spellings.
- Sees whether the work can be improved.
- Makes sure the group is doing its' best.

Encourager

- Encourages teammates to participate and do well.
- Motivates the team.

Recorder

- Records the team's answers and ideas.

Materials Monitor

- Obtains, distributes and returns team supplies.
- Oversees the clean-up operation at the end of the task.

Reflector

- Leads the team in looking back upon how well they worked together, and how they might improve next time.

Appendix 7.11(a): Social Inclusion Survey

'Like to Work' Questionnaire

NFER-NELSON

SOCIAL INCLUSION SURVEY (SIS)

How much do you like to ...Work...... with each person at school?

	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
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	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹

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Code [illegible]

Appendix 7.11(b): Social Inclusion Survey

'Like to Play' Questionnaire

NFER-NELSON

SOCIAL INCLUSION SURVEY (SIS)

How much do you like to .. Play ...... with each person at school?

	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
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	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹
	?	☺	😐	☹

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Appendix 7.11(c): Social Inclusion Survey

Administration Script

SOCIAL INCLUSION SURVEY (SIS)

INSTRUCTIONS TO THE CLASS

NFER-NELSON

Prepare and hand out the two questionnaires with the 'work with' sheet on top.

Say: *We are going to complete some questionnaires about how pupils of your age get along with each other at school. There are no right or wrong answers, you just have to put what you think. These questionnaires ask about how you get along with other people at school and I know that this is quite a private thing, so I will be careful to keep your questionnaires private. It is very important that you keep them private as well. That means not looking at your neighbour's questionnaire to see what they are putting and not talking about what you have put, now or afterwards. Does everybody understand that?*

Look down the side of the first sheet of your questionnaire and you will see that it has got the names of everyone in this class in the order they come in the register. Now, if you look across the top it says, 'How much do you like to work *with each person at school? Opposite each person's name there are four little circles. The second circle has got a smiling face and you are going to tick that circle if it is the name of somebody who you like to work with at school. The third circle has got a straight-mouthed face and you are going to tick that circle against the names of people if you don't mind whether you work with them or not. The last circle has got a sad face and you are going to tick that circle if it is the name of someone who you prefer not to work with at school. We all have different people that we like to work with at school, that we don't mind whether we work with them or not and that we prefer not to work with. The first circle has got a question mark in it and you are going to tick that circle if it's the name of someone who you don't know well enough to decide how much you like to work with them at school.*

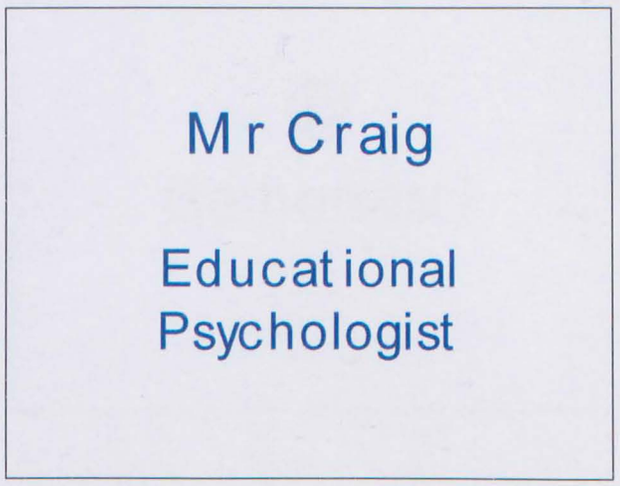
Turn over now and look at the next sheet. This time the question at the top says, 'How much do you like to play *(or substitute with the term used) with each person at school?'. So this time you have to tick the circles just like the page before but now it's to show how much you like to (play) with each person at school.*

