

**The Socio-Emotional Functioning of Primary Aged Children with
Specific Language Impairment**

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**Thesis submitted for the degree of Doctor of Philosophy
2010**

ABSTRACT

Aims: This thesis investigates the socio-emotional functioning of children with Specific Language Impairment. It aims to: i) investigate different types of behavioural, emotional and social difficulties; ii) examine which language dimension (receptive vs expressive vs pragmatic language ability) is related to difficulties with socio-emotional functioning; iii) explore the role of social cognition; iv) examine whether the nature of children's difficulties are context specific.

Sample: Participants were forty-two children with SLI, forty-two children matched for chronological age and non-verbal cognitive ability, and forty-two children matched for language ability. The children were identified from five mainstream primary schools and one Language Unit.

Method: Parents and teachers completed a behavioural questionnaire assessing socio-emotional functioning, and a communication checklist assessing pragmatic language ability. The children were assessed on tasks measuring emotion identification, emotion labelling, emotion explanation, and knowledge of conflict resolution strategies.

Results: The SLI Group was rated significantly higher by parents and teachers than both matched groups on all the Strengths and Difficulties Questionnaire subscales indicating considerable problems with socio-emotional functioning. Parents and teachers reported increased difficulties in children's pragmatic language ability on Children's Communication Checklist-2 and varying significantly to both matched groups. Significant variations between parent and teacher reports on difficulties with socio-emotional functioning and pragmatic language ability existed only for the SLI Group. Significant group differences were found for all the social cognition tasks. Social cognition, but not language ability, predicted both parent and teacher rated behavioural, emotional and social difficulties for the SLI Group.

Conclusions: The results challenge current understanding about difficulties with socio-emotional functioning experienced by children with SLI by pointing to the crucial role of social cognition and the importance of the social environment. Atypical developmental trajectories are evident for this group of children with factors other than language playing more of a role for their socio-emotional functioning.

ACKNOWLEDGEMENTS

I would like to thank my supervisor Julie Dockrell for her advice and support over the years.

I am grateful to the children, parents, teachers, SENCOs and Headteachers who participated in this study and inspired me to study language impairments.

I would like to thank my parents, Chronis and Fotini, and my sister Penny for giving me their endless love and support!

There are many friends I would like to mention for their encouragement and support, in particular Vicky, Yoshimi, Claire, Tom, Efi, Panagiotis, Magda, Eleni, Manos, Freddie, Maria, Polyna and Lena, my colleagues and dear friends Sarah and Theodora and the rest of my colleagues at the Educational Psychology Service in Wandsworth (including Philip with his endless cds) for their help and care over many years. I am truly grateful to Lesley for reading the thesis and for many interesting and useful comments. I would also like to thank the girls in my reading group for their suggestions and critical contributions, Catherine for her generosity and contagious laughter and Diane for reading my Discussion Chapter and for many helpful comments.

In particular a huge thank-you to Maro for being such a brilliant supportive friend – for her humour, kindness and love. I would like to add one final extra thank-you to Dan for his numerous contingency plans, for providing me with wonderful distractions and for truly believing that I would finish this thesis and helping me to.

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CHAPTER ONE:

SPECIFIC LANGUAGE IMPAIRMENT

1.1 ORGANISATION OF THE CHAPTER

The first chapter begins by introducing the area of child development investigated in this thesis – the social and emotional functioning of children diagnosed with Specific Language Impairment. The next section describes in detail the group of children with Specific Language Impairment in order to shed light into the possible effects their difficulties might have on their social and emotional functioning (described in chapters 2 and 3).

The chapter is organised in four parts: the first discusses issues around Specific Language Impairment, such as the terminology and the diagnostic criteria, and the different types of language impairment. The second part reviews the non-linguistic skills of children with Specific Language Impairment, and in the following part the proposed explanatory models of specific language impairment are outlined. The chapter finishes with a discussion about the impact of Specific Language Impairment on general functioning in order to set the scene for the main focus of this thesis. Throughout the chapter, an effort is made to point out limitations of current research and the implications these have for future research in the area of language and socio-emotional functioning.

1.2 OVERVIEW OF THE FOCUS OF THE THESIS

Children with a Specific Language Impairment (SLI) are characterised by poor language ability in the absence of difficulties in other areas of their development. Delay in language development is the most common childhood disability (Law et al., 2000; Tomblin et al., 1997) with wide-ranging consequences. Children with language impairments represent a significant proportion of the population of pupils with special needs with 46.3% of children with Statements of Special Educational Needs having identified language impairments (Lindsay et al., 2002).

An increasing amount of research evidence has shown that language impairments are strongly associated with behavioural, emotional and social difficulties (Baker & Cantwell, 1982b; Beitchman et al., 2001; Brownlie et al., 2004; Lindsay et al., 2007; Conti-Ramsden & Botting, 2008; Botting & Conti-Ramsden, 2008), and that children with language impairments commonly experience difficulties with their social and emotional functioning (Ingram, 1959; Beadle, 1979; Goldman, 1987; Botting & Conti-Ramsden, 2000; Clegg et al., 2005; Durkin & Conti-Ramsden, 2007; van Daal et al., 2007). Several studies have found those children being less socially competent and experiencing great difficulties with social interactions with both adults and peers compared with children with typically developing language (Stanton-Chapman et al., 2007; Brinton et al., 2007; Beilinson & Olswang, 2003), as well as facing difficulties with various aspects of emotional development (Fujiki et al., 2008; Spackman et al., 2006). However, the full extent and severity of these difficulties is not yet known, and more information is needed about the prevalence and precise nature of children's difficulties. The first aim of this thesis was to extend the data regarding the socio-emotional difficulties found in children with SLI and to provide a more thorough description of these by contributing evidence of the impact, if any, of the language status and non-verbal cognitive ability on the socio-emotional functioning of a carefully studied group of primary aged children with SLI. This was accomplished by comparing the performance of a group of children with SLI with a group of chronological-age matched and a group of language-age matched peers with typically developing language, and also by investigating individual and group performance of children with SLI.

Three dimensions of the language system have been linked to difficulties with socio-emotional functioning. First of all, difficulties with the ability to construct language to express oneself (expressive language ability) has been linked in previous studies with increased difficulties in socio-emotional functioning (Caulfield et al., 1989) and this was the first language dimension investigated in the present study. Associations have also been found between difficulty understanding language and the development of behavioural, emotional and social difficulties (Baker & Cantwell, 1987; Whitehurst & Fischel, 1994; Toppelberg & Shapiro, 2000; Conti-Ramsden & Botting, 2004; Lindsay et al., 2008), and therefore receptive language ability was the second language dimension examined in the present study. Finally, it has been suggested that problems with socio-emotional functioning may be due to problems relating to the pragmatics of language (Vedeler, 1996; Webb et al., 2003; Olswang et al., 2001; Conti-Ramsden & Botting, 2004). In Conti-Ramsden and Botting's (2004) longitudinal study, it was

found that, when compared with a group of typically developing peers, children with SLI who were 11 years of age had an increased likelihood of demonstrating withdrawn social behaviour and peer difficulties, for which pragmatic language impairments were the main predictor. Difficulties with pragmatic language ability have rarely been investigated in relationship to difficulties with socio-emotional functioning for children with SLI, and therefore that was the third language dimension investigated in the present thesis.

Furthermore, previous studies have failed to consider additional factors or comorbid difficulties that could explain children's behavioural, emotional and social difficulties. The present thesis' third aim was to investigate an additional factor which could be crucial for children's socio-emotional functioning: children's social cognition skills (Clegg et al., 2005; Herba & Philips, 2004; Conti-Ramsden & Botting, 2008). Different aspects of social cognition were considered in the present study through direct assessment of the children, and a comparison with chronological-age matched and language-age matched peers was conducted in order to explore the different ways in which children's relative strengths and weaknesses impact on their socio-emotional functioning.

Finally, in considering the relationship between language impairment and behavioural, emotional and social difficulties, the present study aimed to adopt an interactionist perspective by which children's difficulties were to be seen in context (Lewin, 1935). Although behavioural, emotional and social difficulties show very low levels of consistency across environments (Lindsay et al., 2007), and the correlations between parents' and teachers' ratings of children's socio-emotional functioning are often low (Lindsay & Dockrell, 2000; Redmond & Rice, 1998), the role of the environment has not been fully understood or researched. The present study's final aim was to explore the congruence of children's behavioural, emotional and social difficulties and whether the nature of these varies at home and at school.

1.3 SPECIFIC LANGUAGE IMPAIRMENT

1.3.1 Introduction

The first section of the introductory chapter has SLI as the focus. The aim is to clarify issues around definitions, terminology, prevalence and the diagnostic criteria for SLI. The last part reviews relevant literature on the types of language impairment.

1.3.2 Definitions, Terminology and Prevalence

There are many reasons why children fail to or are slow to acquire language. Some children's language difficulties are part of more general learning difficulties, some may have had limited linguistic input as a result of a hearing impairment (Bench & Bamford, 1979; Friel-Patti & Finitzo, 1990; Bamford & Saunders, 1985) or in others because medical factors may have directly affected their cognitive development (Landau & Kleffner, 1957; Bishop, 1988). Also, limited linguistic input due to various environmental reasons could result in a child not developing language normally (Curtiss, 1977; Locke et al., 2002). Children diagnosed with SLI are children whose language impairments are their primary area of disability, but for whom the above factors are not present (Leonard, 1998; Rice & Wilcox, 1995; Bishop, 1992).

Despite all that has been learned in recent years, SLI remains a condition that is challenging to define precisely. There is still no universally accepted definition of SLI, and the terminology used to refer to it is diverse and often conflicting. There is a broad range of terms used to refer to the unexplained difficulties of language acquisition of children. "Hearing autism" and "word deafness" were used initially to refer to a child's failure to develop language, whereas later on researchers have used the term "developmental aphasia" to refer to speech difficulties, in particular children who presented with ungrammatical speech. The term "developmental aphasia" was later replaced by "developmental dysphasia" to suggest a disorder of speech rather than the complete absence and loss of speech. However, both these terms are used in contemporary neurology to indicate language disorder resulting from brain injury, and are no longer in use when describing SLI in children.

Another term used to refer to language difficulties is “language delay”, which indicates that the child acquires language at a slower rate but in the context of other aspects of the child’s development being normal. Currently researchers prefer the terms “specific developmental language disorder”, “specific speech and language difficulties” and in particular “specific language impairment” to refer to children who fail to develop language normally for no apparent reason (Bishop, 1994a; Lindsay et al., 2005). This term is intended to denote that the language development is slow, limited or impaired in children who otherwise present a picture of a normal development, and for whom the language impairment is the primary difficulty. This term is preferred because it remains neutral with regard to the cause of the language impairment and also to the question of whether children with language impairments are simply slower in acquiring language than their peers, or whether their language is disordered.

Although the term SLI is currently widely used, there are still differences in the understanding of clinicians and researchers, mainly due to the vagueness of the SLI as a diagnostic category. On the one hand clinicians are hampered by the lack of research consensus in the area (Dockrell et al., 2006), and on the other the researchers do not seem to yet agree on either the nature of the difficulties experienced by children with SLI (see section 1.3.4) or the reason for their difficulties (see section 1.5). The variation in terminology and definitions of SLI has implications when conducting research with this population, and leads to differences in who is identified as belonging to this group of children. As will be described in the section below when discussing limitations of the diagnostic criteria for SLI, there have been inconsistencies reported by a number of studies in the diagnosis according to whether one or more language test scores are used (Plante, 1998) or according to the particular language test being chosen (Lloyd et al., 2006; Spaulding et al., 2006; Bishop & McDonald, 2009).

In addition, establishing accurate prevalence of SLI has been a challenging task. Estimates of the proportion of children diagnosed with SLI also vary according to the nature of the data collected (Broomfield & Dodd, 2004) and the use of varying criteria for language impairment (see section 1.2.3). Current research and clinical practice suggests that approximately 5-7% of children are affected by SLI. The most recent systematic review of the literature by Law and his colleagues (2000) identified that 5.9% of children are reported for delay in speech and

language. Law et al. (2000) recognised a sharp drop in language delay after two years of age, but from the studies available the authors found little evidence of a decline in rate in children up to 16 years old. The biggest epidemiological study of prevalence of SLI to date has been conducted in the United States by Tomblin et al. (1997) who found an estimated prevalence rate of 7.4% from a stratified sample of 7,218 children in kindergarten. Lastly, the Bercow Report which reviewed the services in the United Kingdom for children and young people with speech, language and communication needs, reported that in 2007 nearly 40,000 five-year-old children in England entered school with significant difficulties with speech and/or language, this was almost 7% of all five-year-olds (Bercow, 2008).

Valuable information about the issues described above comes from studying SLI in different languages (Leonard, 1998; 2000). This is because the study of languages other than English can provide useful data for the assessment and treatment of children with SLI acquiring those languages but also because studying different languages can help researchers to test hypotheses regarding causes or clinical markers or even develop alternative hypotheses on the basis of the data that other languages provide. Although symptoms of SLI are not the same across languages, studying SLI in different languages can help us expand and/or refine the list of areas where children with SLI show weaknesses – even if these areas vary from language to language – and inform interventions.

Researchers need to be aware of issues around terminology and prevalence and be clear about measures that can effectively identify children with SLI. In order to draw reasonable conclusions and to ensure identifying appropriate candidates for research, there is a need to use multiple reliable measures and current clinical information about the children's language profiles from a variety of sources. The precise measures and instruments used must be dependent on the aims of each research study. For example, if the aim is to investigate the relationship between language ability and children's performance in other areas of their development (e.g. socio-emotional functioning), information about a range of individual linguistic abilities as well as children's strengths and weaknesses in social and emotional development in a variety of contexts may be needed.

1.3.3 Diagnostic Criteria

1.3.3.1 Introduction

SLI is a term used to describe limitations in language ability in the absence of other factors. In other words, the word “specific” in the term SLI refers to the supposedly circumscribed nature of the impairments found in SLI: a child is said to have SLI if there is an absence of the predisposing or precipitating factors such as low non-verbal cognitive ability, hearing loss, neurological disease, severe environmental deprivation, emotional disorder, physical malformation of the articulators and poor oral motor function (Bishop, 1997; Miller & Gilbert, 2008).

However, it is now widely believed from research studies with a particular emphasis on twins that there is a strong heritable link between family members and SLI (Bishop, 1992; Fisher, 2005; Tomblin & Buckwalter, 1998; Bishop & Hayiou-Thomas, 2008). This means that, if SLI is a genetic disorder, there is no theoretical reason why an individual could not have SLI and any other feature, such as a hearing impairment (Ebbels, 2000), a poor non-verbal cognitive ability (Bishop et al., 1995) or poor oral motor function (Gopnik & Crago, 1991). Furthermore, although it is agreed that language impairments represent a difference from the typical language development, typical development itself is not easy to define. In their review of the literature, Enderby and Emerson (1995) describe the difficulty in distinguishing a child at the lower end of the normal range and one who is deviating from the usual pattern of language development. Researchers and clinicians agree that in their everyday practice there is substantial diversity in the rate at which children acquire language (Bates et al., 1995). Thus, there is no exact point that divides typical development from that which should cause concern.

This means that there is considerable diversity in the criteria used to identify SLI. As reviewed in the section above, this leads to different definitions being adopted that refer to different kinds of language problems and different levels of severity resulting in differences in who is identified as belonging to the group. Children who do not unmistakably meet all the diagnostic criteria are often diagnosed differently by professionals with different training (Botting & Conti-Ramsden, 2003) and research studies have shown that there are children receiving clinical services and

do not meet the criteria for language impairment (Dunn et al., 1996; Keegstra et al., 2007). Below, the criteria for the key characteristics of SLI will be discussed.

1.3.3.2 Language Ability

The most essential criterion for diagnosing SLI is a significant impairment in language ability. Although the primary problem in SLI is poor language, it is still debatable how severe a language problem has to be and exactly what aspects of language should be taken into account in diagnosing SLI. Because each child acquires language at its own pace and because children's language skills develop throughout childhood, SLI cannot be defined in terms of some absolute language criterion. Clearly, the child's language abilities in relation to those of other children need to be considered.

One method of diagnosing SLI has been to make comparisons with reference to developmental norms. Such comparisons aim to identify differences in language as well as to provide baselines for comparative purposes (Dockrell & Lindsay, 2003). For example, the research diagnostic criteria specified by the World Health Organisation (International Classification of Diseases, ICD-10, 1993) state that the child's language skills, as assessed on standardised tests, should be more than 2 standard deviations below average for the child's age.

In making comparisons to developmental norms, some have attempted to differentiate language impairments in terms of delayed and disordered development. In their systematic review of the literature reported in section 1.2.2, Law et al. (2000) outlined language delay as a slowing in the rate of language development and noted that in this kind of impairment the language follows a developmental pattern along the lines of typical normative stages. Research indicates that there are many children who are slow to pass through language developmental milestones but then catch up (Paul et al., 1996; Whitehurst & Fischel, 1994). To determine whether a child is language delayed, one needs to examine whether its linguistic characteristics, on a particular aspect of language, are like those observed in younger typically developing children. Research studies traditionally compare children with SLI either to chronological-age or language-age controls or both. By using chronological-age matched controls researchers establish whether the children with SLI have more difficulty with the area

under investigation than would be expected for their age. This is crucial for establishing whether they do in fact have a clinical difficulty with the particular area or not.

When language development is disordered, however, it develops in an uneven and atypical way in terms of normative stages following rather unusual courses leading to atypical linguistic profiles. A child with disordered language, therefore, will show a delay that involves not only the late emergence of language, but also a delay of language from the point of emergence to the point of mastery (Leonard, 1998). Also, language-disordered children show linguistic features not characterising the course of typical language development (Bishop & Rosenbloom, 1987), which are more persistent than those of a language delay (Bishop, 1994a; Bishop & Edmundson, 1987). Although different investigators have defined language delay in different ways (Rescorla & Schwartz, 1990; Stackhouse & Campbell, 1983), there is a general consensus that language delay has a more benign outcome when compared to disordered language development.

Traditionally, the method used in research to investigate whether there are differences in children's linguistic profile is by comparing the performance of children with SLI on one measure of language ability with that of younger typically developing children, whose language skills are expected to be age-appropriate. The purpose of language-age matched controls is to establish whether the children with SLI have more difficulties in particular areas than would be predicted from their general language abilities. In that way, the researchers aim to reveal discrepancies between components of language, or differences in how children learn language and how quick they are in doing so (Bishop, 1997; Aram et al., 1993). An example of that would be to compare a group of younger typically developing children, matched on the basis of their mean length of utterance, with a group of children with SLI for their use of the third person singular. If children with SLI perform similarly with the group of typically developing children, this would reveal that the SLI Group is delayed but not "disordered" as their performance is corresponding to the one observed in younger children. If, on the other hand, children with SLI perform at a lower level in their use of the third person singular in comparison to the group of typically developing peers, that would suggest a specific difficulty with this particular aspect of language, and would point to a profile that is not typical with normal language development.

However advantageous the matching technique is for research purposes, there is still need for additional information to ensure an accurate interpretation of the results. The non-verbal cognitive abilities of children with SLI, their attention or/and their motor skills are likely to be more advanced when compared to those of the younger typically developing peer groups. These additional skills and abilities should be taken into account as on some occasions they could contribute to an enhanced performance of the SLI Group compared to the language-age matched group. Another difficulty with language-age matched groups is that the interpretation of the findings depends on the test or measure on which they have been matched. That means that when non-significant differences between the language-age matched group and children with SLI are found, then the area being studied might be closely related to the area used to match the groups. If, however, differences between the two groups are found, then that might mean that the two areas are less closely related.

It should be noted that the distinction between “language delay” and “language disorder” described above is not always clear. Curtiss et al. (1992) considered that our knowledge and understanding with regards to typical language development is not sufficient to allow accurate judgement of what is normal and what is not. Furthermore, case studies reported by Rinaldi (1992) illustrate that children may continue to simplify their language into the secondary school years in ways usually seen in the language of preschool children, despite specialist teaching and ongoing therapy in their primary school years. The research focus has thus moved in the past few years from issues mainly related to the “delay/disorder” model to a more careful analysis of language profiles across a variety of tasks and experimental paradigms.

Another point to be considered here is the differences reported in language skills of children when these are measured by different language tests. Professionals' divergent perspectives on what constitutes a “language impairment” are reflected in the current plethora of language instruments available and reported in the literature (Salvia & Ysseldyke, 1995), and questions regarding which language test is chosen (Spaulding et al., 2006) and whether one or more than one language test score is used (Plante, 1998) need to be well thought-out. In the present thesis, issues related to language measures are considered in chapter 4.

It has also been suggested that SLI should be defined not in terms of statistical abnormality but in terms of disability and interference with everyday life. According to this view clinicians and researchers should diagnose a child as having SLI only if its language impairments place the child at a disadvantage in society and inhibit everyday activities. Following the notion of disability, the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-IV; 1994) has diagnostic criteria closely similar to those of ICD-10, but they additionally require that the language impairments interfere with the child's academic or occupational achievement or with the child's socio-emotional functioning.

Although this approach escapes the circularity of the statistical criteria of ICD-10, it allows for inter-rater conflict. Deciding on what constitutes language impairment is dependent on whether the professionals involved with the child share the same model of language impairment and whether they have the same opinion about whether it interferes with the child's everyday life. Research has shown that these children's teachers express serious concerns about the levels of training they have in language development, and, in particular their ability to accurately identify children who may have language impairments (Dockrell & Lindsay, 2001; Mroz, 2006). In the same vein, available research on the accuracy of parental estimations indicates that parents overestimate their children's language skills (Dinnebeil & Rule, 1994; Thal et al., 1999; Glaun et al., 1999; Boynton-Hauerwas & Stone, 2000). Also, it is a common phenomenon in educational practice to identify earlier children's difficulties because of reduced speech intelligibility, rather than difficulties with comprehension or verbal memory (Zhang & Tomblin, 2000; Shriberg et al., 1999; Shriberg, 2001; Bishop & Hayiou-Thomas, 2008; Bishop & McDonald, 2009). Moreover, as this thesis will later discuss, language impairments are sometimes masked by additional behavioural, emotional and social difficulties and go unrecognised altogether (Cohen et al., 1989; Cohen et al., 1993; Bryan et al., 2007). All these issues have implications about how and whether these children are identified or not.

An early study by Stark and Tallal (1981) illustrated the difficulties in applying the definition of SLI. These researchers found that only 39% of 132 already diagnosed preschoolers met the diagnostic criteria, despite the fact that these children were already placed in a specialist educational provision. The researchers used alternative criteria which involved translating a child's score into an 'age equivalent' score, and regarding the child as language-impaired if the

gap between chronological age and language test exceeded a certain amount. According to Stark and Tallal's criteria for SLI, language age (mean of receptive language age and expressive language age) should be at least 12 months lower than chronological age or performance mental age. In particular, receptive language age should be at least six months lower than chronological age or performance mental age, and expressive language age should be at least 12 months lower than chronological age or performance mental age.

In summary, these three key approaches to the identification of language ability in SLI demonstrate that the diagnostic criterion of poor language ability is still a subject of debate. Each one of these approaches differs from the others in terms of the cut-off points specified for the children's language ability, and should be taken into account according to the purpose of the diagnosis. It is often the case that research studies aim to rule out all possible confounding factors and employ as 'pure' cases of SLI as possible in order to allow for an investigation of the fundamental mechanisms of language. In clinical practice, however, the reality is very different as the aim of clinicians is to provide children with the most appropriate support available, regardless of additional difficulties. The implications of the first criterion for diagnosing SLI will be returned to and discussed later in this chapter (see section 1.3.3.4) and details about the criterion chosen in the present research are given in chapter 4 (Methods).

1.3.3.3 The Discrepancy between Language and Non-verbal Cognitive Ability

The other key characteristic of children with SLI is their advanced non-verbal cognitive ability in relation to their poor language ability. Traditionally SLI has been defined by a discrepancy approach in that a child's non-verbal cognitive ability is considered to be within the average range, while their language skills are at a significantly lower level (Whitehurst & Fischel, 1994).

However, the discrepancy approach in defining SLI is considered one of the most controversial exclusionary criteria. Firstly, as for the criterion of language ability, there have been different approaches to the identification of the discrepancy, leading again to substantial variations in which children are identified as belonging to the group (Cole et al., 1995; DeThorne & Watkins, 2001; Fey et al., 1994). According to the ICD-10 and DSM-IV a statistical approach is used to define the discrepancy by a difference in percentage points between the child's language ability

and non-verbal cognitive ability scores. In ICD-10 the difference of 1 standard deviation between language ability and non-verbal IQ is proposed.

A different approach to that has been to draw a distinction between a child's language score below a stated cut-off point and a non-verbal cognitive score above a cut-off point. Different cut-off points for non-verbal cognitive ability have been used. Although there is a broad agreement that a Performance IQ below 70 represents a significant delay, many have argued that this cut-off point is over restrictive. The criterion used most frequently by researchers is a non-verbal IQ score no more than 1 standard deviation below the mean (i.e. Performance IQ score above 85). This widely accepted criterion is based on the work of Stark and Tallal (1981).

The use of a cut-off point has been questioned for a number of reasons. Firstly, some investigators have been apprehensive about the fact that there are children who do not show a sufficient discrepancy between non-verbal IQ and language score to be placed in the SLI category with confidence. For example, Bishop (1997) suggested that a non-verbal IQ of 86 and a language score of 79 might not constitute a sufficient discrepancy between the two skills to result to a secure diagnosis of SLI, and argued that a clearer discrepancy should exist. Studies like the ones by Stark and Tallal (1981) reviewed above (see section 1.3.3.2), and Conti-Ramsden & Botting (1999) have suggested that there are many children currently educated in specialist language provisions who present with all the linguistic characteristics of SLI, but do not demonstrate a large mismatch between verbal and non-verbal cognitive ability.

In a similar vein, several researchers questioned whether children with language impairments and low performance IQs actually present with language difficulties that are qualitatively different from those with higher performance IQs who meet stricter criteria (Bishop, 1994; Tomblin et al., 1997). Bishop queried whether these children have the same underlying deficits in language but happen to fall at the lower end of the normal performance IQ distribution. For example, Rice et al.'s (2004) study showed that children at the beginning of primary education (6 years) with low performance IQ showed similar abilities to control children with IQs within the normal range on a test of verb tenses. When compared with children with SLI (with performance IQs within the normal range), children with low performance IQ scored higher on

the test of verb tenses. Similar findings were demonstrated in families and identical twins studies (Vargha-Khadem et al., 1995; Bishop, 1994a) showing that the discrepancy criterion was over-restrictive. A recent study by Tommerdahl and Drew (2008) examined identical 12-year-old twins with language difficulties, one of whom fell into the diagnostic remit of SLI while the other did not due to not meeting the verbal – non-verbal discrepancy criterion. When further diagnostic testing was carried out to examine whether the diagnoses were reflected by different linguistic abilities, it was shown that their linguistic profiles were actually very similar.

As explained above, the discrepancy criterion is considered useful in research, mainly because a selection of children with as pure an impairment as possible leads to an easier interpretation of the results of the study, and minimises the chance of obtaining ambiguous and confusing findings. A comprehensive assessment using well-normed and valid instruments yields important insights into a child's overall ability (Camarata & Nelson, 2002).

However, the use of discrepancy criterion has come under mounting attack, with the main argument being that discrepancies lack reliability. Both non-verbal IQ tests and language tests have measurement error (Lahey, 1990; Muma, 1986; Leonard, 1998; Miller & Gilbert, 2008), and a diagnosis of SLI that relies exclusively on results from such tests can prove highly problematic. Traditionally measures used to identify SLI include language sample analysis and norm-referenced standardised tests which are designed to gauge a child's language skills compared to his or her peers, and as such they are considered to be knowledge- or experience-dependent (Kohnert et al., 2006; Campbell et al., 1997). The same difficulty is faced in relation to non-verbal cognitive tests. Different tests of non-verbal cognitive ability use a variety of tasks and theoretical constructs with varying psychometric properties (DeThorne & Schaefer, 2004) and on occasions they have led to different children showing age-appropriate non-verbal cognitive ability (Swisher et al., 1994) or even just performing differently on different tests (Miller & Gilbert, 2008). It could also be argued that many language-free measures are actually directly or indirectly dependent on language ability (Camarata & Swisher, 1990; Camarata & Nelson, 2002). The use of verbal instructions for a non-verbal test hinders performance for some children with SLI (Colozzo & Johnston, 2004) and the impact of impaired language ability, and in particular language comprehension necessary to understand and follow test instructions, is not always carefully considered (Walters & Chapman, 2000).

Apart from the questionable use of language and non-verbal cognitive tests, serious consideration needs to be given to the general relationship between language and non-verbal cognitive ability. Although the directionality of this relationship is not fully understood yet, studies indicate that there is considerable interaction between language skills and non-verbal cognitive ability in clinical samples, and improvement in one seems to lead to improvement in the other (Goorhuis-Brouwer & Knijff, 2002; Sowell et al., 2001). Also, Miller and Gilbert's study (2008) reported above complemented a growing body of evidence showing that non-verbal IQ is not necessarily a good predictor of who will benefit from language intervention (DeThorne & Watkins, 2001; Cole et al., 1999; Fey et al., 1994).

Finally, the discrepancy criterion should be treated with great caution when considering the bigger picture of these children's non-verbal cognitive abilities. Later in this chapter, evidence will be reviewed suggesting that on certain non-linguistic cognitive tasks, children with SLI have been found to perform less well than chronological-age matched peers. Thus, the fact that these children perform as one might expect for children of the same age on non-verbal tests of intelligence should not be interpreted as meaning that all non-verbal cognitive abilities in these children are advanced.

1.3.3.4 Summary of the Diagnostic Criteria and Implications for Further Research

Children with SLI experience significant limitations in language ability that cannot be attributed to problems of hearing, neurological status, or severe environmental deprivation and emotional or social difficulties (either internal to the child, as in autism, or as a result of their environment). Also, SLI is diagnosed when there is a discrepancy between the child's verbal and non-verbal cognitive ability. Although children with SLI have been extensively researched for over a century, formal diagnostic criteria are still evolving, and the criteria used currently are rather stringent. The literature reviewed so far has highlighted that there are children with language impairments, who do not meet all of the criteria described above, but who do not fall confidently into any other diagnostic category.

An important point to make concerning the criteria for SLI is that children with SLI do not constitute a homogeneous group. As it will be discussed later on in this thesis, this heterogeneity is evident by the wide profile of children and young people identified with SLI both in research studies and in the wider population by clinicians. Also, the degree to which functioning is affected by the impairment varies considerably from mild to severe. Finally, longitudinal studies of language impairment indicate that the nature of the disorder is dynamic and may change considerably over time (Conti-Ramsden & Botting, 1999; Botting, 2005; Botting & Conti-Ramsden, 2004).

In a more practical sense, in research it is important to be aware of the type of non-verbal cognitive and language tests to be used for children with SLI, and to consider how (and whether) these tests can represent children's strengths and weaknesses, and what information they might reveal about a child's learning. For example, Jarvis and Gathercole (2003) reported that assessments that reduce reliance on working memory skills are beneficial as this is an area that children with SLI often show limitations (see also section 1.5).

Most importantly, the discrepancy criterion between children's verbal and non-verbal cognitive abilities must be considered in the light of children's general development. Available information from longitudinal studies suggests that the change in non-verbal IQ over time might be more striking in those with SLI than in typically developing children. For example, Cole et al. (1992) showed that the same child may have different verbal – non-verbal discrepancies when assessed over a period of only two years, and there is also evidence that non-verbal IQ may drop or fluctuate considerably in children with SLI with average decline of around 10-20 points (Botting, 2005; Krassowski & Plante, 1997; Conti-Ramsden et al., 2002). Research has shown that particularly for older children with SLI performance IQ decreases with age (Cole et al., 1995; Mawhood et al., 2000; Hansson et al., 2004). That means that accurate histories and comparisons between children of different ages and of different abilities are vital in establishing informative clinical definitions. Furthermore, clinicians in their everyday practice rarely exclude children on the basis of performance IQ as there is little evidence that children with lower IQs respond in different (and less susceptible) ways to intervention (Cole et al., 1995; Notari et al., 1992; Fey et al., 1994) or that performance IQ accounts for any variation in outcome once

linguistic factors have been taken into account (Tommerdahl & Drew, 2008; Botting et al., 2001).

In addition, studies so far have failed to address the issue of a developmental interaction between various areas of a child's development over time, a view that is being increasingly highlighted as a more valid model in understanding atypical development (Karmiloff-Smith, 1998; Thomas & Karmiloff-Smith, 2003). From the diagnostic criteria described above, it can be concluded that SLI has traditionally been seen as a disorder in which language is the single area affected in a child's development. Thomas and Karmiloff-Smith (2003) and Thomas et al. (2009) have questioned the view that language is the only affected system and argued that impairment of any individual system (such as language) cannot remain separate of other systems. All the recent research findings indicate that children's skills in other areas of their development are not entirely spared. Supporting evidence comes from studies indicating that even children with apparently resolved language scores perform more poorly on non-verbal tasks, but also present with difficulties in other domains of their development, such as their social and emotional functioning (Conti-Ramsden et al., 2001; Bishop et al., 1996; Davison & Howlin, 1997; Gertner et al., 1994). Thus, even when the specific impaired system has recovered following intervention, there may be a secondary effect in another area of a child's development and evidence of impairment elsewhere.

The main implication of that is that there is a need to examine children's abilities in other developmental areas. A focus on other areas of a child's development is crucial in order to investigate whether other areas are affected, but also determine the extent to which they interact with each other. For example, an investigation of the social and emotional functioning of children with SLI will provide extremely useful information so that a more flexible and developmentally appropriate description for SLI can be devised.

1.3.4 Types of Language Impairment

1.3.4.1 Introduction

Although recent years have witnessed a tremendous advance in our understanding of the nature of language impairment (Dockrell & Lindsay, 1998), children with SLI are considered both theoretically and practically to be a very diverse group (Aram & Nation, 1975; Aram et al., 1984; Conti-Ramsden et al., 1997; Rapin & Allen, 1983). The fact that these children exhibit a mixed profile of language impairments (Conti-Ramsden et al., 1997; Dockrell et al., 2006; van Weerdenburg et al., 2006; Dollaghan, 2004) has made it difficult to arrive at a consensus of what exact difficulties they face and of what causes them, and clinicians and researchers appear to agree only with the fact that there is considerable variability from child to child. Below, the difficulties with the different components of the language system affected are described.

1.3.4.2 Problems with the Different Components of the Language System

Language difficulties can be viewed in relation to the different part or parts of the language system affected. During early investigations of SLI a common distinction was between a speech or a language disorder. This classification was considered to be too simplistic for two reasons: many children have impairments in both categories, or at least are reported to present with considerably higher co-morbidity rates (Broomfield & Dodd, 2004; Shriberg et al., 1999; Shriberg & Kwiatkowski, 1994), and each category includes a range of differing impairments in terms of causal factors and symptomatology (Dodd, 1995).

The World Health Organisation (WHO, 1993) suggested a broad classification, between expressive and receptive forms of language impairment. Children with receptive language impairments present with a limited comprehension of spoken and written language, difficulties with understanding of abstract concepts, indirect requests, humour or multiple word meanings. Generally, children with receptive language impairments fail to recognise and extract meaning from verbal information, and their performance in language comprehension measures should be at least 2 standard deviations (SD) below age level. Children with expressive language

impairments, on the other hand, present with limited use of language, difficulty in starting and responding to conversations, limited or non-specific vocabulary, heavy reliance on gestures or non-verbal communication, difficulties with grammar, or difficulty sequencing rhymes or stories. Children may have isolated expressive or receptive language impairments but it seems to be the case that more often a combination of expressive and receptive impairments is present (Leonard, 2009).

An important step in understanding impairments in the language system derives from an analysis of the sub-components of language. Children with SLI differ in their patterns of impairment over a range of language skills (Vance & Wells, 1994), and some children have difficulties with each of the sub-components of the language system.

Speech Sounds

Children with speech sound impairments comprise the largest group of children referred for speech and language therapy, with an estimated prevalence of approximately 15% of children at 3 years of age (Shriberg, 2001). Children in this category have difficulties in producing and processing speech sounds, which results in early processes of their phonological system coexisting with later ones. In this category there are children who face problems in planning and executing movements involved in producing certain sounds and/or difficulties in analysing speech sounds and distinguishing between them, and also children with phonemic difficulties – difficulties with producing a sound in the appropriate contexts, i.e. dyspraxia.

Dodd (1995) proposed a classification system of speech sound difficulties, which classifies speech sound difficulties into five subtypes, including articulation disorder, delayed phonological acquisition, consistent deviant disorder, inconsistent deviant disorder, and other (including dysfluency, dysarthria, and apraxia of speech). Dodd's system is based on the types of speech sound errors observed rather than the hypothesized etiological basis.

There is evidence that difficulties with speech sounds may lead to later learning difficulties, and in particular difficulties with the development of phonological skills necessary for literacy development, such as rhyme detection and non-word reading (Smith et al., 2005; Bird et al.,

1995). Children with speech sounds impairments have been found to present with difficulties in spelling and reading relative to normative expectations (Sices et al., 2006; Lewis et al., 2002; Young et al., 2002).

Morphology

Difficulties with morphology, particularly verb morphology, are widely reported for children with SLI. The overwhelming majority of past tense errors reported by research studies are omissions. Children with SLI omit the 3rd person singular –s marker and also forms of “be”. As regards past tenses, children with SLI omit regular past tense –ed. Although they also present with difficulties producing irregular past tenses, compared to controls they seem to have fewer difficulties as they were found to perform at the same level as their language-age matched controls (Leonard et al., 1992a; Leonard et al., 1997). Research findings support that morphological rather than lexical abilities affect children’s difficulties with irregular past tense. Additional evidence for that comes from van der Lely and Ullman’s (2001) study pointing out that children with SLI performed worse than children matched on vocabulary but not those matched on morphology. Gopnik & Crago (1991) and Leonard et al. (1992b) have further supported the fact that children with SLI have not formed morphological paradigms for the past tense by showing that in their study children with SLI produced few over-generalisations compared to controls.

Use of plurals is another area of difficulty for children with SLI although the data from research studies are conflicting. Early studies by Bishop (1994b) and Rice and Wexler (1996) have found that children with SLI produce very few errors on plurals; however there were no control groups in those studies. Of those who compared performance with controls, two studies found that children with SLI performed worse than language-age matched children (Leonard et al., 1992a; Leonard et al., 1997) and two found that they were worse only than chronological-age matched children (Oetting & Rice, 1993; Bortolini et al., 1997).

The Lexicon

Children with SLI can have difficulties in learning new words as well as producing already known words. As children with SLI are often delayed in their first use of words, they tend to lag

behind their peers in the accumulation of words they understand (Rice et al., 1994). In an earlier study by Rice et al. (1992) pre-school children with SLI were found to have more difficulties than their chronological-age matched peers in learning the meaning of newly introduced words when presented with a fast-mapping task and were asked to learn new words. This finding was repeated in later studies (Oetting et al., 1995; Ellis Weismer & Hesketh, 1996), as was the finding that problems in acquiring new vocabulary persist into the school years (Oetting et al., 1995). Learning newly-introduced verbs has been found to be a particular difficulty for children with SLI (Rice et al., 1994; Oetting et al., 1995). Similarities, however, to chronological-age matched children were found for the learning of nouns (Dollaghan, 1987; Oetting et al., 1995; Rice et al., 1994).

When compared with language-age matched children, most studies showed that children with SLI can comprehend new words introduced in experimental learning situations as well as their language-age matched peers (Leonard et al., 1982; Schwartz et al., 1987; Schwartz, 1988; Rice et al., 1992; Ellis Weismer & Hesketh, 1996). When looking at children's ability to produce new words, research studies have shown that children with SLI are generally poorer than both chronological-age matched groups (Dollaghan, 1987) and language-age matched groups (Ellis Weismer & Hesketh, 1996).

There is also a group of children who have word-finding difficulties, in that they face difficulties in retrieving a word that already exists in their receptive vocabulary. In the case of children with word-finding difficulties there is a mismatch between the comprehension and the production of words (Messer & Dockrell, 2006). A survey carried out by Dockrell et al. (1998) indicated that word-finding difficulties are a widespread problem for children with SLI, and up to 23% of children in language support services were identified as having word-finding difficulties. Kail et al. (1984) have proposed that word-finding problems are due to either a "storage" or a "retrieval" difficulty. According to the first hypothesis, a child has not learnt the names for lexical items adequately, and is therefore less accurate and slower at naming (McGregor & Appel, 2002). The retrieval explanation claims that the stored lexical representations are comparable to those of children with typical language development but that the information or names are less accessible.

Best (2005) describes difficulties in four areas: storing lexical semantic information used for comprehension and production, accessing lexical semantic information for production, accessing the phonological form for production, and storing phonological information for production.

Syntax

The syntax of language is another problem that a large majority of children with SLI have. Children may face difficulties with both the comprehension and the expression of syntactic structures. In terms of comprehension of syntax, children with SLI were found to have difficulties understanding active (van der Lely & Dewart, 1986; van der Lely & Harris, 1990) and passive sentences (van der Lely & Harris, 1990; van der Lely, 1996; Ebbels & van der Lely, 2001; Norbury et al., 2001). Other common difficulties are with both forms of the dative alternation (van der Lely & Harris, 1990; Ebbels et al., 2007), embedded phrases and clauses and some pronouns (van der Lely & Stollwerck, 1997).

The most common errors in terms of expression of the syntactic structures are the use of fewer or subordinate clauses (van der Lely, 1997) and frequent errors in forming wh- questions. A common error in terms of wh- questions is for children to produce double tense errors (e.g. 'What did he bought?') (Ebbels & van der Lely, 2001) or to fill the gap left by the moved wh- word (e.g. 'Which one did they eat the sweet?') (Connell, 1986; Leonard, 1995; van der Lely & Battell, 2003).

Pragmatics

Children with SLI can also face pragmatic impairments (Bishop, 2000; Adams & Lloyd 2007). That is, they have difficulties in understanding language in context, in understanding implied meaning, and in using pragmatic cues in conversation to understand the intended meaning. In particular, a child's pragmatic impairments can take the form of failing to engage in communication, such as taking turns in conversation, using language appropriately or following the principles of social conversations (Bishop, 2000; Leinonen et al., 2000; Dockrell & Messer, 1999). Children with pragmatic impairments often give irrelevant answers to questions and frequently need clarifications from others when attempting to follow a conversation. There is

evidence that children with SLI can have difficulties with narrative (Norbury & Bishop, 2003; Reilly et al., 2003; Wetherell et al., 2007), constructing inferences on verbal and pictorial story tasks and understanding the intended meaning of the interlocutor (Vance & Wells, 1994; Norbury & Bishop, 2002). Bloom & Lahey (1978) described children with pragmatic difficulties as appearing “intrapersonal” instead of “interpersonal”.

In recent years, another sub-group of children with Pragmatic Language Impairment (PLI) has been identified. This sub-group was once referred to as having “semantic pragmatic disorder” (Rapin & Allen, 1983; Bishop & Rosenbloom, 1987), and is frequently discussed in relation to children diagnosed within the autistic spectrum disorder. It has been suggested that PLI represents the point at which the conditions of autism and SLI overlap (Bishop, 2000). For these children, the pragmatic aspects of language are the primary difficulty: they tend to be able to produce complex sentences (although usually not without errors) and are often verbose, but they have poor understanding of functional communication including turn-taking, understanding of roles in conversations, limited conversational topics, a lack of sensitivity regarding social cues and a tendency to give too much or too little information (Adams & Lloyd, 2005; Bishop, 1998; Botting & Conti-Ramsden, 1999; 2003; 2008; Conti-Ramsden & Botting, 1999; Bishop & Norbury, 2002; Marton et al., 2005; Spanoudis et al., 2007). Pragmatic language ability in children with SLI will be further discussed in chapter 2 as a language dimension that could affect children’s socio-emotional functioning.

1.3.4.3 Summary of Linguistic Difficulties and Implications for Future Research

The section above has discussed issues about the different linguistic difficulties, and has reviewed relevant literature with the hope of highlighting the main areas of weakness in children with SLI. In summary, there may be a particular impairment in one or more aspects of the language system: speech sounds, morphology, lexicon, syntax, and pragmatics.

This inevitably has implications for conducting research in the area of SLI. The heterogeneity observed in this population makes it even more important to gather detailed and valid information about children’s language skills, using a range of sources such as standardised language tests but also information from significant people in the children’s life. Also, in order

to establish that an appropriate sample has been selected for a study investigating the relationship between language and performance in another developmental area (e.g. social and emotional development), it is necessary to look at children's linguistic profiles and obtain information about different language dimensions so as to have a clearer understanding about how the different strengths and weaknesses of these children fit together, and what mechanisms might inform their overall development.

1.4 NON-LINGUISTIC COGNITIVE ABILITIES OF CHILDREN WITH SLI

1.4.1 Introduction

Clinicians and researchers have long suspected that children with SLI present with limitations not only in the area of language and communication, but also in areas of functioning that require little or no language ability. Research on that issue has indicated that children with SLI may perform poorly in non-verbal cognitive tasks despite the fact that they achieve age-appropriate scores on standardised non-verbal tests of intelligence (Hill, 2001; Botting, 2005; Hick et al., 2005; Windsor et al., 2007).

Below, hierarchical planning, analogical reasoning and symbolic representations will be discussed in order to review the main non-linguistic difficulties that children with SLI face with the aim of investigating their implications for children's general performance.

1.4.2 Hierarchical Planning

First of all, children with SLI have been found to be less proficient in their ability to recognise and process hierarchical planning, "the ability to convert thoughts and intentions that are not temporarily ordered into events that occur in real time" (Kamhi et al., 1995). An initial study in the area by Cromer (1983) reported limitations in hierarchical planning when studying a group of children with Landau-Kleffner syndrome. As comparisons, Cromer used a group of children with SLI, a group of deaf children and a group of chronological-age matched children. He tested children by adapting a method used by Greenfield and Schneider (1977) in which

children were asked to replicate symmetrical tree structures. Children with SLI did not complete the task in a hierarchical manner, but used a developmentally earlier sequential method. Cromer interpreted this as indicating that children with SLI have a hierarchical planning deficit which might also explain children's language difficulties and suggested that a central hierarchical planning mechanism underlies language.

Kamhi (1981) and Kamhi et al. (1995) further researched this area by investigating the relationship between hierarchical planning and grammatical ability in 15 school-aged children with SLI and a control group of the same mental age. Children were asked to build four hierarchical structures: a block construction, a puzzle construction, a simple straw construction, and a complex straw construction. Children who failed to complete the complex straw construction were taught how to construct the model using a sequential strategy, thus providing a measure of learning ability. The results of this study revealed inconsistencies with the results reported by Cromer (1983) which could be attributed to the different age of the participants (much younger in the Kamhi et al.'s study) and differences in the severity of language impairment. The data of Kamhi et al. indicated that as a group, children with SLI had some difficulty replicating hierarchical structures using a sequential strategy, but no group differences were found for the use of an interrupted strategy (with the exception of the training task). Kamhi et al. (1995) concluded that children with SLI do seem to present with hierarchical planning difficulties but that the notion of a specific difficulty with hierarchical planning in explaining language impairments might not be a useful one.

The studies reported above suggest that skills such as hierarchical planning need to be further investigated in order to explain whether children with SLI consistently present difficulties with organising incoming stimuli as research findings at the moment are inconclusive and limited. Hierarchical planning also needs to be considered in the light of difficulties in other areas of children's development, such as their social and emotional functioning. For example, limitations in hierarchical planning could contribute to difficulties with social skills such as a child's ability to resolve conflicts, and to solve social problems. A discussion of this will be attempted further on in chapter 3.

1.4.3 Analogical Reasoning

Another cognitive ability examined in children with SLI is analogical reasoning, the cognitive ability to apply existing knowledge to a new experience. Nippold et al. (1988) tested the analogical reasoning abilities of children with SLI using both verbal and non-verbal tasks and reported that they had difficulties with both tasks. However, after matching the SLI Group with a group of children with the same non-verbal cognitive ability scores, children with SLI performed as well as the control group.

Verbal analogical reasoning was also researched by Masterson et al. (1993) by testing a group of children with SLI, a group of mental age controls and a group of younger controls matched on their receptive vocabulary. Five types of verbal analogies were administered: synonyms, antonyms, linear order, category membership, and functional relationships. The authors concluded that the performance of children with SLI was poorer than the mental age controls and similar to the language test controls, although they had significantly higher mental ages.

Interesting findings were presented by Kamhi et al. (1990) in which children with SLI and mental age controls were asked to apply a series of concepts to different (but similar) situations after being presented with a solution to a specific problem. Kamhi and his colleagues concluded that children with SLI were less successful in their ability to use analogical thinking when information was presented exclusively verbally without a visual demonstration, and also when there is a requirement to process information more quickly.

There are important issues to bear in mind from the studies reviewed above. First of all, in the Kamhi et al. study (1990), it could have been that a more general processing difficulty hindered the performance of children with SLI. It is possible that difficulty in processing auditory information explained children's difficulties where information was presented only verbally. More studies are needed to investigate whether children with SLI present with difficulties in analogical reasoning and again these need to be considered in the light of whether they have an impact on other areas of children's development, such as their interactions with their peers. For example, one hypothesis might be that a difficulty in applying new knowledge and in generating rules might affect a child's ability to successfully interact with peers by using prior information in new social situations. These issues will be discussed in detail in chapter 3.

1.4.4 Symbolic Representations

In the early 1960s, Piaget and his colleagues studied the mental representational abilities of children. Piaget argued that children have a capacity to form symbolic representations, a capacity they used in language, pretend play and drawing. Morehead and Ingram (1976) suggested that the language impairments of children with SLI might reflect an underlying difficulty in using symbolic representations.

The first area that was studied was the symbolic play of children with SLI. There are a number of research studies (Lovell et al., 1968; Udwin & Yule, 1983; Terrell et al., 1984) demonstrating that children with SLI engage in less symbolic play than normally developing children of the same age and are less adaptive in their use of objects in a pretend manner. Although all the studies come to the same conclusion, the exact nature of the difficulties are far from clear. In reviewing the literature, Johnston (1991) and Casby (1997) suggested that there may be no underlying symbolic deficit, but that children with SLI could have restrictions in symbolic play ability because of their less developed language abilities. However, the studies examining the relationship between the levels of language development and symbolic play (Folger & Leonard, 1978; Shub et al., 1982; Thal & Bates, 1988; Kushnir & Blake, 1996) yielded rather conflicting and far from conclusive results.

In Thal and Bates' study (1988) a language-age matched group was included in order to investigate whether there is a causal relationship between children's impaired language abilities and poor symbolic play. Their research was based on a 'lexical gesture' play task where children had to imitate single symbolic gestures. Thal and Bates found that the language delayed group performed poorer in comparison to the typically developing chronological-age matched group, but similar to the language-age matched group, and they concluded that the level of language could explain children's lower level of play. But, the later study of Kushnir and Blake (1996) reported different results indicating that slightly older children with SLI (3-5 years old) performed similarly to typically developing chronological-age matched peers. A possible reason explaining the inconsistencies in the studies above could be the different language measures as well as the different play tasks used with children (Casby, 1997).

Some researchers have investigated other related areas. Johnston and Ellis Weismer (1983) studied anticipatory imagery in children with SLI using the mental rotation paradigm. Children were presented with visual displays consisting of two rows of geometric shapes with a different orientation, and had to decide whether the spatial sequence of shapes was the same. The authors suggested that children with SLI were successful at using imagery, and were able to generate, maintain and interpret appropriately the necessary visual image. However, they found that children with SLI needed significantly more time to respond when compared with their peers. A possible explanation of this study's results could be in terms of generally slow rate of responding in speeded tasks rather than a symbolic deficit. Evidence for a slow rate of processing has been found by Tallal et al. (1985) and Bishop and Edmundson (1987), and will also be discussed in the next section of this chapter. Also, the limited size of the group of this study should be taken into account before generalising its results.

To further investigate that area, and in order to use accuracy rather than speed as a dependent variable, Kamhi (1981) and Kamhi et al. (1984) examined the relationship between mental imagery ability and vocabulary comprehension. The researchers found that children with SLI, when compared with their peers on age and non-verbal cognitive ability, performed more poorly and their performance was strongly related to receptive vocabulary. It could be proposed that this task required the child to generate and interpret a symbolic representation of an unseen object, by retaining this information while examining other aspects of the task leading to a memory capacity overload. The results of their study do not indicate the precise nature of children's difficulty but it seems more likely that the performance of children with SLI may be linked to a difficulty with the processing involved in the task rather than a failure to form symbolic representations.

The studies reviewed above do not provide sufficient information to conclude with confidence that children with SLI fail to develop a symbolic capacity. However, there is no doubt that children with SLI do have problems forming and using types of symbolic representations as the studies suggest, and it might be the case that these problems appear alongside their language impairments.

1.4.5 Implications for Future Research

The literature reviewed above signals that children with SLI show weaknesses in areas of functioning that fall outside of the language domain. While the key feature of SLI is impaired language along with age-appropriate non-verbal cognitive ability, there has been strong evidence in recent years challenging the “specificity” of the difficulties children with SLI experience.

Future research should aim to consider the limitations in the area of non-verbal cognitive ability of children with SLI and tease apart the various factors contributing to their performance on both verbal and non-verbal tasks. Also, limitations in certain areas of non-verbal cognitive ability should be carefully considered when thinking of other areas of children’s development, such as their social and emotional functioning, as possible contributing factors of their difficulties. In chapter 3, a detailed description of how poor performance on non-verbal areas of development can affect children’s social and emotional well-being will be attempted.

Furthermore, it is important to consider developmental changes and to compare whether children with SLI of different ages show the same or different patterns of difficulties in the area of non-verbal cognitive abilities. As discussed above, there is evidence from research studies indicating that the non-verbal scores of children with SLI decline over time (Clegg et al., 2005; Tallal et al., 1991; Tomblin et al., 1992). As children grow older, the non-verbal intelligence measures used contain more items for which verbal mediation is helpful resulting in poorer performance in non-verbal tasks. Research above further supports the fact that there must be a careful consideration of the assessments used.

1.5 EXPLANATORY MODELS OF LANGUAGE DIFFICULTIES

There are two different perspectives debating the nature of language development: the nativist and the developmental perspective. The nativist perspective centres around the fact that language is learned using specialised mechanisms which develop under genetic control (Pinker, 1994; 2002; Fodor, 1983; Chomsky, 1986). On the other hand, the developmental

perspective of language development argues that language is learned using general cognitive abilities (Karmiloff-Smith, 1998; Thomas & Karmiloff-Smith, 2003; Thomas et al., 2009).

These two perspectives about the nature of language development are mirrored in the two main groups of theoretical explanations of SLI: theories that regard SLI as a linguistic impairment versus theories debating that SLI is a processing impairment. The linguistic theories (or domain specific theories) regard the linguistic deficits seen in children with SLI as a primary deficit and claim that their deficits result from an impairment in functions relating to language development.

Theories within this account argue that innate language learning mechanisms are impaired and the difference between these theories is centred on which precise area of language is thought to be impaired. For example, some researchers have suggested a specific delay in morpho-syntax necessary for tense marking (Rice et al., 1995a). Others define the deficit in SLI as an impairment in establishing agreement relations in grammar (Clahsen, 1989; Clahsen et al., 1997). Finally, other researchers have hypothesised that the core deficit of SLI lies in the computational grammatical systems of syntax, morphology and phonology and within each of these systems is related to grammatical complexity (van der Lely & Stollwerck, 1997; van der Lely, 2005; van der Lely & Battell, 2003).

Conversely, processing theories differ from the linguistic theories in that they claim that the deficits seen in SLI do not stem from the language system itself and are not caused by an impairment in specialised linguistic mechanisms. They propose instead that the impairments seen in children with SLI are secondary to other underlying cognitive difficulties which are not specific to language but can cause language difficulties. The domain general account of SLI includes theories that explain their difficulties as being general due to slow processing (Bishop, 1994b) or as a consequence of limitations in their information processing capacities (Leonard, 1998) to theories which are centered around deficits with specific mechanisms. For example, some researchers have argued that impairments in auditory processing may be the likely cause of SLI (Tallal et al., 1985) as significant differences have been found between children with SLI and their typically developing peers in discriminating both non-speech (Tallal & Piercy, 1973; van der Lely et al., 2004) and speech sounds when these are brief or rapidly presented (Tallal

& Piercy, 1974; Tallal & Stark, 1981). Another theory has been put forward by Gathercole & Baddeley (1990) and states that the impairments seen in children with SLI are caused by specific processing difficulties with phonological short term memory (Gathercole & Baddeley, 1990).

It is important to be aware that specific language impairments are likely to have different causes in different children. The proposed explanatory models briefly reviewed above propose one underlying cause but it may not in fact be the case that one underlying cause can account for all the difficulties for all the children with SLI. The proposed explanatory models may not therefore be mutually exclusive. Increasingly researchers have proposed that both domain general and domain specific deficits can be experienced by individuals with SLI (Paradis et al., 2006) or even that a domain specific deficit could operate within a domain general explanation (Leonard, 1998).

The discussion so far has revolved around whether it is possible to identify a specific within-child factor or series of factors observed in all children with SLI or whether it is more appropriate to look for mechanisms or factors related to children's environment. In order to get a clearer picture of SLI, there is a need to examine the interrelationship among children's language and cognitive features, to consider any changes with age, and to investigate the impact of SLI on children's general functioning and how all these present in different environments. Below the impact of SLI on functioning is discussed.

1.6 IMPACT OF SPECIFIC LANGUAGE IMPAIRMENT ON GENERAL FUNCTIONING

Many children with SLI experience additional difficulties (Bashir & Scavuzzo, 1992; Dockrell & Lindsay, 1998), including non-verbal cognitive impairments (Botting, 2005; Hick et al., 2005) delayed literacy (Dockrell et al., 2007; Catts et al., 2006; Snowling et al., 2000; Stothard et al., 1998; Botting et al., 2006; Mackie & Dockrell, 2004) and numeracy skills (Cowan et al., 2005; Newton et al., 2004) and difficulties with their general academic attainment (Aram et al., 1984; Conti-Ramsden et al., 2001b; Snowling et al., 2001).

Longitudinal studies that have been conducted in the area provide very useful data on children's additional difficulties and the impact of their language impairments. Studies by Stothard et al. (1998) and Baker and Cantwell (1987) report that for those children whose language difficulties persist into adolescence there is a high rate of linguistic, educational and behavioural, emotional and social difficulties persisting many years after the language difficulty was first diagnosed and these young people continue to fall behind in respect to their typically developing peers. The findings of these studies were confirmed in the UK by Botting et al. (1998), who researched the outcomes of children attending language units, Haynes and Naidoo (1991), who conducted a follow up study of a special language school, and Dockrell and Lindsay (2000), who followed a cohort of children when they were 8, 10 and 12 years of age and into adolescence.

Of particular interest in the present study is the growing evidence for the comorbidity of SLI with a range of behavioural, emotional and social difficulties, including conduct problems (Cohen et al., 2000; Coster et al., 1999), relationship difficulties (Fujiki et al., 2001; Conti-Ramsden & Botting, 2004) and impaired self-esteem and confidence (Dockrell & Lindsay, 2000; Lindsay et al., 2000; Jerome et al., 2002; Wadman et al., 2008). Of course, factors other than language ability might have contributed to difficulties with socio-emotional functioning, but language is certainly the first factor under investigation, for limited language skills constitute the characteristic that the children with SLI share. Further investigation of children's socio-emotional functioning will be attempted in chapter 2 and chapter 3.

1.7 CONCLUSIONS ABOUT SPECIFIC LANGUAGE IMPAIRMENT

Chapter 1 has reviewed research studies demonstrating the wide range of language difficulties that children with SLI experience. Compared to their peers, children with SLI can have difficulties with the production and understanding of grammatical forms of language, and their rate of acquisition of new vocabulary can be slower than expected for their age. Children with SLI commonly have difficulties with word production and word retrieval, and might present with limitations on their ability to effectively use conversational context and non-verbal means of communication, such as gestures and facial expressions, to convey meaning.

Problems with language are fundamental to a child's ability to access the curriculum, but also the child's ability to interact with their peers and other significant people in their lives (Dockrell & Lindsay, 2000). Children with SLI have been found to face difficulties in social interactions, and a considerable amount of literature highlights the increased prevalence of behavioural difficulties in this population. If co-morbidity seems to be the rule rather than the exception among children with SLI (Pennington, 2002), then understanding the basis for co-morbidity is an important step towards understanding the language impairment itself. There is no doubt that further research is needed in order to assess the range of difficulties experienced by children with SLI and to explain the exact relationship between language impairments and children's behavioural, emotional and social difficulties.

In the next chapter, the notion of competent social and emotional functioning will be considered in detail, as will its relationship with language ability. Relevant literature will be reviewed with particular attention to the implications for further research needed in the area.

CHAPTER TWO:

SOCIAL AND EMOTIONAL FUNCTIONING AND LANGUAGE

2.1 ORGANISATION OF THE CHAPTER

The second chapter commences by introducing the notion of social and emotional competence. It firstly focuses on definitional and conceptual issues around social and emotional competence in the typically developing population, and then explores issues around behavioural, emotional and social difficulties.

The subsequent section of this chapter introduces the importance of language for children's developing emotional and social competence. In order to address this issue, the section is divided in three parts: the first one discusses the importance of language for the development of emotional and social competence by presenting findings from available research. The second reviews the literature by presenting evidence that SLI is associated with difficulties in emotional and social competence. The third part presents evidence of the association between language impairments and behavioural, emotional and social difficulties by looking at relevant research studies, and provides a comprehensive description of the two theoretical views that could possibly be accounting for children's difficulties. The chapter concludes by highlighting the implications for further research and setting the scene for the present study.

2.2. SOCIAL AND EMOTIONAL COMPETENCE

2.2.1 Introduction

In this section the notion of emotional and social competence is discussed with the aim of highlighting central issues around emotional and social competence in children, and exploring how children develop their emotional and social competence. Towards that aim, the section is organised in three parts. In the first part, the notion of emotional and social competence is explored. The second part focuses on behavioural, emotional and social difficulties both

through a clinical and an educational perspective. In the final part, key challenges surrounding the term 'behavioural, emotional and social difficulties' are examined.

2.2.2 Emotional and Social Competence – Definitional and Conceptual Issues

Emotional and social development refers to the development of skills and values that enable the child to form relationships and to function among family members, peers and the society. It is a term used to refer to the child's developing ability to perceive accurately, appraise, and express emotion, to understand the causes of emotional states, and the ability to regulate emotions to promote emotional and intellectual growth. For example, when children are learning to share toys with their peers, they are developing their social skills. If they are learning to talk through things when they are angry, rather than throw a toy or hit someone, then they are developing their emotional skills.

For emotional development to take place, relationships and social interactions with significant people are necessary. First of all, caregiver-child relationships provide children with a secure emotional base based on comfort, guidance and protection during the early years. There is a considerable amount of literature indicating that social skills emerge within these secure relationships with the caregiver (Hartup, 1989; Sroufe, 1997; Weinfield et al., 1997; Wood et al., 2004; Haskett & Willoughby, 2007). All these studies highlighted that, through their interactions with their child, caregivers prompt, encourage and model behaviours that will eventually contribute to the development of positive relationships with peers and adults. In discussing this issue, a number of researchers (Coplan et al., 2008; Goodvin et al., 2006; Szewczyk-Sokolowski et al., 2005; Gentzler et al., 2005; Rubin et al., 1995) considered the caregiver-child relationship as being a training ground for social and emotional skills: caregivers act as guides of their child's emotional and social world, exposing them to social situations from which skills emerge and providing them with feedback and advice to ensure that such skills will be transferred successfully into relationships with peers and other adults. Relationships with peers, on the other hand, are used for children to elaborate and practise the skills acquired in the caregiver-child relationship with individuals who are more or less similar to themselves (Brownell et al., 2008; Berndt, 2002; Hartup, 1989).

The foregoing shows that emotional development is linked with advances in social development through exposure to rich social opportunities and practice of skills. Emotions derive their meaningfulness from the social context they are expressed in. Commenting on the inextricability of emotional and social development, Saarni (1989; 1990) and von Salisch and Saarni (2001) argue that emotional experience is deep-rooted in social experience, and the two are reciprocally influential.

The value of social and emotional development for children's general development has been extensively highlighted in the literature (Gardner, 1993; Higgins et al., 1983), and the recognition of the importance of children being socially and emotionally competent has significantly increased over recent years. This widespread concern has been the upshot of several factors, including an increasing recognition of links between difficulties in social and emotional development and poor academic performance (Newcomb et al., 1993; Wentzel, 1993; Parker et al., 1995; Cole et al., 1996; Fleming et al., 2005; Mestre et al., 2006) and lower general functioning (Grey et al., 2000).

What is meant though by emotional and social competence? In the developmental literature, the terms 'social and emotional competence' are used frequently as if researchers share a common understanding. However, many authors have noted the wide variety of published definitions of social and emotional competence, but the lack of shared understanding of what these terms really mean (Dodge et al., 1985; Hubbard & Coie, 1994; Dougherty, 2006).

The term "emotional competence" is relatively new and there is still some debate about its meaning, particularly the way it relates to terms such as emotional literacy and emotional intelligence. Elias et al. (1997) have defined emotional competence as 'the ability to understand, manage and express the social and emotional aspects of one's life in ways that enable the successful management of life tasks such as learning, forming relationships, solving everyday problems and adapting to the complex demands of growth and development'. In Elias' definition, emotional competence covers the contribution that emotional literacy makes to successful relationships and to social problem solving. In this respect emotional competence overlaps with social competence. A sample of research definitions of social competence is presented in Table 2.1.

Table 2.1

Definitions of Social Competence

Author	Definition of Social Competence
Howes (1987)	'behaviour that reflects successful social functioning'
Duck (1989)	'ability to achieve desired outcomes and show adaptability across contexts'
Yeates & Selman (1989)	'the development of the social-cognitive skills and knowledge, including the capacity for emotional control, to mediate behavioural performance in specific contexts, which in turn are judged by the self and others to be successful and thereby increase the likelihood of positive psychosocial adjustment'
Welsh & Bierman (1998)	'the ability to establish and maintain high quality and mutually satisfying relationships and to avoid negative treatment or victimization from others'
Attili (1990)	'social success'
Rubin & Rose-Krasnor (1992)	'the ability to achieve personal goals in social interaction while simultaneously maintaining positive relationships with others over time and across settings'
Mendez et al. (2002)	'the ability to develop peer and adult relationships that are necessary to succeed in both academic and non-academic settings'
Stewart-Brown & Edmunds (2003)	'behaviour, attitudes and understanding that supports the development of good relationships and enables children and adults to be successful in tasks involving others'

From the definitions above, it is evident that most conceptualisations of social competence in the literature are centered around the notion of 'effectiveness in interaction'. It is also evident that the task of defining social competence has been approached in four different ways: a) specific skills, b) sociometric status, c) relationships and d) outcomes. Each approach to the definition of social competence has its relative strengths and weaknesses, some of which will be discussed below.

Firstly, social competence has been defined solely in terms of a set of desirable social skills (Mize & Ladd, 1990). Skills-based approaches to defining social competence have, however, been heavily criticised mainly because they are overrestrictive. The social skills selected to prove whether a child is socially competent or not tend to be difficult to measure in an objective manner as some behaviours can be interpreted differently by different people (Rose-Krasnor, 1997). Also, skills-based approaches tend to take an adult-centred perspective on child competence by listing the skills that should constitute children's social competence a priori.

The second approach to defining social competence adopts a more child-centred perspective by placing more emphasis on the child's peer status (Hubbard & Coie, 1994). Denham et al. (1990) consider that one of the major strengths of sociometric status assessments is that they reflect the combined judgements of peers. However, although sociometric status assessments are useful for identifying children who lack or have poor social competence, they are mainly descriptive and as such they provide little information on the cause of children's difficulties failing to explain the nature or source of the difficulties (Parker et al., 1995).

The third approach to defining social competence is based on the child's ability to form positive social relationships. From this perspective, competence is assessed by the quality of the child's relationships, and in particular the child's friendships, which, in turn, depend on the skills of both relationship partners (Rose-Krasnor, 1997). In that sense, a child who interacts with a socially skilled partner is likely to have a higher quality relationship (and thus appear more competent) than the same child interacting with a less skilled partner. Although there is considerable literature on the importance of friendships for a child's development (Hoglund et al., 2008; Ladd et al., 2008; Ladd & Troop-Gordon, 2003; Hartup, 1992; 1996; Newcomb & Bagwell, 1995; Harris, 1995), as well as a well established correlation between efficient social competence skills and the formation of friendships (Hay et al., 2004; Hartup, 1996), the directionality of this relation is still hard to establish.

Finally, in defining social competence there has been a focus on children's social outcomes and their achievement of social goals. However, the social outcomes approach presents further challenges, the most important of which is the difficulty in determining social success or failure. The question of which outcomes should define social competence is subject to

personal interpretation, so that different groups and cultures judge outcomes differently, and place value on different emotional and social behaviours. Similarly, a child's behavioural, emotional and social difficulties considered problematic within a specific culture might not generate concern within the child's family culture. This longstanding issue of cultural relativity was explored initially by Ogbu (1981) who argued that social competence is strongly shaped by culturally-defined tasks and perspectives. As a result, it is difficult to specify the number of children or adolescents whose behaviour is problematic because of cultural or group differences in identifying such behaviours (Javo et al., 2009; Weisz et al., 1995; Stevens et al., 2003; Epstein et al., 1998; Chazan et al., 1998). In Chazan et al's work for example, far more children were rated by teachers, parents and health nurses in Norway as having internalised than externalised problems, which is not usually the case in other countries.

Finally, social and emotional competence as terms are difficult to define because the skills and behaviours required for healthy social and emotional development vary with the age of the child and with the demands of particular situations. A socially and emotionally competent preschooler behaves in a different manner to a socially and emotionally competent adolescent. Conversely, and as will be discussed in section 2.2.3.3, the same behaviours (e.g., aggression, shyness) have different implications for social adaptation and functioning depending upon the age of the child and the specific demands of the social context. Elicker et al. (1992) talked about social and emotional competence being better considered as developmentally based phenomena, or the way children adapt in an age-appropriate distinctive manner to different developmental issues. According to this approach, the components of social and emotional competence can only be determined according to the child's age and will inevitably differ at each developmental level. The child can be described as emotionally or socially competent when specific patterns in the child's behaviour emerge in response to the challenges or issues encountered at each developmental period (Guralnick et al., 1996).

The issues discussed above point to the importance of looking at the child's general context, age and culture before drawing conclusions about their emotional and social competence. The next section will focus on children's difficulties in the area of social and emotional competence, often described as behavioural, emotional and social difficulties.

2.2.3 Behavioural, Emotional and Social Difficulties

2.2.3.1 Introduction

The first part of this section describes the notion of Behavioural, Emotional and Social Difficulties, both through a clinical and an educational perspective. The second part raises some of the major challenges surrounding the term Behavioural, Emotional and Social Difficulties, and considers the issues that legitimate the use of this term in relation to some children as opposed to others, aiming to legitimise some of the essential points that need to be considered for further research.

2.2.3.2 Definitional and Conceptual Issues

The literature shows that defining the term Behavioural, Emotional and Social Difficulties (BESD) can be imprecise and problematic (Crawford & Simonoff, 2003). As a term, BESD is very wide and comprises a great variety of problems.

At the most general level, emotional and behavioural difficulties can be classified under three broad categories (according to the Diagnostic and Statistical Manual of Mental Disorders (DSM – IV)):

- *Pervasive Developmental Disorders (PDD)*: which are characterised by severe deficits and pervasive impairments in multiple areas of development. These include impairments of interactions, communication skills and imaginative activity through the presence of stereotyped behaviour, activities and interests. Autism falls under this category as a severe example of this type of disorder, whereas Asperger's syndrome is included as a more subtle type.
- *Disruptive Behaviour Disorders*: Under this category, disorders like Attention Deficit Hyperactive Disorder (ADHD), Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD) are included. ADHD is characterised by symptoms of inattention and/or hyperactivity-impulsivity.

- *Emotional Disorders:* Under this sub-category fall two main disorders, Overanxious Disorder and Dysthemia.

Apart from the above classification system, disorders can also be grouped into “externalising” or “internalising” problems. Externalising problems consist of aggressive anti-social behaviour, such as CD, while internalising problems include anxiety and depression, such as Overanxious Disorder.

When looking at the educational context, BESD as a concept is surrounded by confusion and is highly controversial. BESD as a term appeared first in the revised SEN Code of Practice (DfES, 2001). Paragraph 7:60 is headed ‘Behaviour, emotional and social development’, but describes BESD, and in particular children and young people who demonstrate features of emotional and behavioural difficulties, who are withdrawn or isolated, disruptive and disturbing, hyperactive and lack concentration; those with immature social skills; and those presenting challenging behaviours arising from other complex special needs.

Confusion occurs when BESD, and the slightly older Emotional and Behavioural Difficulties (EBD), occurs in government documents and professional discourse as an unproblematic reference point although a quick look at the literature indicates the range of contrasting approaches. Two of the most significant challenges when considering BESD, context and time, are discussed below in detail.

2.2.3.3 Challenges in Identifying Behavioural, Emotional and Social Difficulties

When assessing children’s BESD, there are two critical issues to be considered; these are the context within which the child functions and operates; and the issue of time in terms of considering some behaviours as being typical or problematic according to the child’s developmental stage.

Firstly, there is sound evidence suggesting that BESD as a term is constructed differently in different contexts. This means that, when considering BESD it is important to consider whether

the child exhibits a specific problematic behaviour across settings and caregivers. Given that people with different perspectives are aware of different aspects of a child's functioning in different settings, it is necessary to consider a child's behaviour within all the contexts within which they live and operate (Achenbach & Rescorla, 2007; Achenbach, 1995; De Los Reyes & Kazdin, 2005; Achenbach, 2006). Bronfenbrenner's (1986) bio-ecological model provided a useful framework for understanding the influence of contextual factors on children's development. As an example of this framework, Hedegaard's (2001) account of a study by McDermott (1993) who demonstrated how a child's behaviour changed and improved, going from a test situation to a class situation and, finally, to an after-school club situation. This demonstrates that a person's competence is interwoven with the context and cannot be viewed separately. Conversely, problem behaviours may reflect a mismatch between a child's developmental level and the situational demands and supports in the environment. So the understanding of an issue to do with BESD is unlikely to emerge from assessing the child or the environment in isolation, as it is the interaction of the two that creates the problem behaviour.

However, in considering the child within different contexts, researchers and clinicians are faced with a major challenge, and that is the integration of data from multiple sources and informants, an issue which continues to puzzle the research and clinical community (Achenbach, 2009). When two informants are available to report on a young child's behaviour or when parent report and teacher report are compared, discrepancies are often found (Drabick et al., 2008; Boyle et al., 1996.; Cluett et al., 1998; MacLeod et al., 1999). These discrepancies between the parents and teachers' reports have been extensively studied in an effort to describe response biases, which are typically construed as contributing to measurement error (Briggs-Gowan et al., 1996; Richters, 1992). Many studies have found that home and school perceptions differ as to what counts as BESD. Gadow and his colleagues mention this in their discussion of ADHD (2004) illustrating the phenomenon of situation specificity. Similar results have been presented in the area of communication disorders by Redmond and Rice (1998) who indicated that teachers of children with language impairments, but not parents, rated the children as having more behavioural problems than their typically developing peers. Discrepancies between parent and teacher ratings were also supported by a number of further studies (Redmond & Rice, 2002; Lindsay et al., 2007; McCabe & Meller, 2004; Marton et al., 2005; McCabe & Marshall, 2006).

Secondly, it is important to highlight the fact that the rapid pace of developmental transitions and growth in childhood is a factor affecting the understanding of BESD. As discussed in section 2.2.2 when considering the influence of children's quick rate of development on their social and emotional competence, it is necessary to consider the influence of the rapidly changing nature of children's development when defining and assessing BESD (Zeanah et al., 1997). Carter et al. suggested (2003) that social and emotional competence skills through the early childhood period change at a dramatic rate. Specifically, many behaviours that are considered problematic at older ages may be manifestations of typical development when they appear in early childhood.

A final issue that needs to be highlighted when considering the factor of context and time is the need to evaluate children's social and emotional competence within the context of their general development. Anna Freud (1966, cited in Hoffs 1973) wrote about the need to evaluate multiple lines of development and to attempt to understand the manner in which a specific developmental area along one line may set constraints on growth in other developmental domains. Although all developmental domains deserve attention, language development is an area highlighted by researchers and clinicians as strongly linked with the development of social and emotional competence. These two areas of development have been extensively researched in the past as strongly affecting each other but the directionality of their relationship is as yet unknown. This thesis aims to explore some of the issues around the relationship between language development and social and emotional competence by examining the social and emotional functioning of children with SLI as reported in two contexts: home and school. The following section will discuss the role of language in social and emotional functioning and will review available research evidence on the relationship of language impairments and BESD.

2.3 LANGUAGE DEVELOPMENT AND SOCIAL AND EMOTIONAL FUNCTIONING

2.3.1 Introduction

The role of language in emotional and social functioning has been an important question in psychological theories of development, and has been central for educators. Different views

about this relationship lead to different perspectives about the impact of language impairments on socio-emotional functioning. The section below reviews studies describing the relationship between language and emotional and social competence, aiming to unravel the nature of this relationship, meaning whether these two factors are co-existing or whether one is affecting the development of the other.

2.3.2 The Role of Language in Social and Emotional Functioning

As discussed in section 2.2.2, social competence could be defined as a range of skills, including knowledge of social standards of behaviour, social problem-solving, emotion understanding, and communication and language efficacy. Even from the range of definitions it is apparent that interpersonal communication and/or language are a necessary element of social and emotional competence (McCabe & Marshall, 2006). Language serves a fundamental role in interpersonal contacts, relationship formation, regulation of interactions, and the socialisation of children. Gallagher (1993) stated that “conversation as a social behaviour, therefore, is fully understood only by situating it in its interpersonal context; conversely, social competence is fully understood only by considering it in the context of language skill” (p.199).

But the relationship between social and emotional competence and language ability appears to be reciprocal. Language is a primary tool in social interactions, which in turn function as the training ground for developing language skills. For example, peers play a critical role in the development of language by providing opportunities for practising language skills, role modelling, and offering feedback (Botting & Conti-Ramsden, 2008; Gallagher, 1993; 1999; Windsor, 1995). On the other hand, the ability to initiate conversation appropriately, contribute to ongoing conversations, address all participants when joining a group, communicate intentions clearly, present more positive than negative comments and modify one’s communication style to suit the listener’s needs have all been related to ratings of children’s peer acceptance and sociometric status ratings (Wadman et al., 2008; Brinton & Fujiki, 1999; Dodge et al., 1986; Gallagher, 1999). Studies have stressed the importance of conversational skills to peer acceptance and positive social outcomes even in children as young as three or four years (Aram & Shlak, 2008; Kemple et al., 1992). Observed in a variety of contexts, socially adept children tend to use language more skilfully in social interaction than less socially adept children.

The studies reported above show some of the ways in which language is involved in social competence. The theoretical views, that emphasise the key role of language, would predict that problems in using language would inevitably create difficulties in these processes and therefore have an impact on the development of social and emotional competence. Some support of this view comes from research involving children and adults with age-appropriate cognitive skills but atypical language ability due to hearing loss. There is some evidence, for example, indicating that deaf children are more egocentric, have more limited social problem solving skills and experience peer relationship difficulties (Martin & Bat-Chava, 2003; Lederberg, 1991).

The next section will review the literature presenting evidence that SLI is associated with poor socio-emotional functioning by looking at the social interactions of children with SLI.

2.3.3 Social Interactions of Children with SLI

2.3.3.1 Introduction

The first investigations of the socio-emotional functioning of children with SLI presented results which showed that children with SLI interacted in a similar way to younger children with similar language level (Fey & Leonard, 1984). In this early study, children with SLI used language to express the same communicative intentions by demonstrating communication skills that were as good as the skills of children with similar language ability as them. Since then, there has been a growing body of research supporting this position and it is commonly accepted that children with SLI present with difficulties in their socio-emotional functioning. In this section evidence about the social interactions of children with SLI will be presented by discussing research studies looking at the ability of children with SLI to access and participate in social interactions.

2.3.3.2 Access and Participation in Social Interactions by Children with SLI

A number of research studies draw attention to the fact that children with SLI experience a significant difficulty participating in and accessing social interactions. Children with SLI do not often initiate interactions with their peers, and are more likely to initiate interactions with adults than with their peers. They frequently fail to respond when a peer speaks to them, and their initiations tend to be ignored by their peers with typically developing language (Hadley & Rice, 1991). Children with SLI often react impulsively by being physically intrusive or they withdraw from interactions (Windsor, 1995), and present with difficulties entering a peer group and playing cooperatively (Beilinson & Olswang, 2003).

Traditionally, research studies have used observations or questionnaires to investigate this issue. Support of the claims of limited participation in social interactions by children with SLI was initially presented by Craig and Washington (1993). Their study showed that, when compared to chronological-age and language-age matched peers, children with SLI were less able to access ongoing interactions between two other children, and were more likely to use non-verbal behaviours to do so rather than verbal forms like those most typically developing children use. Fujiki et al.'s (2001) study reinforced these findings with observational data by examining the social behaviours of children with SLI and their typically developing peers in the playground. Typically developing children spent significantly more time interacting with peers than did children with SLI, and conversely, children with SLI demonstrated significantly more withdrawn behaviours than did their typically developing peers.

The issue of withdrawal and sociability in children with SLI has also been examined through the use of questionnaires. Fujiki et al. (1996) found that primary aged children with SLI rated themselves as significantly more lonely at school than did their typically developing chronological-age matched peers on the Williams and Asher loneliness questionnaire (Williams & Asher, 1992). Children with SLI reported having fewer peer contacts than typically developing children in a range of social activities.

These findings were reinforced by a number of research studies which used teachers' ratings (Fujiki et al., 1996; 1999a; 1999b; Redmond & Rice, 1998). Teachers tended to rate children with SLI as less socially skilled than typically developing children of the same age. They also

tended to report that children with SLI displayed higher levels of reticent behaviour than typically developing children and significant lower levels of impulse control, peer acceptance and prosocial behaviour.

Brinton et al. (1998a) investigated this issue further by examining the involvement in a cooperative group task of children with SLI. For the purpose of the study, children with SLI were grouped with a peer of the same age, and another peer of the same language ability, and children's verbal and non-verbal behaviours were measured during a task requiring them to collaborate. The results indicated that children with SLI were more likely to contribute less in the cooperative task than both chronological-age matched and language-age matched children. Also, their verbal contributions were limited, and their use of non-verbal behaviour was minimal in relation to both control groups. In a later study, Brinton et al. (2000) examined the way in which the individual social-behavioural profiles of children with SLI influenced their ability to participate and work within cooperative groups. Children were grouped in triads, and were asked to work together towards a specific goal. Children's teachers were also asked to complete the Teacher Behavioral Rating Scale (TBRS, Hart & Robinson 1996) in order to relate the child's ability to work cooperatively with their social profiles. The results suggested that the success of the individual interactions was highly variable from child to child. However, the social profile of children with SLI appeared to be a good predictor of their ability to work with other members of the triad towards a joint goal. Children with SLI who showed withdrawn as well as aggressive behaviours had more difficulties in working within cooperative groups.

Being able to access a social interaction is only the first step and might not necessarily lead to inclusion and successful participation in the social conversation that follows. In order to maintain and successfully participate in the subsequent interaction, a number of skills are required which children with SLI find difficult. When investigating the ability to enter and participate in an established dyadic peer interaction, Brinton et al. (1997a) found that children with SLI who actually managed to access ongoing peer interactions, talked significantly less, were addressed significantly less and collaborated less than either the chronological-age matched and language-age matched peers. In a further study, Brinton et al. (1997b) went on to investigate the way in which 10 children with SLI, 10 chronological-age matched, and 10 language-age matched children maintained topics which were introduced to them by an adult.

Children with SLI contributed more inappropriate comments than children in either of the two control groups.

Craig and Evans (1989) showed that children with SLI had difficulties with turn exchanges, and results from their study showed that children with both receptive and expressive language impairments were relatively passive conversationalists and less other-directed than their chronological-age matched peers. A study by Rice et al. (1991) showed that in their interactions with both adults and peers, children with SLI tended to give shorter responses that were more likely to be non-verbal when compared with typically developing children and tended to use non-verbal means in place of language in their initiation and participation in social interactions. This was also confirmed by Marton et al. (2005).

2.4 THEORETICAL EXPLANATIONS REGARDING THE RELATIONSHIP BETWEEN LANGUAGE IMPAIRMENT AND DIFFICULTIES WITH SOCIO-EMOTIONAL FUNCTIONING

2.4.1 Introduction

In this section, two explanations that have been put forward to account for the relationship between children's language impairment and their difficulties with socio-emotional functioning are reviewed. The last part of this section addresses issues around implications for researching socio-emotional functioning in children with SLI.

2.4.2 Difficulties with Socio-Emotional Functioning Due to Inadequate Opportunity for Social Learning

The first explanation describes difficulties with socio-emotional functioning seen in children with SLI as a result of an interaction between the children's language impairment, social context, and their limited social experiences (Rice et al., 1993; Bishop, 1997; Redmond & Rice, 1998). According to this view, the social and emotional development of children with SLI is intact, but

their repertoire of socio-emotional behaviours and poor social skills reflects their impoverished social experiences.

Redmond and Rice (1998) argued that three components of a child's social situation are filtered through the psychosocial system to generate compensatory behaviours: a) the communicative demands of the environment and the social situation, b) a child's verbal limitations, and c) the biases and behaviours of people within the environment. In section 2.3.3.2, studies were reported demonstrating that, based on the communicative demands of the social situation, children with SLI adjust their behaviour by initiating and responding less compared to their typically developing peers (Craig & Evans, 1989; Liiva & Cleave, 2005; Craig & Washington, 1993; Hadley & Rice, 1991) and by showing a tendency to rely on adults to mediate their interactions (Rice et al., 1991).

According to the third component in Redmond and Rice's study (1998), it might also be the case that these children are devalued by those they interact with because of their disability. Given that children with a varied range of disabilities experience social difficulties with peers, this possibility cannot be ignored. Studies have shown that children with SLI are likely to be perceived negatively by others and may consequently experience less academic and social success (Macharey & von Suchodoletz, 2008). DeThorne and Watkins (2001) studied perceptions of children with SLI by four groups of listeners (teachers, speech and language therapists, undergraduate students and sixth grade students) and found that all four listener groups consistently perceived the child with SLI more negatively than typically developing children. Similarly, Rice et al. (1993) explored adults' attitudes toward children with limited linguistic competence by asking the adults to listen to audio taped samples of the verbal interactions of children with SLI and typically developing children. Children were rated on a variety of variables, including popularity, social maturity and leadership abilities. The study revealed systematic biases against these children that were mainly reflective of adults' expectations of children's language. Similarly, language impaired children have been rated negatively by children of the same age (Evans et al., 2008).

In line with the first theoretical explanation, children with SLI enter a cycle of social rejection through exclusion by peers (McAndrew, 1999; Wood et al., 2002; Gagnon & Nagle, 2004), and

may be rejected and isolated by peers in an educational or social setting (Durkin & Conti-Ramsden, 2007; Fujiki et al., 1996; Gertner et al.; Rice et al., 1991). Rice et al. (1991) showed that even before they start school, children are sensitive to the communicative status of other children and will cease to approach and initiate conversations with those who have limited language abilities. The same negative social experiences of rejection have been observed in studies examining adults' reactions to children with language impairment (Rice et al., 1993).

The results of these studies point to a picture of the child with SLI being caught up in a spiralling cycle of rejection and negative social experiences. These negative experiences could lead to children with SLI ceasing to seek out opportunities for social interaction with a subsequent lack of exposure to social conversations and interactions. Gagnon and Nagle (2004) described these interactions as providing children with the opportunity to experience the variability of social situations, practise and apply learned skills. In that way social skills are developed and mechanisms for coping and dealing with everyday social interactions are evolved, such as sharing, cooperation and negotiation (Fujiki et al., 1996; 1999a; Brinton & Fujiki, 1999). Because children with SLI lack this kind of exposure, they gain increasingly less experience of how others behave in everyday social situations, miss out on learning age-appropriate social skills and are more likely to continue to adopt ineffective socio-emotional behaviours with consequences for their social and emotional functioning.

2.4.3 Difficulties with Socio-Emotional Functioning Due to an Impairment of Information Processing

The second theoretical explanation regards difficulties with socio-emotional functioning of children with SLI as a result of general limitations in working memory and processing capacity (Bishop, 1997). These limitations may lead to difficulties in conversation and therefore difficulties in developing appropriate understanding of social interactions.

As reviewed in section 1.5, children with SLI have been found to process information more slowly than their typically developing peers. Children with SLI can process individual pieces of information in isolation but have difficulties in performing operations involving several pieces of information simultaneously (Marton & Schwartz, 2003; Bishop, 1992) or when the amount of

the information to be processed increases (Hoffman & Gillam, 2004; Gillam et al., 2002). For example, children with SLI have difficulties in integrating meaning from a series of sentences to build a coherent narrative. That was suggested in an early study by Bishop and Adams (1991) who concluded that when children with SLI were asked to formulate messages, they presented with difficulty in integrating different types of information even though they had the necessary vocabulary to comprehend each sentence separately. To be skilled in conversations, one needs to keep track of utterances over time, and build a mental model that amalgamates contributions from all the participants.

When investigating comprehension of indirect utterances, Shatz et al. (1980) found for example that children with SLI had difficulty processing multiple sentences across time and inferring conversational meaning among them. Similarly, Donlan and Masters (2000) verified a strong correlation between short-term verbal memory skills and sociability in children with language impairment. Further support for this account comes from the studies by Berk et al. (1983) and Courtright & Courtright (1983) who investigated emotion understanding when emotional cues are given verbally. Berk and his colleagues administered a task in which children had to identify angry, happy, and sad utterances and found that participants with language impairment were less accurate than those with typically developing language. The researchers suggested that children with language impairment may need more time to process verbal content, and therefore, may fail to encode or recall affective intonation cues.

In general, this account explains why children with SLI tend to do poorly on experimental tasks with a high information load. Children with SLI tend to fail such tasks not because they have difficulty in working out what the listener does and does not know, but rather because they are inundated by the need to hold a large amount of information in mind while formulating or interpreting messages, and when they are required to maintain a topical thread during conversations. Implicit in this account then is the notion that children's ability to interact and effectively converse will be somehow affected by the information processing demands of the social situation/conversation. Social situations with fewer processing demands (for example, conversing with a familiar adult, or with only one person at a time) are more likely to be less of a challenge for children with SLI. Conversely, social situations with great processing demands (for example, being involved in a group conversation or conversing with an unfamiliar adult) are

bound to be more challenging for them. Recent studies (Peets, 2009) investigating the impact of context on the communicative skills and social patterns of interaction among language impaired children showed that contexts with varying communicative demands affected children's performance on language productivity and complexity measures, their participation and their turn-taking patterns.

2.4.4 Limitations of the Theoretical Explanations Reviewed

The theoretical explanations described above have limitations because they are inconclusive, and also because one does not necessarily rule out the alternative explanation. For example, it is not clear whether children are rejected and isolated because their linguistic abilities limit learning opportunities (as the first explanation suggests) or because of their difficulties with processing information speed (as the second explanation argues). Farmer (2000) studied the validity of these accounts and provided some evidence for the social learning explanation indicating that the group of children with SLI who attended a special school differed significantly from the typically developing children in scores of social cognition and ratings of social competence.

It is essential also to consider the great individual variations within the language impaired population. There is mounting evidence that difficulties with socio-emotional functioning in language impaired children cannot be totally reduced to secondary consequences of their linguistic limitations. Performance on language tests does not necessarily predict successful socio-emotional functioning, and a child's social status is not determined solely based on language ability. If language impairment does not guarantee difficulties with socio-emotional functioning, the theoretical accounts will need to reflect the variability within the SLI population and also consider additional individual factors that could account for children's difficulties with socio-emotional functioning.

2.5 THE RELATIONSHIP BETWEEN COMMUNICATION DIFFICULTIES AND BEHAVIOURAL, EMOTIONAL AND SOCIAL DIFFICULTIES

2.5.1 Introduction

Specifying the relationship between language impairment and BESD in children with SLI is complex. Three different types of studies are reviewed in the following section: 1) studies focusing on children from speech and language clinics, 2) studies of the general population, and 3) studies discussing the increased likelihood of developing BESD according to difficulties with different dimensions of language. In each part, efforts are made to clarify issues concerned with differences in population and the methodology of the studies. This section concludes with a consideration of the main limitations of the literature and subsequent implications for future research.

2.5.1.1 Clinic-based Studies

The co-morbidity of language impairment and BESD was first studied in clinical settings. Children seen in speech and language clinics appeared to have high rates of BESD. A first influential study showing the co-morbidity between speech and language impairments and BESD or even psychiatric disorders was conducted by Cantwell et al. (1979). The researchers evaluated one hundred speech and language delayed children presenting to a speech and language clinic for psychiatric disorders. Commonly reported problems for children included having a short attention span, being shy, being overly sensitive and having frequent temper tantrums. Psychiatric diagnosis of the 100 children seen in this study revealed the presence of a diagnosable psychiatric disorder, according to DSM-III criteria, in approximately one-half of the group of children. Two years later (1982a, b), Baker and Cantwell analysed data from a larger number of children (180 children) seen in the same speech and language clinic – 76 of these children had a speech impairment whereas the remaining 104 had difficulty with language development. The most common BESD reported by both parents and teachers of these children were submissiveness, restlessness, short attention span, and solitary behaviours. As in the first study, the data suggested that over half (53%), of children with speech and language impairments presented with psychiatric disorders. The most common diagnosis seen in children with speech and language impairments was ADHD. ODD was the second most common, following by anxiety disorders.

About ten years later, the same researchers (Cantwell & Baker, 1991) studied 600 English-speaking child referrals to a community speech and language clinic. Their results looked very similar to their earlier studies: the psychiatric prevalence was 50% for any diagnosis, 26% for behavioural disorders, and 20% for emotional disorders, respectively. The most common psychiatric diagnoses were ADD (19%), ODD and CD (7%), and anxiety disorders (10%).

Evidence from Longitudinal Studies

Some researchers investigated the presence of BESD or psychiatric disorder in populations of children with speech and language impairments by focusing on their long-term outcomes, and conducting follow-up studies. From these, there is some evidence of an association between lack of improvement in language functioning and the development of BESD or a psychiatric disorder. Benasich et al. (1993) evaluated 56 children with developmental language disorder (DLD) and 43 matched children of the same socio-economical status (SES) and typical intelligence (IQ) 4 and 8 years of age. Scores in the clinical range of the Total Child Behavior Checklist were more common for children with DLD (11% versus 2%) at age 4 years and increased significantly in the DLD population from age 4 to age 8 (from 11% to 32%) but not in the control group. Language disorder was associated with hyperactivity, and, for the girls in the sample, with social withdrawal.

Similarly, Baker and Cantwell (1987) conducted a follow-up study of a cohort of children seen initially in a speech and language clinic (Baker & Cantwell, 1982a; 1982b; Cantwell et al., 1979; Cantwell & Baker, 1980) aiming to evaluate psychiatrically, linguistically, and educationally 300 children with speech and language impairments 4 to 5 years after initial presentation at the speech and language clinic reported above. Their study aimed to determine what changes occurred in the children and to isolate factors associated with these changes, and also tested the prevalence of speech and language impairments, clinical psychiatric disorders and learning difficulties. Despite improvements in some areas, Baker and Cantwell found significant increases in the prevalence of psychiatric disorders. Compared with only 44% of the children who were diagnosed with a psychiatric disorder initially, 60% of the children experienced some psychiatric disorder at follow-up. Baker and Cantwell argued that some of the increase in

prevalence of psychiatric disorders was probably a result of the increased age of the children, as for many psychiatric disorders the prevalence typically increases with age.