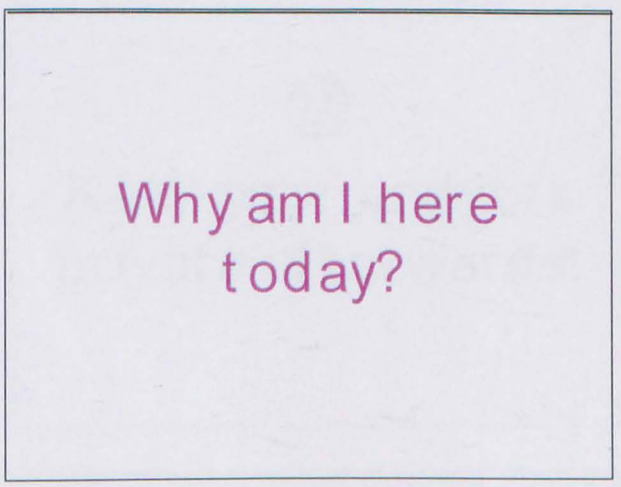
Before we start I would like everyone to find their own name on the 'work with' questionnaire and cross it out, then find your own name on the 'play with' questionnaire and cross it out. [This allows pupils completing each questionnaire to be identified without having to write their name on it. Check this has been done as you collect them in.]

In a minute, I will ask you to start and I want you to go carefully down the 'work with' list showing how much you like to work with each person at school. Tick the question mark if it is someone that you don't know well enough to decide how much you like to work with them, tick the smiling face if it's the name of someone you like to work with, tick the sad face if it's the name of someone you prefer not to work with and tick the straight-mouthed face if it's someone you don't mind whether you work with them or not. Make sure that you haven't missed anybody out and then turn over the page and go carefully down the 'play with' list, ticking to show how much you like to play with each person at school.

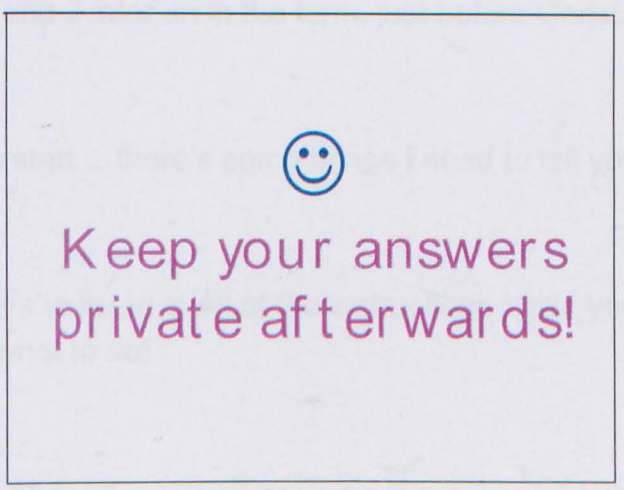
If you can't make out any of the names, just put up your hand and I will tell you who it is. Also remember to keep your questionnaires private.

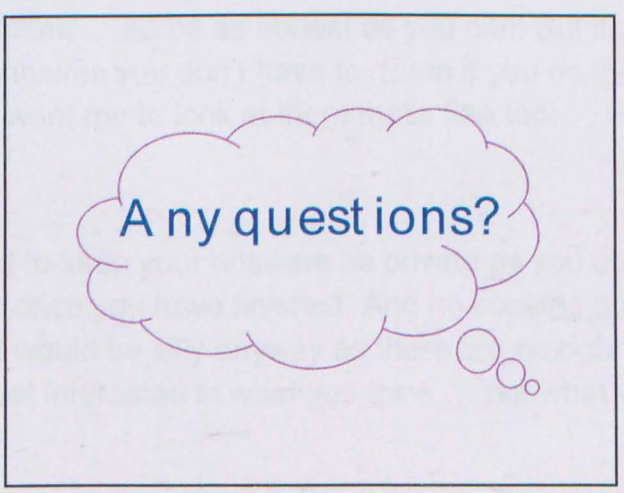
Appendix 7.12(a): Pre-measure Presentation






Be honest!


Keep your answers
private afterwards!


Any questions?

Appendix 7.12(b): Pre-measure Presentation Notes

Slide 1
What's an EP?