Another striking result from this study is that almost a quarter of the entire sample did not experience any initial difficulties, but by follow-up was diagnosed with a psychiatric disorder. This figure is even more worrying when compared with the small number of children (8% of the sample) who were diagnosed with a psychiatric disorder initially but had resolved their difficulties at follow-up. The development of a psychiatric disorder for children who initially had no psychiatric diagnosis correlated with the type of language impairment initially present, the development of a learning difficulty during the follow-up period and the presence and the severity of certain psychosocial stressors, such as lower social class, and parental mental illness.

2.5.1.2 Population-based Studies

A significant weakness of the studies reviewed above is that their data are taken from speech and language clinics. As such, the results of these studies cannot easily be generalised to the general population, and questions about the association among language impairment and BESD cannot straightforwardly be addressed. Although the studies described above are considered to be landmark studies in this area of research, their results should be treated with caution when considering that clinics usually have selective attendance affected by factors, such as social class, ethnicity, and the severity of the speech and language impairment.

Population-based studies helped establish the true co-morbidity of BESD and psychiatric disorders with speech and language impairments. One first such study is the epidemiological study conducted by Richman and Stevenson at the late 1970s (the findings are reported in: Richman, 1977; Richman, Stevenson & Grapham, 1975; Stevenson & Richman, 1976; 1978). The researchers screened a random sample of 705 3-year-old children living in an outer London borough by using the Behaviour Screening Questionnaire (BSQ) and a language screening procedure, and identified three groups of children: a behaviour-problem group consisting of 99 children, a control group consisting of 99 children, and a language-delayed group consisting of 18 children. All these children were further assessed for language

impairments and BESD. It was found that 59% of the language-delayed children had behaviour problems compared to only 14% of the non-language-delayed children.

The Dunedin Multidisciplinary Child Development Study is another example of a population-based longitudinal study examining a large number of children in New Zealand in different areas of their development (Silva et al. 1982; 1984; 1987; McGee et al., 1984) from birth, and then at the ages of 3, 7 and 9 years. The study showed a clear tendency for the language-delayed children to have a higher degree of later behavioural problems than children without such delay.

Beitchman et al. (1986) assessed a representative initial community sample of 1,655 5-year-old kindergarten children in Canada for speech and language impairments. Those identified as having a speech and language impairment were then assessed for BESD and compared with a matched control group. The results indicated that the speech and language impaired group was more likely than the control group to show BESD, and to be diagnosed as having a psychiatric disorder. The psychiatric disorders fell into two main areas – attention deficit disorders and emotional disorders.

Later on (Beitchman et al., 1989a), four different language groups were distinguished in the initial sample: a high functioning group, a low functioning group, a group with poor articulation, and a group with poor comprehension. They then (Beitchman et al., 1989b) collected information from the children's teachers, parents, child self-reports, and conducted a psychiatric interview in order to examine the rate and type of psychiatric symptomatology associated with each of the four distinct language groups. The results suggested that there is an association between the type of language profile and the rate of psychiatric disorder: The rate of behavioural difficulties was greatest among children in the low functioning group. There also appeared to be a particular clinical syndrome associated with this group of children and the results clearly pointed to hyperactivity as the most consistently identified psychiatric disorder.

A year later (Beitchman et al., 1990), the same authors provided further evidence that speech and language impairment significantly increases a child's risk for psychiatric disorder. Based on the same initial community sample (1,655 5 year old children reported in 1986a), the study estimated a child's risk for developing a psychiatric disorder depending on the child's speech and language impairment status. The results suggested that risk estimates depended upon a number of factors, including the child's gender and the source of information (teacher, parent, and psychiatric reports). Teacher ratings were more often in the clinical range among children with speech and language impairment compared with typical language controls, placing these children at greater risk for psychiatric disorder. Prevalence of disorder based on parent ratings, however, varied according to which parent completed the questionnaire (mothers were more likely to report difficulties), their child's language status, and whether they were rating a daughter or a son (girls received higher rates than boys by both their mothers and the psychiatrist).

Evidence from Longitudinal Studies

Additional evidence for the link between language impairment and BESD comes from population-based studies focusing on the long-term outcomes of children with language impairment. One of them is the follow-up study by Beitchman et al (1994) suggesting that for the majority of children with SLI difficulties persist at least until later childhood. Later studies (Beitchman et al., 1996a, b) examined the 7-year behavioural, emotional and social outcomes of the initial sample of children and their controls at the age of 12. From the initial sample of 169 children, 138 participated in the follow-up studies, which included behavioural, language, academic and developmental assessments. The results suggested that there was an association between the type of speech and language profile at age 5 and BESD both concurrently and at 7-year follow-up. Children with pervasive language impairments and poor auditory comprehension were at greatest risk for prolonged BESD when compared to all the other groups of children. Fourteen years after the initial study, Voci et al. (2006) examined the relation between a history of early language impairment, identified at age 5, and prevalence of social phobia and social fears at age 19. Findings suggested that adolescents with a history of language impairment were at greater risk for the development of social phobia in late adolescence compared to peers with a history of typically developing language.

In addition, the association between early language impairment and subsequent BESD was supported by the work of Silva et al. (1987) reported in section 2.5.1.2. The findings of this follow-up study suggested that children in their study with early language impairments were an exceptionally high risk group, since they had lower intelligence, lower reading scores and higher scores for behaviour problems, not only at ages 7 and 8, but also at 11.

A study by Lindsay et al. (2007) followed up a sample of children with SLI identified at the age of 8 years (Lindsay & Dockrell, 2000) and explored the relationship between SLI and BESD between the ages of 8 and 12 years, in particular whether children with SLI continued to have raised levels of BESD that persist over this period. The results showed that children with SLI continued to have raised levels of BESD over the period 8-12 years. However, the nature of these difficulties at the age of 12 varied depending on whether they were rated by parents at home or teachers at school. With the exception of peer problems, parents consistently rated the children as having more problems than teachers on all types of BESD. Differences were also found in levels of different types of BESD and in their persistence over this age period.

Finally, a longitudinal study by Snowling et al., (2006) assessed the psychosocial adjustment in adolescence of young people with a history of SLI, and investigated specific relationships between language impairment and psychiatric disorders. Seventy-one young people (aged 15-16 years) with a preschool history of SLI and 49 chronological-age matched controls participated in a psychiatric interview to assess their psychological adjustment. Questionnaires asking participants about the difficulties they experienced in social situations and parental ratings of behaviour and attention were also used. Overall the rate of psychiatric disorder was low in the sample and there was no significant association between having a history of SLI and rate of adolescent psychiatric disorder. However, the study showed that psychosocial outcome depended on the persistence and the severity of the initial SLI. Thus, participants whose language delay had resolved by 5.5 years (including those with pure speech impairments) had a particularly good outcome. This was not the case for children whose language impairment persisted through the school years. Consistent with all the studies mentioned above, there was a raised incidence of attention and social difficulties among the group of adolescents with persistent language impairment. Attention and social difficulties were associated with different language profiles: the group with attention problems showed a profile of specific expressive

language difficulties, the group with social difficulties experienced receptive and expressive language impairments, and the group with both attention and social difficulties was of low IQ with global language impairments.

There are also a few studies which examine social adjustment in adolescents and young adults with a history of language impairments. The results of longer-term studies in adulthood are contradictory with some studies suggesting a continuing risk into early adulthood for the SLI population and difficulties with independent living, the quality of their social relationships and psychosocial adjustment (Beitchman et al., 2001; Clegg et al., 2005; Conti-Ramsden et al., 2008; Conti-Ramsden & Durkin, 2008; Whitehouse et al., in press) and others indicating that the long-term consequences of early language impairment may not be readily observed and identified in adulthood. For example, Tomblin et al. (1992) used the Present Life History survey (a quality of life measure) and indicated that despite histories of mild to severe SLI, the young adults with SLI did not differ significantly from the control subjects along these dimensions.

2.5.2 Association between Types of Communication Difficulties and Behavioural, Emotional and Social Difficulties

The main question that arises from the studies reviewed above is whether the factors that are most strongly associated with the development of BESD in children with speech and language impairment are related to the nature, type and severity of the speech and language impairment itself. Thus, despite a considerable body of literature, a number of issues remain unclear. It is still not known whether children with SLI manifest a specific or characteristic clinical syndrome, nor is it clear whether children with difficulties in different language dimensions present different rates and types of BESD. Research on the relation between language impairment and BESD fails to differentiate significantly diverse speech and language impairments or to make links with different types of BESD.

The findings from some studies indicate that there may be a relationship between the presence of specific types of BESD and the type of speech and language impairment. For example, it has been argued that if the language impairment is isolated to unintelligible speech production and articulation, then the association is at its weakest. This may be because many such

speech impairments are resolved early (Shriberg & Kwiatkowski, 1994), even though they can cause frustration in the short term.

That was supported by an early study by Baker et al. (1980) which aimed to compare children with speech impairments to children with impairments of both speech and language in order to determine whether the frequency of BESD is different between the two groups, and whether the types of BESD they experience are dissimilar. In the study 46 children with speech impairments and 53 children with impairments of both speech and language were rated by parents and teachers for BESD. The findings of the study supported the fact that both parents and teachers rated the children with speech and language impairment as having more severe and more frequent BESD. In particular, behaviours related to hyperactivity distinguished the two groups, with difficulties being far more common in the group of children with speech and language impairment. Conduct disorders, social and emotional difficulties did not consistently distinguish the two groups of children, although there were tendencies in each of these categories for greater difficulties in the group of children with speech and language impairment. The results also indicated that speech impairments are most strongly associated with emotional difficulties rather than with behavioural difficulties. Results from the above study were supported by a further study by Baker and Cantwell (1982a) who reported that the risk of psychiatric comorbidity is lower in impairments affecting the ability to produce intelligible speech than in those with language impairments (including poor vocabulary and/or grammatical skills).

Others have focused on whether there is an association between language impairment and BESD for children who have difficulty constructing language to express themselves, rather than those with unintelligible speech. Beadle (1979) found that preschool children with expressive language impairment were at risk for poor attention, emotional difficulties, impulsivity, and high levels of arousal. Focusing exclusively on two-year-olds with expressive delay, Caulfield et al. (1989) examined parent-child interaction and behaviour difficulties using behavioural observations. The results of this study suggested that children with expressive language delay exhibited higher levels of negative behaviour and were perceived as different and difficult to manage by their parents.

However, particular association has been found between children's difficulty understanding language and the development of BESD (Baker & Cantwell, 1987; Whitehurst & Fischel, 1994). Toppelberg and Shapiro (2000) reviewed ten years of research in child language and communication impairments and concluded that receptive language impairments are high-risk indicators for later BESD and psychiatric disorders. For example, in the study of Cantwell and Baker (1991) described in section 2.5.1.1, the highest prevalence of psychiatric disorders (around 70%) was associated with the presence of a receptive language impairment, whereas the lowest prevalence (30%) was associated with difficulties isolated to a speech impairment. Also, the Dunedin Multidisciplinary Child Development Study reviewed in section 2.5.1.2 has reported the association of receptive language impairment with psychiatric outcomes. Among the 1,037 children in the study, receptive language impairment at age 3, either with or without expressive language impairment, predicted significantly higher behavioural difficulties at ages 7, 9, and 11, compared with expressive language impairment only or typically developing language (Silva et al., 1987). More recent studies also pointed to the fact that children with receptive language impairment were more likely to experience significant social difficulties at school and to be victims of bullying (Conti-Ramsden & Botting, 2004; Lindsay et al., 2008).

The type of language impairment which has received the least attention in relation to children's difficulties with socio-emotional functioning is pragmatic language impairment. The very few studies which have looked at this association found that pragmatic language impairments are linked to BESD (Vedeler, 1996; Olswang et al. 2001). Westby (1999) has suggested that pragmatic language impairment is related to social difficulties and in Conti-Ramsden and Botting's (2004) longitudinal study reported above it was found that pragmatic language impairments were the main predictor of difficulties with socio-emotional functioning, and in particular of the likelihood of children showing withdrawn social behaviour and having difficulties with peers. Vedeler's (1996) earlier case study showed that a preschool child with pragmatic language impairment, whose dialogue structures, use of utterance functions and dialogue coherence were significantly different from peers, showed improvements in his social interactions after receiving intervention targeting the use of appropriate conversational initiation. Farmer and Oliver (2005) examined the association between pragmatic language impairment and difficulties with socio-emotional functioning and found that no specific aspects of pragmatic language ability could be identified as relating to difficulties in peer relationships. The only significant association in their study was between pragmatic language impairment and

ratings of hyperactivity, but the results of this study must be considered warily due to a very small sample size which does not allow strong claims to be made.

Finally, it seems to be the case that where there are complex or severe language impairments (including the ability to understand and express language), externalising or behaviour difficulties become more common (McGrath et al., 2008), in addition to the internalising difficulties of anxiety. Conti-Ramsden and Botting (1999) assessed over two hundred children with SLI and found that those with complex language impairment (i.e. difficulty with both understanding language and expressing themselves) were most likely to present with a clinical level of BESD. Children exhibiting mainly expressive language impairment showed the least BESD. Also findings suggested that children with complex language impairment were the most likely to be rated as having more marked social difficulties with peers than the other subgroups, extending results from earlier studies (Craig & Washington, 1993).

2.5.3 Limitations of Literature Reviewed and Implications for Future Research

The studies reviewed above concur in the finding of a high incidence of BESD and psychiatric disorders in children with SLI. The above review also denotes that despite many years of study and a general consensus among professionals that children with SLI are at considerable risk for the development of BESD, there is little that can be stated with certainty. This is mainly due to difficulties in the research design of many of the studies reviewed. First of all, there are problems with the definitions of BESD and psychiatric disorders and in the precise delineation of the type of speech and language impairment. The different use of definitions and terms complicates the integration of data across studies. For example, in defining and diagnosing BESD and psychiatric disorders, terms such as behaviour problems, maladjusted, behaviour disorders, psychiatric diagnoses, emotional problems and social problems have all been used to designate apparently similar phenomena.

There is also a serious concern about the reliability and the validity of the techniques used to assess both children's speech and language skills (as reviewed in chapter 1 and summarised in Appendix C) and the presence of BESD or/and psychiatric disorders. For example, some studies used standardised parent or teacher questionnaires while others used only clinical

assessment of the child. In chapter 1 and section 2.2.3.3, the disadvantages of using research methods in isolation and not ensuring the triangulation of data were discussed and this has serious implications for future research methods.

Also, as shown in section 2.5.2, there is lack of consensus as to whether there is a relationship between specific dimensions of language and different types of BESD. Traditionally research has differentiated between speech impairments and language impairments and between receptive language and expressive language impairments, while other important dimensions of language, such as pragmatic language ability, have been largely ignored. From the studies considered above, there is clearly a need to examine the relationships between difficulties with different language dimensions and different types of BESD, and include into that a detailed examination of children's pragmatic language ability as a language dimension which might be affecting children's socio-emotional functioning. Similarly, examining different types of BESD rather than a general psychiatric diagnosis will provide a much clearer description of these children's difficulties with socio-emotional functioning.

Finally and most importantly, some of the studies reviewed above fail to address the issue of the variability amongst the SLI population. There are differences between individuals and between different aspects of socio-emotional functioning. For example, in Brinton et al.'s (1997) study exploring the access and participation capabilities in children with SLI in an ongoing interaction (reviewed in 2.3.3.2), it was highlighted that the poor performance of children with SLI may not be solely attributable to their language impairments. This finding was based on the fact that children with SLI displayed poorer social performance even than a younger group of children with similar language ability, but also on the basis that there was no correlation found between the children's performance in terms of their ability to access and be included in the group and their language ability as measured by standardised language tests.

In the same vein, Brinton et al. (1998a) examined the ability of children with SLI to participate in cooperative learning groups. They conducted an analysis of children's verbal and non-verbal behaviours and noted that children with SLI lacked the ability to work together with their peers even in a non-verbal way, thus were not able to compensate for their language impairments. This observation suggests that the impaired language ability evident in children with SLI was

not a single factor responsible for their impoverished social performance. Additional support comes from a study by Brinton et al. (1998b) in their research on negotiation skills of children with SLI. In the study, it was pointed out that children with SLI demonstrated poor negotiation skills even when the social situation posed minimal linguistic demands that seemed to be well within the children's expressive language abilities, signifying a lack of social knowledge that is separate from poor language functioning. Likewise, in a recent study by Marton et al. (2005) investigating the social cognition of children with SLI, including negotiation, conflict resolution skills and their ability to access an ongoing interaction, it was found that children with SLI experienced a lack of social knowledge that did not appear to be causally related to their language impairment.

Together, these results suggest that although, typically, language plays an important part in competent socio-emotional functioning, so that impairment in language would be expected to lead to BESD, the relationship is not straightforward. The results from the studies reviewed above demonstrated clearly that language ability alone cannot direct social status and does not consistently predict levels of socio-emotional functioning. Although competent language ability is an essential prerequisite for the implementation of socio-emotional skills, it is not the only one. When observing a child's social and emotional behaviours, it is difficult to discern between language and socio-emotional functioning, as they are interdependent. Social behaviour is conducted through the use of language, such as initiating, responding, and negotiating, while efficient language ability is often tested in the context of social settings. By the same token, language impairments are thought to be most accurately assessed in tasks that are also considered as social skills (i.e. participating in interaction, responding to questions, making requests, understanding directions etc). Although the two variables are co-dependent, their relationship may not be a causal one.

Therefore, there is a need to take into account children's profiles of strengths and weaknesses in order to draw valid conclusions about the relationship between language ability and socio-emotional functioning, and to look at the large number of cognitive, behavioural and emotional processes, in addition to language ability, which must operate in concert in order for children to be socially and emotionally successful. By considering other possible additional within-child factors that might facilitate or exacerbate children's difficulties with socio-emotional functioning

we will be able to extend our understanding and explore different ways in which children's relative strengths or weaknesses can affect their behavioural, emotional and social profiles.

It is this study's aim to address some of the issues mentioned above. The following chapter will consider one possible within-child factor that plays a role in children's socio-emotional functioning: children's social cognition skills.

CHAPTER THREE:

SOCIAL COGNITION AND SPECIFIC LANGUAGE IMPAIRMENT

3.1. ORGANISATION OF THE CHAPTER

Chapter 2 discussed issues related to socio-emotional functioning and the importance of language for its development. The present chapter focuses on the additional within-child factor considered in this thesis: children's social cognition skills.

Social cognition has not been considered in detail in relation to children's socio-emotional functioning and could be crucial for better understanding children's difficulties. One reason for this might be because social cognition is an 'umbrella term' (Botting & Conti-Ramsden, 2008) that can refer to a wide range of behaviours. In the present thesis, the term social cognition was conceptualised as children's theory of mind abilities, their ability to identify and label emotions, the ability to explain causes of emotions and finally the knowledge of different conflict resolution strategies. All these sub-components of social cognition are interrelated with each other and competence in one of them will have an effect and facilitate the development of the other. For example, when a child is able to understand and explain negative emotions during an argument with a peer, it is very likely that the child is effectively solving everyday conflicts. By researching interrelated sub-components, one is able to obtain a more comprehensive picture of children's competencies in the area of social cognition.

The following sections of Chapter 3 review each of these sub-components both in typical development and in children with SLI. Throughout, an attempt is made to draw on the insights offered by existing research and to identify key questions for further research on the social cognition skills in children with SLI.

3.2 SOCIAL COGNITION AND SPECIFIC LANGUAGE IMPAIRMENT

3.2.1 Introduction

The first part of this section commences by considering the importance of theory of mind for children's socio-emotional functioning by reviewing studies conducted with typically developing children. The second part focuses on the role of language in the development of children's theory of mind. Then, evidence in regards to the theory of mind ability of children with SLI is provided. The last part concludes by considering the limitations of the current studies and the implications these limitations have for further research.

3.2.2 Theory of Mind in Typically Developing Children

The cognitive achievement that enables us to convey our propositional attitudes, to attribute similar attitudes to others, and to use such postulated or observed mental states in the prediction and explanation of behaviour is known in the child development literature as theory of mind (Baron-Cohen et al., 1985; Garfield, 2001; Howlin & Asgharian, 1999). The child's developing theory of mind provides a cornerstone for social and intellectual life. Most typically developing children acquire theory of mind between the ages of 3 and 5 years (Wellman & Bartsch, 1988; Baron-Cohen et al., 1985).

Traditionally, theory of mind is discussed as a single cognitive process or achievement, especially in some areas of enquiry such as autism. However, many researchers believe that developing a theory of mind encompasses several distinct domains and includes an understanding of numerous concepts which are acquired in a series of gradual developmental accomplishments (Wellman, 2004; de Rosnay & Hughes, 2006). Consequently, research enquiries of young children's understandings of intentions, desires, emotions and others mental representations have become prevalent. When looking specifically at children's understanding of desires, beliefs and emotions, research showed that children understand at the age of 3 years that other people's actions are regulated by their desires and beliefs, but the understanding of the mediating role of desires and beliefs for people's emotional states, comes

later on when they are aged 4 years (Astington, & Barriault, 2001; Bartsch & Wellman, 1989; Gopnik & Slaughter, 1991; Wellman & Wooley, 1990). As Wellman and Wooley (1990) showed, at the age of 5 children accurately predict a happy emotion when the character of a hypothetical scenario receives what s/he desires and an unhappy emotion when the character is frustrated in fulfilling a desire.

Additionally, children at that age have an understanding of others' emotions and this understanding seems to take place even when emotions do not correspond to what they themselves feel or want (Gross & Harris, 1988). In other words, they are aware that different people can have different desires or that others' desires can differ from their own. Alongside emotions and desires, young children at that age also show the ability to attribute beliefs to the character of a story that differ from their own. In this respect, false beliefs are frequently used in research. False belief ability is the understanding that people will act in line with their beliefs about reality even if those beliefs are false.

Much of the theory of mind research has focused on false belief tasks, and a task that is often used is the 'change of location' task designed by Wimmer and Perner (1983). The task involves a character hiding an object and then leaving the room. The object is moved to a new location by the researcher, and the child is asked where the character will look for the object when he/she returns, or where the character thinks the object is. From 4 years on children typically demonstrate an understanding of false belief in these tasks (Call & Tomasello, 1999; Flavell, 1999). Another version of the false belief task is the 'false appearance' task in which the character falsely believes that a Smartie box contains Smarties, whereas (as participants know) the Smartie box actually contains pencils. An early study by Harris et al. (1989) showed that, when children aged 4-6 years were asked to predict how the character would feel when given the box but had not yet discovered its actual contents, most emotion predictions by the 4-year-olds (75%) were based on their own belief and stated that the character would feel unhappy. That is they made an emotion prediction as if the character could know that the box did not contain Smarties. Yet, 75% of the emotion predictions by the 6-year-olds were based on the character's false belief and stated that the character would be happy when receiving the box.

3.2.3 The Role of Language in the Development of Theory of Mind

There is considerable evidence that the development of theory of mind is closely interrelated with language development. First, several studies have demonstrated that early theory of mind abilities shown in episodes of joint attention are crucial for sharing vocabulary and discovering the meaning of others' words and are significantly associated with later language development (Baldwin, 1995; Harris et al., 1995; Tomasello & Farrar, 1986; Tomasello & Barton, 1994; Chiat & Roy, 2008; Baldwin & Moses, 1994).

In addition, there is some research focusing on the communicational aspect of language, arguing that language allows the child to participate in conversations, to engage in social interactions and story-telling with adults, and it is these activities that bring mental states to the children's attention (Slaughter et al., 2007; Ensor & Hughes, 2008; Nelson, 2005; Ontai & Thompson, 2008; Peterson et al., 2000; Brown et al., 1996), thus enabling children to develop theory of mind. The main idea underlying this argument is that for all children, the ability to understand and use language is critical because it broadens children's experience. In fact, research studies have found that conversational processes in the family are strongly associated with the development of theory of mind abilities (McAlister & Peterson, 2007; Astington & Jenkins, 1995; Peterson, 2001; Perner et al., 1994; Lewis et al., 1996; Ruffman et al., 1998).

Additional support for the importance of conversational interactions in promoting children's theory of mind development comes from the special case of deaf children. In a study by Peterson and Siegal (2000) late-signing deaf children were found to be severely delayed in their performance on theory of mind tasks in comparison to native-signing deaf children who showed no such delay. Restricted access to conversational discourse with significant adults appears to have directly contributed to these children's delay, a finding which was supported by a later study by Woolfe et al. (2002), a recent study by Meristo et al. (2007) with deaf children in a bilingual environment and a study by Rimmel and Peters (2009) with children with cochlear implants. Support for the view that engagement in conversational discourse improves children's theory of mind abilities also comes from training studies like the one by Lohmann and Tomasello (2003) and Hale and Tager-Flusberg (2003) who provided various types of conversational interventions to improve children's false belief understanding.

Furthermore, children with well developed language abilities have been found to show higher levels of theory of mind competence in experimental tasks in a study by Jenkins and Astington (1996). The same authors (Astington & Jenkins, 1999) conducted a longitudinal study to assess the direction of the relationship between general language development and theory of mind, and found that earlier language abilities, and in particular syntactic ability (but not semantic), predict later theory of mind performance, but theory of mind did not predict language ability. Similar findings come from a study by Cassidy and Balluramen (1997) who suggested that for language impaired children, performance in false belief tasks was predicted by language ability as measured 6 months earlier.

The research reviewed above highlights Astington's argument (2001) about the future of theory of mind research: Theory of mind development depends on children's internal resources as well as on the input from their social context. Theory of mind is equally dependent upon language and social experience, and its development is based on language acquisition as well as children's growing understanding of the social world, acquired through conversation and interaction with others. As Garfield et al. pointed out (2001) competent language and competent social skills are jointly causally needed, and individually causally essential, for theory of mind development.

If language and theory of mind are linked, it should follow that children who experience difficulties in the area of language should show some impairment in the area of theory of mind. The following section will review studies conducted with children with SLI, and consider whether this group of children present with difficulties in the area.

3.2.4 SLI and Theory of Mind

3.2.4.1 Introduction

The following section reviews the theory of mind abilities of children with SLI by presenting evidence from available research. The section concludes with the limitations of the current literature and some possible suggestions for further research.

3.2.4.2 Theory of Mind in Children with SLI – Research Findings

The theory of mind abilities of children with SLI have not received a great deal of attention in the research literature. The study by Cassidy and Balluramen (1997) reported in the above section demonstrated that preschool children with a language delay performed more poorly on false belief tasks than chronological-age matched peers. However, the language–delayed children participating in this study may not all have met the criteria for SLI and so valid conclusions about the false belief understanding of children with SLI cannot easily be drawn.

A few studies of theory of mind in autism have contrasted the development of autistic and SLI groups (Baron–Cohen et al., 1985; Leslie, & Frith, 1988; Perner et al., 1987; 1989; Ziatas et al., 1998). The children with SLI in these studies showed no difficulties in the domain of theory of mind, and were successful on false belief tasks, but had an average age of 7 to 8 years and were considerably older than the preschool children who typically participate in theory of mind studies. In addition to this limitation, children with SLI were not sub-classified and it is unclear from the description of the populations whether specific dimensions of language were more relevant to their development of theory of mind.

When researchers have differentiated groups of children with SLI, the results have been interesting. Van der Lely et al. (1999) found that children with grammatical SLI (age ranges 12–19 years) performed well on false belief tasks, despite failing to understand complement clauses and embedded noun phrases. On the other hand, an earlier study by Shields et al. (1996) demonstrated that primary aged children with difficulties in the development of

phonology and syntax performed better than children with autism, but not always as well as typically developing chronological-age matched peers. However, the performance of children classified as having semantic–pragmatic impairments was similar to children with autism. That was also supported later by studies by Bishop (1997) and Ziatas et al. (1998).

In her discussion of the results, Bishop (1997) suggested that the children's performance on theory of mind tasks could be attributed to the linguistic difficulty of the task rather than an impairment in theory of mind abilities. Evidence for the view comes from studies by Lewis and Osborne (1990) and Siegal and Beattie (1991) who found that the false belief performance of typically developing 3-year-olds can be improved by reducing the linguistic demands of the task. A more recent study by Miller (2001) provided further evidence that linguistic competence serves as a limiting factor in false belief performance by demonstrating that children with SLI (age ranges 4:5 to 7:1 years of age) performed similarly to chronological-age matched peers when the linguistic complexity of experimental tasks was low, but similarly to younger children when the linguistic complexity was high. Miller's study suggests that children with SLI are conceptually more mature than typically developing children of the same language ability (in this study matched for receptive language skills) but are less able to demonstrate this when the language demands of the task are too great.

Johnston et al. (2001) found, however, that the use of cognitive state terms, such as 'know', 'pretend', 'think', in the conversational discourse of children with syntactic impairments resembles that of younger language-age matched children, and is less than that of children matched on mental age, in terms of both the proportion of speech occupied by such terms and in the variety of terms used. The researchers argued that syntactic difficulties, by impairing children's abilities to verbally represent complex prepositional structures, may inhibit the development of theory of mind abilities.

Gillott et al. (2004) further investigated this hypothesis by conducting a study, which aimed to explore theory of mind ability in children with phonologic-syntactic language impairment (range of 8 to 12 years of age). They used the 'Strange Stories' task, which asks children to account for a person's behaviour in twelve short vignettes, and they compared the performance of children with phonologic-syntactic impairments with that of children with autism and typically

developing children. The results from their study added to the body of evidence suggesting that children with SLI may experience difficulties with theory of mind tasks, by showing that children with SLI performed similarly to children with autism in making appropriate mental state attributions to explain a character's behaviour. The authors discussed the possibility that similarities in performance in the two groups result from differing impairments or from the heterogeneity seen in the group of children with SLI. The 'Strange Stories' task has also been used recently in a study by Botting and Conti-Ramsden (2008) who compared two groups of adolescents with and without a history of language impairment, and also showed an impaired pattern of performance for those with a history of SLI in comparison to their chronological-age matched peers.

Apart from the linguistic aspect, it has been suggested that the theory of mind abilities of children with SLI can be hindered by the information-processing and memory demands of tasks (also discussed at section 2.4.3). Some evidence to support this suggestion emerges from studies of typically developing children (Davis & Pratt, 1995; Freeman & Lacohee, 1995; Jenkins & Astington, 1996; Sullivan et al., 1994), but to date, no studies have investigated the effect of memory demands of the tasks on the performance of children with SLI.

Finally, it has been argued (also discussed at section 2.4.2) that poor social experience may contribute to theory of mind impairments in children with SLI, which could in turn affect children's socio-emotional functioning. This idea was supported by Farmer (2000), who explored the links between the development of language and the development of social cognition, and further examined the relationship of social cognition and educational experience. The results of the study showed significant differences between the scores for social cognition and ratings of social competence of typically developing children and the scores of children with SLI who attended a special school. The author concluded that children's limited social experience and lack of rich conversational discourses may interact with the language acquisition problems of the children with SLI in a significant way to affect the development of not only the language but also the development of social cognition.

3.2.5 Summary and Limitations of Literature Reviewed

The studies reviewed above are inconclusive, and in large conflicting. Early research suggested that children with language impairments (but as can be seen in Appendix C not necessarily with SLI) are not impaired in their theory of mind abilities, and that a theory of mind impairment is specific to children with autism. More recently, theory of mind impairments have been suggested for some groups of children with SLI, although without clear results about the causes of the poor performance in theory of mind tasks children with SLI showed in these studies.

When reviewing existing literature, one significant first limitation is that most of the studies have targeted older primary aged children (between the ages of 8 and 12 years) or preschool children (under 5 years old) resulting in a significant lack of information on the performance of younger primary aged children (6-8 years of age). Although we have some understanding of how children with SLI at the later stages of primary education perform in theory of mind tasks, little is known about younger children with SLI. Differences in SLI criteria (described in Appendix C) as well as the heterogeneity in the group of children with SLI may contribute to the pattern of different and conflicting results seen by the studies reviewed so far, and within group comparisons are vital for our understanding of how children with SLI perform on such tasks so as to be able to conclude whether the theory of mind development of children with SLI is delayed or whether it follows an atypical developmental pattern. Conti-Ramsden and Botting (1999) have found that individual children's difficulties do change over time, so it is important to map these differences and investigate possible developmental factors affecting children's theory of mind abilities.

Another methodological limitation affecting the generalisability of the findings is the small sample sizes. In studies with small samples, the performance of a few individuals on theory of mind tasks have a big effect on the data, and render the data less representative of the general population. This is an issue that needs to be considered and addressed in future studies in order to draw valid conclusions about children's abilities. Furthermore, apart from Miller's study (2001), all the studies investigating theory of mind development in children with SLI have compared children's performance with typically developing children of the same chronological age. Although this kind of comparison is valid and can be informative, it fails to investigate the

important question of whether children's difficulties are due to linguistic limitations or due to a specific difficulty with theory of mind abilities. Comparisons with children of the same language ability are needed to investigate whether children's language impairments affect the development of theory of mind. A number of studies have expressed the need to investigate further the extent to which difficulties in comprehension may limit the performance of children with SLI on theory of mind tasks (Shields et al., 1996; Gillott et al., 2004). Making such comparisons with language-age matched groups would provide useful information on whether the performance of children with SLI on theory of mind tasks is delayed due to their poor language abilities or whether their theory of mind abilities follows an atypical pattern of development that cannot be explained by language alone.

One final limitation of previous research with children with SLI has been its reliance on false belief and false appearance tasks, which investigate specific aspects of theory of mind abilities. Until now, theory of mind in children with SLI has mainly been investigated in relation to beliefs and little is known about children's understanding of emotions. Further light might be shed on the theory of mind of children with SLI by using tasks evaluating children's understanding of emotions, as well as their ability to predict and explain others' emotional responses. Further research using such tasks may reveal subtle impairments in theory of mind abilities, which may not be apparent with false belief and false appearance tasks.

3.3 EMOTION UNDERSTANDING AND SPECIFIC LANGUAGE IMPAIRMENT

3.3.1 Introduction

In this section, evidence from typically developing children's ability to identify and understand emotions is reviewed, and in the second part, the role of language in the development of identification and understanding of emotions is examined. The third part of this section aims to review the research findings on the ability of children with SLI to identify and understand emotions in themselves and others. The final part focuses on the limitations of the research reviewed and suggests ways forward.

3.3.2 Emotion Identification and Emotion Understanding by Typically Developing Children

Identifying and understanding emotions is a significant milestone for children's emotional development. This is because being able to correctly identify and understand emotions enables children to perceive the fact that the emotions they and the people around them are feeling have a communicative function; emotions convey specific messages to significant people to assist them in fulfilling their needs (Jenkins & Ball, 2000).

Long before children are able to verbally label emotions, they are responsive to people's expressions around them. The first step in emotion understanding is children's ability to understand and recognise facial expressions. The face is argued to be the most effective way to convey emotions (Angeli et al., 2008; Fernandez-Dols et al., 2008; Etcoff & Magee, 1992), and the ability to understand facial expressions is vital to the ability to infer another's mental state and make sense of other people's behavioural responses to a situation (Leerkes et al., 2008; Izard et al., 2001; Walden & Field, 1990). According to Mehrabian (1981), 93% of emotions are expressed via the face and other non-verbal communication means, such as body language and gestures, and only 7% are expressed through language. Also, understanding of the emotions of happiness, sadness, anger and fear via facial expressions is universally practised (Ekman, 1992).

Infants as young as 2 months of age can respond to facial expressions of happiness and surprise by smiling and engaging in vocal play (Flin & Dziurawiec, 1989). By the end of the first year, children rely on facial expressions to assist them in determining others' behavioural responses (Klinnert et al., 1986). Children as young as 2 years are able to identify some facial expressions (sad, happy) through a verbal labelling task (Bretherton et al., 1981). Preschool children are able to use facial expressions to make inferences regarding basic emotions (Denham & Couchoud, 1990). They are also able to predict a character's emotional response in a story by choosing the appropriate facial expression (Denham, 1986).

By the age of 4 years, children begin to use contextual information to understand and explain the basic emotions – fear, anger, sadness, and happiness (Dunn & Hughes, 1998). Through their everyday experiences and increased social understanding, children develop the ability to

assess emotions in others when contextual cues are less salient, recognise different emotions and experience more than one emotion simultaneously (Denham, 1998).

There is considerable evidence that the ability to recognise and understand emotions in others is a non-trivial aspect of what is considered successful socio-emotional functioning (Leerkes et al., 2008; Holder & Kirkpatrick, 1991; Nowicki & Duke, 1992; Nowicki & Mitchell, 1998). For example, Nowicki and colleagues have reported several studies in which primary aged children's ability to understand facial expressions significantly correlated with peer ratings of popularity. Similarly, Norwick and Mitchell (1998) found an association between preschoolers' ability at recognising facial and prosodic affect with ratings of social competence by both peers and teachers.

3.3.3 The Role of Language in the Development of Emotion Identification and Emotion Understanding

The role of language is significant in effective identification and understanding of emotions. The development of competent language skills transforms children's development by enabling them to deal more effectively with their emotions and make sense of the world around them (Vallotton, 2008; Kopp, 1992). Saarni (1999) argues that understanding one's own and others' emotions could not take place without access to language as language provides us with a representational system for symbolically encoding and communicating emotional experiences. With the acquisition of language, and later on an appropriate emotion vocabulary, we can make our emotional experiences understood by others and use this skill to regulate our emotional and internal states.

Greenberg et al. (1995) suggested that, initially, a baby's needs and feelings are directly communicated to the significant adults through their behaviour. At about the age of 3 years, when early language skills are developed, language is used to provide a moment of contemplation between the experience of an emotion and its expression. At this age, the child can identify and label basic emotions, and, through language, begins to engage in planning sequences of actions and reflects on them. From around the age of 6 years, children more consistently think in words, and increasingly engage in reflective social planning and problem-

solving. Children of this age also begin to understand that their actions have emotional consequences and are more able to predict the type of emotion an action or a situation might evoke to themselves and others. In adolescence, the ability to consider multiple perspectives simultaneously is developed. Adolescents further develop an understanding of the emotions and thoughts of people and possess a wider and richer emotional vocabulary to describe this. Therefore, it seems that language serves two roles: firstly, it can provide a moment of delay, which can lead to a situation being dealt with in a way other than an immediate response through action. Secondly, it provides a representational system, a tool, for children to communicate their emotional experiences.

Further support for the role of language comes from research studies investigating the relationship between language and emotion understanding. Cutting and Dunn (1999) found a significant relationship between the language ability of 3- and 4-year-olds (assessed via a test of vocabulary comprehension and a test of expressive narrative) and their understanding of the expression and causes of emotion in that the better children's language skills were, the more advanced their understanding of the causes of emotions was found to be. Similarly, de Rosnay and Harris (2002) found that the language ability of 3- to 6-year-olds (assessed via the same test of vocabulary comprehension) was a significant predictor of their emotion understanding. Pons et al. (2003) examined the development of individual differences between the ages of 4 and 5 years and 10 and 11 years by investigating the effects of age and language on children's emotion understanding. More specifically, they examined whether language ability of children assessed by the Test of Receptive Grammar (TROG) (Bishop, 1989) was associated with individual differences in emotion understanding. They found that children improved with age in both their emotion understanding and language ability. Age and language ability together explained a significant 72% of emotion understanding variance.

Additional support for the importance of language comes from experimental language-based interventions that used language training to improve children's emotion understanding and found that children in the experimental group significantly improved in their ability to understand and explain emotions in comparison to the control groups who were not exposed in emotion conversations (Tenenbaum et al., 2008). Finally, support for strong associations between language and emotion understanding comes from the studies showing that exposure to rich

social contexts, in the form of maternal conversations rich in emotional references, significantly promotes children's emotion understanding. Various concurrent (Denham et al., 1994; Garner et al., 1997) and longitudinal studies (Dunn et al., 1991a, b) have shown strong links between increased levels of discourse between mother and child and the way children identify and talk about emotions. This association was found to be stronger in cases where mothers talked about the causes of emotions or generally talked about causes in their discussions with their children (Brown & Dunn, 1996).

The research above highlights the importance of language for the development of children's ability to identify and understand their emotions. The next section will review research evidence from studies conducted with children with SLI in order to investigate whether this population of children has difficulties in this area of social cognition.

3.3.4 SLI and Emotion Identification and Emotion Understanding

3.3.4.1 Introduction

This section focuses on reviewing the literature on the ability of children with SLI to identify, and understand emotions. Towards that aim the section is divided in two parts: the first part presents evidence on the ability of children with SLI to identify and understand emotions, and the second part considers the limitations of available research and points out useful recommendations for future research.

3.3.4.2 Emotion Identification and Emotion Understanding by Children with SLI

Given the relationship between emotion identification and emotion understanding and language ability, it might be expected that children who have difficulty with language would be at a disadvantage in developing appropriate emotion understanding and emotion identification skills (Gallagher, 1999). Firstly, research has suggested that children with SLI may have difficulty quickly and accurately identifying and labelling emotions depicted by facial expressions. An early study by Holder and Kirkpatrick (1991) presented children with facial expressions

depicting six emotions (anger, fear, sadness, surprise, happiness, and disgust) and found that children with language impairments (age ranges 8 to 15 years) were less accurate than their chronological-age matched peers at labelling emotions. In contrast, Trauner et al. (1993) found no differences in abilities of children with SLI (age ranges 9 to 14 years) and their chronological-age matched peers to identify facial expressions. However, they asked children to identify only three expressions (happy, sad, and angry) in a forced choice situation, and, as a result, a ceiling effect was obtained for all emotions. A later study by Dimitrovsky et al. (1998) compared typically developing children's ability to identify facial expressions with that of children with three types of learning difficulties (age ranges 9 to 12 years): non-verbal only, verbal only, and both non-verbal and verbal. The researchers found that, overall, the control group of children was better at the task than any of the three groups with learning difficulties. Although children with verbal only difficulties identified more accurately facial expressions than did children with either non-verbal only difficulties or with both non-verbal and verbal difficulties, children with language impairment were still at risk in this area.

As mentioned above, in addition to identifying a facial expression, a child must also attend to and use contextual information to predict someone's emotional response to an event. Thus, even if children with SLI are able to correctly identify and label facial expressions, they may not be able to use contextual information in a linguistically demanding situation to make an appropriate emotional inference (Worling et al., 1999). In section 2.4.3 it was discussed that time requirements for making a successful inference, in addition to the linguistic demands, may lead to children with SLI being overwhelmed by the processing demands of the task. To date, this hypothesis has only been tested in a few studies. In the study of Trauner et al. (1993) reported above, the researchers asked participants to identify happiness, sadness and anger in photographs and tape-recorded utterances, and found that, although children in the SLI and control groups performed identically in the photograph task, they differed in the auditory task, with children in the SLI Group performing significantly worse than the control group.

To address the issue of whether children's difficulty is modality related or not, Ford and Milosky (2003) assessed children's ability (mean age 5:9 years) to label facial expressions depicting 1 of 4 emotions (happy, surprised, sad and angry) and to identify those expressions from photographs when given a verbal label. Children were then presented with stories and were

asked to choose among these facial expressions to infer the character's emotional reactions. The stories were presented in 1 of 3 modalities: verbal, visual, and visual/verbal concurrent modality. As in the study of Trauner et al. (1993), Ford and Milosky found that all children were able to correctly identify and label the facial expressions when presented with photographs. However, the language impaired group had difficulty integrating their emotion knowledge with event context in order to infer a character's feelings, regardless of modality of presentation. The surprising finding was that when these inferencing errors occurred, children in the SLI Group were more likely to suggest emotions of a different sense altogether (for example, to say happy instead of sad) than were children in the chronological-age matched group. Finally, it was found that inferencing ability was related to language comprehension performance on a standardised language test, even when stimuli were only presented visually.

Creusere et al.'s study (2004) examined the ability of children with SLI and their chronological-age matched peers (4 to 6:5 years) to recognise vocal and facial cues to affect. This study used different stimuli from prior investigations which included: 1) facial expression and unfiltered speech, 2) low-pass filtered speech only, 3) facial expression only, 4) facial expression and filtered speech. Low-pass filtered utterances were used in the second condition so that children's perception of emotional prosody could be examined independent of the influence of semantic content and linguistic processing demands. Also, videotaped displays of emotion were used in the third condition rather than still photographs. The researchers aimed to determine whether children with SLI perform poorly on tasks of verbal emotion recognition because they have difficulty in interpreting emotional prosody or because they have difficulty processing the linguistic structure. They also wanted to find out whether children with SLI would succeed on a task in which prosodic and facial cues to emotion are presented simultaneously. The results indicated that children with SLI in their study had no difficulty in identifying emotions depicted in moving displays of facial expression (third condition), but performed more poorly than typically developing children for the items in which both the face and unfiltered speech were presented (first condition).

Spackman et al. (2006) examined the ability of primary aged children to infer the emotion a character might experience given a social scenario. Comparisons were made between 43 children with SLI (5 to 8 years and 9 to 12 years) and 43 typically developing chronological-age

matched peers. Spackman and his colleagues also explored how children with SLI and their typically developing peers described emotion experiences in response to open-ended questions. Participants were presented with short scenarios in which the main character was in a situation that would be expected to elicit one of the four basic emotions (anger, fear, happiness or sadness). Children were then asked to predict what emotion the character would have experienced. Following that, children were asked why the character would feel a particular emotion and then asked for a description of how the particular emotion would feel (e.g. How does it feel inside to be happy?). Both groups of children identified happiness most accurately, followed by sadness, fear and anger. Older children were significantly more accurate than younger children, and typically developing children were significantly more accurate than children with SLI. Children with SLI were less sophisticated in their descriptions of emotion than were typically developing children.

Finally, verbal emotion recognition was investigated in a recent study by Fujiki et al. (2008) examining children's ability to understand emotion conveyed by prosody in a narrative passage. Children with SLI (8 to 10:10 years) were presented with a seven-sentence narrative read by actors to express happiness, anger, sadness, and fear, and were then asked to indicate what emotion the speaker expressed. The children's performance was compared with a group of chronological-age matched peers. The results of the study showed that children with SLI performed significantly more poorly than their typically developing peers in identifying the emotion expressed in the passage. There were also differences between emotions, with happiness being the easiest emotion to identify and fear the most difficult.

3.3.5 Summary and Limitations of Literature Reviewed

The studies described above represent a considerable advance in our knowledge of the emotion identification and emotion understanding skills by children with SLI. Although there are some conflicting results, the majority of the studies indicated that children with SLI do differ from their typically developing peers in processing social information and adequately identifying and understanding emotions. There is also some evidence available showing that children with SLI present with difficulties in assessing the event context in order to identify or predict a character's feelings.

Nevertheless, critical questions remain unclear. First of all, with the exception of Creusere et al.'s (2004) and Spackman et al.'s studies (2006), the children tested in the studies reported above were often older primary aged children (older than eight years old), and there is a significant lack of information regarding children's ability to identify and explain emotions when at the earlier stages of primary education. Consequently, it is difficult to say how individual differences in children's emotion identification and emotion explanation develop before the age of 8 years, and whether there are differences between younger and older primary aged children with SLI. This kind of comparison is central for two reasons. First of all, examining performance in tasks of emotion understanding in younger and older primary aged children with SLI will provide valuable information about developmental patterns of performance. Secondly, comparisons between younger and older primary aged children with SLI will bring some light into the effect of other factors influencing emotion identification and understanding. It is likely that the possible difficulties found among young primary aged children with SLI either disappear or diminish once they are at the later stages of primary education. At school, they will have the opportunity to encounter a wider range of emotions. These new social experiences could diminish the impact of their language limitations. Creusere et al.'s study (2004) provides some evidence for the effect of age on children's performance, but further investigations in the area are needed.

An additional limitation in terms of the population investigated is that the sample sizes in most studies are very small, which again suggests that findings should be treated cautiously as they have implications for the generalisability in the wider population. Furthermore, studies so far have not looked in detail children's ability to match emotion-eliciting situations to facial expressions. The findings of the few studies reported in the section above highlighted an impairment in children with SLI in understanding links between expressed emotions and social situations. A detailed examination of children's emotion understanding is needed whereby tasks assessing emotion labelling and identification as well as understanding of how emotions relate to situations in order to be able to draw valid conclusions about the ability of processing emotional information of children with SLI. A final limitation is that literature has failed so far to relate children's ability with other factors such as the processing demands of the task, and to further address the question of whether children's ability to identify and understand emotions is modality-specific. That is, there is very little information on whether the ability of children with

SLI is dependent on the way they perceive social information (verbal or visual information or both), and also whether, if given more time, children with SLI are equally successful with peers of the same age.

3.4 CONFLICT RESOLUTION AND SPECIFIC LANGUAGE IMPAIRMENT

3.4.1 Introduction

The last sub-component of social cognition investigated in this thesis is children's ability to successfully resolve conflicts. This section seeks to review some of the literature on young children's conflicts and the development of conflict resolution abilities. Following that, it reviews evidence on the conflict resolution abilities of children with SLI by describing the cognitive and linguistic abilities involved in effective conflict resolution, and presents evidence supporting the fact that children with SLI can be expected to have noticeable difficulty in this area. The next part of this section presents evidence from previous studies on language impaired children's ability to resolve conflicts. The findings are from case studies and also some experimental studies that have compared children's performance on conflict resolution tasks with groups of children with typically developing language. In the last part, the limitations of the current findings are considered.

3.4.2 Conflict Resolution by Typically Developing Children

Conflicts are defined in the research literature as events in which a person protests, retaliates, or resists the action of another (Hay, 1984; Shantz, 1987). Shantz and Hobart (1989) argue that conflict is an inevitable aspect of human existence, involving contrasting behaviours or differing goals evidenced in verbal and/or physical actions. The literature on young children's conflicts indicates that conflicts between children are frequent (Chen et al., 2001), but often brief (Chen et al., 1998).

The most common sources of conflict for school aged children are: the distribution of resources (e.g., toys, materials, and space), claims about opinions and beliefs, psychological harm (e.g.,

teasing), social order (e.g., classroom rule violation) and physical harm. Children initiate conflicts by using a simple 'No', reasoning and justifying, offering alternative proposals, postponing agreements and evading (Chen, 2003). Studies of typically developing children show how they are able to use a range of verbal and non-verbal communication skills to resolve conflict. These skills include negotiating, compromising, validating others' opinion, suggesting alternatives, using facial expressions to convey sadness, and apologising (Eisenberg & Garvey, 1981). Some children respond by soliciting adult assistance by complaining and stating their annoyance, or simply by directly requesting for help (Chen et al., 2001; Dunn & Munn, 1987).

Previous research has demonstrated that children's conflict resolution abilities become more sophisticated with age (Abrahami et al., 1981). Physical aggression, threats, appeal for help from an adult and complaints are low-level developmental strategies because limited interpersonal understanding is required. Higher level conflict resolution strategies, such as empathy, accommodation of others' needs, discussion to clarify the situation and better understand motives, appeal for unity, mutual decision-making, and interpersonal negotiation, require a more highly developed social cognitive level.

Competent conflict resolution behaviour involves a wide variety of skills and abilities, such as a social perspective taking, rather than an egocentric view of social situations, an effort and ability to balance one's own interests and needs with those of others, an ability to assess accurately conflict situations and to decide on the most appropriate approach to take (Putallaz & Sheppard, 1992). It is clear then that when resolving conflicts, children need to understand the other person's point of view, and also to recognise that others may view a situation from a different perspective to one's own (Goncu & Canella, 1996). Research indicates that resolution is achieved more often and relationships are more likely to continue when children use less egocentric, more collaborative resolution behaviours such as explanations and validations and conciliatory gestures during conflict (Eisenberg & Garvey, 1981; Laursen & Hartup, 1989; Phinney, 1986; Sackin & Thelen, 1984).

3.4.3 SLI and Conflict Resolution Abilities

3.4.3.1 Introduction

This section aims to firstly describe the linguistic and cognitive abilities involved in effective conflict resolution and then reviews evidence from the available research on the area of SLI. Again, the section concludes with a discussion of the main limitations and suggests recommendations for further research needed in the area.

3.4.3.2 Linguistic and Cognitive Abilities Involved in Conflict Resolution - Evidence from SLI Research

As discussed in the previous section, conflict resolution is highly mediated by language, so it could be hypothesised that language impaired children would present with difficulties in this area. In regards to specific linguistic abilities, children with SLI have been found to give short or non-verbal responses when addressed (Rice et al., 1991) which surely would have an impact on their ability to resolve conflicts. To effectively resolve conflicts, complex syntax and sophisticated linguistic structures are needed. For example, difficulties with compound and complex syntax (van der Lely, 1997; van der Lely & Battell, 2003; Clark, 1973) reduce the linguistic capabilities of a child. Also, the ability to produce advanced polite forms, such as modals and complex sentences, necessary to negotiate or soften a verbal message when in a conflict situation (Bliss, 1992; Prinz & Ferrier, 1983) has also been found to be poor in language impaired children. This limitation would result in the use of blunt requests that may offend others and cause misunderstandings. The ability to understand and appropriately ask questions and clarify situations is vital for effective conflict resolution. Children with SLI have been found to have difficulties with comprehending *wh*-questions (Deevy & Leonard, 2004) and using questions to extract information (van der Lely & Battell, 2003; Ingram, 1972; Morehead & Ingram, 1973). Another linguistic limitation found in children with SLI is that they less frequently use problem-solving language and fewer modal expressions in comparison to their peers (Sturm & Johnston, 1999). In addition, effective conflict resolution requires an ability to use linguistic rules in social contexts, and there is some evidence suggesting that children with SLI have difficulty in successfully integrating form and function and applying linguistic rules for

specific communicative needs (Craig, 1991). Alongside these skills, pragmatic language abilities are necessary when resolving conflicts. Research has indicated that children with SLI frequently fail to respond when a peer speaks to them, and their initiations tend to be ignored by their chronological-age matched peers (Hadley & Rice, 1991).

As reported in the above sections, there is also research indicating that children with SLI have difficulty perceiving and properly identifying facial expressions, intonational patterns, and other nonverbal cues (Fujiki et al., 2008; Ford & Milosky, 2003; Pickering, 1985; Wiig & Semel, 1976; Johnson & Myklebust, 1967). Other necessary abilities for effective conflict resolution are turn-taking, persuasion ability, ability to access interactions and being assertive (Katz et al., 1992). Turn taking is an area of difficulty for children with SLI who tend to be passive conversationalists and less other-directed than their chronological-age matched peers (Craig & Evans, 1989). Children with SLI find it difficult to initiate and access social interactions (Craig & Washington, 1993), and have been found to lack assertiveness (Fey, 1986; Fey & Leonard, 1983). There is also evidence from research studies (Bliss, 1991; Goldman, 1987; Gallagher, 1991; Loucks, 1987) showing that children with SLI experience great difficulty in devising high-level persuasive strategies that involve perspective taking.

In terms of non-verbal cognitive abilities, conflicts provide a unique opportunity for individuals to use reasoning to solve problems. Hierarchical and abstract reasoning, for example, is required in order for the individual to be able to prioritise solutions and solve social problems. As discussed in chapter 1, children with SLI have been found to have immature hierarchical reasoning (Kamhi, 1981), difficulties with hierarchical planning (Cromer, 1983) and deficits in representational abilities and abstract reasoning skills (Ellis Weismer, 1985; Weismen, 1991; Johnston & Ellis Weismer, 1983; Nelson et al., 1987). Finally, the ability to resolve conflicts also requires hypothesis testing abilities which children with SLI have been found to struggle with (Ellis Weismer, 1991; Kamhi et al., 1984).

3.4.3.3 Conflict Resolution by Children with SLI - Research Findings

Research that has focused on the conflict resolution strategies of children with SLI is limited. Early on, Bryan et al. (1981) studied the interaction skills of children with learning disabilities,

who exhibited linguistic and pragmatic language impairment in a problem-solving task. The researchers suggested that children with learning disabilities were more passive than their peers in avoiding disagreements, were less persuasive, and were the least effective participants in cooperative group decisions.

Conflict resolution abilities of children with SLI have been studied at different ages by using various types of measures, such as hypothetical situations, role enactments, and observation of spontaneous disputes. Loucks (1987) examined the dispute behaviours of two preschool children with SLI, a boy and a girl, and observed the spontaneous interactions of children with SLI and their typically developing peers. Loucks concluded that both children exhibited social difficulties, and suggested that these were partially due to their language impairment. The boy tended to initiate disputes and showed overly aggressive social interactions, whereas the girl tended to avoid conflicts and exhibited behaviour similar to that of younger children with typically developing language.

Focusing as well on preschool children with SLI, Horowitz et al. (2005) studied the behavioural patterns of conflict resolution strategies in preschool boys with language impairment. They found that the boys with language impairment in their study attempted reconciliation in fewer conflicts when compared to a group of preschool children with typical language development, and were found to attain reconciliation with strictly verbal reconciliatory behaviours in a smaller proportion of conflicts. In this study, preschool boys with language impairment were more inclined to seek adult contact rather than contact with their peers, which has been reported in a number of studies (Rice et al., 1991; Fujiki et al., 1996; Redmond & Rice, 1998; Brinton & Fujiki, 1999).

Ineffective conflict resolution abilities have also been reported in primary aged children with SLI. Baker et al. (1980) argued that the children with SLI in their study showed tendencies towards bullying, submissive behaviours, and excessive fighting. Further to that, when the ability of children with SLI to negotiate with two other chronological-age matched peers in triad interactions was examined (Brinton et al., 1998b), the results indicated that children with SLI did not produce significantly fewer utterances than their partners, but they produced a significantly smaller percentage of negotiation strategies and they used developmentally lower

level strategies than either of the partners. For example, children with SLI tended to produce strategies that asserted solely their own desires, failed to request an opinion from their partners and ask for more information in order to clarify the situation or to recognise that it was necessary to reach an agreement within the group. These behaviours highlight the fact that children with SLI may have difficulty considering others' perspectives.

Stevens and Bliss (1995) explored the conflict resolution ability of children with SLI and children with typically developing language through children's participation in a hypothetical problem solving activity and engagement in role enactments of conflicts. The children with SLI suggested fewer types of strategies to resolve hypothetical conflicts than the typically developing children in the hypothetical scenarios but in the role enactments children with SLI used a similar number of conflict resolution strategies as children in the comparison group. Stevens and Bliss found that the children with receptive and expressive SLI performed more poorly than the children with primarily expressive language impairments. Children with SLI had a particular difficulty using strategies involving persuasion, asking questions to clarify situations, and the ability to take into account the perspective of another individual.

Finally, Marton et al. (2005) confirmed prior research findings by demonstrating that children with SLI employed more non-verbal coping strategies than their peers regardless of its appropriateness to the situation. Children's non-verbal strategies included physically aggressive behaviours, such as, pushing and shoving and conversely passive/withdrawn reactions, such as, relinquishing to their partner and so avoiding the negotiation process. Congruent with previous research, children with SLI showed little evidence of utilizing effective strategies to negotiate and resolve presented conflicts. They tended to depart the scene without resolving the conflict or tried to involve a third person to solve the conflict in an attempt to avoid the negotiation process.

3.4.5 Summary and Limitations of Literature Reviewed

Previous studies have shown that children with SLI tend to have knowledge of fewer types of strategies to resolve conflicts, and they rely more on adults to intervene when faced with a difficult social situation when compared to typically developing children of the same

chronological age. Given that conflict resolution is an ability heavily mediated by language, limited ability to resolve conflicts is predicted due to children's language impairments.

However, there are important limitations from the studies reviewed above. Firstly, much of the evidence reviewed is based on relatively small samples of children. Although the studies so far have suggested important associations between children's language impairments and their conflict resolution abilities, larger participant groups are needed to look for patterns that apply across larger samples of children and increase the generalisability of the findings.

In addition, as shown in Appendix C studies have not used consistent identification criteria or have not allowed for comparisons with typically developing children. Studies are needed with well-defined samples that include comparison groups individually matched for age, non-verbal cognitive ability and language so the contributions of these factors to performance on conflict resolution hypothetical tasks can be explored.

Finally, so far most of the studies have focused on preschool children (Horowitz et al., 2005) or children at the later stages of primary school, but not at the earlier stages (below 8 years). The transition into formal education represents a key period of vulnerability for children in general and data from this age is critical in evaluating competing accounts on the social cognition skills of children with SLI. It is also important to investigate the possible changes in the profile of children with SLI as they grow older, and to make comparisons between the performance of younger primary children and children at the later stages of their primary education to examine whether their conflict resolution abilities follow typical developmental patterns or not.

CHAPTER FOUR:

EXAMINING SOCIO-EMOTIONAL FUNCTIONING IN CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT

4.1 ORGANISATION OF THE CHAPTER

The fourth chapter commences by summarising the aims, the research hypotheses and the design of the main study. The chapter continues by describing the criteria and standardised tests used for the selection and identification of the participants. The different methods used in this research to investigate socio-emotional functioning are described starting with the standardised questionnaires of socio-emotional functioning and pragmatic language ability. The chapter continues with a description of the experimental tasks of social cognition used with details about the aims, methods and the scoring used for each task presented, as well as predictions about the performance of the three groups. The chapter continues with an account of the three sets of comparisons between the groups of children and concludes with a rationale for the group comparisons, and the statistical analysis used.

4.2 AIMS AND RESEARCH HYPOTHESES OF THE MAIN STUDY

The present study aimed to tackle four main issues concerning the socio-emotional functioning of children with SLI. By employing a group of children with SLI and two carefully matched groups of typically developing children from mainstream schools, the present study aimed to investigate the extent to which this group of children presented with difficulties in the area of socio-emotional functioning. Specifically, the present study examined the different types of difficulties experienced by children with SLI. It was also of interest to investigate developmental patterns and examine whether children with SLI of different ages experience different difficulties.

To address the first aim of the study information about children's socio-emotional functioning was obtained through the use of a standardised behavioural questionnaire completed by children's parents and teachers. Comparisons were then made between younger SLI

participants (below 8 years) and older SLI participants (8 years and above) to investigate developmental differences in the socio-emotional functioning of children with SLI as reported by their parents and teachers. In addition, comparisons were made with typically developing children of the same chronological age to identify similarities in the development of children with SLI with typically developing children and to determine the extent of any difficulties with socio-emotional functioning that children with SLI might experience.

Research Prediction:

1. It was predicted that the younger SLI participants (below 8 years) would be rated by their parents and teachers as experiencing more difficulties with socio-emotional functioning than older SLI participants (8 years and above).
2. It was predicted that children with SLI would be rated by their parents and teachers as experiencing more difficulties than their typically developing peers matched for chronological-age.
3. Based on the literature review in Chapters Two and Three, it was predicted that difficulties with peers and attention/hyperactivity will be more commonly reported for children with SLI than emotional and conduct problems.

Secondly, the study aimed to examine the reasons for children's difficulties by exploring possible mechanisms linked to their socio-emotional functioning. To do so, the study investigated the relationship between children's socio-emotional functioning, three different language dimensions (receptive language, expressive language and pragmatic language ability) and their non-verbal cognitive ability.

To address the second aim of the study information about the children's receptive and expressive language and non-verbal cognitive ability was obtained and associations between these and ratings of socio-emotional functioning were explored. In addition, information about children's pragmatic language ability was obtained through the use of a standardised checklist completed by children's parents and teachers assessing children's communicative and pragmatic language ability. Comparisons were then made between younger SLI participants (below 8 years) and older SLI participants (8 years and above) to investigate developmental

differences in children's pragmatic language ability as reported by their parents and teachers. In addition, comparisons were made with typically developing children of the same chronological age to identify similarities in the development of children with SLI with typically developing children and to determine the extent of any difficulties with pragmatic language ability in children with SLI. Comparisons were also made with typically developing children matched for language ability to examine the relationship between children's socio-emotional functioning and language and non-verbal cognitive ability.

Research Prediction:

1. The poor language ability of children with SLI was predicted to relate strongly to ratings of socio-emotional functioning.
2. Receptive language measures were predicted to correlate more strongly to measures of socio-emotional functioning than expressive language measures.
3. It was predicted that the younger SLI participants (below 8 years) would be rated both by children's parents and teachers as having poorer pragmatic language ability than older SLI participants (8 years and above).
4. Children with SLI would be rated poorly by both parents and teachers' on the pragmatic language ability checklist in relation to both comparison groups.
5. Pragmatic language measures were predicted to correlate with measures of socio-emotional functioning for all three participant groups.

The third aim of the study was to examine children's social cognition skills and explore their role for children's socio-emotional functioning. To address the third aim of the study a range of experimental tasks was carried out in order to examine different aspects of children's social cognition skills. Comparisons were then made between younger SLI participants (below 8 years) and older SLI participants (8 years and above) on their performance on the social cognition tasks to examine developmental differences in the social cognition skills of children with SLI. Comparisons were also made with a group of typically developing children of the same chronological age and a group of typically developing children who were matched for language to identify the ways in which performance on the social cognition tasks was influenced by language abilities. In addition, associations between children's performance on

tasks of social cognition and children's socio-emotional functioning as rated by their teachers and parents were explored to investigate whether children's social cognition were related to ratings of socio-emotional functioning.

Research Prediction:

1. Children with SLI were predicted to follow typical developmental patterns in their performance on social cognition tasks in that the younger SLI participants were expected to perform worse than the older SLI participants in all four social cognition tasks.
2. Children with SLI were predicted to perform worse than typically developing children matched for chronological age and similarly to typically developing children matched for language ability on tasks of social cognition requiring only receptive language abilities. For the more demanding, multi-leveled social cognition tasks where children are expected to use language, children with SLI were predicted to perform worse than the typically developing children matched for chronological-age, and, similarly to typically developing children matched for language ability.
3. Social cognition performance was predicted to relate to ratings of socio-emotional functioning for all three participant groups.

Finally, previous research has suggested that BESD and difficulties with pragmatic language ability show lower levels of consistency across environments than cognitive and language abilities. The fourth aim of the study was therefore to explore whether the nature of children's difficulties with socio-emotional functioning and pragmatic language ability varied between settings, namely home and school.

To address the final aim of the study, parents and teachers' ratings of the socio-emotional functioning and pragmatic language ability of children with SLI on standardised questionnaires were compared in order to investigate possible similarities and/or differences between what parents and teachers report. Similar comparisons between parent and teacher ratings were conducted for the chronological-age matched and the language-age matched groups in order to examine whether similarities and/or differences in parent and teacher ratings exist only for

children with language impairments or whether these are extended to typically developing populations as well.

Research Prediction:

1. It was predicted that parents and teachers ratings of children's socio-emotional functioning and pragmatic language ability would be different for all three groups of participants, in that parents would express more concerns than teachers in some areas, for example children's social relationships.

4.3 DESIGN OF THE MAIN STUDY

To address those aims and in order to draw valid conclusions about the performance of children with SLI, an independent factorial design was selected with two comparison groups: a chronological-age matched group (CA Matched) and a group of language-age matched children (LA Matched). In that way, the role of language ability (one of the independent or predictor variables of this study) on children's socio-emotional functioning was investigated through standardised measures of language. Socio-emotional functioning (the dependent or outcome variable) was researched through a standardised questionnaire completed by parents and teachers. The rationale behind utilising an independent factorial design is further explained in chapter 5 where details about the statistical analysis are given.

4.4 PARTICIPANTS

4.4.1 Overview of the Three Participant Groups

One hundred and twenty-six children participated in the study: Forty-two children with SLI, forty-two children matched for chronological age and non-verbal cognitive ability, and forty-two children matched for language ability. The children were identified from five mainstream primary schools and one language unit attached to a mainstream school within an inner London borough. The chronological-age matched children included children from Year 1 to

Year 6 classes, and the language-age matched children included children from Reception to Year 4 classes. This provided the following sample:

- 42 language impaired children (SLI Group)
- 42 chronological-age matched children (CA Matched Group)
- 42 language-age matched children (LA Matched Group)

Gender was taken into account in the process of sampling.

4.4.2 Identification of Participants with Specific Language Impairment

4.4.2.1 Description of the Criteria

4.4.2.1.1 Age Range

The age range chosen for the participants with SLI was 6 years to 11 years and 2 months so that children's general ability to perform in tasks of social cognition could be investigated without any evidence of floor or ceiling effects. An examination of the performance of children in tasks of social cognition within the specific age range could also provide a full picture of a developmental pattern within the primary school years.

4.4.2.1.2 Educational Setting

Children were selected from four mainstream primary schools and one Language Unit attached to a mainstream school. The reason for employing children attending mainstream primary schools was two-fold. Firstly, based on the design of the study, it was essential to be able to include two comparison groups of typically developing children from the same educational settings to ensure, as far as possible, similar socio-economic status and educational background. Also, recruiting children from mainstream primary schools aimed to ensure that the sample of language impaired children of the study would accurately represent children with SLI who are being mainly educated in mainstream schools (Law et al., 2000; Lindsay et al., 2002; Dockrell et al, 2006). Finally, the institutions selected were from the same inner London borough to ensure, as far as possible, similar socio-economic status.

4.4.2.1.3 Language Ability

All the children were initially screened through the use of standardised tests. Children's verbal skills were assessed using measures of receptive and expressive language ability using the Clinical Evaluation of Language Fundamentals – Revised (CELF-R) (Semel et al., 1987). The CELF-R includes three sub-tests measuring receptive language and three sub-tests measuring expressive language ability. The receptive language sub-tests were:

- *Linguistic Concepts* - the child is shown stimulus pictures involving a series of coloured lines and is asked to respond to an instruction by pointing. The instructions increase in length and complexity and include concepts such as 'any of', 'if', 'after', 'either'.
- *Sentence Structure* – the child is shown stimulus pictures involving four pictures and is asked to respond to an instruction by pointing to the right picture.
- *Oral Directions* – the child responds to an instruction involving a series of black and white shapes by pointing to the right shape in a stimulus picture. The instructions increase in length and complexity and also include concepts such as 'all', 'before', 'to the left of', 'first', 'second', 'next to'.

Older children (8 years and above) were assessed by two more sub-tests:

- *Word Classes* – the child listens to three or four words and decides which two of the words 'go together', e.g. 'table, red, blue, hat'.
- *Semantic Relationships* – the child completes a sentence such as 'oranges are sweeter than....' using two or four options which are listed in a stimulus book (e.g. lemons, french fries, sugar, candy). These included comparative relationships, as well as spatial, passive and temporal relationships. Because many of the children with SLI have literacy difficulties, the researcher read out the answers before giving the stimulus and then read out the answers again, while pointing at them.

The expressive language sub-tests are:

- *Word Structure* – the child is shown a stimulus picture and given sentences which they have to complete.

- *Formulated Sentences* – the child is shown a stimulus picture and given a word which they have to use in a sentence to describe the picture.
- *Recalling Sentences* – the child repeats sentences of increasing length and complexity, ranging from ‘Did the boy kick the ball?’ to ‘The mailman sorted, labelled, bundled, and delivered the magazines’.

Older children (8 years and above) were assessed by one more sub-test:

- *Sentence Assembly* – the child creates two sentences from a series of words or phrases, e.g., ‘tall, ‘strong, ‘the man, ‘and’, ‘is’.

The raw score for each sub-test can be converted to a standard score based on the child’s age with selected confidence intervals, percentile ranks and age-equivalents based on UK norms. These standard scores are on a scale with a mean of 10 and a standard deviation of 3. Composite standard scores for both receptive and expressive language are calculated from the sum of the three sub-test standard scores. These give a measure of the child’s overall receptive and expressive language abilities, and can also be combined to give a ‘Total Language’ score. All of the composite scores, Receptive, Expressive and Total Language Scores, are on a scale with a mean of 100 and a standard deviation of 15.

The CELF-R was considered an appropriate assessment tool for several reasons. Firstly, it is a standardised and reliable test: reliability .77; validity with the Test of Language Development – Intermediate (TOLD-I) (Newcomer & Hammill, 1977) .68, with the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981) .52, and with the Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1974) .42. Also, the CELF-R is applicable to the age range of this thesis’ sample, and is a widely recognised measure having been used extensively in previous studies to identify children with language impairment. It gives a detailed and comprehensive account of children’s language abilities, which was considered appropriate in order to make the necessary comparisons with the performance of the comparison groups. The language criteria used in this study were that both receptive and expressive composite standard scores should be at or below -1.5 standard deviations.

4.4.2.1.4 Non-Verbal Cognitive Ability

Children's non-verbal cognitive ability was assessed using the Raven's Coloured Progressive Matrices (Raven's CPM) (Raven et al., 1998). The 1998 norms cover the age range from 5 years and 3 months to 11 years and 8 months. In this test, children are shown a pattern with a section missing and have to select the item that would complete the pattern from a choice of four. The test involves perceptual skills and reasoning. The complete set of items is presented. Children achieve a raw score of up to 36 points, and this can be converted to a percentile score. The percentile score is reported here as the 1998 norms suggest a cut-off at 25% for significantly low scores.

This test was considered appropriate to use because it is a frequently used, standardised and reliable test of non-verbal cognitive ability: reliability .80; validity with the WISC-R (Wechsler, 1974) .91 and with the Stanford-Binet Intelligence Scales .69 (Roid, 2003). The instructions of Raven's CPM are simple and straightforward which makes it suitable for use with children with language impairment. The test is also appropriate for the age range of the children with SLI participating in the study, and it is quick to administer, which proved to be helpful due to difficulties with the attention and concentration of the children. The criterion of identification for children with SLI was to obtain a centile score on the Raven's CPM no lower than the 25th percentile (or a standard score of 90).

4.4.2.1.5 Summary of Criteria

The criteria for the identification of the SLI Group were as follows:

- 1) Age equivalent score on the Clinical Evaluation of Language Fundamentals – Revised (CELF-R) (Semel et al., 1980) at least 12 months below chronological age and / or Total Language Standard Score at least 1.5 standard deviations below the mean for chronological age.
- 2) Percentile score on the Raven's CPM no lower than the 25th percentile.
- 3) Percentile score on Raven's CPM at least twenty points higher than the percentile score on the CELF-R.

4.4.2.2 Procedure

School staff were asked to suggest children for the sample who had a language and communication difficulty, no known impairment in their physical, emotional or neurological development and were at School Action or School Action Plus of the Code of Practice or who had received a Statement of Special Educational Needs with language development as their primary need. It was explained to school staff that there should be a discrepancy between children's level of functioning in the area of speech and language and that which would be expected given the children's functioning in other areas. Pupils did not need necessarily be receiving support for their language impairment.

In the first two testing sessions, the standardised verbal and non-verbal tests were administered in order to identify children who met the criteria for language and non-verbal cognitive ability. A total of 42 children met the criteria for inclusion in the study. The parents of all the children were informed of the aims of the research study and were asked to consent to their child being involved in it. The participants ranged in age from 6 to 11 years old. The youngest of the participants was 6 years old, and the oldest was 11 years and 2 months. The mean age of the SLI Group was 7 years and 10 months.

Of the 42 children, thirty-seven were male and five were female, reflecting a well-documented gender difference in children with SLI (Law et al., 2000; Shriberg et al., 1999; Tomblin, 1996). Thirteen children attended a language unit attached to a mainstream school for part of their week, and were included in some of the lessons in the mainstream school's classes. The remaining twenty-nine children attended four mainstream primary schools within an inner London borough. Twenty-seven children were at School Action Plus, and fifteen had received a Statement of Special Educational Needs stating language and communication as their primary need. All participants had attended their current school for at least one academic year. None were learning English as an additional language.

The first three chapters of the thesis highlighted the gap in the literature in terms of studies looking at the socio-emotional functioning and social cognition skills of children with SLI aged 5 to 8 years of age. In order to ascertain whether there were any developmental trends in parent and teacher ratings of children's socio-emotional functioning, pragmatic language ability, and

children's social cognition skills, the SLI participants were also sub-divided into two main groups:

- Participants up to 96 months of age (Below 8 years)
- Participants above 97 months of age (8 years and above).

This provided the following categorisation of the SLI sample:

- 25 children with SLI in the young group (6 years to 8 years old)
- 17 children with SLI in the older group (8:01 to 11:02 years old)

4.4.3 Identification of Chronological-Age Matched Participants (CA Matched Group)

4.4.3.1 Description of the Criteria

Forty-two children were selected as individual matches for the participants with SLI. Children were matched on the basis of chronological age and non-verbal cognitive ability. This group was included in order to address the first aim of the study (see section 4.2) and to make comparisons between children with similar age and non-verbal cognitive ability.

4.4.3.2 Procedure

School staff of the same four primary schools were asked to suggest children of Year 1 to Year 6 classes for the study who had no history of speech and language impairment, no known impairment in their physical, emotional or neurological development and no other academic difficulties. Where possible, efforts were made to select children from the same class as the children with SLI. Due to difficulties identifying children who could meet the criteria, children from one more primary school within the same inner London borough were included. Again, school staff were asked to suggest children who had attended their current school for at least one academic year, and for whom English was their first language.

Children were screened by administering the two tests referred to in sections 4.4.2.1.3 and 4.4.2.1.4. From these results, a CA Matched peer was selected for each child in the SLI Group.

Children within a matched pair had ages that differed by no more than 3 months and Raven's CPM scores in the same centile range (i.e. 25 to 50, 50 to 75, 75 to 90 and 90 to 100). The CA Matched children had age appropriate language skills, defined as a CELF-R score above the 25th centile.

4.4.4 Identification of Language-Age Matched Participants (LA Matched Group)

4.4.4.1 Rationale for Matching

As discussed in chapter 1, traditionally, studies have used control groups to compare children with SLI on one or more language tests in order to elucidate the nature of SLI. In particular, one of the most common strategies used in the study of SLI is to compare a language impaired group with a younger control group matched on some index of language age. In that way, if children with SLI perform more poorly than language-age matched controls on a specific test, this is regarded as an indication of atypical developmental pathways since their poor performance cannot be considered just a consequence of low language skills.

However, there are many problems in defining experimental controls for children with SLI since they are not uniformly delayed in their development of all aspects of language (Aram et al., 1993; van Weerdenburg et al., 2006; Bishop, 1997; Leonard, 1998; Stark & Tallal, 1981). Bishop (1997) describes finding a control group of typically developing younger children who exactly match an SLI Group on all aspects of language as a virtually impossible task. Also, SLI often changes with age, and the pattern of language impairment that children show can vary quite markedly, as they grow older (Leonard, 1998; Botting, 2005).

For the present study, children with SLI were matched with a group of younger children with similar language ability based on the CELF-R test. This LA Matched Group was included in order to address the second aim of the study and to make comparisons on the experimental tasks of social cognition and the standardised questionnaires between children with non-verbal cognitive ability within the normal range and same language ability with the SLI Group. In that way, the role of language in children's performance in tasks examining social cognition as well as in their difficulties with socio-emotional functioning was further explored with the aim being

to investigate whether children's difficulties with socio-emotional functioning and social cognition were related to their language impairment or whether the two problems were co-occurring.

Children within the LA Matched Group were required to have the same total receptive language raw score on the CELF-R, which translated into a centile score above the 25th centile, i.e. a score that is age-appropriate. Children within the LA Matched Group were also required to have a Raven's CPM score above the 25th percentile. For children, not old enough for the Raven's CPM norms to be applied, the British Ability Scales II Matrices sub-test was administered, and children were required to receive a score of no more than 1.5 standard deviation below the mean for their chronological-age.

It was decided to match children on the basis of their receptive language for a number of reasons. First of all, there is evidence suggesting that the ability to understand and process verbal information is linked with the areas researched in this study: emotion recognition and identification, emotion explanation and conflict resolution. Receptive language difficulties have been associated with social cognition impairments and children's ability to explain emotions in others (Clegg et al., 2005), and poorer understanding and expression of emotions (Farmer, 2000). Receptive language ability has also been related to significant social skills abilities, such as accessing and participating in interactions (Craig & Washington, 1993), which is an important skill for effective conflict resolution.

Studies reported in chapter 2 suggest that children with receptive language impairment are at a greater risk for BESD than children presenting only with expressive language impairment (Baker & Cantwell, 1987; Whitehurst & Fischel, 1994; Beitchman et al., 1996b; Botting & Conti-Ramsden, 2000; Lindsay & Dockrell, 2000). A review of the studies conducted in the area concluded that receptive language impairments are high-risk indicators for the development of later psychiatric disorders (Toppelberg & Shapiro, 2000).

The second reason for matching children on the basis of their receptive language ability was methodological. The ability to process verbal information is involved in all the elements of

social cognition so it was important to be able to relate this variable to performance on the tasks. In this study, all the social cognition experimental tasks administered to children required receptive language ability, and three out of the four tasks required both receptive and expressive language abilities. Matching on the basis of receptive language was considered appropriate in order to assess whether receptive language scores, which was a requirement for all the tasks, would be commensurate with children's performance on the experimental tasks, and investigate whether understanding affects task performance.

4.4.4.2 Description of the Criteria

Forty-two children were selected as individual matches for the participants with SLI. Children were matched on the basis of their receptive language ability. This group was included in order to address the second aim of the study and to make comparisons on the experimental tasks of social cognition and standardised questionnaires between typical and atypical children with similar language ability, and non-verbal cognitive ability within the average range.

For children selected as language-age matches who were not old enough for the Raven's CPM norms to be applied, it was necessary to use an alternative measure of non-verbal cognitive ability that included norms for this age range. The British Ability Scales II (BAS II) Matrices Scale was used for this purpose. This test is suitable for young children because the instructions are straightforward and clear. It is a standardised and reliable scale frequently used with children of that age (see also section 4.4.4.4).

4.4.4.3 Procedure

Forty-two children were individually selected on the basis of their receptive language ability. School staff were asked to select children for the study who had no known impairment in their physical, emotional or neurological development, no history of speech and language impairment or other academic difficulties. All participants had attended their current school for at least one academic year. None were speaking English as an additional language.

In the first two testing sessions the assessments for language and non-verbal cognitive ability were administered. The language measure used for the matching was the CELF-R. For each child with SLI, a match was identified who had the same raw score in the three receptive language sub-tests (Linguistic Concepts, Sentence Structure, Oral Directions) on the CELF-R but for whom this translated into a centile score above the 25th centile, i.e. a score that was age appropriate.

The LA Matched children were also required to have age-appropriate non-verbal cognitive ability. As for the SLI and CA Matched Groups, that was defined as a Raven's CPM score above the 25th centile, or, for children not old enough for the same norms on the Raven's CPM to be applied, a score no more than 1.5 standard deviations below the mean for chronological age on the BAS II Matrices subtest.

4.4.4.4 British Ability Scales II: Matrices

This scale provides a measure of non-verbal cognitive ability. It can be used with children aged 5:00 to 17:11 and was used here for children in the LA Matched Group who were not old enough for the Raven's CPM norms to be used. To successfully complete the task, children are required to identify the correct item to complete a grid of designs with a piece missing. Children receive a raw score indicating a number of correct items. This can be then converted to an ability score (that reflects both their raw score and the level of difficulty of the items presented), a t-score (a standard score based on a mean of 50 and a standard deviation of 10) and / or a percentile score. The Matrices sub-test from the BAS II was chosen as it is similar with the Raven's CPM and because it was considered to be a reliable and valid test measuring non-verbal cognitive ability: reliability .85; validity with the WISC-III performance scale .47.

4.5 DATA COLLECTION

4.5.1 Introduction

This section describes the range of measures used in this study to examine children's socio-emotional functioning, pragmatic language ability and social cognition. The section begins with a description of the two questionnaires given to children's parents and teachers measuring socio-emotional functioning and pragmatic language ability, with information about their reliability and validity. The section concludes with a detailed description of the experimental tasks of social cognition used in the main study with information about the aims, methods and the scoring used for each task presented, as well as predictions about the performance of the three groups.

4.5.2 Questionnaires

4.5.2.1 Strengths and Difficulties Questionnaire

The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997; 1999) was completed by the parents and teachers of the participants. The SDQ is a 25-item behavioural questionnaire providing a dimensional checklist-based assessment of psychological functioning. It is available for both parents and teachers reporting on 4 to 16-year-olds and a self-report version for 11 to 16-year-olds. The 25 items are divided between five subscales of five items each, generating scores for: Emotional Symptoms, Conduct Problems, Inattention-Hyperactivity, Peer Relationship Problems, and the positive attribute of Prosocial Behaviour. All subscales but the last are summed to generate a Total Difficulties Score. The items and their groupings were developed from DSM-IV symptoms associated with disorders occurring in childhood (Goodman, 2001).

The final aim of the study was to explore whether the nature of children's difficulties with socio-emotional functioning varies between home and school settings, and, therefore, the SDQ was selected so that the views of parents and teachers about children's socio-emotional functioning

could be investigated using the same measure. The SDQ is brief and can be completed in five minutes, which makes it easier to use and preferred by respondents (Goodman & Scott, 1999). This characteristic makes the SDQ particularly appropriate for use as a screening tool in community samples.

The SDQ subscale scores are used to categorise participants according to the extent of their difficulties. Typically, a participant is classified as being Normal, Borderline or Abnormal in each of the five subscales and the Total Difficulties Score. The cut-off points for the classifications have been set so that in a community sample approximately 80% of the participants are in the normal range, 10% are in the borderline range, and a further 10% are in the abnormal range on any given score (Meltzer et al., 2000).

4.5.2.1.1 Reliability and Validity of Strengths and Difficulties Questionnaire

The SDQ has been widely used in epidemiological, developmental and clinical research, as well as in clinical and educational practice. Related to the present research, the SDQ has been extensively used in studies in the area of language and communication and/or social communication (Botting & Conti-Ramsden, 2008; Lundervold et al., 2008; Lindsay et al., 2007; Farmer & Oliver, 2005; Conti-Ramsden & Botting, 2004; Lindsay & Dockrell, 2000; 2004; Tyler & Tolbert, 2002; Dunn & Hughes, 2001).

The psychometric properties of the SDQ were addressed by Goodman (2001). In order to validate the SDQ, the study looked at 10,438 British 5 to 15-year-olds and obtained questionnaires from 96% of parents and 70% of teachers. Blind to the SDQ findings, all subjects were also assigned DSM-IV diagnoses based on a clinical review of detailed interview measures.

The results of the study highlighted that the reliability and validity of the SDQ make it a useful brief measure of the socio-emotional functioning of children and adolescents. Internal consistency, test-retest stability, psychometric properties, cross-scale correlations, criterion validity, inter-informant correlations and results of comparisons with other existing scales for child psychopathology were examined.

Firstly, the results of the study confirmed the five-factor structure for all informants (parents, teachers and 11- to 16-year-olds), and all 25 items loaded onto the correct factor. In particular, the proposed structure fitted the parent report particularly well. The reliability of the SDQ was regarded as generally satisfactory when judged by internal consistency (mean Cronbach's alpha for teachers: 0.71, for parents 0.81, and for adolescents 0.66). The test-retest stability after 4 to 6 months was found to be reasonable (agreement for Total Difficulties $r = 0.72$ for parents, $r = 0.80$ for teachers and $r = 0.62$ for adolescents). Also, the inter-informant correlations were found to be moderate (parent-teacher correlation for Total Difficulties $r = 0.46$ for a sample of 7,313), but the inter-informant correlations were found to be higher with the SDQ than other comparable questionnaires (Goodman et al., 1998). The SDQ has been compared with the well-validated Child Behavior Checklist (1991a, b) and the Rutter parent and teacher scales (Elander & Rutter, 1996) and found to correlate highly with these (Goodman, 1997; Goodman & Scott, 1999). Finally, the SDQ's criterion validity, meaning its ability to distinguish between groups, has been tested. The SDQ was found to distinguish well between children recruited through a psychiatric service (high-risk sample) and children from a community low-risk sample (Goodman & Scott, 1999).

4.5.2.2 Children's Communication Checklist – Second Edition

The Children's Communication Checklist – Second Edition (CCC-2) (Bishop, 2003) is a 70-item checklist that assists in identifying difficulties with communication and pragmatic language ability in children. The checklist may also be used as a secondary diagnostic assessment to distinguish between children with a typical SLI versus a pragmatic language impairment such as that seen in autistic spectrum disorder. It is designed to be completed by an adult who has regular contact with the child, and takes approximately 5-15 minutes to complete. The respondent is asked to give a rating reflecting the frequency with which different behaviours are observed (less than once a week or never, at least once a week but not every day, once or twice a day, several times a day).

Items are divided into 10 subscales, each with seven items. The first four subscales (*Speech, Syntax, Semantics, Coherence*) assess aspects of language structure, vocabulary and

discourse. These are all areas that are often impaired in children with SLI. The next four subscales (*Inappropriate Initiation, Stereotyped Language, Use of Context, Nonverbal Communication*) cover pragmatic aspects of communication that are not readily assessed by conventional language assessments, and were of particular interest to the present study. The last two subscales (*Social Relations and Interests*) assess behaviours that are usually impaired in cases of autistic spectrum disorder, but were also of interest in this study because of their social aspect.

The main purpose of the CCC-2 is to screen for children who are likely to have a language impairment, but also to identify pragmatic language impairments in children with communication and language difficulties. Two composites are derived from the checklist. The *General Communication Composite* (GCC) is used to identify children likely to have clinically significant communication problems. The *Social Interaction Deviance Composite* (SIDC) can assist in identifying children with a communication profile characteristic of autism. For the purpose of this study, and since the pragmatic language abilities of children were of particular interest, a *Pragmatic Composite* was created by adding together the four subscales assessing pragmatic aspects of language (*Inappropriate Initiation, Stereotyped Language, Use of Context, Non-verbal Communication*) and the two autism-related subscales (*Social Relations and Interests*).

The CCC-2 was selected to be completed by both parents and teachers for a number of reasons. Firstly, Bishop et al. (2006b) found that CCC ratings were as effective as standardised language tests at identifying children with language impairments. Ensuring rich language data derived from an integration of information from parents and teachers with data from standardised language tests was the present study's aim. Both parents and teachers' views were investigated in order to ensure (as in the case of the SDQ) triangulation of data and a detailed picture of children's communicative abilities, in particular children's pragmatic language abilities. Finally, the norms of the checklist are based on children attending mainstream schools in the United Kingdom and so CCC-2 is appropriate for use with the study's population.

4.5.2.2.1 Reliability and Validity of Children's Communication Checklist – Second Edition

The CCC-2 is commonly used in research studies (Geurts & Embrechts, 2008; Bignell & Cain, 2007; Farmer & Oliver, 2005). It was standardized in the UK on 542 typically developing children aged 4–17 years. The internal consistency (alpha) values for the CCC-2 subscales ranged from .65 to .80, indicating that ratings on the CCC-2 items cluster together coherently within each subscale. To assess inter-rater agreement, CCC-2 data were gathered from a parent and a professional for 55 children. Pearson's correlations ranged from a low .15 (Stereotyped Language) to a high .79 (Social Interaction Deviance Composite). Bishop (2003) reported that the correlations for the subscales assessing pragmatic aspects of communication tended to be lower than those for structural aspects, and the correlations did not reach conventional levels of statistical significance. This was to be expected, and linked well to one of the aims of the present study since children's pragmatic language abilities are by definition context-dependent, and teachers and parents observe children in different contexts.

Two studies were conducted to look at the validity of CCC-2 (Norbury et al., 2004). In the first study, the participants were 87 children attending full-time special education for SLI, pragmatic language impairments or autistic spectrum disorders. All the parents and the teachers of half the sample completed CCC-2 checklists. In the second study, the sample was increased to include 24 children with similar diagnoses in educational contexts drawn from speech and language therapy clinics in Scotland, and then 27 children were included who were referred for clinical evaluation at a neurodevelopment clinic.

In general, it was confirmed from all three studies that CCC-2 was a useful screening instrument, and that significant differences between the clinical groups and the comparison groups were found on all the CCC-2 subscales. The CCC-2 distinguished well children with communication impairments from typically developing children and the results suggested that children with clinically significant communication disorders are unlikely to obtain a GCC above the 10th percentile, and the majority of children scored below the 3rd percentile. From the three validation studies there was also a significant report of pragmatic language impairments by parents of children with a diagnosis of SLI, which will also be further investigated in the present study.

4.5.3 EXPERIMENTAL TASKS OF SOCIAL COGNITION

4.5.3.1 Description of Experimental Tasks of Social Cognition

4.5.3.1.1 Introduction

This section describes the experimental tasks of social cognition used with the children. For each of the tasks, the aim, materials, procedure and scoring are presented. Also, research predictions for each task are made and the rationale behind the predictions is given.

4.5.3.1.2 TASK A: 'Labelling and Identifying Emotions' Task

Aim

This first social cognition task was used to establish whether children can recognise, identify, and appropriately label basic emotions: happiness, sadness, anger, and fear.

Materials

The first question asked children to identify the emotions, and the second question asked children to label the emotions. The materials used were eight felt faces portraying happy, sad, angry and frightened expressions – a set of four photographs for the first question and a set of four photographs for the second question - taken from a social skills programme, widely used in schools (Spence, 1995). The child photographs were used, and the male and female version was matched for the child's gender.

Procedure

Firstly, children were shown the set of four felt faces portraying happy, sad, angry and frightened expressions. They were asked to identify these expressions, expressively, by naming, and prompted by the question "Please can you tell me what does this boy / girl feel?"

Participants were asked to comment in turn, on each of the pictures. The order of presentation of pictures was randomised.

After having labelled the emotions, the researcher showed the second set of four photographs portraying happy, sad, angry and frightened expressions and asked the children to identify these expressions receptively, by pointing to the expression the researcher named. Participants were prompted by the question "Which of these children feel happy / sad / angry / frightened?". Again, participants were asked to comment in turn on each of the pictures which were presented in a random way.

All participants were tested individually.

Scoring

Children were given a point for a correct answer. A Total Emotion Identification Score and a Total Emotion Labelling Score were then measured out of 4.

Also, for each emotion, children were given 2 points for identifying both by naming and by pointing correctly, 1 point for doing either and 0 point for failing to identify the expression either way.

Research Predictions

a) It was expected that the SLI Group would follow typical developmental patterns in that older SLI participants (8 years and above) would score higher on the Total Emotion Identification and Total Emotion Labelling Scores than younger SLI participants (below 8 years).

b) It was also expected that the SLI Group would perform similarly to their CA Matched peers, and better than their LA Matched peers. This was predicted for several reasons: Emotion identification and labelling is a single-level task measuring the most common, universal emotions so children were expected to be familiar with them. For the first part of the task, children were asked to point to pictures, so no use of language was required. For the second part of the task, the emotion vocabulary required was not complex, and although children with

SLI have been found to have difficulties with the production of emotion labels (Ford & Milosky, 2003; Spackman et al., 2006), for this task they were required to label the four most frequently used emotions. Also, in terms of the instructions given to children, the task required minimal verbal processing. Therefore the task was intended to be a relatively easy task to provide a baseline indication of children's skills.

c) The performance of the SLI Group was expected to follow typical developmental patterns: some emotions – happiness and sadness – were expected to be easier to identify and label than others as discussed in chapter 3 (section 3.3.2).

4.5.3.1.3 TASK B: 'Inferring the Causes of Emotions' Task

Aim

Short stories were presented to the children where the main character faces various social situations that would be expected to elicit happiness, sadness, anger or fear. This task aimed to examine the ability of children to infer the emotions elicited by specific social situations.

Materials

The materials used were four felt faces portraying happy, sad, angry and frightened expressions, based on stories from a publicly available collection (National Deaf Children's Society & Reed, 2001). The stories were presented to the children through a software programme devised for the purpose of the present study, and their responses were timed.

Procedure

In order to make participants familiar with the emotional concepts used in the stories, children were asked at the beginning of the session if they sometimes feel happy, sad, angry, or frightened, and if they could give an example of such an occasion. The researcher helped children who found it difficult to provide examples. Children were then trained to use the software programme, and were instructed in the meaning of the five buttons on the keyboard.

The participants heard four stories. In each case, the story was supported by pictures of the activities described where the character's face was blank. After listening to each story, the children were asked to choose from a selection of four pictures the face that showed what the character feels by pressing a button on the keyboard. Four emotions were presented: happy, sad, angry and frightened. Children were also given the choice to press a button indicating that they do not know how the character would feel.

Instructions for the Stories

Today is Dan's birthday. He is having a party with his friends. Dan is going to blow out all the candles on his cake.

How does Dan feel?