Help children to learn and be happy at school

Slide 2
Try to understand what sort of things help children like you to learn things at school and make friends better.

You can help me to do that by filling out some pieces of paper for me.

We'll do 2 today and 2 later on in the term, just before Christmas.

Slide 3
But … before we start …there's some things I need to tell you …

Slide 4
It's really important to listen to all of the instructions I give you … Otherwise you won't know what to do!

Slide 5
The only person who will see your answers is me … and I won't tell anybody what you have written … so be as honest as you can! But if you don't want to do the questionnaires you don't have to. Even if you do them and then decide you don't want me to look at them that's fine too.

Slide 6
It's also important to keep your answers as private as you can … so turn your papers over once you have finished. And no copying off your neighbours! That would be silly anyway as there are no right or wrong answers … I'm just interested in what you think … not what your neighbour thinks!

Slide 7
Before I talk about what we're going to do a bit more … are there any Questions?

Appendix 7.13: Strengths and Difficulties Self-report Questionnaire

Strengths and Difficulties Questionnaire

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

Your Name ..... Male/Female

Date of Birth.....

	Not True	Somewhat True	Certainly True
I try to be nice to other people. I care about their feelings	☐	☐	☐
I am restless, I cannot stay still for long	☐	☐	☐
I get a lot of headaches, stomach-aches or sickness	☐	☐	☐
I usually share with others (food, games, pens etc.)	☐	☐	☐
I get very angry and often lose my temper	☐	☐	☐
I am usually on my own. I generally play alone or keep to myself	☐	☐	☐
I usually do as I am told	☐	☐	☐
I worry a lot	☐	☐	☐
I am helpful if someone is hurt, upset or feeling ill	☐	☐	☐
I am constantly fidgeting or squirming	☐	☐	☐
I have one good friend or more	☐	☐	☐
I fight a lot. I can make other people do what I want	☐	☐	☐
I am often unhappy, down-hearted or tearful	☐	☐	☐
Other people my age generally like me	☐	☐	☐
I am easily distracted, I find it difficult to concentrate	☐	☐	☐
I am nervous in new situations. I easily lose confidence	☐	☐	☐
I am kind to younger children	☐	☐	☐
I am often accused of lying or cheating	☐	☐	☐
Other children or young people pick on me or bully me	☐	☐	☐
I often volunteer to help others (parents, teachers, children)	☐	☐	☐
I think before I do things	☐	☐	☐
I take things that are not mine from home, school or elsewhere	☐	☐	☐
I get on better with adults than with people my own age	☐	☐	☐
I have many fears, I am easily scared	☐	☐	☐
I finish the work I'm doing. My attention is good	☐	☐	☐

Your signature ..... Today's date .....

Thank you very much for your help

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Appendix 7.14: Consent Form Distributed to Head Teacher and Implementers

Name of Participant:

Title of the project: Cooperative Learning

Researcher's contact details:

[redacted]

- I agree to take part in the above research. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.
- I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.
- I have been informed that the confidentiality of the information I provide will be safeguarded.
- I am free to ask any questions at any time before, during and after the study.
- I have been provided with a copy of this form.

Name of participant:	Name of witness:
Print.....	Print.....
Signed.....	Signed.....
Date.....	Date.....

Appendix 7.15: Consent Form for Parents

Dear Parent / Guardian

I am a Trainee Educational Psychologist currently in my final year of training at the University of Nottingham. I am also employed by [redacted] Educational Psychology Service, working in several schools in the area.

As part of my training I am conducting research into 'Cooperative Learning' in schools in [redacted]. Cooperative Learning is a method of promoting learning and fostering social interaction skills for all children in the class through the introduction of structured group activities.

[redacted] School has agreed to participate in this research and [redacted] has volunteered to introduce Cooperative Learning into some lessons during the autumn term, with [redacted] also intending to introduce these methods subsequently.