David had a fight with his brother. Their mum told them to stop.

How does David feel?

Jack's cat has died. He loved his cat and misses him. Jack looks at the empty basket the whole day.

How does Jack feel?

Wendy sometimes wakes up in the middle of the night. Wendy does not like being in an empty room in the dark.

How does Wendy feel?

Children's responses were timed in order to investigate the effects of general processing capacity and attention for the three groups and whether these were linked to children's performance in the task.

Scoring

The participants' answers were coded with: 0 (not the right emotion) or 1 (the right emotion). A Total Emotion Identification Score was then measured out of 4.

Research Predictions

a) It was predicted that the SLI Group would follow typical developmental patterns in their ability to infer the causes of emotions in that the younger SLI participants (below 8 years) would be less accurate in inferring the causes of emotions than the older SLI participants (8 years and above).

b) It was predicted that children with SLI would perform similarly to their LA Matched peers, and differently from their CA Matched peers. This was expected for the following reasons: Inferring the causes of emotion-eliciting contexts is a multi-level task. The task instructions were linguistically more demanding than the first task, although no use of language was required from children. Therefore, the performance of children with SLI was expected to be delayed in relation to CA Matched peers and similar to their younger LA Matched peers. In addition, the performance of the SLI Group was expected to be affected by the processing demands of the task, as the information was presented verbally and visually and the children were asked to respond by pointing to the right picture. For that reason, it was considered important to time children's responses. It was predicted that even if children with SLI performed similarly to their CA Matched peers, the time to respond would be longer.

c) The performance of the SLI Group was expected to follow typical developmental patterns, in that some emotions (happiness and sadness) were expected to be easier to identify and link to social situations than others (anger and fear). As discussed in chapter 3 (section 3.3.2), younger children from all three groups were expected to be less accurate than older children at recognising stories that might elicit fear and anger.

4.5.3.1.4 TASK C: 'Emotion Explanation' Task

Aim

The third task consisted of six short stories examining children's understanding of emotions, their ability to infer the causes of emotions, and the extent to which they were able to explain

these emotions. In particular, the task aimed to examine the extent to which children referred to mental states rather than situational factors as causes of other people's emotions. In order to further pursue that aim, the researcher also asked the children to explain, besides the typical (expected) emotions, the character's atypical (unexpected) emotions.

Materials

The material consisted of six stories, designed to be used with deaf children from a study by Rieffe and Terwogt (2000). The stories described emotion-eliciting situations, adopted and simplified to be linguistically appropriate for children with SLI. Two stories were designed to provoke happiness, two to provoke sadness or anger, and two to provoke fear. In each case, the story was supported by pictures to facilitate children's understanding.

Procedure

The researcher read the story to the participants and asked them if they would like the story to be repeated. If they said yes, the researcher read the story again. After hearing each story twice, participants were asked how the character would feel and why (Question 1 and 2). If participants failed to identify an emotion, they were prompted by the question "Do you think the boy / the girl feels happy, sad, angry or frightened?". The order of the suggested emotions was randomised to avoid biased responses.

Once participants predicted and explained an emotion, the researcher agreed and then said that the character feels differently and named an atypical (unexpected) emotion. The atypical (unexpected) emotions (happiness, sadness, anger or fear) were fixed. The researcher asked participants to explain the atypical emotion (Question 3). Thus, children were asked to predict the character's typical emotion and explain both the typical and atypical emotion.

All participants were tested individually. The sessions were tape recorded, and transcriptions were derived from the tapes after the sessions.

Instructions for the Stories

This girl sees her friends are playing hide and seek. She goes outside to join them.

- How does the girl feel?
- Why (happy)?
- I would have thought so too. But the girl does not feel (happy). The girl feels frightened now that she goes outside to meet her friends. Why does the girl feel frightened?

This girl is lying in bed because she is going to sleep. The lights in her room are switched off. Suddenly, the girl hears a strange noise.

- How does the girl feel?
- Why (frightened)?
- I would have thought so too. But the girl does not feel (frightened). The girl feels angry when she hears the strange noise. Why does the girl feel angry?

This boy comes home from school. His mother says "I have a surprise for you" and she gives him a present. He does not know what is inside the box.

- How does the boy feel?
- Why (happy)?
- Yes I would have thought so too. But the boy does not feel (happy). The boy feels angry now that he got the present. Why does the boy feel angry?

This girl comes home from school. The house is dark. Suddenly, she sees someone standing in the living room. It is too dark to see who it is.

- How does the girl feel?
- Why (frightened)?
- I would have thought so too. But the girl does not feel (frightened). The girl feels happy when she sees that person. Why does the girl feel happy?

This girl's parents had said that they would go to the zoo. But now her mother says that they cannot go and that they will have to stay at home.

- How does the girl feel?
- Why (angry, sad)?
- I would have thought so too. But the girl does not feel (angry, sad). The girl feels happy now that she is not going to the zoo and she is staying at home. Why does the girl feel happy?

This boy has a dog that he plays with. Today the dog is not well and he lies in his basket.

- How does the boy feel?
- Why (sad)?
- Yes, I would have thought so too. But the boy does not feel (sad). The boy feels frightened now that his dog is not well. Why does the boy feels frightened?

Scoring

Children were given a point for every correct typical emotion prediction. A Total Emotion Prediction score was calculated at the end out of 6. The same procedure was followed for each emotion-cluster (happiness / sadness or anger / fear). Children were given 2 points if they predicted the correct emotion in both stories of each cluster, 1 if they predicted the emotion for only one story, and 0 if they did not predict the correct emotion in either story.

In order to ascertain the extent to which children attributed mental states to the character in their emotion explanations, responses were assigned to one of the following categories.

(1) *Fact beliefs*: This category was applied when the participant referred to the character's beliefs about the situation. For example: 'She is happy, because she thinks that her friends will come over to play now she isn't going to the zoo'.

(2) *Desires & preferences*: This category was applied to answers that referred to the character's desires. For example: 'She wants to stay at home and play with her friend'. Value

beliefs, that is, beliefs that do not refer to reality but to someone's preferences, also fell into this category.

(3) *Situational*: Answers that only elaborated on the situation or referred to another situation without reference to a character's mental state fell into this category. For example: 'She is happy because she is going to play with her friend'.

(4) *Missing*: Responses fell into this category if the participant had not predicted correctly the typical emotion or if they did not answer.

Children were then given a score of 1 for each story in which they referred to the character's beliefs or desires/preferences about the situation. As there were two stories in each cluster, children could receive scores of 0, 1 or 2 for each cluster. A Total Mental State Attribution Score was then calculated (both for the typical and atypical emotions). Children could receive a minimum of 0 (= no mental state attributions in their explanations) and a maximum of 12 (= use of mental state attributions for all the stories, both typical and atypical).

Research Predictions

a) It was predicted that there would be developmental differences between the younger SLI participants (below 8 years) and the older SLI participants (8 years and above) in that the younger SLI participants were expected to be less accurate in predicting emotions but also less capable in their use of mental states to explain emotions than the older SLI participants.

b) It was expected that children with SLI would perform similarly to their LA Matched peers, and differently from their CA Matched peers in the typical emotion prediction questions and the emotion explanation questions. This was expected for a number of reasons: Children were asked to predict the four basic emotions and although the task instructions were linguistically more demanding than the two first tasks, children with SLI were expected to be familiar with the four basic emotions. Therefore, children with SLI were predicted to show a delayed performance in emotion prediction, which would be similar to the LA Matched Group. Similarly, performance on the emotion explanation questions was expected to be different for the SLI Group when compared to their CA Matched peers, but similar to their LA Matched peers as children are required to use more complex and sophisticated language.

c) The performance of the SLI Group was expected to follow typical developmental patterns in that the causes of some emotions (happiness and sadness) would be easier to infer. Linked to the first prediction above, younger children's explanations of emotions for all three groups were expected to be less sophisticated, using less mental state attributions, than older children's explanations.

4.5.3.1.5 TASK D: 'Conflict Resolution Abilities' Task

Aim

The final task aimed to assess children's response to a difficult social situation with a peer, their knowledge of a range of conflict resolution strategies and their ability to apply these strategies appropriately in different social contexts. In general, the aim was to assess the participants' skills in thinking of behavioural responses in a variety of key social situations.

Materials

The four hypothetical conflict stories were presented orally to each child. The context of the story was equated in length, taken from the 'Child Role Play Measure', developed by Dodge et al. (1985). For the present study, only one out of six categories of the 'Child Role Play Measure' was used, and that was the 'Response to Peer Provocation' category. These are stories which describe situations in which the pupil's task is to preserve self-integrity while maintaining peer status. Dodge et al. (1985) report a high level of inter-rater agreement for the role play scoring system (Cohen's kappa = 0.92).

Procedure

Hypothetical problem solving stories were presented orally to the children. The children were instructed as follows:

"I would like to know what boys/ girls your age do in different situations in school. I'm going to tell you some things that might happen to you in school. Then, I'd like you to think of what you would do and say if the same thing happens to you. There are no right or wrong answers; I just want you to tell me what you would really do and tell me what you would really say".

Immediately following each presentation, the children were asked if they would like the story to be repeated. Participants were asked to imagine themselves in each of four social situations in turn and to indicate possible responses to the situations. Each participant was then asked questions and hypothetical solutions were required. The questions were open-ended ('What do you say?' 'What do you do?') to elicit conflict resolution strategies. The stories were presented in a random order.

All participants were tested individually. The sessions were tape recorded, and transcriptions were derived from the tapes after the sessions.

Scoring

The scoring system was developed by Dodge et al. (1985) and is set out in the following section. For each story, the scale has six possible categories ranging from low-level conflict resolution strategies to high-level conflict resolution strategies (indicating a response of an age-appropriate and sophisticated conflict resolution strategy). The child's responses were assigned to one of the six different categories.

Instructions and Categories for Each Story

- You are in the dining hall and you carry out your tray of food. There is a boy / girl walking right next to you. He / She wants to sit by his / her other friend. By accident, he / she bumps you. You drop your whole tray on the floor. He / She looks back at you!

Scoring:

6: Responses asking for further clarification: Responses that deal with the person in the situation or acknowledge the accidental nature of the event, e.g. 'Well if s/he did it by accident...Ok', 'I would ask if s/he would help me pick up my food'.

5: Situational Responses: Responses that deal only with the spilled tray, e.g. 'I'd get more food', Responses that attempt to clarify the motivation behind the incident, e.g. 'Why did you do that?', 'What have you done?', 'You knocked my tray over'.

4: Being Submissive: Responses indicating that child is being submissive or responses involving retaliation of a non-physical type, e.g. 'I'd leave and go sit by my friend cause I wouldn't know what else to do'.

3: Involving an Adult: Responses aiming to involve an adult, e.g. 'I'd get a supervisor'; 'I'd get a teacher'. Note: When getting a teacher is used as a threat, score as 2.

2: Verbal Retaliation: Responses that are threats, e.g. 'I'm going to tell', 'Don't you do it again'. Responses that criticise the child, e.g. 'The least you could do is say you are sorry', 'Thanks a lot', 'Pay attention', 'You clean it up'. Responses that involve name calling, e.g. 'You clumsy fool'.

1: Physical Retaliation: Retaliation responses that involve physical force, e.g. 'I'd dump his tray', 'I'd hit her'.

0: No response: Doesn't know what to do, doesn't answer, does nothing.

- The teacher has the whole class to line up for lunch. You are standing in the line. Then a boy / girl comes and stands in front of you. He / she says, 'I'm standing here now'.

Scoring

6: Responses asking for further clarification: Asks the child to go to the end of the line or to allow them to return to their original position, e.g. 'I think you need to go to the end of the line', 'Let me have my place back. I was here first'. Participant asks the child why s/he cut in, e.g. 'That's OK if s/he's a friend, if not, I'd ask why s/he cut in'.

5: Situational Responses: Comments on the child's behaviour without asking for a specific replacement behaviour, e.g. 'You cut in', 'No you don't', 'Thanks a lot', 'I was here first', 'Stop it', 'Out of my way!'.

4: Being submissive: e.g. 'I wouldn't do anything' 'I would let them cut in even if it's unfair'.

3: Involving an Adult: Tells the teacher.

2: Verbal Retaliation: Threatening, swearing, e.g. 'You go back to the line or else', 'Go back or I will tell the teacher what you did'.

1: Physical Retaliation: At that time or later, e.g. 'I'd push him out of the way', 'I'd knock over his/her lunch tray later'.

0: No response: Doesn't know what to do, doesn't answer, does nothing.

- You are ready to go to school and your mother tells you that you can't leave the house unless you put on your boots and your ugly black raincoat. When you get to school the rain has stopped and all the other children have on shorts. A boy / girl sees you and starts laughing.

Scoring

6: Responses asking for further clarification: Attempts to give the child his/her viewpoint or give a rationale for his/her behaviour, e.g. 'How would you like it if your mum made you wear this?'. Says to child, 'I can wear whatever I want and so can you', e.g. 'My other raincoat doesn't have any pockets so I had to wear this', 'It was raining you know'. Attempts to explain the other child's behaviour. Asks child to stop laughing or pointing because it makes them feel sad. Asks for more information, e.g. 'What's wrong? Why are you laughing at me?'

5: Situational Responses: e.g. 'You are laughing at me', 'You are making fun of me'.

4: Being Submissive: Trying to hide clothes. Takes off raincoat, hides it, or goes home to change.

3: Involving an adult: Tells the teacher.

2: Verbal Retaliation: Child threatens or swears, e.g. 'You look dump too', 'I don't care', 'I'd hit her', 'I'm gonna kick him', 'I'll take the raincoat and put it on you to see how you like it'. Tells or warns the child to 'shut up' or 'get lost'. Says they would feel angry.

1: Physical Retaliation: Child uses physical force.

0: No response: Doesn't know what to do. Would do nothing.

- A boy / girl in your class brought a new toy to school. He / she lets you play with it. He / she said you could use it for the whole of break time. After a few moments, he/she comes over to you and says, 'I want my toy back right now'.

Scoring

6: Responses asking for further clarification: Asks for clarifications or gives reasons to the child for keeping the toy for a bit longer. Points out that a promise was made, e.g. 'You promised. If you don't keep your promise, I won't trust you anymore, then I'd wait to see if they

kept their promise'. Asks why the child wants the toy back. Asks if they can play with the toy longer, or if they could both play.

5: Situational Responses: Responses that do not deal with the problem. The child exclaims, 'But you said I could have it all break time'.

4: Being Submissive: Returns the toy, e.g. 'I'd give it back, after all it's theirs'. Child cries and gives the toy back.

3: Involving an adult: Tells the teacher.

2: Verbal Retaliation: Shouts at the child. Threatens not to let the child play with his/her toys in the future.

1: Physical Retaliation: Refuses to return the toy and hits the other child, e.g. 'You said I could play with it so I will', 'I'd say, 'No and I'd run'. Throws the toy out of the reach of the child. Hits or pushes the child.

0: No response: Doesn't know what to do or doesn't answer. Says they would do nothing.

Finally, a Total Conflict Resolution Strategies Score was developed from the strategies children used in the four stories above (based on the Dodge et al.'s scoring system):

- For 'No Response / I don't Know' answers children received a score of 0,
- For the use of 'Physical Retaliation' conflict resolution strategies children received a score of 1,
- For the use of 'Verbal Retaliation' conflict resolution strategies children received a score of 2,
- For answers indicating that children would choose to 'Involve an Adult' to resolve their conflicts children received a score of 3,
- For answers indicating that children were 'Being Submissive' children received a score of 4,
- For answers indicating that children would try to resolve the conflict themselves but using 'Situational Responses' children received a score of 5, and finally
- For answers indicating that children would try to solve the conflict themselves and would 'Ask for Clarification' from their peers, children received a score of 6.

Since four hypothetical scenarios were presented, children could receive a minimum score of 0 and a maximum score of 24.

Research Predictions

a) It was predicted that there would be developmental differences between the two age groups (children below 8 years and children 8 years and above) in that older SLI participants were expected to be able to use more efficient and sophisticated conflict resolution strategies in comparison to younger SLI participants.

b) It was predicted that children with SLI would perform differently from their CA Matched but that their performance would be delayed and thus similar to their LA Matched peers. This was expected because the instructions of the task were linguistically demanding, and because children were required to use more sophisticated and complex language.

4.5.3.1.6 General Scores Derived from the Four Social Cognition Experimental Tasks

The experimental tasks used above to explore children's social cognition skills were combined to create a **Social Cognition Composite Score**. This composite score was used in chapter 8 where relationships between children's socio-emotional functioning, language, non-verbal cognitive ability and performance on social cognition tasks were explored. The Social Cognition Composite Score was derived from three different general scores: a Total Emotion Prediction Score, a Total Mental State Attribution Score, and a Total Conflict Resolution Strategies Score.

From the first three experimental tasks, a **Total Emotion Prediction Score** was calculated. That was based on:

- The Total Emotion Labelling Score (min 0 – max 4) and Total Emotion Identification Score (min 0 – max 4) from Task A,
- The Total Emotion Prediction Score from Task B (min 0 – max 4), and

- The Total Emotion Prediction Score from Task C (min 0 – max 6).

Thus, for the Total Emotion Prediction Score children could receive a minimum score of 0 and a maximum score of 18.

Also, from Task C, the **Total Mental State Attribution Score** was used. Since there were 2 stories for each cluster (Happiness Cluster, Sadness/Anger Cluster and Fear Cluster) and children were asked to explain both the typical and the atypical emotions, children could receive a minimum score of 0 and a maximum score of 12 for the Total Mental State Attribution Score.

Finally, the **Total Conflict Resolution Strategies Score** developed from the strategies children used in Task D (based on the Dodge et al.'s scoring system) was used. Since four hypothetical scenarios were presented, children could receive a minimum score of 0 and a maximum score of 24.

These three scores were combined to yield a **Social Cognition Composite Score**. Children could receive a minimum of 0 and a maximum of 54. The Social Cognition Score is unequally-weighted due to the different score ranges of the component sub-scales.

4.5.3.2 Validity and Reliability of Experimental Tasks of Social Cognition

Validity

Validity refers to how well a test measures what it is supposed to measure (Field, 2005). On a test with high validity the items will be closely linked to the test's intended focus. Validity can be assessed in a number of ways (Harvey, 1996; Gipps, 1994; Wainer & Braun, 1988).

Typically, with experimental tasks much effort is spent in piloting the tasks to ensure they evaluate what is intended. For the present research, a pilot study (Appendix A) was carried out first with typically developing children only, using methods based on tasks previously used with language impaired children and deaf children but of older age. This was done in order to

ensure that children's performance in the experimental tasks provide a true indication of their competence. In their discussion about researching children's perspectives, Dockrell et al. (2000) describe children's performance being determined by their developmental levels in relevant domains, and also by the nature of the task. In the present thesis, the main objective of the pilot study was to identify the reasons why children might have passed or failed the particular tasks, and to address issues related to what are commonly called Type I errors, that is, errors that occur because a child's competence is underestimated.

In particular, two main features that may lead to an underestimation of children's competence have been taken into account in the present research:

Linguistic:

Due to the nature of SLI participants' main difficulty, careful consideration was placed on the effects of language on participants' performance. That is, an effort was made to ensure that children did not fail the experimental tasks because they did not understand the language being used or because they did not have the necessary vocabulary knowledge to give correct responses. To ensure that, following the pilot study all the tasks were adapted and simplified to be linguistically appropriate for language impaired children. Two out of four tasks were adapted from studies used with deaf children, where the participants' language and communication capacities were almost certainly constrained. Moreover, for two out of four tasks children were required to use another means of communication instead of oral language, that is, children were asked to point to the correct answer. By doing that, it was hoped that their language limitations would not constrain their performance. Also, all children were instructed and trained carefully to perform the experimental tasks (see Description of the Experimental Tasks - section 4.4.2.2). Finally, the researcher tested understanding by asking the children whether they would like the instructions or the story to be repeated.

Memory Skills:

In order to enhance the validity of the experimental tasks, careful consideration was also placed on the effects of short-term memory demands of the tasks on participants' performance. That is, additional demands being placed on the memory system or information processing

resources may lead children to fail a task even though they understand the nature of the task (Dockrell et al., 2000). As mentioned above, for 2 out of 4 tasks, children were asked to point to drawings or pictures representing the various emotions (happiness, sadness, anger, fear or I don't know), This technique was also used by a number of studies, most recently Spackman et al. (2006), in their study investigating the effects of language impairment on children's ability to infer emotional reactions. In the present study, care was taken to ensure that asking children to point to the pictures / drawings would not make the tasks overly complex. The pilot study highlighted the fact that children's performance was actually enhanced when drawings / pictures were used. These findings were also supported by two pilot studies conducted by Spackman et al. (2006) prior to their main study. In the first pilot study carried out, the researchers asked two groups of typically developing children to name the emotion likely to be experienced from a scenario being read to them: one group had to label the emotion and the other one had to point to emotion cards. Children performed similarly under both conditions. In the second pilot study, children with language impairments were presented with a task in which they identified the emotion expressed in pictures of faces. In the first condition, children were asked to respond to each face by simply naming the emotion verbally, and in the second condition children had to use emotion cards. Performance in the two conditions showed no statistically significant difference.

Apart from conducting a pilot study prior to the main research in order to enhance the validity of the experimental tasks, it is also possible to include techniques typically used in the construction of psychometric measures. For the purpose of this study, the criterion validity of the experimental tasks, meaning whether the tasks are consistent with what we already know and expect, was considered. In particular, a type of criterion validity, concurrent validity, was examined. Concurrent validity looks at the association of the tasks with pre-existing indicators or tools that already measure the same concept.

Studies that have looked at children's emotional understanding and knowledge have used the same or similar tasks. For example, Pons et al. (2003) examined individual differences in typically developing children's emotion understanding by using cartoon scenarios and four different emotional outcomes (represented as facial expressions) for children to choose.

Emotion cards/photographs were also used in a longitudinal study by Hughes and Dunn (2002) investigating children's accounts of anger and sadness in themselves and significant others.

A literature review prior to the beginning of this research indicated that the same techniques were used in previous studies with children with language impairment. Trauner et al. (1993) used photographs to assess emotion understanding and found that children with SLI (age 9 to 13 years) identified facial expressions of happiness, anger and sadness as accurately as did typically developing chronological age-matched peers, but that the rate of their responses was significantly longer. Also, Holder and Kirkpatrick (1991) used black-and-white slides of various adult male and female faces expressing different emotions to assess the ability of children with and without language impairments to interpret emotions from facial expressions. The results revealed children with language impairments to be less accurate interpreters of emotion and to spend more time identifying emotions. Ford and Milosky (2003) extended this work by considering a more complex aspect of emotion understanding, the ability to infer the causes of emotion eliciting contexts, and used similar tasks to do so. And finally, a recent study by Spackman et al (2006), investigating the effect of language impairments on children's ability to infer emotional reactions, used similar tasks and found that typically developing children were significantly more accurate than children with language impairment in their ability to identify emotions and infer the emotions elicited by specific social situations.

Reliability

Test reliability is the aspect of test quality concerned with whether or not a test produces consistent results (Patton, 2002). For the purpose of this study, four experimental tasks of social cognition were used with children, and a number of steps were taken in order to ensure that the tasks used were reliable.

Firstly, the pilot study described in Appendix A was conducted in order to draw reliable conclusions about the relations of the experimental tasks. Efforts were made to administer a series of tasks that increased in difficulty, while measuring related social cognition skills. The study focused predominantly on the four primary emotions of happiness, sadness, anger and fear, and children's understanding of those four emotions was investigated through different tasks linked and related to each other.

Furthermore, as with the validity of the tasks, techniques typically used in the construction of psychometric measures were used where possible. The first step was to consider the internal consistency of the tasks. The internal consistency method estimates how well the set of items on a test correlate with one another; that is, how similar the items on a test are to one another. In the present study, for the task measuring children's ability to explain and predict typical and atypical emotions (Task C), it was decided to use two stories for each emotion cluster: Two stories were designed to provoke happiness, two to provoke sadness or anger, and two to provoke fear. In that way, any systematic differences found between conditions, could not be caused by the content of one story, since the stories were varied over conditions.

Another way to ensure the reliability of the tasks was to use inter-observer or inter-rater reliability. Inter-rater reliability provides a measure of the dependability or consistency of scores that might be expected on a test or a scale. For that purpose, Cohen's Kappa (Cohen, 1968) statistic is used to estimate the degree of consensus between two raters with values above 0.60 indicating good agreement between the two raters. For the present study, inter-rater reliability was used for Task C measuring children's ability to predict and explain typical and atypical emotions, as well as for Task D measuring children's conflict resolution abilities. The children's answers were tape recorded and transcribed in order to be judged by a second rater who did not participate in the administration of the experimental tasks. Cohen's Kappa for Task C was 0.94 and 0.86 for Task D.

4.6 GROUP COMPARISONS

The collated data from the two questionnaires completed by children's parents and teachers and the experimental tasks of social cognition carried out by the children were used to make three sets of comparisons between the participants. First of all, comparisons were made between the younger SLI participants, who were below 8 years, and the older SLI participants, who were 8 years and above. This was important in order to address the first aim of the study which was to investigate whether there were developmental differences in the socio-emotional functioning of children with SLI, their pragmatic language ability and in their social cognition skills. Thus, the first comparison aimed to explore whether younger children with SLI were

perceived by their parents and teachers to present the same or different difficulties in the area of socio-emotional functioning and pragmatic language ability as older children with SLI, and also whether there were developmental differences in the performance of younger and older children with SLI in tasks of social cognition (results reported in Appendix B).

Secondly, comparisons were made between the children with SLI and the chronological age-matched children. This was considered essential in order to address the first aim of the study which was to explore whether children with SLI experience difficulties in their socio-emotional functioning in relation to the ability of a group of children of the same chronological age and non-verbal cognitive ability with age-appropriate language skills. Thus, the second comparison aimed to investigate whether children with SLI were perceived by their parents and teachers to present with difficulties in the area of socio-emotional functioning, and also whether children with SLI performed on a par with their peers in experimental tasks of social cognition. Information from this set of comparisons could therefore indicate one of two possibilities: If the analyses show that parents and teachers rate the socio-emotional functioning of both groups similarly, and also if the two groups perform similarly in the experimental tasks of social cognition, this would imply that, although the SLI Group experiences impaired language abilities, their socio-emotional functioning and social cognition skills follow a typical developmental pattern. Otherwise, if children with SLI are found to perform poorly in the experimental tasks of social cognition or are perceived by their parents and teachers as different in their socio-emotional functioning compared to their chronological-age matched peers, this could indicate that children with SLI experience a particular difficulty in the area of socio-emotional functioning and social cognition as a result of their language impairment and/or additional processing limitations associated with SLI.

The third set of comparisons was between the views of parents and teachers of children with SLI and that of parents and teachers of the language-age matched children, and the performance of children with SLI and that of language-age matched children in the experimental social cognition tasks. This comparison was carried out in order to explore the views of parents and teachers of the SLI Group in relation to the views of parents and teachers of a younger group matched for language comprehension, and also in order to investigate the performance of children with SLI in the experimental tasks of social cognition in relation to a

younger group matched for receptive language ability. This comparison will serve to address the second aim of the study which attempts to explore the reasons why children with SLI present with difficulty in the area of socio-emotional functioning and investigate the mechanisms behind their performance. Again, according to the results, this comparison could allow us to reach one of two major conclusions: 1) If the SLI Group is found to perform similarly in the experimental tasks of social cognition and is perceived by their teachers and parents to do equally well with the LA Matched Group in the area of socio-emotional functioning, that would point to the fact that the SLI Group experience difficulty in the area of socio-emotional functioning and social cognition, when considering the children's average non-verbal cognitive ability, and most importantly their greater than the LA Matched Group years of age but also years of educational and social experience, or 2) If the SLI Group was found to perform differently in the experimental social cognition tasks and was perceived by their parents and teachers to perform differently from the language-age matched group in the area of socio-emotional functioning, then this would indicate a specific difficulty that could not be explained solely by children's poor language status, and would suggest that socio-emotional functioning and social cognition is dissimilar pointing to atypical developmental trajectories.

4.7 RATIONALE FOR THE STATISTICAL ANALYSIS USED

Data for the present study were analysed using the statistical packages SPSS v14.0 and SPSS v16.0. Prior to the main analysis for the study, all data were first explored through histograms. This preliminary overview of the data aimed to examine whether there was considerable heterogeneity in the variance of the children's scores.

4.7.1 Group Comparisons

In order to carry out the comparisons described in chapter 4, a series of *t*-tests and one-way analysis of variance tests (ANOVA) were used for parametric data to test for significant differences between the scores of the two age groups within the SLI Group (below 8 years or 8 years and above) and then the three participants groups. For all significant one-way ANOVAs, effect sizes are reported as eta squared η^2 . This is an estimate of the degree of association between the independent variable and the dependent variable based on the sample. The effect

size is calculated by dividing the Mean Sum of Squares by the Total Sum of Squares. For *t*-tests, the effect size *d* is presented. This indicates the number of standard deviations by which the two samples differ. It is calculated by subtracting the two sample means from each other and dividing by their pooled standard deviation.

For post hoc comparisons, the conservative Bonferonni test was used. Furthermore, when presenting ANOVAs, *t*-tests and correlations, the data were corrected for Type I error (rejecting the null hypothesis when it is true) using a Bonferonni correction. This was done when multiple significance tests were carried out and on all planned comparisons. Thus, the probability of .05 was divided manually by the number of comparisons being made, i.e. for group comparisons a probability of .002 (.05/20) was used as an indicator of statistical significance.

Group differences for the SDQ and CCC-2 subscales were analysed using a Multivariate Analysis of Variance (MANOVA). This analysis was considered appropriate for a number of reasons: Firstly, conducting MANOVA instead of multiple ANOVAs to investigate several dependent variables simultaneously (in this case, the five SDQ subscales and the ten CCC-2 subscales) reduced the possibility of inflating the familywise error rate (Type I error). A further reason for choosing to conduct MANOVA to explore the differences of the three groups was so as not to ignore any possible relationship between the dependent variables (Field, 2005). MANOVA takes account of the relationship between outcome variables. The rationale behind this is that participants' responses for each of the five SDQ subscales and the ten CCC-2 subscales are very likely to be correlated. Ignoring the correlation by modelling each of the subscales separately may therefore lead to erroneous statistical inferences. To account for the existence of correlation in participants' responses, it was decided to employ a multivariate response model that allows the error terms of the different models to be correlated. Related to the above point, modelling each of the subscales separately with ANOVAs can indicate only whether groups differ along a single dimension whereas MANOVA has the power to detect whether groups differ along a combination of dimensions (Huberty & Morris, 1989).

When reporting the results of MANOVAs, the author also indicates that the statistical assumptions of MANOVA (independence, random sampling, multivariate normality and homogeneity of covariance matrices) have been met. Follow-up analysis was conducted in

order to analyse and interpret group differences; when a statistically significant MANOVA is found, separate ANOVAs on each of the dependent variables were used. The overall multivariate test protects against inflated Type I error rates because if that initial test is non-significant (i.e. the null hypothesis is true) then any subsequent tests are ignored (any significance must be a Type I error because the null hypothesis is true). However, because a significant MANOVA, more often than not, reflects a significant difference for one, but not all, of the dependent variables, a Bonferonni correction was also applied to the subsequent ANOVAs. In that way, all the ANOVAs, and not only the dependent variable for which group differences genuinely exist, were protected (Bray & Maxwell, 1985). For all significant subsequent ANOVAs, effect sizes are reported again as eta squared η^2 .

When comparisons are being made between the three groups for categorical data, Pearson's chi-square tests χ^2 were carried out. For all significant chi-square tests χ^2 effect sizes are reported as Cramer's V. This is a measure of the strength of the association between two categorical variables used when one of these variables has more than two categories.

4.7.2 Correlations and Regressions

When the data were analysed for correlations, Pearson's bivariate correlation r was used. According to Cohen's criteria for effect sizes (Cohen, 1988), Pearson's correlations $r < 0.30$ were considered to be low, $r = 0.30-0.50$ moderate, and $r > 0.50$ high. If one-tailed probability values are quoted, this is noted in brackets. In some cases, partial correlations were used in the analysis controlling for the effect of age. The effects of age were partialled out as it was considered that some aspects of pragmatic language ability may be affected by increase in age, as might some aspects of socio-emotional functioning and performance on social cognition tasks.

In chapter 8, hierarchical regressions were conducted to examine the second aim of the thesis, and in particular to investigate what predicts measures of socio-emotional functioning for the three participant groups. Hierarchical regressions were chosen as they were able to examine each variable's unique contribution in terms of what is added to the equation at its own point of

entry. When running hierarchical regressions, the data were checked to ensure that the statistical assumptions (no perfect multicollinearity, homoscedasticity and normally distributed errors) have been met.

CHAPTER FIVE: RESULTS

5.1 ORGANISATION OF THE CHAPTER

The first four chapters of this thesis focused on a critical review of the literature and an examination of the methods used to assess the socio-emotional functioning of children with SLI. Following this, the results of within-group comparisons for the SLI Group are provided and then the three groups participating in the study are described.

5.2 WITHIN-GROUP COMPARISONS FOR PARTICIPANTS WITH SLI

In the first section of this chapter, the details of the SLI Group are provided. The detailed picture of the children's scores are shown in Table 5.1, which reports on the language and non-verbal cognitive measures of participants within the four mainstream primary schools and participants within the Language Unit attached to a mainstream primary school.

On average, SLI participants from the mainstream schools scored higher on Receptive Language Standard Scores ($M = 17.45$, $SE = .66$) than SLI participants from the Language Unit ($M = 17.08$, $SE = .99$). This difference however was not significant ($t(40) = -.31$, *ns*). When comparing SLI participants in CELF-R Expressive Language Standard Score, it was found again that participants attending the mainstream schools scored higher ($M = 17.21$, $SE = .57$) than participants attending the Language Unit ($M = 15.69$, $SE = .65$) but again the difference was not statistically significant ($t(40) = -1.57$, *ns*). Similar results were repeated for the CELF-R Total Language Standard Score with participants from mainstream schools scoring higher ($M = 34.66$, $SE = 1.15$) than participants from the Language Unit ($M = 32.77$, $SE = 1.49$) but with no statistically significant difference between their mean scores ($t(40) = -.94$, *ns*).

Table 5.1

Details of Participants with SLI: Standard Score means (SDs)

	Mainstream N = 29	Language Unit N = 13
Chronological Age	91.07 (72 – 134)	103.15 (75 – 133)
Gender		
▪ <i>Girls</i>	5	-
▪ <i>Boys</i>	24	13
Code of Practice		
▪ <i>School Action Plus</i>	27	-
▪ <i>Statemented</i>	2	13
CELF-R Receptive Language Score	17.45 (3.60)	17.08 (3.57)
CELF-R Expressive Language Score	17.21 (3.08)	15.69 (2.35)
CELF-R Total Language Score	34.66 (6.21)	32.77 (5.38)
Raven's CPM	3.41 (2.62)	2.46 (2.22)

5.3 COMPARISON BETWEEN CHILDREN WITH SLI, CA MATCHED AND LA MATCHED GROUPS ON SELECTION MEASURES

The results from the standardised measures of language and non-verbal cognitive ability are presented in this section to describe the profile of the children's language and non-verbal cognitive ability skills but also in order to validate the matching procedures.

Profile of the Language skills and Nonverbal Ability of the SLI, CA Matched and LA Matched Groups

Initially, one-way ANOVAs were carried out with Group as the between-subjects variable to look at children's scores on the language measures. As expected, children in the SLI Group scored significantly lower than both comparison groups on the z-scores of the CELF-R; receptive language score of the CELF-R ($F(2,123) = 134.94, p < .001, \eta^2 = .68$); expressive language score of the CELF-R ($F(2,123) = 120.72, p < .001, \eta^2 = .66$); total language score of CELF-R ($F(2,123) = 151.86, p < .001, \eta^2 = .71$).

In order to validate the matching procedures, the three groups were compared on: chronological-age (in months), raw scores of the three Receptive Language sub-tests of the CELF-R, and percentile scores of Raven's CPM. The detailed picture of the children's scores are shown in Table 5.1, which reports on the language and non-verbal cognitive measures used for the identification of the three groups. Again, analysis of the children's scores was conducted using one-way ANOVAs with group (3 levels) as the between-subjects factor, and planned comparisons using *t*-tests with Bonferonni corrections were then carried out.

These analyses showed a significant effect of age ($F(2,123) = 32.25, p < .001, \eta^2 = .34$) where children with SLI did not differ in age from the CA Matched Group ($p = .91, d = .01$), but differed significantly from the LA Matched Group ($p < .001, d = 1.24$). The latter two groups also differed significantly from each other ($p < .001, d = 1.26$).

The three groups differed significantly on the raw scores of the three receptive language sub-tests of the CELF-R. On the raw-scores of the Linguistic Concepts sub-test, the three groups differed significantly ($F(2,123) = 62.0, p < .001, \eta^2 = .50$), where children with SLI did not differ from the LA Matched Group ($p = 1.0, d = .0001$) but differed significantly from the CA Matched Group ($p < .001, d = 1.74$). Also, both the LA and CA Matched Groups differed significantly from each other ($p < .001, d = 1.74$). Raw scores on the Sentence Structure also showed a significant effect of group ($F(2,123) = 38.27, p < .001, \eta^2 = .38$), where children with SLI did not differ from the LA Matched Group ($p = 1.0, d = 0.001$), but the difference with the CA Matched Group was statistically significant ($p < .001, d = 1.23$). Raw scores on the Oral Directions sub-test of the CELF-R showed a significant group effect ($F(2,123) = 67.14, p < 0.001, \eta^2 = .52$), where children with SLI again did not differ from the LA Matched Group ($p = 1.0, d = 0.001$), but differed significantly from the CA Matched Group ($p < .001, d = 1.80$).

Finally, when looking at children's non-verbal cognitive ability scores, the three groups showed no difference in their performance on the percentiles of Raven's CPM ($F(2,118) = 1.62, p > .05, \eta^2 = .26$). Children in the SLI group did not differ significantly from the CA Matched Group ($p = 1.0, d = 0.01$), and did not differ with the LA Matched Group either ($p > .05, d = .29$).

In summary, children with SLI matched their comparison groups very closely on the relevant language and non-verbal cognitive measures, indicating the effectiveness of the individual matching. The following table presents a summary of the characteristics of the three groups including their ages, their scores on the standardised tests of language and non-verbal cognitive ability.

Table 5.2

Summary of participants details: Raw score means (SDs) and range values for children's chronological age in months, along with the Raven's CPM and CELF-R measures used for matching.

	SLI (N = 42)	CA (N = 42)	LA (N = 42)	Significant Differences
Age (in months)	94.81 (20.15) 72-134	95.21 (21.02) 69 - 137	68.88 (6.40) 60-85	SLI = CA > LA
Raven's CPM (centile)			(N = 37)	
Mean	61.43	61.43	70.41	SLI = CA = LA
(SD)	(23.74)	(23.74)	(28.26)	
Range	25-95	25-95	25-95	
CELF-R – Linguistic Concepts				
Mean	12.26	17.62	12.26	SLI = LA < CA
(SD)	(2.72)	(2.14)	(2.72)	
Range	10-18	9-20	10-18	
CELF-R – Sentence Structure				
Mean	19.29	22.88	19.29	SLI = LA < CA
(SD)	(2.28)	(1.92)	(2.28)	
Range	17-25	16-26	17-25	
CELF-R – Oral Directions				
Mean	7.38	15.98	7.38	SLI = LA < CA
(SD)	(3.90)	(3.97)	(3.90)	
Range	4-18	7-22	4-18	
CELF-R – Receptive Language (standard score)				
Mean	17.33	31.36	27.86	SLI < CA = LA
(SD)	(3.55)	(4.78)	(3.33)	
Range	9-25	25-46	24-35	
CELF-R – Expressive Language (standard score)				
Mean	16.74	32.36	31.14	SLI < CA = LA
(SD)	(2.93)	(5.73)	(5.18)	
Range	11-22	24-50	24-44	
CELF-R – Sum of Standard Scores				
Mean	34.07	63.71	59.00	SLI < CA = LA
(SD)	(5.96)	(9.60)	(7.38)	
Range	20-47	50-96	50-78	

CHAPTER SIX: QUESTIONNAIRE RESULTS

6.1 ORGANISATION OF THE CHAPTER

Chapter 6 presents the findings of the study based on an analysis of the two questionnaires administered to children's parents and teachers. A description of the two questionnaires was given in section 4.5.2 and details of the statistical analysis used were presented in section 4.7. The first section focuses on the Strengths and Difficulties Questionnaire (SDQ), which examined the socio-emotional functioning of children according to their parents and teachers. The second subsection focuses on Children's Communication Checklist - Second Edition (CCC-2), which looked at children's pragmatic language ability. In each section, the findings for children with SLI are compared to the two matching groups, the CA Matched Group and the LA Matched Group. Within group comparisons for the SLI Group are reported in Appendix B. Further on, the chapter investigates relationships between children's parents and teachers reports. Initial interpretation of the results is attempted and implications for further analysis are discussed.

6.2 RESULTS OF THE STRENGTHS AND DIFFICULTIES QUESTIONNAIRE (SDQ)

6.2.1 Comparison with the CA Matched and the LA Matched Groups

6.2.1.1 Group Comparisons Based on Parent Ratings

In order to address the first aim of the study related to an examination of whether children with SLI present with difficulties in the area of socio-emotional functioning, comparisons with two groups of typically developing children were conducted.

The first section compares the three groups based on the parent questionnaires. The numbers of questionnaires returned were: SLI Group, all 42 questionnaires returned; CA Matched

Group, 38 out of 42 questionnaires returned; LA Matched Group, 36 out of 42 questionnaires returned.

As explained in chapter 4 (section 4.5.2.1), Goodman's (1997) three-category system (Normal, Borderline and Abnormal) was used to categorise the data and the scores for the SLI Group were compared with those from the CA and LA Matched Groups. For all the subscales except the Prosocial subscale, the lower the score obtained the fewer difficulties the child is reported to have. For the Prosocial subscale, the higher the score obtained the more prosocial the child is reported to be. The detailed results from the three groups (with percentages according to the SDQ three-category system) as rated by their parents are presented in Table 6.1.

Table 6.1

SDQ Percentages for the SLI, CA and LA Matched Groups - Parents

		SLI (n = 42)	CA (n = 38)	LA (n = 36)
Total Difficulties	Normal	52.4	94.7	88.9
	Borderline	2.4	5.3	8.3
	Abnormal	45.2	.0	2.8
Emotional Symptoms	Normal	64.3	94.7	83.3
	Borderline	11.9	5.3	11.1
	Abnormal	23.8	.0	5.6
Conduct Problems	Normal	52.4	94.7	94.4
	Borderline	21.4	5.3	5.6
	Abnormal	26.2	.0	.0
Inattention-Hyperactivity	Normal	26.2	89.5	77.8
	Borderline	23.8	5.3	13.9
	Abnormal	50.0	5.3	8.3
Peer Relationship Problems	Normal	42.9	92.1	77.8
	Borderline	21.4	5.3	13.9
	Abnormal	35.7	2.6	8.3
Prosocial	Normal	42.9	97.4	88.9
	Borderline	26.2	2.6	8.3
	Abnormal	31.0	.0	2.8

Results for the Total Difficulties Score indicate that, although half of the children with SLI were rated within the normal range (52.4%), a large proportion was rated as being within the abnormal range by their parents (45.2%).

A further analysis explored the differences between the three groups using the numerical data of the SDQ. Means, standard deviations and significant differences between the groups are presented in Table 6.2.

Table 6.2

SDQ Means (SDs) for the SLI, CA and LA Matched Groups - Parents

		SLI (n = 42)	CA (n = 38)	LA (n = 36)	Significant Differences
Total Difficulties	Mean	15.17	5.26	6.39	CA = LA < SLI
	SD	7.38	4.13	4.61	
Emotional Symptoms	Mean	2.93	1.24	1.42	CA = LA < SLI
	SD	2.42	1.32	1.88	
Conduct Problems	Mean	2.88	.66	.56	CA = LA < SLI
	SD	2.37	.96	.84	
Inattention- Hyperactivity	Mean	6.19	2.26	3.22	CA = LA < SLI
	SD	2.34	2.31	2.45	
Peer Relationship Problems	Mean	2.98	1.11	1.31	CA = LA < SLI
	SD	2.34	1.00	1.30	
Prosocial	Mean	6.05	8.13	8.00	CA = LA < SLI
	SD	2.28	1.58	1.60	

Group differences for the SDQ subscales were analysed using a MANOVA with group (3 levels) as a between factor. Box's test of the assumption of equality of covariance matrices and Levene's test of equality of error variances were found to be non-significant (and therefore the assumption of homogeneity of variance has been met).

The results of MANOVA indicated that there was a significant group main effect, Wilk's Lambda: $F(2,113) = 6.35, p < .001, \eta^2 = .26$. Groups differed significantly in the Total

Difficulties Score ($F(2,113) = 37.05, p < .001, \eta p^2 = .39$), and all the SDQ subscales (Emotional Symptoms: $F(2,113) = 9.13, p < .001, \eta p^2 = .13$; Conduct Problems: $F(2,113) = 27.01, p < .001, \eta p^2 = .32$; Inattention-Hyperactivity: $F(2,113) = 30.20, p < .001, \eta p^2 = .34$; Peer Relationship Problems: $F(2,113) = 14.90, p < .001, \eta p^2 = .20$; Prosocial: $F(2,113) = 15.63, p < .001, \eta p^2 = .21$).

Post-hoc univariate F-tests and pairwise multiple comparison tests with a Bonferonni correction applied revealed that for the Total Difficulties Score the mean score of the children with SLI was significantly higher than the mean score of both the CA and LA Matched children ($p < .001$) and that the mean score of the children in the CA Matched Group did not differ significantly from the mean score of the children in the LA Matched Group (*ns*). The same pattern was repeated for all the SDQ subscales ($p < .005$).

6.2.1.2 Group Comparisons Based on Teacher Ratings

As with the parents' analysis, Goodman's (1997) three-category system (Normal, Borderline and Abnormal) was initially used to categorise the data, and the scores from the SLI Group as rated by their teachers were compared with those from the CA and LA Matched Groups. All the questionnaires ($N = 42$) were returned by the teachers for the SLI and CA Matched Group, and 39 out of 42 questionnaires were returned for the LA Matched Group. The detailed results from the three groups (with percentages according to the SDQ three-category system) are presented in Table 6.3.

Table 6.3

SDQ Percentages for the SLI, CA and LA Matched Groups - Teachers

		SLI (n = 42)	CA (n = 42)	LA (n = 39)
Total Difficulties	Normal	57.1	90.5	82.1
	Borderline	14.3	7.1	17.9
	Abnormal	28.6	2.4	.0
Emotional Symptoms	Normal	78.6	100	92.3
	Borderline	4.8	.0	5.1
	Abnormal	16.7	.0	2.6
Conduct Problems	Normal	71.4	92.9	89.7
	Borderline	7.1	7.1	5.1
	Abnormal	21.4	.0	5.1
Inattention- Hyperactivity	Normal	52.4	85.7	87.2
	Borderline	11.9	11.9	5.1
	Abnormal	35.7	2.4	7.7
Peer Relationship Problems	Normal	61.9	90.5	94.9
	Borderline	9.5	9.5	5.1
	Abnormal	28.6	.0	.0
Prosocial	Normal	40.5	97.6	76.9
	Borderline	11.9	2.4	20.5
	Abnormal	47.6	.0	2.6

For the Total Difficulties Score, teachers rated about a third of children in the SLI Group as being within the abnormal range, with a high incidence of difficulties being reported on the Prosocial subscale.

A further analysis was conducted on the numerical data of the SDQ. Table 6.4 presents SDQ means, standard deviations and significant differences between the three groups as rated by their teachers.

Table 6.4

SDQ Means (SDs) for the SLI, CA and LA Matched Groups - Teachers

		SLI (n = 42)	CA (n = 42)	LA (n = 39)	Significant Differences
Total Difficulties	Mean	12.57	4.45	5.82	CA = LA < SLI
	SD	7.86	4.42	4.71	
Emotional Symptoms	Mean	2.76	.95	.97	CA = LA < SLI
	SD	2.73	1.36	1.73	
Conduct Problems	Mean	1.90	.60	.92	CA = LA < SLI
	SD	2.40	.93	1.28	
Inattention- Hyperactivity	Mean	5.00	1.98	3.10	CA = LA < SLI
	SD	2.62	2.19	2.40	
Peer Relationship Problems	Mean	2.90	.95	.82	CA = LA < SLI
	SD	2.35	1.24	1.23	
Prosocial	Mean	4.67	8.36	7.33	CA = LA < SLI
	SD	2.63	1.46	2.00	

As for the data obtained from the parents' questionnaires, a MANOVA with group (3 levels) as a between factor was conducted and Levene's test of equality of variances was found to be non-significant for all dependent variables. The results of the analysis indicated that there was a significant group main effect for the SDQ questionnaire completed by teachers, Wilk's Lambda: $F(2,120) = 7.21, p < .001$. The three groups differed significantly in the Total Difficulties Score and all the SDQ subscales (Total Difficulties: $F(2,120) = 22.59, p < .001, \eta^2 = .27$; Emotional Symptoms: $F(2,120) = 10.81, p < .001, \eta^2 = .15$; Conduct Problems: $F(2,120) = 6.92, p = .001, \eta^2 = .10$; Inattention-Hyperactivity: $F(2,120) = 16.83, p < .001, \eta^2 = .21$; Peer Relationship Problems: $F(2,120) = 19.36, p < .001, \eta^2 = .24$; Prosocial: $F(2,120) = 34.69, p < .001, \eta^2 = .36$).

On all the SDQ subscales and the Total Difficulties Score, post-hoc univariate F-tests showed that the mean score for the children with SLI was significantly higher than the mean score of both the CA and LA Matched children ($p < .005$), and that the mean score of the CA Matched children did not differ significantly from the mean score of the LA Matched Group (*ns*).

6.2.2 Comparison of Parent and Teacher Ratings on SDQ

To address the fourth aim of the study of an investigation of possible context related differences of children's socio-emotional functioning, a further analysis was conducted to compare parents' and teachers' ratings for all three groups. Table 6.5 reports on the SDQ percentages according to the three-category system (Goodman, 1997).

Table 6.5

Percentages of SDQ subscales – Parents and Teachers (Combined Groups)

		Parents (n = 116)	Teachers (n = 120)	χ^2
Total Difficulties	Normal	77.6	75.8	5.97
	Borderline	5.2	13.3	
	Abnormal	17.2	10.8	
Emotional Symptoms	Normal	80.2	90.0	5.12
	Borderline	9.5	3.3	
	Abnormal	10.3	6.7	
Conduct Problems	Normal	79.3	84.2	1.54
	Borderline	11.2	6.7	
	Abnormal	9.5	9.2	
Inattention-Hyperactivity	Normal	62.9	74.2	3.46
	Borderline	14.7	10.0	
	Abnormal	22.4	15.8	
Peer Relationship Problems	Normal	69.8	81.7	4.51
	Borderline	13.8	8.3	
	Abnormal	16.4	10.0	
Prosocial	Normal	75.0	70.8	1.39
	Borderline	12.9	11.7	
	Abnormal	12.1	17.5	

To test for differences among the frequencies of difficulties reported by parents and teachers, Pearson's chi-square analyses were initially conducted to the SDQ subscales for all three groups. These indicated that there was no statistical significant association between parents' and teachers' reports on any of the SDQ subscales for the sample as a whole (*ns*).

Of particular interest though was whether there were any differences between parents' and teachers' reports for any of the three groups. Therefore, further analysis was conducted on the numerical data of the SDQ to investigate general trends between parents' and teachers' reports within the three groups. Differences between parents' and teachers' ratings on SDQ subscales were examined using a 2 (rater: parent and teacher) X 3 (group: SLI, CA and LA) mixed measures ANOVA for each subscale. Table 6.6 presents the means, standard deviations and interaction effects for each subscale.

Table 6.6

Mean (SD) SDQ Scores For The Three Groups and F Statistic For Main Effect of Rater.

	Parents			Teachers			F (Rater)	F (Rater * Group)
	SLI (n = 42)	CA (n = 38)	LA (n = 36)	SLI (n = 42)	CA (n = 42)	LA (n = 39)		
Emotional Symptoms	2.93 (2.42)	1.24 (1.32)	1.42 (1.88)	2.76 (2.73)	.97 (1.38)	.97 (1.73)	1.23	.09
Conduct Problems	2.88 (2.37)	.66 (.96)	.56 (.84)	1.90 (2.40)	.64 (.95)	.92 (1.28)	.94	3.54*
Inattention- Hyperactivity	6.19 (2.34)	2.26 (2.31)	3.22 (2.45)	5.00 (2.62)	2.13 (2.20)	3.10 (2.40)	2.38	1.33
Peer Relationship Problems	2.98 (2.34)	1.11 (1.00)	1.31 (1.30)	2.90 (2.35)	.95 (1.27)	.82 (1.23)	1.14	.31
Prosocial	6.05 (2.28)	8.13 (1.58)	8.00 (1.60)	4.67 (2.63)	8.33 (1.49)	7.33 (2.00)	5.57*	3.15*
Total Difficulties	15.17 (7.38)	5.26 (4.13)	6.39 (4.61)	12.57 (7.86)	4.67 (4.51)	5.82 (4.71)	2.73	.81

* $p < .05$ for d.f. 1

From the mean SDQ scores, it is apparent that parents rated all groups of children with higher scores, indicative of greater levels of problems, than teachers did. Parents rated Total Difficulties Score higher, but there was a non-significant main effect of rater ($F(1, 230) = 2.73$, ns). A significant rater main effect was found only for the Prosocial Behaviour subscale ($F(1, 230) = 5.57$, $p < .05$), indicative of a significant difference between parents' and teachers'

ratings for the whole sample. The results showed that teachers rated children as having more difficulties with Prosocial Behaviour, although the effect size was small ($\eta p^2 = .02$).

The results also point to statistically significant interaction effects in two cases. There was a statistically significant rater by group interaction for the Prosocial Behaviour subscale ($F(2, 230) = 3.15, p < .05, \eta p^2 = .02$), reflecting that teachers reported lower scores than parents, indicative of greater levels of problems with prosocial behaviour. Post-hoc tests pointed to significant differences between parent and teacher ratings only for the SLI Group ($p < .0005$), but not for the CA Matched or LA Matched Group (*ns*).

The interaction effect for Conduct Problems by contrast, ($F(1, 230) = 3.54, p = .03, \eta p^2 = .03$), reflected higher parent scores, indicating more problems, than teachers. Post-hoc tests confirmed again that there were statistically significant differences between parent and teacher ratings for the SLI Group only ($p < .0005$), but not for the CA and LA Matched Groups (*ns*).

Comparison of Parent and Teacher Ratings for the SLI Group

For the last part of the SDQ questionnaire analysis, a comparison between parent and teacher ratings was conducted only for the SLI Group so as to determine whether the same children are being identified on the SDQ by parents and teachers. Table 6.7 below reports on the correlations between parents and teachers SDQ ratings for the SLI Group. Partial correlations, controlling for the effects of age, were carried out to examine the relationships between parent and teacher ratings as it was considered that some aspects of socio-emotional functioning (e.g. prosocial behaviour) may be affected by increase in age.

As seen in Table 6.7, there were strong positive associations found between parent and teacher ratings on all the SDQ subscales, highlighting the fact that parents and teachers of the appeared to identify the same children from the SLI Group as experiencing difficulties with their socio-emotional functioning.

Table 6.7

Partial Correlations between Parent and Teacher SDQ Ratings – SLI Group

	Teachers Emotional Symptoms	Teachers Conduct Problems	Teachers Inattention Hyperactivity	Teachers Peer Relationship Problems	Teachers Prosocial Behaviour	Teachers Total Difficulties
Parents Emotional Symptoms	.62**	.54**	.43**	.37*	-.14	.63**
Parents Conduct Problems	.22	.45**	.46**	.40**	-.51**	.49**
Parents Inattention- Hyperactivity	.21	.35**	.68**	.25	-.38*	.48**
Parents Peer Relationship Problems	.40**	.32*	.17	.40**	-.02	.41**
Parents Prosocial Behaviour	-.09	-.17	-.29	-.29	.48**	-.27
Parents Total Difficulties	.50**	.57**	.57**	.51**	-.36*	.69**

** p < .005, * p < .05

6.2.3 Summary of SDQ Results

Significant problems were identified by the SDQ questionnaire for the SLI Group. Although half of the children in the SLI Group were rated as experiencing no difficulties by their parents (52.4%) and teachers (57.1%), a high proportion of children with SLI presented with BESD, with 45.2% (according to parents) and 28.6% (according to teachers) rated above the SDQ 'abnormal' cut-off for the Total Difficulties Score. Both parents and teachers reported fewer emotional symptoms and conduct problems. In contrast, Inattention-Hyperactivity and Peer Relationship Problems were reported by parents as significant difficulties and Inattention-Hyperactivity and limited Prosocial Behaviour were reported by teachers as the most common difficulties.

When the children's scores were compared with their CA Matched and LA Matched peers, all the subscales varied significantly between the groups with the SLI Group being rated significantly higher than both matched groups by both parents and teachers.

There was a general agreement between parents' and teachers' reports for the whole sample; there was only one statistical significant difference found and that was for the Prosocial Behaviour subscale with teachers expressing more concerns than parents. When looking at differences between the groups though, there were two statistically significant differences reported between parent and teacher ratings and that was in the case of the SLI Group only. Although correlational analyses showed that parents and teachers identified the same children as experiencing difficulties with their socio-emotional functioning, there were some differences in the types of difficulties reported by the two groups: parents of children with SLI reported more conduct problems than teachers, whereas teachers reported more problems with prosocial behaviour than parents.

6.3 RESULTS OF THE CHILDREN'S COMMUNICATION CHECKLIST – SECOND EDITION (CCC-2)

The second part of chapter 6 reports on the Children's Communication Checklist – Second Edition (CCC-2), which examined children's pragmatic language ability. Results from the SLI Group are analysed in relation to the two matching groups – the CA Matched and the LA Matched Groups – to explore group differences and address the second aim of the study. Following that, a comparison of parent and teacher reports is conducted in order to address the final aim of the study.

6.3.1 Comparisons with CA Matched and LA Matched Groups

6.3.1.1 Group Comparisons Based on Parent Ratings

The numbers of questionnaires returned were: SLI Group, 32 out of 42 questionnaires returned; CA Matched Group, 38 out of 42 questionnaires returned; LA Matched Group, 40 out of 42 questionnaires returned.

Table 6.8 presents the mean scaled scores for the three groups on the parents CCC-2. All subscales are scored so that a high scaled score indicates communicative strength. A scaled

score of 6 or more is regarded to be within normal limits. The two composite scores (*General Communication Composite - GCC*, *Social Interaction Deviance Composite - SIDC*) and the one created for the purpose of this study (*Pragmatic Composite*) are reported at the end of the table.

As shown in Table 6.8, for the SLI Group, with the exception of two subscales (Inappropriate Initiation and Interests), all the other subscales fell below a score of 6, indicating significant communicative difficulties. The group had particular problems with subscales A to D, with relatively better scores on the subscales assessing pragmatic aspects of language. Nevertheless, children's average scores on subscales E to J are below the means of the two comparison groups, with the average score on subscale G (Use of Context) and on subscale I (Social Relations) particularly poor.

The results of the MANOVA with group (3 levels) as a between factor indicated that the groups differed significantly in the Pragmatic Composite, the GCC, the SIDC and all the CCC-2 subscales (Wilk's Lambda: $F(2,107) = 19.59, p < .001$), with a large effect size ($\eta^2 = .66$).

Table 6.8

Mean CCC-2 Scaled Scores (Parent Ratings)

		SLI Group (n = 32)	CA Group (n = 38)	LA Group (n = 40)
A. Speech	Mean	3.50	11.84	11.03
	SD	2.24	1.32	2.91
B. Syntax	Mean	2.00	10.84	10.88
	SD	2.28	2.40	2.97
C. Semantics	Mean	2.88	12.71	11.78
	SD	1.62	2.84	2.37
D. Coherence	Mean	3.31	11.63	12.18
	SD	1.37	2.31	2.91
E. Inappropriate Initiation	Mean	8.84	12.82	13.68
	SD	1.78	3.46	3.64
F. Stereotyped Language	Mean	5.47	12.29	12.13
	SD	1.36	2.54	2.72
G. Use of Context	Mean	4.69	12.26	12.73
	SD	2.40	3.05	3.30
H. Nonverbal Communication	Mean	5.38	11.68	11.88
	SD	2.32	2.00	2.52
I. Social Relations	Mean	3.47	10.08	10.30
	SD	2.40	3.03	2.88
J. Interests	Mean	8.44	12.66	13.13
	SD	2.46	4.00	3.58
Pragmatic Composite	Mean	36.28	71.79	73.83
	SD	9.25	14.93	14.84
GCC	Mean	36.06	96.08	96.25
	SD	10.12	15.69	18.90
SIDC	Mean	14.44	.21	3.13
	SD	6.89	6.15	6.03

Post-hoc univariate F-tests of group differences showed a statistically significant difference between the SLI Group and both comparison groups in all the CCC-2 subscales, the Pragmatic Composite, the GCC and the SIDC scores as rated by children's parents (Pragmatic Composite: $F(2, 107) = 83.39, p < .001, \eta^2 = .60$; GCC: $F(2, 107) = 167.25, p < .001, \eta^2 = .75$; SIDC: $F(2, 107) = 47.93, p < .001, \eta^2 = .47$).

For all the CCC-2 subscales the same pattern was repeated whereby there was a significant main group effect (Speech: $F(2, 107) = 139.31, p < .001, \eta^2 = .72$; Syntax: $F(2, 107) = 132.43, p < .001, \eta^2 = .71$; Semantics: $F(2, 107) = 178.53, p < .001, \eta^2 = .76$; Coherence: $F(2, 107) = 152.75, p < .001, \eta^2 = .74$; Inappropriate Initiation: $F(2, 107) = 23.05, p < .001, \eta^2 = .30$; Stereotyped Language: $F(2, 107) = 93.71, p < .001, \eta^2 = .63$; Use of Context: $F(2, 107) = 78.21, p < .001, \eta^2 = .59$; Nonverbal Communication: $F(2, 107) = 88.41, p < .001, \eta^2 = .62$; Social Relations: $F(2, 107) = 64.99, p < .001, \eta^2 = .54$; and Interests: $F(2, 107) = 19.00, p < .001, \eta^2 = .26$). It is worth noting that for most CCC-2 subscales the effect sizes were large indicating a substantial group effect.

The pairwise multiple comparison tests showed a statistically significant difference between the SLI Group and both comparison groups in all the CCC-2 subscales, the Pragmatic Composite, the GCC and the SIDC scores as rated by children's parents ($p < .001$). There was no statistically significant difference found between the two comparison groups in any of the CCC-2 subscales (*ns*).

6.3.1.2 Group Comparisons Based on Teacher Ratings

The numbers of questionnaires returned were: SLI Group, 41 out of 42 questionnaires returned; CA Matched Group, all 42 questionnaires returned; LA Matched Group, 41 out of 42 questionnaires returned. Table 6.9 shows mean CCC-2 scaled scores for subscales A-J and the three composite scores.

As shown in Table 6.9, for the SLI Group, with the exception of three subscales (Inappropriate Initiations, Stereotyped Language and Interests), all the other subscales fell below a score of 6,

indicating significant communicative and pragmatic difficulties. According to children's teachers, the group had particular problems with subscales A to D, with relatively better scores on the subscales assessing pragmatic aspects of language. Nevertheless, children's average scores on subscales E to J were below the means of the two comparison groups, with the average score on subscale G (Use of Context) and on subscale I (Social Relations) particularly poor, replicating the ratings from the parents' reports discussed in section 6.3.1.1. This was also indicated by the overall Pragmatic Composite Score, which in relation to the two comparison groups was low.

As for the parents' comparisons, a MANOVA test showed that the groups differed significantly in the Pragmatic Composite, the GCC, the SIDC and all the CCC-2 subscales (Wilk's Lambda: $F(2, 121) = 10.39, p < .001$), with a large effect size ($\eta p^2 = .55$).

Post-hoc univariate F-tests of group differences showed a statistically significant difference between the SLI Group and both comparison groups in all the CCC-2 subscales, the Pragmatic Composite, the GCC and the SIDC scores as rated by children's teachers (Pragmatic Composite: $F(2, 121) = 80.03, p < .001, \eta p^2 = .57$; GCC: $F(2, 121) = 130.63, p < .001, \eta p^2 = .68$; SIDC: $F(2, 121) = 12.09, p < .001, \eta p^2 = .16$).

For all the CCC-2 subscales the same pattern was repeated whereby a significant main group effect was found (Speech: $F(2, 121) = 76.82, p < .001, \eta p^2 = .55$; Syntax: $F(2, 121) = 89.13, p < .001, \eta p^2 = .59$; Semantics: $F(2, 121) = 102.42, p < .001, \eta p^2 = .62$; Coherence: $F(2, 121) = 128.21, p < .001, \eta p^2 = .67$; Inappropriate Initiation: $F(2, 121) = 34.43, p < .001, \eta p^2 = .36$; Stereotyped Language: $F(2, 121) = 75.21, p < .001, \eta p^2 = .58$; Use of Context: $F(2, 121) = 91.94, p < .001, \eta p^2 = .60$; Nonverbal Communication: $F(2, 121) = 66.04, p < .001, \eta p^2 = .52$; Social Relations: $F(2, 121) = 49.40, p < .001, \eta p^2 = .41$; and Interests: $F(2, 121) = 11.11, p < .001, \eta p^2 = .15$). Again as for the parents' ratings, for most CCC-2 subscales the effect sizes varied from medium to large indicating that the observed difference between the three groups was important.

The pairwise multiple comparison tests showed a statistically significant difference between the SLI Group and both comparison groups in all the CCC-2 subscales, the Pragmatic Composite, the GCC and the SIDC scores as rated by children's teachers ($p < .001$). Pairwise comparisons did not reveal any differences between the two comparison groups for any of the CCC-2 subscales (*ns*).

Table 6.9

Mean CCC-2 Scaled Scores (Teachers' Ratings)

		SLI Group (n = 41)	CA Group (n = 42)	LA Group (n = 41)
A. Speech	Mean	4.24	11.31	11.22
	SD	3.54	1.95	3.18
B. Syntax	Mean	3.05	10.55	10.95
	SD	3.30	2.50	3.21
C. Semantics	Mean	4.02	12.00	10.59
	SD	2.09	2.98	2.92
D. Coherence	Mean	4.44	12.19	11.54
	SD	2.14	1.71	3.21
E. Inappropriate Initiation	Mean	8.68	13.17	13.24
	SD	2.61	2.26	3.54
F. Stereotyped Language	Mean	6.12	12.26	11.61
	SD	2.08	1.96	3.24
G. Use of Context	Mean	4.68	12.81	12.27
	SD	2.47	2.60	3.86
H. Nonverbal Communication	Mean	4.76	11.45	10.59
	SD	2.65	2.44	3.44
I. Social Relations	Mean	4.02	10.57	9.44
	SD	2.80	3.00	3.71
J. Interests	Mean	9.71	13.02	13.46
	SD	5.13	2.65	3.66
Pragmatic Composite	Mean	37.27	73.55	70.05
	SD	11.97	10.92	18.92
GCC	Mean	39.27	95.48	92.00
	SD	16.24	12.65	22.76
SIDC	Mean	10.39	2.43	2.44
	SD	10.02	8.12	7.00

6.3.2 Comparison of Parent and Teacher Ratings on the CCC-2

Following the initial analysis of the CCC-2, a comparison of parents' and teachers' ratings was conducted in order to address the final aim of the study and explore whether there were differences between parents' and teachers' views about children's pragmatic language ability. The parents' and teachers' ratings of the children's communication and pragmatic language ability were examined using a 2 (rater: parent and teacher) X 3 (group: SLI, CA and LA Matched Groups) mixed measures ANOVA for each subscale. Table 6.10 reports the means, standard deviations and interaction effects for each subscale.

When looking at the whole sample together, from the mean CCC-2 scores, there was no significant rater main effect for any of the CCC-2 subscales apart from the Nonverbal Communication subscale, where parents rated children higher, indicative of fewer levels of concerns ($F(1, 230) = 4.29, p < .05$), although the effect size was small ($\eta^2 = .01$). With the exception of the SLI Group, parents rated children's GCC higher, but again there was a non-significant main effect of rater ($F(1, 230) = .06, ns$).

From the results reported below, there were statistically significant interaction effects in two cases. For Semantics, the interaction effect ($F(1, 230) = 4.39, p = .03, \eta^2 = .03$) reflected a difference between parent and teacher ratings, and subsequent post-hoc tests pointed to significant differences between parents and teachers ratings only for the SLI Group ($p < .001$), with parents rating the vocabulary skills of children with SLI as poorer than teachers did. Post-hoc tests did not reveal any differences between parent and teacher ratings for the CA Matched Group and the LA Matched Groups (ns).

Finally, there was a statistically significant rater by group interaction for children's SIDC ($F(1, 230) = 3.26, p = .04, \eta^2 = .01$), suggesting more difficulties with the social interactions of children as reported by parents than by teachers. Subsequent, post-hoc tests pointed to the fact that the difference in parent and teacher ratings existed only in the case of the SLI Group ($p < .0005$), and not for the two comparison groups (ns).

Table 6.10

Mean (SD) CCC-2 Scores for SLI, CA and LA Matched Groups and F Statistic for Main Effect of Rater.

	Parents (N = 110)			Teachers (N = 124)			F (rater)	F (rater*group)
	SLI	CA	LM	SLI	CA	LM		
A. Speech	3.50 (2.24)	11.84 (1.36)	11.03 (2.91)	4.24 (3.54)	11.31 (1.95)	11.22 (3.18)	.15	1.10
B. Syntax	2.00 (2.28)	10.84 (2.40)	10.88 (2.97)	3.05 (3.30)	10.55 (2.50)	10.95 (3.21)	.55	1.12
C. Semantics	2.88 (1.62)	12.71 (2.84)	11.78 (2.37)	4.02 (2.09)	12.00 (2.98)	10.59 (2.92)	.55	4.39*
D. Coherence	3.31 (1.37)	11.63 (2.31)	12.18 (2.91)	4.44 (2.14)	12.19 (1.71)	11.54 (3.21)	1.23	2.73
E. Inappropriate Initiation	8.84 (1.78)	12.82 (3.46)	13.68 (3.64)	8.68 (2.61)	13.17 (2.26)	13.24 (3.54)	.04	.35
F. Stereotyped Language	5.47 (1.36)	12.29 (2.54)	12.13 (2.72)	6.12 (2.08)	12.26 (1.96)	11.61 (3.24)	.01	1.10
G. Use of Context	4.69 (2.40)	12.26 (3.05)	12.73 (3.30)	4.68 (2.47)	12.81 (2.60)	12.27 (3.86)	.00	.55
H. Nonverbal communication	5.38 (2.32)	11.68 (2.00)	11.88 (2.52)	4.76 (2.65)	11.45 (2.44)	10.59 (3.44)	4.29*	.83
I. Social Relations	3.47 (2.40)	10.08 (3.03)	10.30 (2.88)	4.02 (2.80)	10.57 (3.00)	9.44 (3.71)	.02	1.38
J. Interests	8.44 (2.46)	12.66 (4.00)	13.13 (3.58)	9.71 (5.13)	13.02 (2.65)	13.46 (3.66)	1.81	.37
Pragmatic Composite	36.28 (9.25)	71.79 (14.93)	73.83 (14.84)	37.27 (11.97)	73.55 (10.92)	70.05 (18.92)	.03	.91
GCC	36.06 (10.12)	96.08 (15.69)	96.25 (18.90)	39.27 (16.24)	95.48 (12.65)	92.00 (22.76)	.06	.94
SIDC	14.44 (6.89)	.21 (6.15)	3.13 (6.03)	10.39 (10.02)	2.43 (8.12)	2.44 (7.00)	.71	3.26*

* $p < .05$

6.3.3 Summary of CCC-2 Results

Both parents and teachers reported increased difficulties in the communication and pragmatic language ability of children with SLI, with scores falling below the average for all the CCC-2 subscales apart from the Inappropriate Initiations, Stereotyped Language and Interests subscales which were within the average range. Both parents and teachers rated children with SLI better on the subscales assessing pragmatic aspects of language in relation to the subscales assessing language structure. Nevertheless, pragmatic language ability was considered significantly impaired by both parents and teachers.

When compared with their typically developing peers, there were significant differences between the group means on all the CCC-2 subscales, with the SLI Group being rated significantly lower by both parents and teachers than both matched groups.

Although there was a general rater agreement in most CCC-2 subscales, two differences were reported in children's communication and pragmatic language abilities in relation to parents' and teachers' views. Parents of the children with SLI reported more difficulties with Semantics than teachers. There were also differences between parent and teacher ratings in the SIDC for the SLI Group, with parents reporting more difficulties than teachers. Again, the differences appeared only for the SLI Group, and not for the two typically developing comparison groups.

6.4 INITIAL INTERPRETATION OF THE RESULTS AND IMPLICATIONS FOR FURTHER ANALYSIS

The SLI Group was rated both by parents and teachers as experiencing more problems in their socio-emotional functioning and their pragmatic language ability than both their CA Matched peers and the younger LA Matched Group. Both questionnaires provided useful information about the different types of difficulties with socio-emotional functioning and pragmatic language ability children with SLI experienced in comparison to their typically developing peers.

When looking at the whole sample together, there were no apparent differences found between what parents and teachers reported for children's behaviour or pragmatic language ability;

significant variations between parents and teachers existed only for the SLI Group. In particular, on the SDQ questionnaire, parents regarded children's conduct behaviour problems as more concerning than teachers did, whereas teachers highlighted difficulties in skills impeding children's behaviour and relationships. These differences might indicate the importance of context as different patterns of prevalence were found for different types of difficulties with respect to the school (as judged by teachers) and the home (as judged by parents). Although overall both parents and teachers reported difficulties with inattention and hyperactivity, parents focused more on social difficulties, whereas teachers reported more difficulties with specific skills that facilitate and enhance social interactions, such as sharing, helping and comforting peers. These patterns raise the question whether these specific variations reflected absolute differences in the children's behaviour in home and school settings or whether the main reason of variance was the rater.

Differences between parents and teachers could be linked to the fact that teachers are more skilled than parents in identifying the reason why children's peer interactions fail and can more readily ascertain the difference in specific skills between the SLI Group and their typically developing peers. Prosocial skills are often less easy for parents to notice whereas they are more apparent to teachers who can readily compare children's behaviour with their peers in the structured school environment. Also, these results may suggest that certain social skills are more highly regarded in certain situations, and this seems to be the case for prosocial skills. Parents on the other hand are more concerned than teachers about children's conduct behaviour problems which might reflect difficulties to manage children's behaviour at home.

In terms of the CCC-2, the differences between parent and teacher reports were found in children's vocabulary skills (Semantics subscale) and social interactions (SIDC subscale). In terms of children's vocabulary skills, it could be the case that differences in ratings reflected the fact that parents of children with SLI have more opportunities to listen to their children using age-appropriate and varied vocabulary in different contexts as they have the most contact with their children in comparison to teachers who can only explore children's vocabulary skills within the structured school environment. Also, as seen in CCC-2, parents of children with SLI continued to report more problems with children's social interactions, whereas teachers focused more on specific pragmatic language ability promoting and facilitating social

relationships. As for the SDQ questionnaire, the parents seemed to be more concerned about their children's relationships, whereas teachers focused more on the gap in children's social interactional skills in relation to their typically developing peers.

In general, the results reported above indicated that both questionnaires showed the increased levels of difficulty for the SLI Group in aspects of socio-emotional functioning and in pragmatic language ability. To further understand the factors affecting children's socio-emotional functioning, it was important to consider different aspects of children's social interactions. Thus, in order to understand what affects children's socio-emotional functioning, it was necessary to examine children's competences to ascertain whether they had specific difficulties or whether they lacked specific skills, in accordance to what their parents and teachers reported.

The next chapter examines the role of social cognition and deals with the performance of children with SLI on experimental tasks designed to examine different aspects of social cognition. Performance on the experimental tasks was investigated firstly to examine whether there were developmental differences within the SLI Group (Appendix B) and then in relation to the performance of the two comparison groups.

CHAPTER SEVEN:

RESULTS OF THE EXPERIMENTAL TASKS OF SOCIAL COGNITION

7.1 ORGANISATION OF THE CHAPTER

Chapter 6 looked at the performance of children in the two questionnaires measuring their general socio-emotional functioning and their communication and pragmatic language ability as rated by their parents and teachers. Chapter 7 reports the findings from the experimental tasks of social cognition administered to the three groups of children. For every experimental task, the findings in relation to the performance of the SLI Group are given, in addition to a comparison with the two matched groups, the CA Matched and the LA Matched Groups. The findings from the within group comparisons for the two age groups in the SLI Group (below 8 years and 8 years and above) are reported in Appendix B.

7.2 OVERVIEW OF THE EXPERIMENTAL TASKS OF SOCIAL COGNITION

This chapter presents the findings from the experimental tasks conducted with children with SLI and the two comparison groups of children. The tasks, the scoring system and the statistical analysis used were described in section 4.5.3. The tasks are summarised in Table 7.1.

Table 7.1

Summary of Experimental Tasks of Social Cognition

Task	Measure
A) Labelling and Identifying Emotions	Children's ability to identify and label four basic emotions (happiness, sadness, anger, fear)
B) Inferring the Causes of Emotions	Children's ability to infer the emotions elicited by specific social situations
C) Emotion Explanation	Children's ability to infer the emotions elicited by specific social situations and their ability to explain typical and atypical emotions
D) Conflict Resolution Abilities	Children's ability to resolve conflict and employ different strategies

7.3 TASK A - 'LABELLING AND IDENTIFYING EMOTIONS' TASK RESULTS

7.3.1 Labelling Emotions – Group Comparisons

The initial part of the first task involved children labelling the four basic emotions: happiness, sadness, anger and fear. The results for the three groups are presented in relation to each emotion separately. Table 7.2 presents group percentages of correct responses for the emotion labelling task.

Table 7.2

Percentages of Correct Emotion Labelling By Group

	SLI (N = 42)	CA (N = 42)	LA (N = 42)
Labelling Happiness	97.6% (N = 41)	100% (N = 42)	100% (N = 42)
Labelling Sadness	90.5% (N = 38)	92.9% (N = 39)	85.7% (N = 36)
Labelling Anger	76.2% (N = 32)	97.6% (N = 41)	88.1% (N = 37)
Labelling Fear	26.2% (N = 11)	57.1% (N = 24)	35.7% (N = 15)

Nearly all the children with SLI correctly labelled the emotion of happiness (97.6%), and one did not answer (2.4%). The CA and LA Matched Groups reached ceiling effects for the emotion of happiness, with all children labelling it correctly (100%). Pearson's chi-square tests revealed that there was no significant association between the three groups and whether children were able to label the emotion of happiness ($\chi^2 (2) = 2.01, ns$).

As Table 7.2 shows, 38 children with SLI correctly labelled the emotion of sadness (90.5%). From the four remaining children (9.5%), three interpreted the emotion as being 'happy', and one as being 'lonely'. Results from the CA Matched Group showed that 39 children (92.9%) correctly labelled the emotion of sadness, and three wrongly labelled the emotion as being 'angry'. The results from the LA Matched Group showed that 36 children correctly labelled the emotion of sadness (85.7%), and the six remaining children who failed (14.3%) interpreted the emotion as being 'surprised'. There was no statistically significant association found between

the three groups and whether children were able to label the emotion of sadness ($\chi^2 (2) = 1.20$, *ns*).

For the emotion of anger, 32 children with SLI correctly labelled the emotion of anger (76.2%). From the ten remaining children who failed to correctly label the emotion of anger (23.8%) seven interpreted the expression as being 'sad' and three did not answer. The results from the CA Matched Group indicated that 41 children correctly labelled the emotion of anger (97.6%), and one did not answer. Results from the LA Matched Group showed that 37 children correctly labelled the emotion of anger (88.1%), and the remaining five children who failed, said that the boy/girl felt 'sad' instead. Pearson's chi-square tests indicated that there was a significant association between the three groups and whether children were able to label the emotion of anger, $\chi^2 (2) = 8.73$, $p = .01$.

Finally for the emotion of fear, only 11 children with SLI labelled correctly the emotion (26.2%). Two children said that they did not know and gave no response (4.8%). From the twenty-nine remaining children, who failed to correctly label the emotion of fear (69%), twelve interpreted the emotion as being 'surprised', four as being 'happy', two as being 'sad', two as being 'naughty', two as being 'amazed', two as being 'angry', two as being 'silly', one as being 'excited', one as being 'normal' and one as being 'sick'. The results from the CA Matched Group showed that 24 children correctly labelled the emotion of fear (57.1%) and eighteen described the emotion as being 'angry', 'upset' or 'surprised' (42.9%). Finally, the results from the LA Matched Group revealed that 15 children were able to correctly label the emotion of fear (35.7%), 25 children described the emotion as being 'angry', 'excited' or 'surprised' (59.5%), and two did not give any response (4.8%). Pearson's chi-square tests showed that there was a significant association between the groups and whether children were able to label the emotion of fear, $\chi^2 (2) = 8.82$, $p = .01$.

7.3.2 Identifying Emotions – Group Comparisons

The second part of the first task required children to identify the four basic emotions from a series of four photographs. The results for the three groups are again presented in relation to

the different emotions. Table 7.3 presents group percentages of correct responses for the emotion identification task.

Table 7.3

Percentages of Correct Emotion Identification by Group

	SLI (N = 42)	CA (N = 42)	LA (N = 42)
Happiness Identification	97.6% (N = 41)	100.0% (N = 42)	100.0% (N = 42)
Sadness Identification	69.0% (N = 29)	95.2% (N = 40)	95.2% (N = 40)
Anger Identification	76.2% (N = 32)	95.2% (N = 40)	83.3% (N = 35)
Fear Identification	71.4% (N = 30)	78.6% (N = 33)	73.8% (N = 31)

As shown in Table 7.3, nearly all the children with SLI identified the emotion of happiness correctly (97.6%). One child pointed at the expression of 'fear' instead (2.4%). As for the first part of this task, the CA and LA Matched Groups reached a ceiling effect for the emotion of happiness. Pearson's chi-square tests demonstrated that there was no statistically significant association found between the three groups and whether children were able to identify the emotion of happiness ($\chi^2 (2) = 2.01, ns$).

For the emotion of sadness, 29 children with SLI identified the emotion correctly (69%). From the twelve remaining children with SLI who failed to identify the emotion correctly (28.6%), seven children pointed at the expression of 'fear', five children pointed at the expression of 'angry', and one at the expression of 'happy'. For the CA Matched Group, 40 children (95.2%) were able to identify the emotion of sadness, and the remaining two children who failed (4.8%), identified the emotion as being 'angry'. Exactly the same results were revealed for the LA Matched Group with 40 children (95.2%) correctly identifying the emotion of sadness, and two (4.8%) pointing at the expression of 'angry'. Pearson's chi-square test indicated that there was a significant association between the groups and the ability to identify the emotion of sadness, $\chi^2 (2) = 16.45, p < .001$.

For the emotion of anger, 32 children with SLI identified the emotion of anger correctly (76.2%). From the nine remaining children with SLI, who failed to correctly identify the emotion of anger (21.4%), six children pointed at the expression of 'fear', two at the expression of 'sad', and one at the expression of 'happy'. One child said that he did not know and gave no response (2.4%). The results for the CA Matched Group revealed that 40 children were able to correctly identify the emotion of anger (95.2%), and the two remaining children who failed to correctly identify the emotion, identified it as being 'sad'. From the LA Matched Group, 35 children correctly identified the emotion of anger (83.3%), and 7 children gave no response (16.7%). Significant associations were found between the groups and the ability to identify the emotion of anger, $\chi^2(2) = 6.07, p < .05$.

Finally, for the emotion of fear, 30 children with SLI identified the emotion of fear correctly (71.4%). From the remaining twelve children with SLI who failed to correctly identify the emotion (28.6%), eight children pointed at the emotion of 'sad' and four at the emotion of 'angry'. The results for the CA Matched Group revealed that 33 children were able to correctly identify the emotion of fear (78.6%) and the remaining nine children pointed to the emotion of 'sadness'. Finally, for the LA Matched Group, 31 children correctly identified the emotion of fear (73.8%) and 11 children gave no response (26.2%). There was no statistically significant association found between the three groups and children's ability to correctly identify the emotion of fear, $\chi^2(2) = .58, ns$.

7.3.3 Total Scores – Group Comparisons

Table 7.4 below reports on the percentages of Total Emotion Labelling Score and Total Emotion Identification Score for the three groups and Table 7.5 reports on the Means and SDs for each group.

Table 7.4

Percentages of Total Emotion Labelling and Total Emotion Identification Scores for the 3 Groups

	Total Emotion Labelling Score			Total Emotion Identification Score		
	SLI	CA	LA	SLI	CA	LA
4 out of 4 Emotions	21.4% (N = 9)	59.5% (N = 25)	28.6% (N = 12)	57.1% (N = 24)	73.8% (N = 31)	71.4% (N = 30)
3 out of 4 Emotions	50% (N = 21)	23.8% (N = 10)	52.4% (N = 22)	4.8% (N = 2)	21.4% (N = 9)	14.3% (N = 6)
2 out of 4 Emotions	23.8% (N = 10)	16.7% (N = 7)	19.0% (N = 8)	28.6% (N = 12)	2.4% (N = 1)	11.9% (N = 5)
1 out of 4 Emotions	4.8% (N = 2)	-	-	9.5% (N = 4)	2.4% (N = 1)	2.4% (N = 1)

Table 7.5

Means, (SDs) and Range of Total Emotion Labelling and Total Emotion Identification Scores

	SLI	CA	LA	SLI	CA	LA
Mean	2.88	3.43	3.10	3.10	3.67	3.55
(SD)	.80	.77	.69	1.12	.65	.80
Range	1 - 4	2 - 4	2 - 4	1 - 4	1 - 4	1 - 4

An analysis of the children's scores was conducted using one-way ANOVAs with group (3 levels) as the between-subjects factor, and planned comparisons with using *t*-tests with Bonferonni corrections were then carried out. These analyses showed a significant effect of Group ($F(2,123) = 5.59, p < .05, \eta^2 = .49$) where children with SLI did not differ in the Total Emotion Labelling Score from the LA Matched Group (*ns, d = .01*), but differed significantly from the CA Matched Group ($p < .05, d = .70$). The latter two groups did not differ significantly from each other (*ns, d = .41*). The analyses also showed a significant effect of Group in the Total Emotion Identification Score ($F(2,123) = 4.92, p < .05, \eta^2 = .49$) where children with SLI differed significantly from the CA Matched Group ($p < .05, d = .62$) but did not differ from the LA Matched Group (*ns, d = .01*). The latter two groups did not differ significantly from each other (*ns, d = .16*).

7.3.4 Total Emotion Scores

A descriptive analysis was also run for every emotion separately in order to ascertain whether some emotions are easier to identify than label, and the other way around. For each emotion, children were given 2 points for identifying both by naming and by pointing correctly, 1 point for doing either and 0 point for failing to identify the emotion either way. This descriptive analysis revealed that children from all the three groups found the emotion of 'fear' the most difficult to identify and label, with the SLI Group showing the greatest difficulty. Table 7.6 below summarises the percentages for the three groups respectively.

Table 7.6

Percentage of Scores By Emotion

		Happiness	Sadness	Anger	Fear
None	SLI		2.4% (N = 1)	7.1% (N = 3)	26.2% (N = 11)
	CA		2.4% (N = 1)		19.0% (N = 8)
	LA		2.4% (N = 1)	2.4% (N = 1)	16.7% (N = 7)
Either	SLI	4.8% (N = 2)	35.7% (N = 15)	33.3% (N = 14)	50.0% (N = 21)
	CA		7.1% (N = 3)	7.1% (N = 3)	26.2% (N = 11)
	LA		14.3% (N = 6)	23.8% (N = 10)	57.1% (N = 24)
Both	SLI	95.2% (N = 40)	61.9% (N = 26)	59.5% (N = 25)	23.8% (N = 10)
	CA	100% (N = 42)	90.5% (N = 38)	92.9% (N = 39)	54.8% (N = 23)
	LA	100% (N = 42)	83.3% (N = 35)	73.8% (N = 31)	26.2% (N = 11)

7.3.5 Summary of the Results of the 'Labelling and Identifying Emotions' Experimental Task

The findings indicate that children with SLI differed from their typically developing peers in their ability to encode and interpret social cues; recognising the four basic emotions and semantically mapping those emotions was a more challenging task for the SLI Group in relation to the two comparison groups.

When looking at the different emotions separately, almost all the children were able to identify and produce the lexical labels for the facial expressions of happiness and sadness, which is consistent with prior research (Ford & Milosky, 2003). Children in all three groups also made significantly more errors for the emotions of 'anger' and 'fear'. However, differences between the groups were still observed. The findings revealed that there was a difference between the groups in their ability to both identify and label the emotions of sadness, anger and fear, with the SLI Group performing worse than the two comparison groups.

7.4 TASK B - 'INFERRING THE CAUSES OF EMOTIONS' TASK RESULTS

7.4.1 Inferring the Causes of Emotions – Group Comparisons

Table 7.7 reports the percentages of correct responses for the three groups, and clearly indicates that the SLI Group was less successful in inferring emotions when presented with social situations than both the CA Matched and the LA Matched Groups. The results for the three groups are presented in relation to each emotion separately.

Table 7.7

Percentage of Correct Responses for the SLI, CA and LA Matched Groups

	SLI	CA	LA
Happiness	83.3% (N = 35)	95.2% (N = 40)	95.2% (N = 40)
Sadness	52.4% (N = 22)	78.6% (N = 33)	69.0% (N = 29)
Anger	57.1% (N = 24)	90.5% (N = 38)	69.0% (N = 29)
Fear	28.6% (N = 12)	83.3% (N = 35)	52.4% (N = 22)

A series of Pearson's chi-square tests pointed out that there were significant associations between the groups and whether children were able to infer the causes of emotion-eliciting context for the emotion of sadness ($\chi^2(2) = 6.64, p = .03$), the emotion of anger ($\chi^2(2) = 11.94, p = .003$), and finally the emotion of fear ($\chi^2(2) = 25.56, p < .001$). There was no statistical significance in the association between groups and children's ability to infer the emotion of happiness (*ns*).

Error Analysis for the SLI Group

An error analysis for the SLI Group was also conducted for each emotion separately. For the emotion of happiness, two children thought that the character felt 'sad' (4.8%), and two children thought that the character felt 'frightened' (4.8%). Three children with SLI gave no answer and said they did not know (7.1%). For the emotion of sadness, the error analysis showed that fourteen children thought that the character felt 'frightened' (33.3%), three children thought the character felt 'angry' (7.1%) and one child thought the character felt 'happy' (2.4%). Two children with SLI gave no answer and said they did not know (4.8%). For the emotion of anger, the error analysis showed that six children thought that the character felt 'sad' (14.3%), six children thought the character felt 'frightened' (14.3%), and two children thought the character felt 'happy' (4.8%). Four children with SLI gave no answer and said they did not know (9.5%). Finally, for the emotion of fear, fifteen children thought that the character felt 'sad' (35.7%), seven children thought the character felt 'happy' (16.7%), and five children thought the character felt 'angry' (11.9%). Three children with SLI gave no answer and said they did not know (7.1%).

7.4.2 Response Times – Group Comparisons

Table 7.8 reports on the mean time needed for each group and each emotion separately.

Table 7.8

Means, (SDs) and range of response time for the SLI, CA and LA Matched Groups.

		SLI (N=42)	CA (N=42)	LA (N=42)
Happiness	Mean	5.27	3.52	4.82
	(SD)	(2.20)	(1.28)	(2.77)
	Range	2.25 – 10.31	1.33 – 6.68	1.63 – 17.89
Sadness	Mean	6.66	4.99	6.07
	(SD)	(2.96)	(2.00)	(2.24)
	Range	2.36 – 17.03	1.63 – 11.23	2.57 – 12.91
Anger	Mean	5.82	4.92	5.78
	(SD)	(2.15)	(3.87)	(2.64)
	Range	2.14 – 11.02	1.74 – 26.53	1.87 – 13.37
Fear	Mean	9.68	7.30	8.37
	(SD)	(4.97)	(4.61)	(4.28)
	Range	2.98 – 27.51	2.30 – 24.61	1.68 – 16.92

The response times for the different emotions were examined using a series of one way ANOVAs for each emotion separately with group (3 levels) as a between factor. These showed a statistically significant difference between the SLI Group compared to the two comparison groups for the emotion of 'happiness' ($F(2,123) = 7.38, p = .001, \eta^2 = .10$). Planned comparisons between the three groups revealed that the mean response time of the SLI Group was significantly different from the two comparison groups ($t(77.31) = -2.67, p = .009, d = .60$), but also that the mean response time of the LA Matched Group differed significantly from the mean response time of the CA Matched Group ($t(57.79) = -2.76, p = .008, d = .72$).

For the emotion of 'sadness', a similar pattern in the results was found, with the mean response time of the SLI Group differing significantly from that of both comparison groups, although the effect size was small ($F(2,123) = 5.05, p = .008, \eta^2 = .07$). Again, planned comparisons between the three groups revealed significant differences between the SLI Group and the two comparison groups ($t(123) = -2.44, p = .01, d = .44$). The difference between the CA and LA Matched Groups' response times was also statistically significant, with the CA Matched Group needing less time to respond and select the correct emotion ($t(123) = -2.03, p = .04, d = .36$).

Following that, the analysis for the emotion of 'anger' and 'fear' indicated that there were no statistical differences between the three groups in the mean time needed for children to respond (Anger: $F(2,123) = 1.22$, *ns*, $\eta^2 = .01$; Fear: $F(2,123) = 2.78$, *ns*, $\eta^2 = .04$).

7.4.3 Summary of the Results of the 'Inferring the Causes of Emotions' Experimental Task

The results of the first experimental task indicated that children with SLI were able to identify the four basic emotions, but were less successful in doing so in relation to the two comparison groups. For the second experimental task, which looked at children's ability to correctly link emotions with social situations, the results suggested that children with SLI were less able at associating basic emotion knowledge with event context, in order to make an accurate social inference regarding a character's emotional state.

In particular, differences between the three groups were found for the emotions of sadness, anger and fear, with the SLI Group being less successful than both comparison groups in their ability to make correct emotional inferences. As in the first experimental task, all groups on this task found it harder to decipher the more ambiguous, subtle and complex emotions of sadness and fear, whereas children in all three groups made significantly more correct inferences in the happy condition.

When looking at the time children needed to make a selection, children in the SLI Group needed more time in relation to both comparison groups in making inferences for all four emotions, but statistical significant differences between the groups were identified for the emotions of happiness and sadness, with the SLI Group needing more time to respond and select the correct emotions than both comparison groups.

7.5 TASK C - 'EMOTION EXPLANATION' TASK RESULTS

7.5.1 Emotion Predictions – Group Comparisons

Typical (Expected) Emotion Predictions

The first aim of the third task was to investigate the extent to which children would be able to predict a character's typical (expected) emotion. Results from the SLI Group indicated that the expected or typical emotion was frequently predicted, although, contrary to the findings of the first two experimental tasks, children made fewer correct predictions for the emotion of happiness (38.1% correct emotion prediction for both stories).