The research will run for approximately 10 weeks during the present autumn term, with questionnaires being distributed to each pupil at the beginning and the end of the research, in order to determine the effectiveness of the Cooperative Learning programme. It is intended that all children within the selected classes will participate in the Cooperative Learning activities. I am, therefore, writing to ask for your consent to your child's involvement in this research. I would be grateful if you could complete the attached slip below and return it to [redacted] by [redacted], indicating your consent.

If you have any questions about this please discuss this with [redacted].

The research will follow the University of Nottingham and British Psychological Society guidelines for conducting research with children. As such, all those children who agree to participate have the right to withdraw from the study at any time and any information collected will be destroyed should they withdraw. Your child's individual data will be made anonymous. Any individual information collected will remain confidential, and will be stored securely.

Thank you for taking the time to read this letter. If you have any questions at all about the research, or would like more information,

please don't hesitate to contact me using the contact details supplied above.

Signed consent slips can be sent back with your child to school and will be collected by your child's class teacher.

Yours Sincerely

Jonny Craig

Trainee Educational Psychologist

[redacted] Educational Psychology Service and the University of Nottingham

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PARENTAL CONSENT SLIP

I give permission for (child's name)
..... to take part in research into the effectiveness of 'Cooperative Learning'.

Parent / Guardian Name.....

Parental / Guardian Signature.....

Date.....

Appendix 8.1:SPSS Output for Descriptive Data

	GROUP		Statistic
SISPREWORKSAMESEX	EXPERIMENTAL	Mean	6.4815
		Median	7.0000
		Variance	18.952
		Std. Deviation	4.35334
		Minimum	-6.00
		Maximum	14.00
		Range	20.00
	CONTROL	Mean	6.9600
		Median	8.0000
		Variance	20.373
		Std. Deviation	4.51368
		Minimum	-9.00
		Maximum	13.00
		Range	22.00
SISPOSTWORKSAMESEX	EXPERIMENTAL	Mean	9.1111
		Median	10.0000
		Variance	18.795
		Std. Deviation	4.33531
		Minimum	-4.00
		Maximum	14.00
		Range	18.00
	CONTROL	Mean	6.2400
		Median	7.0000
		Variance	26.357
		Std. Deviation	5.13387
		Minimum	-12.00
		Maximum	13.00
		Range	25.00
SISPREWORKOTHERSEX	EXPERIMENTAL	Mean	-1.5556
		Median	-1.0000
		Variance	23.103
		Std. Deviation	4.80651
		Minimum	-12.00
		Maximum	11.00
		Range	23.00
	CONTROL	Mean	-3.0000
		Median	-3.0000
		Variance	8.833
		Std. Deviation	2.97209
		Minimum	-11.00
		Maximum	2.00
		Range	13.00

SISPOSTWORKOTHERSEX	EXPERIMENTAL	Mean	1.1481
		Median	.0000
		Variance	18.362
		Std. Deviation	4.28507
		Minimum	-6.00
		Maximum	12.00
		Range	18.00
	CONTROL	Mean	-2.9600
		Median	-4.0000
		Variance	21.457
		Std. Deviation	4.63213
		Minimum	-11.00
		Maximum	7.00
		Range	18.00
SISPREPLAYSAMESEX	EXPERIMENTAL	Mean	6.2963
		Median	7.0000
		Variance	15.217
		Std. Deviation	3.90084
		Minimum	-2.00
		Maximum	14.00
		Range	16.00
	CONTROL	Mean	6.7600
		Median	7.0000
		Variance	17.690
		Std. Deviation	4.20595
		Minimum	-8.00
		Maximum	12.00
		Range	20.00
SISPOSTPLAYSAMESEX	EXPERIMENTAL	Mean	8.5185
		Median	9.0000
		Variance	15.336
		Std. Deviation	3.91614
		Minimum	-2.00
		Maximum	14.00
		Range	16.00
	CONTROL	Mean	6.0400
		Median	6.0000
		Variance	19.790
		Std. Deviation	4.44860
		Minimum	-11.00
		Maximum	12.00
		Range	23.00
SISPREPLAYOTHERSEX	EXPERIMENTAL	Mean	-4.2593
		Median	-5.0000
		Variance	23.969
		Std. Deviation	4.89578
		Minimum	-12.00
		Maximum	11.00

		Range	23.00
	CONTROL	Mean	-5.4000
		Median	-5.0000
		Variance	8.500
		Std. Deviation	2.91548
		Minimum	-12.00
		Maximum	2.00
		Range	14.00
SISPOSTPLAYOTHERSEX	EXPERIMENTAL	Mean	-1.5926
		Median	-1.0000
		Variance	20.481
		Std. Deviation	4.52565
		Minimum	-9.00
		Maximum	13.00
		Range	22.00
	CONTROL	Mean	-5.8000
		Median	-6.0000
		Variance	14.500
		Std. Deviation	3.80789
		Minimum	-11.00
		Maximum	1.00
		Range	12.00
PEERPROBPRE	EXPERIMENTAL	Mean	4.5926
		Median	5.0000
		Variance	4.097
		Std. Deviation	2.02407
		Minimum	2.00
		Maximum	8.00
		Range	6.00
	CONTROL	Mean	4.5200
		Median	4.0000
		Variance	4.760
		Std. Deviation	2.18174
		Minimum	2.00
		Maximum	9.00
		Range	7.00
PROSOCIALPRE	EXPERIMENTAL	Mean	7.2222
		Median	7.0000
		Variance	2.487
		Std. Deviation	1.57708
		Minimum	3.00
		Maximum	9.00
		Range	6.00
	CONTROL	Mean	7.8800
		Median	8.0000
		Variance	3.610
		Std. Deviation	1.90000
		Minimum	3.00

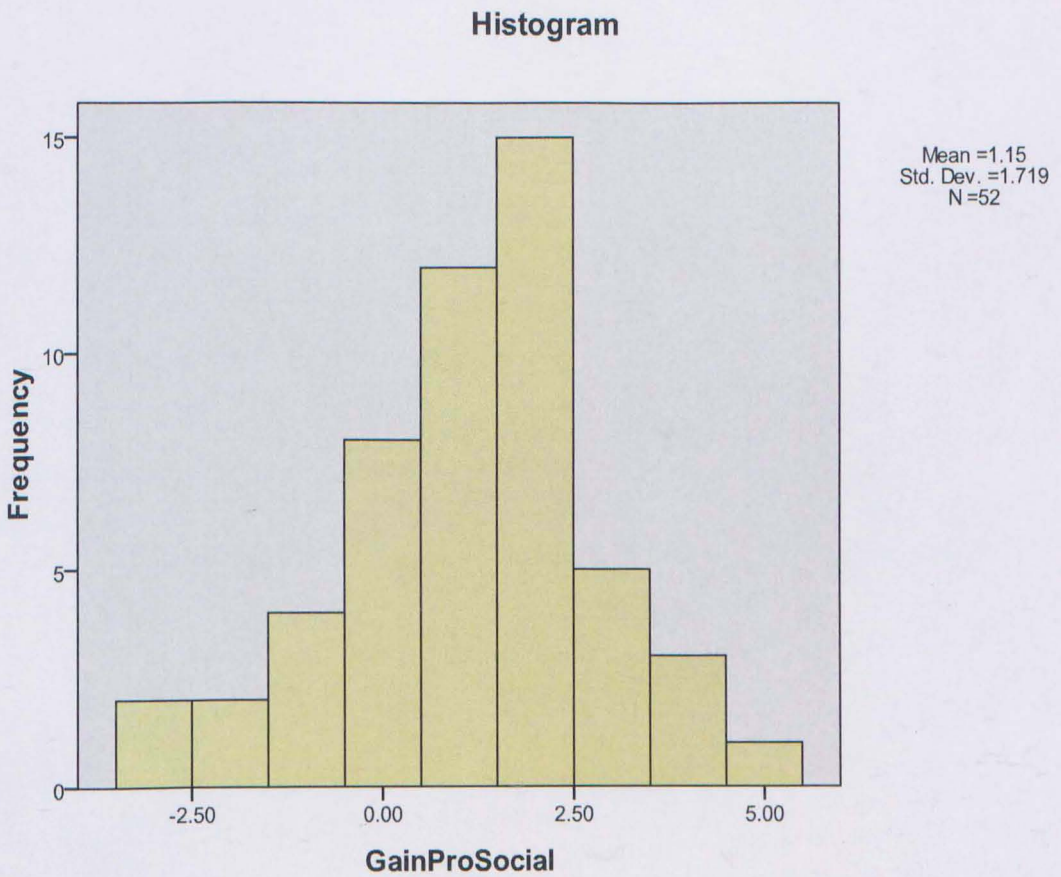
		Maximum	10.00
		Range	7.00
PEERPROBPOST	EXPERIMENTAL	Mean	2.5556
		Median	2.0000
		Variance	6.103
		Std. Deviation	2.47034
		Minimum	.00
		Maximum	8.00
		Range	8.00
	CONTROL	Mean	4.3200
		Median	4.0000
		Variance	4.810
		Std. Deviation	2.19317
		Minimum	1.00
		Maximum	9.00
		Range	8.00
PROSOCIALPOST	EXPERIMENTAL	Mean	9.1852
		Median	9.0000
		Variance	.926
		Std. Deviation	.96225
		Minimum	7.00
		Maximum	10.00
		Range	3.00
	CONTROL	Mean	8.1600
		Median	8.0000
		Variance	2.890
		Std. Deviation	1.70000
		Minimum	4.00
		Maximum	10.00
		Range	6.00