Children were given a score of 1 for each story in which they predicted the typical emotion correctly. As there were two stories in each emotion cluster, children could receive scores of 0, 1, or 2. The following table (Table 7.9) shows in detail the differences between the emotion clusters for the three groups:

Table 7.9

Correct Emotion Predictions for the Three Emotion Clusters According to Group

	Happiness			Anger/Sadness			Fear		
	SLI	CA	LA	SLI	CA	LA	SLI	CA	LA
Both Stories	38.1%	76.2%	71.4%	64.3%	81.0%	71.4%	42.9%	52.4%	52.4%
One Story	54.8%	16.7%	23.8%	33.3%	9.5%	11.9%	33.3%	40.5%	23.8%
None	7.1%	7.1%	4.8%	2.4%	9.5%	16.7%	23.8%	7.1%	23.8%

Total Typical (Expected) Emotion Prediction Scores

Children's ability to predict a typical emotion was scored by giving them a Total Emotion Prediction Score. As there were 6 stories presented to the children, children could receive a Total Emotion Prediction Score from 0 to 6, where 0 indicated that they were not able to predict any emotions and 6 indicated that they correctly predicted all the emotions in the stories. The

following table (Table 7.10) summarises the results for the three groups with means, (SDs) and range.

Table 7.10

Means, (SDs) and Range of Total Emotion Prediction Scores

	SLI	CA	LA
Mean	4.12	4.86	4.48
(SD)	1.38	1.45	1.61
Range	1 – 6	1 – 6	0 – 6

From the results in the table above, it is evident that children in the SLI Group were less successful than both comparison groups in correctly predicting the typical (expected) emotion. However ANOVA with group (3 levels) as a between factor did not reveal statistically significant differences between the three groups in their Total Emotion Prediction Score ($F(2,123) = 2.58$, *ns*).

7.5.2 Typical and Atypical Emotion Explanations – Group Comparisons

The next main consideration of the task was the extent to which children with SLI would refer to mental states (fact beliefs or desires/preferences) in their explanations of others' typical (expected) and atypical (unexpected) emotions, when compared to children from the two comparison groups.

Children were given a score of 1 for each story in which they referred to the character's beliefs or desires/preferences about the situation. As there were two stories in each cluster, children could receive scores of 0, 1, or 2 for each cluster. As described in chapter 4, the expectation was that children in the SLI Group would attribute fewer mental states when explaining a character's (both typical and atypical) emotion than typically developing children. Table 7.11 shows the proportion score of mental state attributions (the total number of mental state attributions, divided by the number of stories (6)).

Table 7.11

Proportion of Mental State Attributions of Six Stories as a Function of Group x Typical or Atypical Emotion Explanation

Group	N	Typical	Atypical
SLI	42	.17	.25
CA	42	.53	.64
LA	42	.26	.46

It can be seen from Table 7.11 that children in the SLI Group referred less to mental states when asked to explain both typical and atypical emotions than the comparison groups. It can also be seen that all three groups attributed more mental states when asked to explain atypical emotions than typical emotions, but this difference was larger for the comparison groups.

Following the same scoring system, a Total Mental State Attribution Score was calculated (both for the typical and atypical emotions). Children could receive a minimum of 0 (= no mental state attributions in their explanations) and a maximum of 12 (= use of mental state attributions for all the stories). Table 7.12 below shows the means for the three groups.

Table 7.12

Means (SDs) of Total Mental State Attribution Score

Group	Mean	SD
SLI	2.48	1.89
CA	7.10	2.90
LA	4.31	2.79

An ANOVA with group (3 levels) as a between factor revealed a statistically significant difference between the three groups in their use of mental state terms to explain a character's emotions ($F(2,123) = 34.37, p < .001, \eta^2 = .35$). Post-hoc univariate F-tests of group differences with pairwise multiple comparison tests with a Bonferonni correction applied showed a statistically significant difference in the mean scores of the SLI Group and the CA Matched Group ($p < .001$), and in the mean scores of the SLI Group and the LA Matched

Group ($p < .005$), but there were also differences found in the mean scores of the CA Matched Group and the LA Matched Group ($p < .001$).

7.5.3 Summary of the Results of the 'Emotion Explanation' Experimental Task

The third experimental task examined children's ability to predict and explain typical and atypical (unexpected) emotions when presented with hypothetical social situations. The results showed that the expected or typical emotion was frequently predicted, although, contrary to the findings of the first two experimental tasks, children with SLI made fewer correct predictions for the emotion of happiness (38.1% correct emotion prediction for both stories). In general, it was evident from the analysis above that children in the SLI Group were less successful than both comparison groups in correctly predicting the typical emotion, although significant differences between the three groups were not found.

When looking specifically at the way children attempted to explain a character's emotions, results from the third social cognition task showed that children with SLI did not only have difficulties with identifying, labelling and linking emotions to social context, but they presented with significant difficulties explaining the causes of emotions. Children in the SLI Group used significantly less mental state attributions in relation to both comparison groups, focusing more on giving explanations that repeated the situational factors rather than how a person thinks or feels.

7.6 TASK D - 'CONFLICT RESOLUTION ABILITIES' TASK RESULTS

7.6.1 Conflict Resolution Abilities – Group Comparisons

The results for the three groups are presented below. Table 7.13 reports on the percentages of the conflict resolution strategies used by the three groups for all stories. As shown in Table 7.13, the most frequent conflict resolution strategy used by children with SLI was to involve an adult (32.1%). On the other hand, the most frequent conflict resolution strategy used by both children in the CA Matched Group and the LA Matched Group was to ask their peer for

clarifications in order to understand the motive behind their actions (38.6% and 25.5% respectively).

Table 7.13

Percentages of Conflict Resolution Strategies according to Group for all Scenarios

	SLI (N = 42)	CA (N = 42)	LA (N = 42)
No response	23 (13.6%)	0 (0%)	1 (0.5%)
Physical Retaliation	25 (14.8%)	2 (1.2%)	19 (11.3%)
Verbal Retaliation	19 (11.3%)	11 (6.5%)	10 (5.9%)
Involving an Adult	54 (32.1%)	31 (18.4%)	38 (22.6%)
Being Submissive	23 (13.7%)	33 (19.6%)	27 (16.0%)
Situational Responses	9 (5.3%)	26 (15.4%)	30 (17.8%)
Asking for clarification	15 (8.9%)	65 (38.6%)	43 (25.5%)

In addition, a Total Conflict Resolution Strategies Score was calculated for each group. Table 7.14 reports on the means, standard deviations and range scores for the three groups.

Table 7.14

Mean, SD and Range Scores of Total Conflict Resolution Strategies Score

	SLI	CA	LA
Mean	11.50	18.26	16.19
SD	(5.61)	(4.29)	(5.76)
Range	2-22	7-24	4-24

One-way ANOVAs were conducted and significant group effects were found for the Total Conflict Resolution Strategies Score ($F(2,123) = 18.17, p < .001, \eta^2 = .22$). Post-hoc comparisons revealed that the SLI Group differed significantly from the CA Matched Group ($p < .001$) and from the LA Matched Group ($p < .001$). However, the two latter groups were not found to differ on the Total Conflict Resolution Strategies Score (*ns*).

7.6.2 Summary of the Results of the ‘Conflict Resolution Abilities’ Experimental Task

The final experimental task aimed to examine children’s knowledge of conflict resolution strategies in difficult peer situations. The most frequent response for children with SLI was to involve an adult to help them out with their peer conflicts. They also reported that they would do nothing and preferred to be submissive when conflicts arose, or use physical aggression to resolve matters. Children in the SLI Group said they would use reconciliation in significantly fewer conflict scenarios in comparison to their CA Matched peers who said they would ask for clarification about the situation in order to resolve matters with a peer.

Statistically significant differences between the three groups were found for the Total Conflict Resolution Strategies Score with the SLI Group scoring less than both control groups, revealing that the SLI participants were less likely to suggest use of the more sophisticated conflict resolution strategies, such as asking for further information or requesting clarification in order to make sense of a conflict situation, which the CA Matched and LA Matched Groups suggested more frequently.

7.7 RELATIONSHIPS BETWEEN THE FOUR SOCIAL COGNITION EXPERIMENTAL TASKS

In this section the relationships between the four social cognition experimental tasks are considered. Table 7.15 below presents the correlational analyses between: the Total Labelling Score and the Total Identification Score from Task A, the Total Emotion Prediction Score from Task B, the Total Emotion Prediction Score and the Total Mental State Attribution Score from Task C, and the Total Conflict Resolution Strategies Score from Task D.

Table 7.15

Correlations between Scores of the Social Cognition Experimental Tasks

	1	2	3	4	5	6
1. Task A Total Labelling Score	-					
2. Task A Total Identification Score	.23**	-				
3. Task B Total Emotion Prediction Score	.19*	.18*	-			
4. Task C Total Emotion Prediction Score	.20*	.38**	.12	-		
5. Task C Total Mental State Attribution Score	.22**	.35**	.31**	.62**	-	
6. Task D Total Conflict Resolution Score	.17*	.36**	.25**	.39**	.42**	-

** p < .005, * p < .05

As seen in Table 7.15, strong positive correlations were identified between the scores of the four social cognition experimental tasks highlighting the fact that all four experimental tasks measured related social cognition skills. Children's understanding of the four primary emotions was investigated through different tasks which appear to be linked and strongly related to each other. The only exception is the correlation between the Total Emotion Prediction Score derived from Task B and the Total Emotion Prediction Score derived from Task C which was not found to be statistically significant.

7.8 GENERAL SCORES DERIVED FROM THE FOUR SOCIAL COGNITION EXPERIMENTAL TASKS

The general scores created from the four social cognition tasks described above were described in section 4.5.3.1.6. The following table reports on the scores of children from the three participant groups and the significant differences between them.

Table 7.16

Mean, SD, Range Scores and Significant Differences on Social Cognition Scales and Social Cognition Composite Score

		SLI	CA	LA	Significant Differences
Total Emotion Prediction Score	Mean	12.31	15.43	13.98	SLI < CA > LA
	SD	(2.82)	(2.38)	(2.43)	
	Range	6-16	8-18	9-18	
Total Mental State Attribution Score	Mean	2.48	7.10	4.31	SLI < CA > LA
	SD	(1.89)	(2.90)	(2.79)	
	Range	0-8	0-11	0-10	
Total Conflict Resolution Strategies Score	Mean	11.50	18.26	16.19	SLI < CA = LA
	SD	(5.61)	(4.29)	(5.76)	
	Range	2-22	7-24	4-24	
Social Cognition Composite Score	Mean	26.29	40.79	34.38	SLI < CA > LA
	SD	(6.90)	(7.16)	(9.44)	
	Range	9-37	22-52	15-50	

One way ANOVAs were carried out with group as a between factor to examine the children's profiles on the Total Emotion Prediction Score and the Social Cognition Composite Score, and planned comparisons with post-hoc *t*-tests, using Bonferonni corrections were then carried out. Analyses of the Total Mental State Attribution Score and the Total Conflict Resolution Strategies Score are reported in sections 7.5.2 and 7.6.1 respectively.

These analyses showed a significant group effect on the Total Emotion Prediction Score, $F(2,123) = 15.68$, $p < .001$, $\eta^2 = .20$, where children with SLI differed from the CA Matched Group ($p < .001$), and from the LA Matched Group ($p = .01$). The latter two groups also differed significantly from each other ($p = .03$) with the CA Matched Group scoring higher than the LA Matched Group.

Finally, the three groups differed significantly on the Social Cognition Composite $F(2,123) = 35.33$, $p < .001$, $\eta^2 = .36$. Post-hoc comparisons showed that the SLI Group differed significantly from the CA Matched Group ($p < .001$), as well as the LA Matched Group ($p < .001$).

Differences were also found between the two comparison groups with the CA Matched Group differing significantly from the LA Matched Group ($p = .001$).

7.8 SUMMARY AND IMPLICATIONS FOR FURTHER ANALYSIS

The findings reported in the last two chapters clearly suggest that children with SLI did differ from their typically developing peers in processing social information and explaining social situations. Results from chapter 6 showed the increased levels of difficulty for the SLI Group in aspects of socio-emotional functioning. It also pointed to increased difficulties with children's pragmatic language ability. The present chapter highlighted that children with SLI also had difficulties with aspects of their social cognition.

To further understand the factors affecting children's socio-emotional functioning, it was important to consider how all these difficulties related together, and whether they could predict poor socio-emotional functioning for children with SLI. Firstly, it was necessary to examine whether the difficulties with socio-emotional functioning highlighted in chapter 6 were related to children's abilities in other areas of their development, in particular to their language and general non-verbal cognitive ability (reported in chapter 5), their pragmatic language ability (reported in chapter 6), and their social cognition skills (reported in chapter 7). Comparisons with typically developing children demonstrated that children with SLI performed significantly differently from not only their CA Matched peers, but their performance was also distinctive from their much younger LA Matched peers. Thus, in order to understand what was affecting children's socio-emotional functioning, it was necessary to examine the effect that measures of language and non-verbal cognitive ability, pragmatic language ability and social cognition had on children's performance.

The next chapter deals with the relationship between the ratings of the groups on the two questionnaires and their performance on the experimental tasks of social cognition and their relationship with the standardised tests of language and non-verbal cognitive ability.

CHAPTER EIGHT: RELATIONSHIPS BETWEEN THE QUESTIONNAIRES, THE STANDARDISED MEASURES OF LANGUAGE AND NON-VERBAL COGNITIVE ABILITY AND THE EXPERIMENTAL TASKS OF SOCIAL COGNITION

8.1 ORGANISATION OF THE CHAPTER

8.1.1 Aims of the Chapter

Chapter 8 examines the possible reasons why children with SLI experience difficulties with their socio-emotional functioning. So far the results of the main study have indicated that:

- a) the current language status of children with SLI was significantly impaired and their performance on standardised tests of language ability was significantly lower when compared with typically developing peers of the same chronological age (chapter 5),
- b) the pragmatic language ability of children with SLI was significantly impoverished when assessed by a standardised checklist of communicative and pragmatic competence by children's parents and teachers, and significantly different when compared to a group of typically developing children of the same chronological age and a group of typically developing children of the same language ability (chapter 6), and
- c) the performance of children with SLI on experimental tasks of social cognition was significantly poorer when compared with a group of typically developing children of the same chronological age and a group of typically developing children of the same language ability (chapter 7).

These three factors will be further investigated in chapter 8 in relation to children's reported levels of socio-emotional functioning. Thus, the aims of chapter 8 are twofold:

1. To investigate the relationships between measures of socio-emotional functioning, language ability, non-verbal cognitive ability, pragmatic language ability, prosocial behaviour, and social cognition, and
2. To examine predictors of socio-emotional functioning and in particular to investigate whether predictive factors differ across the three groups.

8.1.2 Overview of the Measures Used for the Analysis

The analysis conducted in chapter 8 uses the *Social Cognition Composite Score* described in chapter 7 as an overall measure of children's social cognition competence. Similarly, from the CCC-2, only the *Pragmatic Composite Score* was included in the analysis (see section 4.5.2.2) as a measure of children's pragmatic language ability. Finally, from the SDQ, the *Total Difficulties Score* was used as a measure of children's overall socio-emotional functioning and the *Prosocial Behaviour* subscale was used as an index of children's positive social attributes and helpful behaviours.

8.1.3 Group Analyses

The analyses were conducted separately for the three groups. As stated in the Introduction section of chapter 8, a separate analysis for the three groups was considered appropriate in order to investigate whether the relationships between measures of socio-emotional functioning, prosocial behaviour, language ability, non-verbal cognitive ability, pragmatic language ability and social cognition were similar or different across the three participant groups. Analyses conducted to the total cohort would confound age effects. Total cohort analyses would also need to take into account the effect of language. Although this can be controlled for, it was felt that the dimension of language may feature differently across cohorts and also it would not be possible to control for all three different dimensions of language investigated in the present thesis; on the contrary separate analyses allowed us to address the following two questions:

1. Are the relationships between measures of socio-emotional functioning, prosocial behaviour, language ability, non-verbal cognitive ability, pragmatic language ability and

social cognition similar for the SLI and CA Matched Groups? And are measures of socio-emotional functioning (as defined by the Total Difficulties SDQ Score) predicted by the same factors for the SLI and CA Matched Groups? If the analyses show that the relationships between the variables are similar for both cohorts, this would imply that, although the SLI Group is delayed in language and experiencing behavioural, emotional and social difficulties (as shown in chapters 5 and 6), the interrelationships between variables follow a typical developmental pattern. Similarly, if the analyses show that measures of socio-emotional functioning are being predicted by the same factors for the SLI and CA Matched Groups, this would suggest that the SLI Group follows a typical developmental pattern and that the same factors play a key role in predicting measures of socio-emotional functioning for both cohorts.

2. Are the relationships between measures of socio-emotional functioning, prosocial behaviour, language ability, non-verbal cognitive ability, pragmatic language ability and social cognition similar for the SLI and LA Matched Groups? And are measures of socio-emotional functioning (as defined by the Total Difficulties SDQ Score) predicted by the same factors for the SLI and LA Matched Groups? In the case that the interrelationships between variables identified for the SLI Group are similar to the interrelationships found for the LA Matched Group, and measures of socio-emotional functioning are being predicted by the same factors for both cohorts, this would reveal that the SLI Group is delayed but not deviant as the relationships between variables would correspond to the one observed in younger but typically developing children. On the other hand, different patterns of relationships between variables and different predictors of measures of socio-emotional functioning between the SLI and both CA and LA Matched Groups would suggest that the underlying driver of behavioural, emotional and social difficulties is dissimilar pointing to atypical developmental trajectories for the SLI Group.

8.2 RELATIONSHIPS BETWEEN MEASURES OF SOCIO-EMOTIONAL FUNCTIONING, PROSOCIAL BEHAVIOUR, LANGUAGE ABILITY, NON-VERBAL COGNITIVE ABILITY, PRAGMATIC LANGUAGE ABILITY AND SOCIAL COGNITION

8.2.1 Introduction

Partial correlations, controlling for the effects of age, were carried out to examine the relationships between measures of socio-emotional functioning, prosocial behaviour, language and non-verbal cognitive ability, pragmatic language ability and social cognition. These analyses investigated the relations between the Total Difficulties Score of the SDQ and: the Prosocial Behaviour SDQ subscale, the Sum of Receptive Language Standard Scores and the Sum of Expressive Language Standard Scores of the CELF-R, the raw score from the Raven's CPM, the Pragmatic Composite Score of CCC-2, and the Social Cognition Composite Score derived from the four experimental social cognition tasks.

For the correlational analyses, the effects of age were partialled out as it was considered that some aspects of pragmatic language ability (e.g. coherence) may be affected by increase in age, as might some aspects of socio-emotional functioning (e.g. prosocial behaviour) and social cognition abilities. Results reported in Appendix B suggested that there were differences in the performance of the two age groups (younger and older SLI participants), thus partialling out the effect of age in the correlational analyses was considered necessary. A Bonferonni correction was made to the alpha level to control for the increased possibility among multiple correlations of the occurrence of significant correlations by chance. The adjusted alpha level is reported at the bottom of each correlational table. However, correlations significant at a 0.05 level of significance are also reported as moderate significant associations.

8.2.2 Parent Ratings

Tables 8.1, 8.2 and 8.3 below present the correlational tables for the SLI Group, the CA and the LA Matched Groups respectively.

Table 8.1

Partial Correlations between Measures of Socio-Emotional Functioning, Prosocial Behaviour, Social Cognition, Pragmatic Language, Non-Verbal and Language Ability - Parents (SLI Group)

	1	2	3	4	5	6	7
1. Sum of Receptive SS	-						
2. Sum of Expressive SS	.42*	-					
3. Raven's CPM	.54**	.17	-				
4. Pragmatic Composite	.13	.21	.13	-			
5. Social Cognition Composite	.11	.11	.12	.49**	-		
6. Prosocial Behaviour	.14	.26	-.17	.35*	.29	-	
7. Total Difficulties Score	-.04	-.15	.26	-.11	-.33*	-.26	-

* Significant at a 0.05 level

** Significant at 0.007 level with Bonferonni Correction

As seen in Table 8.1, for the SLI Group there was a moderate negative association found between the Total Difficulties Score and the Social Cognition Composite Score ($r = -.33$, $p = .03$), highlighting the fact that there was a negative relationship between measures of social cognition and general socio-emotional functioning, such that weaker social cognition skills related to poorer socio-emotional functioning as reported by children's parents. As expected, there was a moderate positive relationship between measures of children's Prosocial Behaviour and their Pragmatic Composite Score as reported by their parents ($r = .35$, $p = .02$), which indicates that for children with SLI helpful and positive behaviour was strongly linked with social use of language and pragmatic language ability. The only strong statistically significant association (after Bonferonni correction) was found between the Social Cognition Composite Score and the Pragmatic Composite Score ($r = .49$, $p = .002$) pointing to the fact that pragmatic language ability in children with SLI was strongly related to their ability to understand others' emotional or mental states. Language and non-verbal cognitive scores were not found to associate with the Total Difficulties Score of children with SLI, their Pragmatic Composite Score or their Social Cognition Score.

Contrary to the results of the SLI Group, for the CA Matched Group the factor most strongly associated with the Total Difficulties Score was children's Pragmatic Composite Score. As seen in Table 8.2, there was a strong negative association found between children's Pragmatic Composite Score and the Total Difficulties Score ($r = -.49$, $p = .002$), which suggests that pragmatic language ability of the CA Matched Group was strongly related with ratings of socio-emotional functioning as assessed by parents such that the poorer social use of language was,

the more difficulties CA Matched children experienced in their socio-emotional functioning. The second factor significantly correlating with the Total Difficulties Score of CA Matched children was Prosocial Behaviour. As seen in Table 8.2, the correlation between the Total Difficulties Score and the Prosocial Behaviour subscale was negative ($r = -.79, p < .001$), indicating that children's ability to engage in helpful behaviours related to how well they adjusted and functioned socially, so that the poorer their prosocial behaviour was, the more likely it was for them to have difficulties functioning socially and emotionally. The analysis below also indicates a strong positive relationship between the Prosocial Behaviour subscale and the Pragmatic Composite Score of CA Matched children ($r = .51, p = .001$), an association also found for the SLI Group. As was the case for the SLI Group, no associations were found between the Total Difficulties Score and any of the language and non-verbal cognitive ability scores.

Table 8.2

Partial Correlations between Measures of Socio-Emotional Functioning, Prosocial Behaviour, Social Cognition, Pragmatic Language, Non-Verbal and Language Ability - Parents (CA Group)

	1	2	3	4	5	6	7
1. Sum of Receptive SS	-						
2. Sum of Expressive SS	.77**	-					
3. Raven's CPM	.12	.29*	-				
4. Pragmatic Composite	-.02	-.06	-.31*	-			
5. Social Cognition Composite	.21	.03	.08	-.11	-		
6. Prosocial Behaviour	.09	.03	.11	.51**	.26	-	
7. Total Difficulties Score	-.11	-.18	-.11	-.49**	-.12	-.79**	-

* Significant at a 0.05 level

** Significant at 0.007 level with Bonferonni Correction

Finally, for the LA Matched Group the picture of associations between variables was more complex (see Table 8.3). The strongest associations were found between the Total Difficulties Score and non-verbal cognitive ability as measured by Raven's CPM ($r = -.61, p < .001$), the Social Cognition Composite ($r = -.77, p < .001$) and the Prosocial Behaviour subscale ($r = -.70, p < .001$). This suggests that for the LA Matched Group non-verbal cognitive ability, social cognition and prosocial behaviour were negatively correlated with ratings of socio-emotional functioning as defined by the SDQ Total Difficulties Score completed by children's parents. Similarly to the CA Matched Group, there was also a moderate negative association found between the Total Difficulties Score and the Pragmatic Composite Score ($r = -.37, p = .02$).

This suggests that, as for the CA Matched Group, the poorer children's use of language and pragmatic language ability was the more difficulties they experienced in their reported ability to function socially and emotionally. In contrast to both the SLI and the CA Matched Group, moderate negative associations were also found between the SDQ Total Difficulties Score and the Sum of Expressive Language Standard Scores ($r = -.38, p = .01$), indicating that lower expressive language levels were related with higher levels of BESD for the LA Matched Group.

Table 8.3

Partial Correlations between Measures of Socio-Emotional Functioning, Prosocial Behaviour, Social Cognition, Pragmatic Language, Non-Verbal and Language Ability - Parents (LA Group)

	1	2	3	4	5	6	7
1. Sum of Receptive SS	-						
2. Sum of Expressive SS	.52**	-					
3. Raven's CPM	.14	.33*	-				
4. Pragmatic Composite	.49**	.32	.36*	-			
5. Social Cognition Composite	.17	.61**	.66**	.32*	-		
6. Prosocial Behaviour	.11	.52**	.54**	.41*	.73**	-	
7. Total Difficulties Score	-.10	-.38*	-.61**	-.37*	-.77**	-.70**	-

* Significant at a 0.05 level

** Significant at 0.007 level with Bonferonni Correction

8.2.3 Summary of the Results

The first set of analyses aimed to look at the relationships between children's socio-emotional functioning as judged by parents (measured by the SDQ Total Difficulties Score) and measures of language and non-verbal cognitive ability, pragmatic language ability, social cognition skills and prosocial behaviour. When looking at the picture of associations between variables for the three participant groups, certain similarities and differences between the SLI and the two comparison groups were identified. First of all, the SLI and CA Matched Groups showed similar patterns of relationships, in that neither the language nor non-verbal cognitive measures were associated with the Total Difficulties Score as rated by children's parents. This was not the case for the LA Matched Group where both Expressive Language and Raven's CPM were found to be significantly correlated with children's socio-emotional functioning scores.

Additionally, the SLI Group was similar to the LA Matched Group in that there was a highly significant association found for both groups between the Total Difficulties Score and the Social Cognition Composite Score, highlighting the fact that for both groups of children social cognition was strongly related to overall socio-emotional functioning, such that the poorer social cognition skills were, the more BESD parents reported for both groups. In contrast to both the SLI and LA Matched Groups, social cognition was not correlated to either the Total Difficulties Score or any other variables under investigation for the CA Matched Group.

There were two differences identified between the SLI and the two comparison groups. The first one was the lack of negative associations between the Total Difficulties Score and the Prosocial Behaviour score of the SDQ, which was the case for both the CA and LA Matched Groups. Although positive attributes and helpful behaviours were related to how well CA and LA Matched children were adjusted at home, this was not found for the SLI participants. Also, there was no association found between the Total Difficulties Score and the Pragmatic Composite Score which again was the case for both comparison groups. Although the ability to use social language was strongly related to reported socio-emotional functioning by parents for both the CA and LA Matched Groups, pragmatic language ability was not found to correlate with the level of BESD parents reported for the SLI Group.

8.2.4 Teacher Ratings

Relationships between scores of socio-emotional functioning, prosocial behaviour, language and non-verbal cognitive ability, pragmatic language ability and performance on social cognition tasks were subsequently examined for teachers' ratings. As seen in Table 8.4 below, for the SLI Group the two strongest associations found were between the Total Difficulties Score and the Social Cognition Composite ($r = -.56, p < .001$) and the Prosocial Behaviour subscale of the SDQ ($r = -.54, p < .001$). Similarly to the parents' analysis, the negative correlations between the Total Difficulties Score and the Social Cognition Composite Score and the Prosocial Behaviour subscale indicated that the weaker social cognition skills were for children with SLI, the stronger the likelihood was for teachers to report BESD; and similarly, the poorer prosocial behaviour was for children with SLI, the greater the BESD teachers reported. In the case of teachers' ratings, a moderate negative association was found between the Total Difficulties Score of SDQ and the Pragmatic Composite Score of CCC-2, highlighting that

children's difficulties with the social use of language and their reported struggle to understand a speaker's intended meaning (as rated by their teachers) were negatively related to children's ability to socially and emotionally function within the school environment. As for the parents' ratings, the Pragmatic Composite Score of CCC-2 was again strongly correlated with the Social Cognition Composite Score, pointing to a strong positive relation between pragmatic language ability and understanding of other's emotional states for the SLI Group. Finally, as for the parents' ratings, there were no significant relationships found between measures of language and non-verbal cognitive ability and the Total Difficulties SDQ Score, which in this case highlighted the consistency between parents' and teachers' reports.

Table 8.4

Partial Correlations between Measures of Socio-Emotional Functioning, Prosocial Behaviour, Social Cognition, Pragmatic Language, Non-Verbal and Language Ability - Teachers (SLI Group)

	1	2	3	4	5	6	7
1. Sum of Receptive SS	-						
2. Sum of Expressive SS	.53**	-					
3. Raven's CPM	.39**	.03	-				
4. Pragmatic Composite	.11	.25	.16	-			
5. Social Cognition Composite	.11	.04	.16	.44**	-		
6. Prosocial Behaviour	-.02	-.05	-.07	.22	.24	-	
7. Total Difficulties Score	.09	-.03	.04	-.36*	-.56**	-.54**	-

* Significant at a 0.05 level

** Significant at 0.007 level with Bonferonni Correction

For the CA Matched Group (Table 8.5), the strongest significant relationships were found between the Total Difficulties Score of SDQ and the Pragmatic Composite Score of CCC-2 ($r = -.59, p < .001$), the Social Cognition Composite ($r = -.41, p = .004$), and the Prosocial Behaviour subscale of the SDQ ($r = -.43, p = .003$). These results highlight that for CA Matched children, the ability to use language socially, their performance on tasks of social cognition and their prosocial skills were strongly interrelated with their general socio-emotional functioning at school as rated by their teachers. In particular, the negative correlations pointed to the fact that difficulties with social use of language, weak social cognition skills and poor prosocial behaviour correlated with more BESD at school for the CA Matched Group. As for the SLI Group, no statistically significant relationships were found between the language and non-verbal measures and the Total Difficulties SDQ Score. The results reported above also stress

the consistency of the associations reported by both parents and teachers with the only difference being the association between the Total Difficulties Score and the Social Cognition Composite Score, which was found only for teachers' ratings.

Table 8.5

Partial Correlations between Measures of Socio-Emotional Functioning, Prosocial Behaviour, Social Cognition, Pragmatic Language, Non-Verbal and Language Ability - Teachers (CA Group)

	1	2	3	4	5	6	7
1. Sum of Receptive SS	-						
2. Sum of Expressive SS	.66**	-					
3. Raven's CPM	.09	.31*	-				
4. Pragmatic Composite Score	.16	.34*	-.10	-			
5. Social Cognition Composite	.21	.00	.01	.21	-		
6. Prosocial Behaviour	.12	.24	.11	.34*	.15	-	
7. Total Difficulties Score	-.10	-.21	-.02	-.59**	-.41**	-.43**	-

* Significant at a 0.05 level

** Significant at 0.007 level with Bonferonni Correction

Finally for the LA Matched Group, as seen in Table 8.6, the picture of associations was again very rich and complex. The strongest relationships with the Total Difficulties Score of the SDQ were found with the measure of non-verbal cognitive ability Raven's CPM ($r = -.49, p = .002$), the Pragmatic Composite Score of CCC-2 ($r = -.54, p < .001$), the Social Cognition Composite score ($r = -.79, p < .001$) and the Prosocial Behaviour subscale of the SDQ ($r = -.65, p < .001$). As for the parent ratings, the negative correlations emphasise that children's general socio-emotional functioning related strongly with their non-verbal cognitive ability, the pragmatic language ability as well as their ability to understand others' mental and emotional states, in that lower non-verbal cognitive ability scores, difficulties with pragmatic language ability, poorer social cognition and prosocial skills significantly correlated with poorer socio-emotional functioning for the LA Matched Group as rated by their teachers. Apart from the moderate relationship with measures of Expressive Language identified by parent ratings, the analyses pointed to consistent results between parent and teacher ratings for the LA Matched Group in that measures of non-verbal cognitive ability, pragmatic language ability, social cognition and prosocial behaviour strongly correlated with measures of socio-emotional functioning according to both parents and teachers.

Table 8.6

Partial Correlations between Measures of Socio-Emotional Functioning, Prosocial Behaviour, Social Cognition, Pragmatic Language, Non-Verbal and Language Ability - Teachers (LA Group)

	1	2	3	4	5	6	7
1. Sum of Receptive SS	-						
2. Sum of Expressive SS	.48**	-					
3. Raven's CPM	.17	.38*	-				
4. Pragmatic Composite Score	.18	.60**	.43**	-			
5. Social Cognition Composite	.21	.61**	.64**	.72**	-		
6. Prosocial Behaviour	.14	.46**	.34*	.55**	.62**	-	
7. Total Difficulties Score	-.14	-.36	-.49**	-.54**	-.79**	-.65**	-

* Significant at a 0.05 level ** Significant at 0.007 level with Bonferonni Correction

8.2.5 Summary of the Results

The second set of analyses aimed to look at the relationships between children's socio-emotional functioning as rated by their teachers and measures of language and non-verbal cognitive ability, pragmatic language ability, social cognition skills and prosocial behaviour. When looking at the associations between variables for the three participant groups, more similarities than differences between the SLI Group and the two matched groups could be identified this time in comparison to parent ratings. First of all, there were similarities between the SLI Group and the two comparison groups in terms of associations between variables. For all three groups, the three factors significantly correlating with the Total Difficulties Score of the SDQ were the Pragmatic Composite, the Social Cognition Composite and the Prosocial Behaviour scores. The negative relationships between these variables suggested that poor socio-emotional functioning was linked with lower scores of pragmatic language ability, weaker social cognition skills and poorer prosocial behaviour for all three participant groups when rated by their teachers.

The only difference identified between the three groups was that for the LA Matched Group non-verbal cognitive ability scores were related to socio-emotional functioning as rated by children's teachers, which was not the case for either the SLI or the CA Matched Group. This suggests that for the LA Matched Group similarly to the parent ratings, non-verbal cognitive ability was significantly correlated with socio-emotional functioning within the school setting and

pointed once more to a complex picture for the LA Matched Group where the interaction of variables was much richer and harder to disentangle.

8.3 THE ROLE OF LANGUAGE ABILITY, NON-VERBAL COGNITIVE ABILITY, PRAGMATIC LANGUAGE ABILITY, PROSOCIAL BEHAVIOUR AND SOCIAL COGNITION ON SOCIO-EMOTIONAL FUNCTIONING

On the basis of the correlational analyses in section 8.2, multiple hierarchical regressions were carried out to investigate in sequence the role of the variables examined above in predicting children's socio-emotional functioning. In order to examine the relative role of the different factors, two regression analyses were performed for each group separately. This was done in order to investigate the second aim of chapter 8, which looked to examine whether predictive factors of socio-emotional functioning differed across the three participant groups. The dependent variable indexing socio-emotional functioning was the Total Difficulties Score of SDQ. The independent variables were entered stepwise in six steps: (i) chronological age; (ii) social cognition composite; (iii) prosocial behaviour; (iv) pragmatic composite; (v) non-verbal cognitive ability; (vi) receptive language and (vii) expressive language. The section is divided in two parts: the first one investigates which variables predict children's socio-emotional functioning based on parent ratings, and the second one focuses on predictive variables for children's socio-emotional functioning based on teacher ratings.

8.3.1 Predictive Variables for Socio-Emotional Functioning Based on Parent Ratings

In the first analysis, the final model for the SLI Group included only the Social Cognition Composite, explaining 11% of the variance ($F(1,30) = 5.19, p < .05, R_{adj}^2 = .11$). For the CA Matched Group, the final model consisted of the Prosocial Behaviour subscale, which explained 61% of the variance ($F(1,33) = 54.62, p < .001, R_{adj}^2 = .61$). Finally for the LA Matched Group, the final model consisted of the Social Cognition Composite explaining a significant 58% of the variance ($F(1,29) = 43.55, p < .001, R_{adj}^2 = .58$). In all three hierarchical regressions, the assumption of no multicollinearity has been checked using initially the correlation matrixes to assess whether predictors correlate too highly and then by using the Variance Inflation Factor (VIF) values, which indicate whether a predictor has a strong linear

relationship with the other predictor(s). The VIF values for all three regressions were found to be less than 10, thus the assumption of no multicollinearity has been met.

Table 8.7

Regression Analyses for Concurrent Variables predicting Parents Total Difficulties SDQ

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>Sig.</i>
SLI Group					
Social Cognition Composite	-.44	.19	-.38*	-2.28	.03
CA Matched Group					
Prosocial Behaviour	-2.12	.28	-.79	-7.39	.001
LA Matched Group					
Social Cognition Composite	-.37	.05	-.77**	-6.60	.001

* $p < .05$, ** $p < .005$

8.3.2 Predictive Variables for Socio-Emotional Functioning Based on Teacher Ratings

A similar exercise to the parents' analysis was carried out for the questionnaires completed by the teachers. Once again the groups were examined separately in order to investigate whether predictive factors were similar or different across the three groups. The Social Cognition Composite Score, the Prosocial Behaviour subscale, the Pragmatic Composite Score, the Raven's CPM, the Sum of Receptive Language Standard Scores, and the Sum of Expressive Language Standard Scores were again the dependent variables predicting the SDQ Total Difficulties Score from the teacher ratings (independent variable) as a measure of children's socio-emotional functioning.

The SLI Group final model was significant explaining 44% of the variance ($F(1,38) = 13.79$, $p < .001$., $R_{adj}^2 = .44$). The significant predictors comprising the final model were the Social Cognition Composite Score (26% of the variance) and the Prosocial Behaviour subscale (18% of the variance). For the CA Matched Group, the final model was significant and explained 38% of the variance ($F(1,39) = 15.15$, $p < .001$., $R_{adj}^2 = .38$) with the Prosocial Behaviour subscale (16% of the variance) and the Pragmatic Composite Score (22% of the variance) as the most significant variables. Finally, for the LA Matched Group the final model comprised of Social Cognition Composite Score explaining a significant 61% of the variance ($F(1,31) =$

51.87, $p < .001$., $R_{adj}^2 = .61$). The assumption of non-multicollinearity was checked again using the correlation matrixes and the VIF values, which found to be less than 10 in all three regressions thus the assumption of non-multicollinearity was met.

Table 8.8

Regression analyses for concurrent variables predicting Teachers Total Difficulties SDQ

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>Sig.</i>
SLI Group					
Social Cognition Composite	-.49	.13	-.43**	-3.64	.001
Prosocial Behaviour	-1.33	.36	-.44**	-3.71	.001
CA Matched Group					
Prosocial Behaviour	-.77	.39	-.25*	-1.97	.05
Pragmatic Composite	-.20	.05	-.50**	-3.89	.001
LA Matched Group					
Social Cognition Composite	-.37	.05	-.79**	-7.20	.001

* $p < .05$, ** $p < .005$

8.3.3 Summary of the Results

The results above point to the fact that for children with SLI performance on social cognition tasks emerged as a significant predictor of socio-emotional functioning when this was judged by children's parents. According to teacher ratings, social cognition was a significant predictor of children's socio-emotional functioning, combined with their prosocial behaviour which together predicted 44% of the variance. Social cognition was also the most significant predictor of the socio-emotional functioning of LA Matched children, again as rated by both the children's parents and teachers. In contrast, for the CA Matched Group, prosocial behaviour predicted socio-emotional functioning in both contexts. In the teachers case, prosocial behaviour combined with pragmatic language ability were the most significant factors predicting children's socio-emotional functioning.

The findings reported above highlight the importance of social cognition skills for the socio-emotional functioning of children with SLI. Social cognition was a significant predictor of children's socio-emotional functioning as judged both by their parents and their teachers at

school. As social cognition is a factor rarely examined for its predictive value in relation to the socio-emotional functioning of children with SLI, its contribution was examined further.

8.4 THE ROLE OF LANGUAGE ABILITY, NON-VERBAL COGNITIVE ABILITY AND PRAGMATIC LANGUAGE ABILITY ON SOCIAL COGNITION SKILLS FOR THE SLI GROUP

8.4.1 Introduction

Section 8.3 investigated the predictive variables for children's socio-emotional functioning. The results indicated that, both according to parent ratings as well as teacher ratings, social cognition was a significant factor for the socio-emotional functioning of children with SLI explaining 11% of the variance based on parent ratings and 44% of the variance based on teacher ratings together with prosocial behaviour.

The question arising from the results above is if performance on social cognition tasks plays a key role in predicting measures of socio-emotional functioning of children with SLI, then what are the variables predicting social cognition skills for children with SLI. The section below investigates this question in order to examine this complex relationship further.

8.4.2 Predictive Variables for Social Cognition for the SLI Group

In order to examine the relative role of the different factors, two hierarchical regression analyses were performed for the SLI Group separately. In both regressions, the dependent variable indexing social cognition skills was the Social Cognition Composite Score. In the first regression, the independent variables were entered stepwise in five steps: (i) chronological age; (ii) pragmatic composite (based on parents' questionnaires); (iii) non-verbal cognitive ability score; (iv) receptive language and (v) expressive language. For the first regression, the final model was significant and comprised the Pragmatic Composite Score explaining 22% of the variance ($F(1,30) = 9.88, p = .004, R_{adj}^2 = .22$).

In the second regression, the dependent variable was again the Social Cognition Composite Score and the independent variables were entered stepwise in five steps: (i) chronological age; (ii) pragmatic composite (based on teachers' questionnaires); (iii) non-verbal cognitive ability score; (iv) receptive language and (v) expressive language. For the second regression, the model was also significant comprising Chronological Age and again the Pragmatic Composite Score explaining 28% of the variance ($F(1,38) = 9.32, p = .004, R_{adj}^2 = .28$).

Table 8.9

Regression analyses for concurrent variables predicting Social Cognition Composite based on Parents' and Teachers' Ratings

	<i>B</i>	<i>SE B</i>	β	<i>T</i>	<i>Sig.</i>
SLI Group – Parents					
Pragmatic Composite Score	.36	.11	.49**	3.14	.004
SLI Group - Teachers					
Chronological Age	.15	.04	.44**	3.30	.002
Pragmatic Composite Score	.23	.07	.41**	3.05	.004

* $p < .05$, ** $p < .005$

8.4.3 Summary of the Results

The results above highlight the fact that pragmatic language ability, as judged by children's parents and teachers, was the variable predicting social cognition skills for children with SLI. Language and non-verbal cognitive ability were not found to have any predictive value in relation to the social cognition of children with SLI.

From the regression analyses above, it emerges that the ability to use language in a social way was a significant predictor of individual differences in social cognition skills which in turn was predictive of children's socio-emotional functioning as rated both by their parents and teachers. The next and final chapter of this thesis will discuss in detail the findings of the present study in relation to the results from previous studies.

CHAPTER NINE: DISCUSSION

9.1 ORGANISATION OF THE CHAPTER

The final chapter begins by providing an overview of the present research and reviewing its rationale. Based on the research rationale, the results are then considered in detail by highlighting the differences between the two age groups identified within the SLI Group and those between the SLI Group and the two typically developing comparison groups in the light of parent and teacher ratings on questionnaires of socio-emotional functioning. Following this, children's pragmatic language ability based on parent and teacher questionnaires of communicative and pragmatic language ability is considered and compared to the two matched groups. The results from the experimental tasks of social cognition are then presented and comparisons are made based firstly on the performance of younger and older SLI participants and subsequently based on the performance of the three participant groups. Chapter 9 continues by highlighting the contextual effects on children's socio-emotional functioning and pragmatic language ability.

The results are then discussed in the context of the complex role of language, non-verbal cognitive ability, pragmatic language ability and social cognition skills in children's socio-emotional functioning both in typical populations and in children with SLI. The final sections of the chapter discuss the limitations of the present research study and the implications of this research for future studies and interventions. Finally, conclusions about the social and emotional functioning of children with SLI are presented.

9.2 OVERVIEW OF THE STUDY AND REVIEW OF THE RESEARCH RATIONALE

The relationship between language impairment and socio-emotional functioning has been investigated in research for at least the last four decades. Previous research has shown increased prevalence of BESD in samples of children with language impairment (Beitchman et al., 1996a; Fujiki et al., 2002), including conduct problems (Cohen et al., 2000; Coster et al., 1999), difficulties with peers (Fujiki et al., 2001) and impaired self-esteem and confidence

(Jerome et al., 2002; Wadman et al., 2008). However, despite the growing number of studies examining BESD in children with language impairments, there are still uncertainties in the literature about the relationship between language impairment and socio-emotional functioning, as well as regarding the factors underpinning children's reported difficulties.

Firstly, the available literature is limited both theoretically and empirically making the interpretation of the results problematic. There is an increasing need to provide adequate descriptions of the children's skills and the difficulties that they contend with. This need mainly stems from a theoretical motivation where examples of comorbidity are used to explain different developmental trajectories (Angold et al., 1999). The majority of research studies looking at the relationship between language impairment and BESD have focused on possible within-child factors which could be affecting children's socio-emotional functioning; primarily, children's language abilities have been investigated in relation to BESD. Following the review presented in chapter 2, which pointed to the critical role of language for children's socio-emotional development, it was expected that children with language impairment would experience difficulties with their socio-emotional functioning when compared to typically developing children of the same chronological age, and that the ratings of parents and teachers of children's socio-emotional functioning would be similar to the ones of a much younger group of typically developing children matched for language ability. Therefore, the first aim of the present study was to contribute evidence about the impact, if any, of the language status and non-verbal cognitive ability on the socio-emotional functioning of a carefully studied group of primary aged children with SLI.

Nevertheless, previous research has failed to consider that BESD in children with language impairment cannot be totally attributed to their linguistic limitations. Good performance on language tests does not necessarily predict successful socio-emotional functioning, and language ability alone does not determine children's social status. Even if there is a correlation between the two variables, their relationship may not be a causal one. Some research studies suggested that children with SLI may display BESD that are distinct from their difficulties with language ability, but may simply co-occur with one another (Marton et al., 2005; Brinton et al., 1997b; 1998a). In that sense, current research has failed to consider other factors or comorbid difficulties that may account for the BESD of children with SLI. For children to be socially and

emotionally successful, a large number of cognitive, behavioural, and emotional processes, apart from competent language skills, must operate in concert (Bierman, 2004). The present study added to previous work and aimed to address this gap by exploring an additional possible factor that has not been previously considered but plays a crucial role in children's socio-emotional functioning: children's social cognition skills (Herba & Philips, 2004; Clegg et al., 2005; Farmer, 2000). In the present study, an exploration of children's social cognition skills was accomplished through direct assessment. Social cognition was conceptualised as a multifaceted construct that refers to the mental operations underlying social interactions. These mental operations include processes involved in perceiving, interpreting, and generating responses to the emotional states, intentions, and behaviours of others (Brothers, 1990; Fiske & Taylor, 1991; Kunda, 1999). Different aspects of social cognition, such as emotion recognition and understanding, emotion explanation and knowledge of conflict resolution strategies were of interest. Thus social cognition skills were investigated in the present study in order to extend our understanding of children's socio-emotional functioning and allow an exploration of the ways in which children's relative strengths or weaknesses might ameliorate, or put at risk their behavioural, emotional and social profiles.

Additionally, in considering the relationship between language impairment and BESD, the present study built on earlier research work by considering the child's environment. Studies reported in chapters 2 and 3 suggest that BESD show lower levels of consistency across environments than cognitive and language abilities (Lindsay et al., 2007; Swinson et al., 2003). For example, the correlations between parent ratings of behaviour at home and teacher ratings of school behaviour are often low, both for children with SLI and other groups of children with developmental difficulties (Lindsay & Dockrell, 2000; Redmond & Rice, 1998; Rutter et al., 1970). This suggests that BESD are not stable and intrinsic and that children's competences and weaknesses are interwoven with the context and therefore cannot be viewed as separate. In that sense, the understanding of socio-emotional functioning and BESD in children with language impairments is unlikely to emerge from assessing the child or the context in which they operate in isolation, as it is the interaction of the two that creates the problem behaviour. The role of context has not been fully understood or researched and, hence, the present study aimed to explore the congruence of children's BESD and whether the nature of these varied with setting, namely home and school.

Therefore, the present study challenged simple ways of looking at the association between language impairment and BESD by utilising a two-factor model and exploring relationships between within-child factors comprising the child's strengths and weaknesses (verbal ability, non-verbal cognitive ability and social cognition) and the influence of the environment on engendering, maintaining or altering BESD (Adelman, 1992; Lindsay, 1995). Although a number of studies have explored these two factors separately, there has previously been very little evidence offered on the interaction of the two factors considered in the present study: within-child and context.