Appendix 8.2: SPSS Output – Independent Samples T-tests upon Gain Scores

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
GAINWORKSAMESEX	Equal variances assumed	4.110	.048	4.375	52	.000	3.22222	.73653	1.74427	4.70017
	Equal variances not assumed			4.375	45.791	.000	3.22222	.73653	1.73949	4.70496
GAINWORKOTHERSEX	Equal variances assumed	.003	.960	2.753	52	.008	2.48148	.90133	.67284	4.29012
	Equal variances not assumed			2.753	51.915	.008	2.48148	.90133	.67277	4.29019
GAINPLAYSAMESEX	Equal variances assumed	.765	.386	3.720	52	.000	2.59259	.69692	1.19411	3.99107
	Equal variances not assumed			3.720	51.891	.000	2.59259	.69692	1.19404	3.99114
GAINPLAYOTHERSEX	Equal variances assumed	.024	.878	3.314	52	.002	2.92593	.88287	1.15431	4.69754
	Equal variances not assumed			3.314	51.996	.002	2.92593	.88287	1.15431	4.69755
GainProSocial	Equal variances assumed	4.409	.041	4.016	50	.000	1.68296	.41911	.84117	2.52476
	Equal variances not assumed			3.961	42.333	.000	1.68296	.42493	.82561	2.54032
GainPeerProblems	Equal variances assumed	.533	.469	-3.207	50	.002	-1.83704	.57282	-2.98758	-.68650
	Equal variances not assumed			-3.198	48.882	.002	-1.83704	.57446	-2.99153	-.68255

Appendix 8.3:Example of Ascertaining the Normality of Distribution of Data for Gain Scores – Prosocial Behaviour



- The histogram above approximates a normal curve, supporting the assertion that the data is normally distributed.
- A relatively low 'skewness' value (-0.368) also indicates the normal distribution of data pertaining to this variable. Cohen et al (2007) state that a skewness value between 1 and -1 supports a normal distribution and thus the employment of parametric inferential statistics.
- Little discrepancy between the mean and median values for this set of data (mean=1.15, median=1.00) also supports the notion that data for this variable can be considered normally distributed (Robson, 2002).