Apart from addressing limitations of previous research on empirical grounds, the present study also dealt with the significant methodological limitations that permeate current literature and make the results of research studies difficult to interpret. Firstly, the participant samples typically employed to investigate relationships between language impairment and BESD have usually been drawn from clinical populations, which constrains the generalisability of the results. As discussed in chapter 2, clinics invariably have selective attendance affected by factors, such as social class, ethnicity, and the severity of the language impairment. Often, the condition of language impairment is compounded with other clinical conditions, and therefore the results of studies employing clinical samples should be treated with caution. Population-based community samples are needed to investigate fully the relationship between socio-emotional functioning and possible related factors. The present study benefited from the fact that it employed a group of children with language impairment from mainstream schools within an inner London borough enabling further investigation of the relationships between language impairment and BESD in a homogeneous mainstream sample.

Furthermore, a number of research studies reported in chapter 2 have tried to examine whether the factors that are most strongly associated with the development of BESD in children with language impairments are related to the nature and severity of the language impairment itself. Thus, despite a considerable body of literature, it is still not known whether children with language impairments manifest a specific or characteristic difficulty with their socio-emotional functioning. Nor is it clear whether different language dimensions are more strongly related to different rates and types of BESD. Therefore, a further methodological limitation of previous research is that it fails to differentiate between different dimensions of language and types of

behaviour difficulties. Lindsay et al (2007) argue for the importance of examining the specific relationships between different types of BESD and different language dimensions, as the former can have a negative impact on a child's development independent of language impairments.

The present thesis examined three language dimensions: receptive language ability, expressive language ability and pragmatic language ability. There is strong theoretical and empirical evidence in support of the importance of pragmatic language ability and therefore it was considered necessary to add this dimension to the two other dimensions of language traditionally researched. Pragmatic impairments are under-researched in relation to language impaired children's socio-emotional functioning and impairments in pragmatic language ability have in the past been linked to BESD (Vedeler, 1996; Olswang et al. 2001, Conti-Ramsden & Botting 2004). As the studies reported in chapter 1 and chapter 2 have shown, concealed difficulties in the understanding of connected discourse, of word meaning, or of figurative language could impede learning (Rapin, 1996; Shields et al. 1996; Bishop, 1997; Vallance & Wintre, 1997) as well as hinder social and educational inclusion (Westby, 1999; McCabe, 2005). A detailed examination of the role of pragmatic language ability as a language dimension which might be affecting children's socio-emotional functioning was therefore deemed necessary. Assessing pragmatic language ability can be a challenging task owing to the effect of context on a child's social use of language. Therefore, in the present study, an examination of children's pragmatic language ability was realised by investigating both parents' and teachers' views of children's pragmatic language ability and looking at children's pragmatic strengths and weaknesses in the two main environments of their functioning, home and school. The present study also examined different types of BESD, as opposed to only a general composite of socio-emotional functioning or a diagnosis of psychiatric disorder, and looked at possible associations with the different dimensions of language (receptive vs expressive vs pragmatic language ability).

9.3 SOCIO-EMOTIONAL FUNCTIONING OF CHILDREN WITH SLI

Previous studies have indicated that children with SLI present with higher levels of BESD than typically developing children over the period between preschool to 12 years of age (Botting &

Conti-Ramsden, 2008; Lindsay et al., 2007; Conti-Ramsden & Botting, 2004; Lindsay & Dockrell, 2000; Beitchman et al., 1996b; Benasich et al., 1993; Baker & Cantwell, 1987). The present study supports this general finding based on a cohort of primary aged children attending mainstream schools within an inner London borough.

The current sample of participants with SLI demonstrated considerable problems with all aspects of their socio-emotional functioning as identified by the SDQ questionnaire. Within group comparisons between the younger (below 8 years) and older (8 years and above) SLI participants revealed a clear trend for both parents and teachers to rate the group of younger children with SLI as presenting with more difficulties in all the areas of socio-emotional functioning. Differences between the two age groups were not significant according to teacher questionnaires. In the case of parents however, there were two statistically significant differences: the younger group of SLI participants differed significantly from the group of older SLI participants in the Conduct Problems subscale and the Total Difficulties Score of the SDQ, pointing to greater levels of parental concern for the younger SLI participants. According to parents, the older children with SLI presented with less concerning conduct problems but also less difficulties with socio-emotional functioning in general in comparison to the group of younger children with SLI. This is consistent with findings from earlier studies suggesting that externalising problems, such as aggression and conduct problems, are more frequent at younger ages and internalising problems, such as low-self esteem, increase at older ages (Baker & Cantwell, 1987a; 1987b; Haynes & Naidoo, 1991).

When the children's scores were compared with CA Matched and LA Matched peers, all the subscales of SDQ varied significantly between the groups, with the SLI Group being rated significantly higher than both matched groups. A very high proportion of children with SLI experienced BESD at home, with 45.2% rated above the SDQ abnormal cut-off for Total Difficulties, compared with none of the children from the CA Matched Group and 2.8% of children from the LA Matched Group. At school, however, teachers' ratings indicated lower levels of Total Difficulties with 28.6% of children with SLI rated as abnormal, compared to 2.4% of children from the CA Matched Group and none of the children from the LA Matched Group.

The results of the present study also revealed the importance of examining different types of BESD, as opposed to only considering a composite of socio-emotional functioning or a general diagnosis of psychiatric disorder, and therefore extended our understanding by providing a detailed description of these children's behavioural, emotional and social needs. Examination of specific types of BESD revealed firstly that the parents consistently rated the children as having more problems than the teachers on all types of BESD identified by the SDQ questionnaire, which is consistent with findings from previous research studies (Lindsay et al., 2007; Lindsay & Dockrell, 2000). Secondly, peer problems were reported by parents as significant difficulties (35.7%), and poor prosocial behaviour was reported by teachers as the most common difficulty (47.6%). In contrast, and as predicted in chapter 4, both parents and teachers reported fewer emotional symptoms and conduct problems, again in accordance to previous research (Lindsay et al., 2007; Redmond & Rice, 2002; Maughan et al., 2004; Tallal et al., 1989).

As predicted in chapter 4, reports of hyperactivity were very high in both home and school settings, as rated by parents (50%) and teachers (35.7%). The results of the present study concur with recent research studies, which demonstrated increased levels of problems with attention/concentration and hyperactivity for the SLI population (Marton, 2008; Riccio et al., 2007; Farmer & Oliver, 2005). In a review of the literature, Cohen (2002) reported that among children who have a language impairment, the most common types of difficulty are difficulties with attention and concentration.

The second important point arising from the analysis of the SDQ questionnaire is the role of prosocial behaviour and the increased concerns expressed by parents, and, in particular teachers. Difficulties with prosocial behaviour for children with SLI have been reported in research literature by both teachers (Timler, 2008; Hart et al., 2004) and parents (Stanton-Chapman et al. 2007). Poor prosocial behaviour is naturally expected to impact on children's social relationships and interactions with peers. In particular, research in this area has shown that children with higher levels of prosocial skills show greater empathetic awareness, are more likely to achieve popular status and are less likely to be rejected (Findlay et al., 2006; Warden & Mackinnon, 2003). The subsidiary effect of difficulties with prosocial behaviour on social relationships was clearly revealed in the findings of the present thesis with children with SLI

being rated by both parent and teachers as having considerable problems with peers (35.7% and 28.6% respectively), providing further support to a widespread acknowledgement that children with SLI are at a significant risk of experiencing difficulties with social integration and peer acceptance (Lindsay et al., 2007; McCabe & Marshall, 2006; Rice, 1993; Bishop, 1997; Brinton & Fujiki, 1999).

9.4 PRAGMATIC LANGUAGE ABILITY OF CHILDREN WITH SLI

In addition to investigating different types of BESD, the present thesis made novel contributions by investigating different language dimensions and examining associations between these and different types of BESD. Traditionally research has focused on two dimensions of language: receptive and expressive language ability. The present study added to this work by looking also at children's pragmatic language ability since this has been closely linked in the past with BESD (Farmer, 2000).

The findings of the present thesis support previous literature showing that pragmatic language ability is significantly compromised in those with language impairments (Spanoudis et al., 2007; Conti-Ramsden et al., 1997; Rapin, 1996). Both parents and teachers reported increased difficulties in the communication and pragmatic language ability of children with SLI, with scores falling below the average for all the CCC-2 subscales apart from the Inappropriate Initiations, Stereotyped Language and Interests subscales, which were within the average range. Data from the present study indicates that children in the SLI Group, in addition to significant semantic and structural weaknesses as measured by the first four subscales of the CCC-2 assessing aspects of language structure, vocabulary and discourse, also experience significant difficulties with pragmatic language ability, as suggested by the four subscales assessing pragmatic aspects of language and the Pragmatic Composite Score. This finding is compatible with Bishop's (2000) view that pragmatic language impairment is dissociable from (or co-exists with) other language impairments. Difficulties with understanding speaker intentions, listener's prior knowledge and attentional focus were very commonly reported for the SLI Group by both parents and teachers. Within group comparisons between the group of younger and the group of older SLI participants revealed again a trend for the younger SLI age group to score lower on all CCC-2 subscales and the three composite scores, but the

differences between the two age groups did not reach statistical significance based on either the parent or the teacher questionnaires. The only significant difference found between the two age groups was on the Speech subscale of parents CCC-2, where the younger SLI participants were rated as having more difficulties in comparison to the older SLI participants.

When compared with their typically developing peers, there were significant differences between the group means on all the CCC-2 subscales, with the SLI Group being rated significantly lower by both parents and teachers than the CA Matched Group. Surprisingly, pragmatic language ability proved to be significantly disadvantaged for children with SLI even in comparison to the much younger, and of course less experienced, LA Matched Group as rated by both parents and teachers. This finding is in contrast with an earlier study of Rollins (1994) which compared the pragmatic language ability of a group of children with SLI and their younger siblings matched for their Mean Length of Utterance (MLU) and found comparable performance within sibling pairs in terms of their social interchanges, speech acts, and conversational styles, but also that the children with SLI demonstrated a more varied repertoire than their younger, normally developing siblings. Rollins' results might be explained partly by the fact that the children were matched for expressive language (rather than the receptive language used to match the two groups in the present study) and also by the very small sample size (5 SLI participants) which reduces statistical power of the results. Results of an impaired pragmatic language ability of children with SLI even in comparison to their much younger LA Matched peers suggested that children with SLI in the present study showed a different, rather than a delayed, developmental pathway in their development of pragmatic language ability.

Assessing pragmatic language ability can be fraught with problems (Botting, 2004). This is particularly true when taking into account the effect of the context on a child's social use of language (discussed in detail in section 9.5), as well as rater-specific effects which are also often evident in research, especially on measures of pragmatic aspects of communication (Bishop et al., 2006). Data from the present study showed that, although there was a generally high rater agreement in most CCC-2 subscales, two differences were reported in children's communication and pragmatic language abilities in relation to parents' and teachers' views. Parents of children with SLI reported more difficulties with Semantics than teachers, which possibly highlights parents' greater awareness of their children's vocabulary, and therefore

greater concerns about their poor vocabulary skills. There were also differences between parent and teacher ratings in the Social Interaction Deviance Composite for the SLI Group, with parents reporting again more difficulties than teachers, this time about children's social relationships. As with the results obtained from the SDQ questionnaire (reported in section 9.4), the differences between parent and teacher ratings existed only for the SLI Group, and not for the two typically developing comparison groups. As we shall see in section 9.6, this might be partly explained by parents' long-term understanding and knowledge of their child since they have known their children since birth, but also because these children more than children in the CA and LA Matched Groups exhibit significant differences in their discourse patterns across settings.

The present results are in keeping with a limited number of studies looking at language impaired populations and examining the role of pragmatic language impairments as a part of children's general communication difficulties, and arguing that many children with poor linguistic skills also display difficulties with pragmatics (Botting, 2004; Bishop & Baird, 2001; Conti-Ramsden et al., 1997; Rapin, 1996; Craig & Evans, 1993). Data from the present study lends clear support to the notion that children with SLI have broader communicative impairments, extending beyond basic difficulties in mastering language form and affecting children's ability in responding to and expressing communicative intents. These difficulties are distinctive from not only their CA matched peers but also their LA matched peers and thus cannot be explained solely by children's poor structural language ability pointing to atypical pathways of development for the SLI Group. These difficulties should therefore be included in any investigation of the relationship between language impairments and BESD. In order to challenge simplistic models explaining the co-morbidity between language impairment and BESD, concerns reported by both children's parents and teachers regarding pragmatic aspects of language need to be included alongside the two traditionally researched language dimensions (expressive and receptive language abilities).

9.5 SOCIAL COGNITION SKILLS OF CHILDREN WITH SLI

In addition to looking at different dimensions of language in relation to reported difficulties with socio-emotional functioning, a further aim of the present thesis was to examine an additional

within-child factor: children's social cognition skills. To date this factor has received little attention in the literature, especially in relation to children's BESD. As explained in chapter 3, one reason for this may be that social cognition is an 'umbrella term' that can refer to a wide range of behaviours (Botting & Conti-Ramsden, 2008). The detailed nature of such skills is not fully understood, therefore in the present study, social cognition has been adopted as a term to apply to any cognate understanding of other's emotional or mental state. In particular, in the present study social cognition was researched through four experimental tasks assessing children's ability to identify and label emotions, infer the causes of emotion-eliciting contexts, explain emotions and use conflict resolution strategies in their conflicts with peers.

Results from the four experimental social cognition tasks lend support to previous studies which found that those with language impairments (but not autism) may present with subtle social cognition impairments (Farmer, 2000; Clegg et al., 2005; Botting & Conti-Ramsden, 2008). In the present study children with SLI differed from their typically developing peers in their processing of social information, as shown by the significant group differences found for the Social Cognition Composite score. The four areas of social cognition investigated in the present study were found to be closely related to each other and showed an impaired pattern of performance for those with SLI in relation to both comparison groups and therefore cannot be explained by children's language ability levels alone. The results of each experimental task are discussed in detail below:

Task A: Labelling and Identifying Emotions Task

The findings from the 'Labelling and Identifying Emotions' task suggested that children with SLI had some difficulties in their ability to encode and interpret social cues. In particular, recognising the four facial expressions and semantically mapping those emotions was a more challenging task for the SLI Group in relation to both the CA Matched and LA Matched Groups. Contrary to the research predictions (chapter 4), when compared to the two matched groups, children in the SLI Group were less successful in correctly labelling and identifying the four basic emotions of happiness, sadness, anger and fear. This suggests that children with SLI experienced difficulties in the area of emotion understanding, and also that the basic ability to identify emotion from facial expressions may develop more slowly in children with SLI or in a different way, a finding also supported by the work of Boucher et al. (2000), Spackman et al.

(2006) and Holder and Kirkpatrick (1991). However, the findings reported above are in contrast with data presented in a study by McCabe and Meller (2004) who found that their emotional expression identification test failed to differentiate the language impaired group from the typically developing chronological-age matched group (mean age: 4 years 10 months). Most children in their study scored very well on this test overall. This might be because the specific test used may not have an adequate ceiling needed to demarcate the subtle, yet meaningful, differences found in the present study.

In response to the developmental pattern noted in the literature, it was hypothesised that there would be differences between the younger group and the older group of SLI participants in their ability to identify and label facial expressions. Although the differences between the two age groups did not reach statistical significance, there was a clear trend for the older SLI participants to score higher on the Total Emotion Labelling and Total Emotion Identification Scores in comparison to the younger group.

The final prediction for the first social cognition task hypothesised that some emotions might be easier to identify and label than others, especially for the younger children. Denham (1998) noted that "...the trend of comprehending happy situations followed by sad, angry, and fearful situations is clear". In the present study, almost all the children from all three participant groups were able to identify and produce the lexical labels for the facial expressions of happiness and sadness, a finding consistent with prior research (Ford & Milosky, 2003). Children in all three groups also made significantly more errors for the emotion of 'anger' and 'fear', which might be because these two emotions are more abstract and subtle. However, differences between the groups were still observed. The findings revealed that there was a significant statistical difference between the groups in their ability to both correctly identify and label the emotions of sadness, anger and fear, with the SLI Group performing worse than the two comparison groups.

Task B: Inferring the Causes of Emotions

The second social cognition task examined children's ability to infer the emotions elicited by common social situations, such as having a birthday party (happiness), experiencing physical danger (fear), losing a pet (sadness) or having a fight with a sibling (anger). The results from

this task suggested that children with SLI were less proficient at integrating basic emotion knowledge (demonstrated in the first experimental task) with event context, in order to make an accurate emotional inference regarding a character's emotional state. In particular, according to the first research prediction of the task (chapter 4), younger SLI participants were less successful in making inferences in all four emotion conditions (happiness, sadness, anger and fear) in comparison to the older SLI participants, but the differences between the two age groups did not reach statistical significance.

The second research prediction of the task hypothesised that children with SLI would perform less successfully than their CA Matched peers but similarly to their LA Matched peers. However, contrary to this prediction, differences between the three groups were found for the emotions of sadness, anger and fear, with the SLI Group being less successful than both comparison groups in their ability to make correct inferences.

As with the results from the first experimental task and in line with the third research prediction of the task, all groups found it harder to decipher the more ambiguous, subtle and complex emotions of sadness and fear, whereas children in all three groups made significantly more correct inferences in the happy condition, supporting Denham's argument about developmental differences in emotion understanding (Denham, 1998).

Although there is very limited research in the area of emotion understanding and how children with SLI infer emotions elicited by social situations, the findings reported above support those of Ford and Milosky (2003) and Spackman et al. (2006), who found that children with SLI had significantly more difficulty inferring the expected emotional reaction when compared with children with typical language skills. That is, children with SLI in both of these studies could identify emotions in a drawing of a facial expression, but had difficulty linking these emotions with the situations expected to elicit those emotions. Moreover, they were significantly less accurate in doing so than typically developing children. The ability to predict the emotion that an event could be expected to produce is important in judging how to respond to others in social interactions. For example, appreciating that a peer would be sad if he/she lost a favourite toy or frightened if he/she entered a dark room enables a child to commiserate or empathize appropriately (Denham, 1998). The fact that children with SLI in the present thesis experienced

difficulty with this type of emotion understanding could potentially undermine social interactions. Having difficulty making causal inferences about the emotional states of others (e.g. seeing a person's cat dying and inferring that the person is sad) will undoubtedly impact and impede relationship formation for children with SLI.

Task C: Emotion Explanation

The third social cognition task examined children's ability to predict and explain typical (expected) and atypical (unexpected) emotions when presented with hypothetical social situations. Results from the third task showed that the expected or typical emotion was frequently predicted by children, although, contrary to the findings of the first two experimental tasks, children with SLI made fewer correct predictions for the emotion of happiness (38.1% correct emotion prediction for both stories). In line with research predictions, younger SLI participants were less successful in their emotion prediction when compared to the older group of SLI participants, a difference which was found to be statistically significant. The two age groups were found to also differ in their ability to explain the causes of typical and atypical emotions, with the older SLI participants using more mental state attributions. However, this time the difference did not reach statistical significance.

When compared to children in the CA and LA Matched Groups, it was evident that children in the SLI Group were less successful in correctly predicting the typical emotion. Although statistically significant differences between the three groups were not found, this finding is in contrast to the second research prediction for the third experimental task, which hypothesised that the emotion prediction of children with SLI would be different to their CA Matched peers but similar to their LA Matched peers.

When looking specifically at the way children attempted to explain a character's emotions, as predicted, children in the SLI Group used significantly less mental state attributions in relation to both comparison groups to explain both typical and atypical (unexpected) emotions. All three groups attributed more mental states when asked to explain atypical emotions than typical emotions, but this difference was larger for the comparison groups. In general, children in the SLI Group focused more on giving explanations that repeated the situational factors rather than how a person thinks or feels.

Again, research in the area of emotion explanation for children with SLI is limited, but the results reported above are also supported by Spackman et al. (2006) who found that children with SLI were less sophisticated in their explanations of emotion than were typically developing children. In Spackman et al.'s study most of the responses of children with SLI were inappropriate either because they restated the story event (as in the present study where most children used situational responses), or because they just repeated the emotion without explaining the reason why a character would feel the specific emotion.

Task D: Conflict Resolution Abilities

The final experimental task aimed to examine children's knowledge and use of conflict resolution strategies in challenging peer situations. Using a vignette paradigm, the concern of the task was the extent to which children with SLI would choose to react in a socially constructive fashion in response to a conflict with peers. The results showed that the most frequent responses for children with SLI were: a) to involve an adult to assist them with peer conflicts, b) to do nothing and be submissive when conflicts arose or c) to use physical aggression to resolve matters. The reactions of this group of children with SLI mainly reflected the tendency of departing the scene without resolving the conflict or expecting a third person to solve the conflict in an attempt to avoid the negotiation process. Once again there were developmental differences between the younger and older SLI participants, with lower scores on the Total Conflict Resolution Strategies Score for the younger group, a difference which however did not reach statistical significance.

When compared to children in the two matched groups, children with SLI reported that they would use reconciliation in significantly fewer conflict scenarios, whereas both their typically developing CA Matched and LA Matched peers said they would ask for clarification about the situation in order to resolve matters with a peer. Statistically significant differences were found between the three groups on the Total Conflict Resolution Strategies Score with the SLI Group scoring significantly lower than both matched groups.

In general, the SLI Group in the present study showed little evidence of utilizing effective strategies to negotiate and resolve presented conflicts. The findings from the final experimental social cognition task corroborate previous research concluding that children with SLI use fewer conflict resolution (Stevens & Bliss, 1995) and negotiation strategies (Brinton et al., 1998b) than their peers. For example, Stevens and Bliss (1995) found that children in their SLI Group used significantly fewer conflict resolution strategies than the typically developing children and that they displayed limitations in strategies that involve persuasion, asking questions to acquire information, and the ability to take into account the perspective of another individual. Also, the finding that the most frequently chosen conflict resolution strategies for the SLI Group in the present thesis are to involve an adult or be submissive is supported by the early work of Bryan et al. (1981) who studied the interaction skills of children with learning disabilities. Their findings revealed that children with learning disability showed more passive behaviours than their peers to avoid disagreements. Similarly, results from Marton et al. (2005) support the view that children with SLI employ more non-verbal coping strategies than their peers regardless of its appropriateness to the situation. The non-verbal reactions included evidence of physically aggressive behaviour, such as, pushing and shoving and conversely passive/withdrawn reactions, such as, relinquishing to their partner and so avoiding the negotiation process.

9.6 CONTEXTUAL FACTORS AFFECTING SOCIO-EMOTIONAL FUNCTIONING AND PRAGMATIC LANGUAGE ABILITY OF CHILDREN WITH SLI

An additional aim of this thesis was to address the gap in the literature which until now has failed to conclusively identify whether or not children's BESD are context specific. In pursuing this aim the present study adopted a multi-factorial model of socio-emotional functioning and provided a more dynamic and complete picture of the socio-emotional functioning of children with SLI. The present model took into account the role of characteristics which are intrinsic to the child, meaning different dimensions of language ability (receptive vs expressive vs pragmatic language), their non-verbal cognitive ability and their social cognition skills, as well as characteristics which relate to the familial and social environment in which a child is raised.

The role of context was researched in the present study by investigating parents' and teachers' views on their child's general socio-emotional functioning and on their pragmatic language

ability. Studies using teacher ratings alone are limited to the child's behaviour in the school context (Conti-Ramsden & Botting, 2004; Fujiki et al., 2001) and so fail to capture situational variation identified when parent and teacher ratings are available, as in the present study (Scourfield et al., 2004). Conti-Ramsden and Botting (2004) also included child ratings of their own behaviour using the SDQ but children reported on their behaviour generally and not according to how they felt their behaviour was in different settings. Similarly, assessing pragmatic language ability can be a complicated task (Botting, 2004) as a child's use of language in a social situation is subject to contextual influences. Therefore, in the present study an assessment of children's pragmatic language abilities was conducted through an investigation of both parents' and teachers' views in order to explore how children use language in a social way in different contexts and with different people.

In chapter 4 it was hypothesised that differences between parents' and teachers' views would be evident for all three groups. For example, previous studies have highlighted the substantial variations of parent and teacher ratings and the fact that parents tend to generally rate children as having more problem behaviours than do teachers (Collishaw et al., 2009; Cai et al., 2004; Gagnon et al., 1992). Based on these results, it was expected that differences in ratings would be present for the whole sample. However, in contrast to the research hypothesis, when looking at the whole sample, there were no apparent differences found in the present study between what parents and teachers reported for children's socio-emotional functioning or pragmatic language ability for the two matching groups. Although correlational analyses revealed that parents and teachers identify the same children as experiencing problems, significant variations between parents and teachers existed only for the SLI Group as different patterns of prevalence were found for different types of difficulties with respect to the home (as judged by parents) and the school (as judged by teachers).

In particular, on the SDQ questionnaire, although overall both parents and teachers reported difficulties with hyperactivity and attention difficulties, parents focused more on social difficulties, whereas teachers reported more difficulties with a specific set of skills that facilitate and enhance social interactions, such as sharing, helping and comforting peers, i.e. children's prosocial skills. This finding is consistent with studies looking at the behaviour and self-esteem of children with SLI (Lindsay & Dockrell, 2000), which found that parents perceived more

problems than did teachers, but were also more likely to rate their children as having better prosocial behaviour. Also, when looking at the Total Difficulties score, parents perceived more problems (45.2% in the abnormal range) than did teachers (28.6%) revealing more concerns about their children's socio-emotional functioning. Although this score was not found to be statistically different, it does highlight the serious concerns of parents for their children's overall socio-emotional functioning, reported in other studies as well (Conti-Ramsden et al., 2008; Youngstrom et al., 2000; Marton et al., 2005).

In terms of the CCC-2 questionnaire, significant differences were found on two dimensions of children's communicative and pragmatic language ability. The differences between parent and teacher reports were found in children's vocabulary skills (Semantics subscale) and social interactions (SIDC subscale) with parents reporting more concerns on these two areas than teachers do. Again, there is the same pattern with parents reporting more difficulties in all the communicative and pragmatic subscales, as well as the three main composites (Pragmatic Composite, General Communication Composite, Social Interaction Deviance Composite) than do teachers.

Variations in ratings between parents and teachers are not unusual in literature (Rutter et al., 1970; Redmond & Rice, 1998). For example, Hundert et al. (1997) found significant differences between parent and teacher ratings of preschool children with severe difficulties, although not for children with mild/moderate difficulties or typical development. Results from the present study raise the question whether the inconsistency in views between parents and teachers for the SLI Group reflect absolute differences in the children's socio-emotional functioning and pragmatic language ability in home and school settings or whether the main source of variance is the respondent, their experiences of the children and the influence of the environment on children's functioning.

There are several possible reasons for the differences found in the present thesis. First of all, when thinking of the increased reports of difficulties by parents both in terms of socio-emotional functioning and pragmatic language ability, it is necessary to consider the fact that the parent ratings are likely to be influenced by a long-term understanding and knowledge of their child since they have known them since birth. The teachers on the other hand would typically have

met the child and had knowledge of their needs for a matter of months, but have better normative knowledge and more comparisons against which to judge children's skills.

Secondly, it is reasonable to conclude that children exhibit significant differences in behaviour patterns across settings. That is particularly true in terms of problem behaviours with a number of studies highlighting very low correlations between parent and teacher ratings based on different observations of the children in different contexts (Murray et al., 2007; Antrop et al., 2002; Achenbach et al., 1987). For example, parents have the opportunity to observe their child in a greater variety of settings; at home and different settings within the community. A parent may judge problems with peers on the basis of their child having very few friends, or not being invited to others' houses. They may base their ratings on the fact that they often see their child alone, in small groups or dyads, in social settings where they can observe the impact of communication problems on their social interactions. Also, in terms of children's vocabulary skills, it could be the case that parents of children with SLI have more opportunities to listen to their child using varied vocabulary in different contexts where the child interacts with other children in more familiar and less formal circumstances.

Teachers, on the other hand, have the opportunity to see children in one setting, the structured setting of the school, and that would mean that they have fewer opportunities to explore children's less formal social behaviour and social use of language. Teachers, especially in mainstream classes where the participants in this study were employed from, are less able to observe close social interactions very often and to monitor how children's communicative limitations confines their ability to form and maintain relationships. For example, in Marton et al.'s study (2005) the teachers reported no problems in social relations for children with SLI, did not notice their isolation in the class and did not use any specific strategies with these children because they knew very little about their special needs. Also, in terms of children's vocabulary, teachers have fewer opportunities to explore children's vocabulary skills and, when they do, it happens only within the structured school environment where there is not enough variability or time to explore children's word use (Dickinson et al., 2008). Hence, in addition to the effect of context and the impact of the communicative demands on children's socio-emotional functioning and pragmatic language ability, the parents may be in a better position to offer a finer differentiation of their children's everyday experiences and skills.

The reason why teachers report more difficulties with prosocial behaviour could suggest that certain social skills are more highly regarded in certain situations than others (Lane et al., 2007). Although parents regarded children's behaviour and social relationships with more concern than did teachers, teachers highlighted difficulties in skills impeding children's behaviour and relationships, i.e. their prosocial skills. Parental assessments of prosocial behaviour show significantly higher scores than teacher reports in typical populations and there is a general trend for parents to show significant bias in their ratings of their child's prosocial skills (Scourfield et al., 2004). Also, prosocial skills are often less easy for parents to observe whereas they are more apparent to teachers who can readily compare children's behaviour with their peers in the structured school environment (Lindsay & Dockrell, 2000). Although parents have access to a wider range of situations where the child's problems may be evident, the teachers have better normative knowledge and more comparisons against which to judge the child's prosocial skills.

In general, data reported in the present study highlight the importance of examining the additional dimension of the environment when investigating children's socio-emotional functioning and the interaction between different types of BESD with context. Obtaining ratings from multiple informants is critical for gaining a full picture of children's strengths and weaknesses. It was evident from the findings of the present thesis that parents and teachers have a different view of these children's socio-emotional functioning and therefore should be considered complimentary in the assessment process. Additionally, linking different ratings with within-child factors such as verbal, non-verbal cognitive ability and social cognition can provide a broader description and understanding of children's socio-emotional profiles.

9.7 THE IMPACT OF VERBAL, NON-VERBAL COGNITIVE ABILITY, PRAGMATIC LANGUAGE ABILITY, PROSOCIAL BEHAVIOUR AND SOCIAL COGNITION SKILLS ON THE SOCIO-EMOTIONAL FUNCTIONING OF CHILDREN WITH SLI

The final aim of the present thesis was to investigate the relationships between socio-emotional functioning, verbal ability, non-verbal cognitive ability, pragmatic language ability, prosocial

behaviour, and social cognition, and to examine predictors of socio-emotional functioning for the three participant groups. There are three main issues arising for discussion:

1. What were the similarities and differences between the SLI Group and the two matching groups in the interrelationships between the different variables under investigation?
2. What were the similarities and differences between parent and teacher ratings in terms of the interrelationships between the different variables under investigation?
3. What predicts socio-emotional functioning for the SLI Group and is this different or similar to the two matching groups?

9.7.1 Similarities and Differences between the Groups in the Interrelationships between the Different Variables as reported by Children's Parents

In terms of parent ratings, when looking at the relationships between verbal ability, non-verbal cognitive ability, pragmatic language ability, prosocial behaviour, social cognition and children's socio-emotional functioning, two main similarities could be observed between the SLI Group and the two comparison groups. Firstly, no associations were found between the measure of socio-emotional functioning and either language or non-verbal measures for the SLI and CA Matched Groups. In contrast, there was a strong relationship found between both non-verbal cognitive ability scores and expressive language status and ratings of socio-emotional functioning as judged by the parents of the LA Matched Group. The results above indicated that the lower non-verbal cognitive ability and expressive language ability scores are, the greater BESD at home are for the LA Matched Group.

The second similarity arose between the SLI Group and the LA Matched Group, in that for both groups social cognition was found to correlate significantly with the index of socio-emotional functioning, such that weaker social cognition skills were associated with higher reported levels of BESD by parents. In contrast, social cognition was not found to relate with socio-emotional functioning for the CA Matched Group. This finding suggests that for the typically developing CA Matched children the social cognition tasks were straightforward, easy to complete, but also insufficiently difficult to measure their true ability or knowledge leading to a task ceiling effect and therefore making differentiation very hard.

This finding also indicates that qualitatively different relationships might be at play between the three groups: namely that social cognition skills are more strongly related with socio-emotional functioning for those with clinical language difficulties and children of a younger age, whereas pragmatic language ability and prosocial behaviour is more strongly linked with the socio-emotional functioning of typically developing children of the same chronological age.

The main difference arising from the results above between the SLI and the two comparison groups relates to the lack of associations between reported socio-emotional functioning and ratings of pragmatic language ability and prosocial behaviour, which were found for the two comparison groups. For both the CA and LA Matched Groups, difficulties with the use of social language and poorer prosocial behaviours were strongly linked with higher levels of BESD as reported by children's parents. This finding also highlights the complex picture of associations for the LA Matched Group with very strong correlations between the different factors indicating that within the LA Matched Group there is not as much variance in scores as in the SLI Group leading to stronger and multifaceted relationships between variables for much younger children.

9.7.2 Similarities and Differences between the Groups in the Interrelationships between the Different Variables as reported by Children's Teachers

In the case of teachers, there were more similarities than differences found between the SLI Group and the two matching groups in the interrelationships between socio-emotional functioning and verbal ability, non-verbal cognitive ability, pragmatic language ability, social cognition, and prosocial behaviour. For all three groups, reported BESD by teachers were significantly correlated with children's pragmatic language ability, their social cognition skills and their prosocial behaviour. The more BESD teachers reported at school, the more likely it was for children of all three groups to experience difficulties with the use of social language, their understanding of other's mental states and their prosocial behaviours.

Verbal and non-verbal cognitive measures were not found to have any relationship with reported BESD, with the exception of the LA Matched Group where non-verbal cognitive ability

was significantly correlated with measures of socio-emotional functioning at school. Teachers were more likely to express concerns about BESD when non-verbal cognitive ability scores were poorer for the LA Matched Group.

9.7.3 Similarities and Differences between Parent and Teacher Reports in the Interrelationships between the Different Variables

There were three main differences observed in the interrelationships between the different variables when socio-emotional functioning was judged by parents compared to when judged by teachers. For the SLI Group, it was found that Prosocial Behaviour was associated with the Total Difficulties Score reported by children's teachers. This was not the case for the parents' ratings. This is perhaps not surprising since teachers reported more concerns with prosocial behaviour than parents did (see chapter 6 and section 9.5), a difference which was found to be significantly different between raters. It was therefore expected that prosocial behaviour would be significantly correlated with the general index of socio-emotional functioning as this was judged and rated by children's teachers.

The second difference between parents and teachers was the relationship that social cognition had with socio-emotional functioning for the CA Matched Group. Although performance on social cognition tasks was found not to correlate to the index of socio-emotional functioning as judged by children's parents, it was found to be significantly related with the index of socio-emotional functioning when this was judged by children's teachers. This could probably be explained when looking at the Total Difficulties scores for the CA Matched Group and comparing parents and teachers reports: although the vast majority (90.5%) of children in the CA Matched Group were rated as being within the 'Normal' category (according to Goodman's three category system – Normal, Borderline, Abnormal), there were slightly more concerns expressed by children's teachers about a minority of children in the CA Matched Group who were rated as being in the Borderline and Abnormal category (9.5% for both categories). Parents on the other hand reported that almost all children in the CA Matched Group (94.7%) were within the Normal category and only a 5.3% of children were in the Borderline category. This meant that parents' ratings for children in the CA Matched Group reached a ceiling effect since there were no concerns voiced. When considering the fact that the CA Matched Group reached a ceiling effect in the experimental social cognition tasks, one would expect

relationships to be harder to identify between two variables which are positively skewed, and maybe this fact explains why social cognition was found to correlate to the index of socio-emotional functioning in the teachers' case but not in the parents' case.

The third difference between parents and teachers' reports was the relationship of expressive language with socio-emotional functioning for the LA Matched Group. Although there was no significant relationship found between expressive language and teachers' ratings of socio-emotional functioning, there was a moderate negative correlation found for parents' ratings. This reflects the fact that for the parents of LA Matched Group, a lower ability to express oneself and communicate is significantly correlated with more concerns regarding socio-emotional functioning.

9.7.4 Predictors of Socio-emotional Functioning

For children with SLI, performance on social cognition tasks emerged as a significant predictor of socio-emotional functioning when this was judged by children's parents. When socio-emotional functioning was judged by children's teachers, both social cognition skills and prosocial behaviour were significant predictors of individual differences in teacher ratings of socio-emotional functioning (and jointly explained about half of the variance – 44%). Social cognition was also the most significant predictor of the socio-emotional functioning of LA Matched children, again as rated by both the children's parents and teachers. In contrast, for the CA Matched Group, prosocial behaviour predicted socio-emotional functioning as judged by children's parents, whereas prosocial behaviour together with pragmatic language ability predicted socio-emotional functioning as judged by children's teachers.

This first of all highlights the importance of social cognition skills for children's socio-emotional functioning. The results of the present study and previous research focusing on children's social information processing (Crick & Dodge, 1994) clearly suggest that the way children encode, interpret and reason about social information plays an important role in shaping their social lives. It also points to the fact that the social cognition tasks used in the present thesis were straightforward and easy to complete for children in the CA Matched Group and this would explain the absence of a relationship with socio-emotional functioning.

When social cognition was further examined, it emerged that for the SLI Group pragmatic language ability as judged by children's parents and teachers was the most significant variable predicting performance on social cognition tasks. This finding first of all supports Harris et al.'s claim (2005) that it is the pragmatic features of language, rather than the syntactic and semantic that seem to influence more strongly children's development of social cognition skills. Conversations in which varying perspectives on a given topic are articulated appear to be playing more of a role for the development of social cognition skills rather than the acquisition of syntactic tools or a rich mental-state and emotion vocabulary.

More importantly this finding lends support to the first theoretical model described in Chapter 2 and put forward by Bishop (1997) who suggested that the difficulties with socio-emotional functioning seen in children with SLI are a consequence of their distorted social experiences. Findings from the present thesis highlight an interesting relationship between socio-emotional functioning, social cognition and pragmatic language ability for the SLI Group. One plausible account of this close relationship is that children's growing ability to use language socially provides increasing opportunities to understand a person's inner state that eventually foster socio-emotional functioning (Hughes & Leekam, 2004; Woolfe et al., 2002). It appears that for the SLI Group difficulties with the social use of language is what affects their poor understanding of others' emotions and minds, which in turn shapes their general socio-emotional functioning. The lack of rich social environments and the difficulties children with SLI experience in appropriately conversing within these affects the development of their understanding of others' emotions which in turn impacts on their socio-emotional functioning in a detrimental way.

A final point is that language and non-verbal cognitive ability appear to have a complex relationship with socio-emotional functioning. Few associations were found between verbal and non-verbal cognitive measures and socio-emotional functioning scores, and they only existed for the LA Matched Group. There are two main issues arising from the absence of any direct relationship with language: absence of a relationship between language and measures of socio-emotional functioning may reflect the low language scores for the SLI Group and the relatively high scores for the CA Matched Group. In both groups, differentiation of scores would

be difficult which would make relationships between language and socio-emotional functioning hard to identify. The second issue is that other factors may play more of a role for the socio-emotional functioning of those not only with clinical language difficulties (SLI Group) but also their chronological-age matched peers. That further highlights the importance of social cognition skills for the SLI Group and pragmatic language ability for the CA Matched Group.

9.8 LIMITATIONS OF THE PRESENT STUDY

Many of the measures used in the current research indicated substantial individual differences. First of all, there was a wide range of scores on the standardised assessments for language and cognitive processes (see chapter 5). A number of researchers (Conti-Ramsden et al., 1997; Aram et al., 1993; Bishop, 1997; Leonard, 1998; Stark & Tallal, 1981) have highlighted the heterogeneity in the population of children with SLI and the point that this is not a category of children who are straightforward to define. Even when every child has been selected on specific, consistent criteria, as defined in chapter 4, it cannot be assumed that they are equivalent in other respects (Bercow, 2008). Also, there were substantial differences in children's performance on the experimental tasks of social cognition, as well as parents' and teachers' views of children's socio-emotional functioning.

The variation between children presents a problem for drawing general conclusions about the socio-emotional functioning of the group of children with SLI. There is a need to further investigate the relationship between children's language and cognitive profiles and their performance on social cognition tasks but also to look more closely at qualitative differences and error patterns. These may indicate not only the underlying patterns of abilities but also the strategies that children have developed to compensate for their impairment. In the present study, according to parent ratings 52.4% of children with SLI were within the normal range for the Total Difficulties Score of the SDQ, and according to teacher ratings 57.1% of children with SLI did not present with any clinical significant difficulties in their socio-emotional functioning. Recent research on the views of adolescents with SLI about their experiences (Palikara et al., 2009) indicates that they feel positively about their schooling and their post-16 courses and express aspirations and hopes for their future. It would be helpful to further investigate the mechanisms that children use at school, what they find useful and what helps them to

compensate for their language difficulties. As well as using group studies it would be useful to include longitudinal case studies to look at these issues. The variation between children would be particularly important to consider when drawing educational conclusions. Individual children's strengths and weaknesses would need to be identified in order to provide effective support.

Finally, the sample size in the present study limits the generalisability of the findings in that it made it difficult to investigate potentially interesting variables, such as gender. Of the 126 children in the present study, one hundred and eleven children were male and only fifteen were female, reflecting a well-documented gender difference in children with SLI (Law et al., 2000; Shriberg et al., 1999). An interesting future direction would be to explore whether there are any gender differences between males and females in their socio-emotional functioning, whether they present with a similar or different profile in their pragmatic language ability and finally whether performance in tasks of social cognition is comparable. Investigating gender as a potential moderator could further the understanding of children's socio-emotional functioning.

In addition to the individual variation between the participants of the present study, future studies could investigate whether the findings can be generalised to other groups of children. The discrepancy between language and non-verbal cognitive ability was used as a criterion in selecting participants for this study to increase the likelihood of coherent findings and allow for a clearer examination of the factors of interest. However, interpretations to the findings of the present thesis need to be made in the light of the fact that children receiving specialist language support may not have the same language or non-verbal cognitive profile (Cole et al., 1992), and therefore the findings might not be easily generalised to them. Further studies are required to establish this.

On the other hand, as the present thesis clearly showed, there are children in mainstream classes whose language ability is weak who are not receiving language intervention but who may experience some BESD. For example, there is evidence of a link between low socio-economic backgrounds and delays in language development (Locke et al., 2002). Another important question for further studies would be whether socio-emotional functioning, pragmatic language ability and performance on social cognition tasks was similar to that of children

diagnosed with SLI, i.e. the findings may generalise to a group of children who present as experiencing similar needs with the SLI Group of the present thesis.

Future studies could include different groups of children for comparison in order to try to separate the effects of some of the factors involved. For example children could be matched on the basis that they present with an equivalent profile in their phonologic-syntactic or their pragmatic language ability in order to compare their performance on tasks of social cognition. There is evidence from previous studies to suggest that some children with semantic-pragmatic difficulty and some with phonologic-syntactic impairments had difficulties with social cognition tasks (Bishop, 1997). Alternatively, children could be matched on the basis of their memory abilities to further investigate the role of information-processing skills for children's socio-emotional functioning.

There are also a number of additional psychological and demographic factors that could be useful to take into account in further studies on this topic. One additional issue that could be included in a future study is children's self-esteem. Self-esteem as a variable was not formally measured or assessed as a contributory factor for children's socio-emotional functioning. There is evidence of lower self-esteem and confidence from previous research in children with SLI. For example, Jerome et al. (2002) presented findings in their study of impaired self-esteem for children with SLI, and Lindsay et al. (2000) found that at 11 years children with SLI rated their own scholastic competence and social acceptance lower than their peers did. Recent studies conducted in the area also pointed out that adolescents with SLI are at risk of lower self-esteem and increased shyness (Wadman et al., 2008). Lower self-esteem and shyness may reflect lower levels of confidence that could have an impact on children's general performance or even of the choices they made in the social cognition tasks (i.e. choosing withdrawal from a conflict situation and demonstrating difficulties confronting conflict management). A future study could aim to determine what role self-esteem plays in children's social cognition and general socio-emotional functioning.

In addition, other potential contributory factors to consider are children's views of their own socio-emotional functioning at home and at school, whether they have been able to compensate in some ways, the types of experiences they may have had, as well as the level of

support they may have received at home and at school. The present thesis considered in detail parents and teachers views of their children's socio-emotional functioning and indicated that the relationship between language impairment and socio-emotional functioning is a very complex one. In particular, direction of causality cannot be assumed from either perspective, and it does not appear from the results that BESD are associated with language impairment in a simple and straightforward manner. Policy documents (Children Act 1989) and research studies (Palikara et al., 2009; Lewis et al., 2007) have highlighted the need for the voices of children to be heard in relation to their experiences of education, health and social care. The way children view themselves and their difficulties could shed some important light into this complex relationship, assist us in our understanding of the nature of their difficulties and provide a more comprehensive research evidence.

A final factor that could be taken into account is children's social and economic status (SES). SES is related to both socio-emotional development (Mistry et al., 2008) and language development (Hoff, 2003; Whitehurst, 1997), although the significance of these effects for particular profiles of abilities is not yet clear (Black et al., 2008). In the present study efforts have been made to recruit the three participant groups from the same or similar settings in order to increase the homogeneity of the sample. In a future study, a formal measure of SES could be used to systematically recruit participants and compare groups of children of different SES in order to explore the influence of SES on children's socio-emotional functioning.

9.9 SOCIO-EMOTIONAL FUNCTIONING, SOCIAL COGNITION AND CONTEXT

The present thesis has made significant contributions to the growing literature examining the relationship between language impairment and socio-emotional functioning and has addressed the gap in existing evidence in several ways. Firstly, the majority of past research examining the link between language impairment and socio-emotional functioning has been conducted with clinical samples. However, research suggests that SLI is a highly heterogeneous population and that the majority of children with SLI are educated in mainstream classes (Law et al., 2000; Dockrell et al., 2006). Therefore, it was crucial to understand how language affects socio-emotional functioning in a mainstream sample like the one employed in the present study. The study involved a relatively large sample of language impaired and typically

developing children who were all selected from mainstream primary schools and individually matched on objective and consistent criteria for age, language and non-verbal cognitive ability. All the participants with SLI had a significant discrepancy between their verbal and non-verbal cognitive skills.

The comparisons between the children with SLI and their age peers confirmed previous findings of increased difficulties with socio-emotional functioning (Botting & Conti-Ramsden, 2008; Lindsay et al., 2007; Wadman et al., 2008; Stanton-Chapman et al., 2007). These results provided further support for the view that children with SLI experience difficulties with social interactions, hyperactivity / attention as well as prosocial behaviour. The findings of the present study also showed that pragmatic language ability was significantly compromised in this group of children according to both the children's parents and teachers, supporting previous research (Spanoudis et al., 2007; Conti-Ramsden et al., 1997). In addition, results from the four social cognition experimental tasks lend support to previous studies which found that children with SLI differed from their typically developing peers in processing social information (Botting & Conti-Ramsden, 2008; Clegg et al., 2005). In the present study, children with SLI showed an impaired pattern of performance in comparison to their chronological-age matched peers in all four areas of social cognition investigated.

The present study also showed that the current socio-emotional functioning (as rated by parents and teachers), the pragmatic language ability and the performance of children with SLI on tasks of social cognition were not simply delayed to a level that would be expected given their receptive language ability. In order to do this, the study included a group of children who had equivalent receptive language ability but whose language skills were appropriate for their chronological age. Parent and teacher ratings were analysed and performance on tasks of social cognition was compared. Comparisons were also made based on the relationships between measures of socio-emotional functioning, language and non-verbal cognitive ability, pragmatic language ability, prosocial behaviour and social cognition for the SLI and typically developing comparison groups. Using these approaches it was possible to identify qualitative differences in the performance of the SLI and LA Matched children pointing to a very distinct pathway of development for children with SLI.

Using the measures of language and cognitive processes obtained from the children with SLI, as well as their performance on tasks of social cognition, the current study showed that the difficulties in socio-emotional functioning children with SLI present with could not be totally explained by a single factor in their profile of abilities. However, the study indicated that performance on social cognition tasks emerged as a significant factor when this was judged by children's parents, and social cognition skills and prosocial behaviour were significant predictors of individual differences in teacher ratings of socio-emotional functioning. Children's impaired language abilities were not found to associate with poor socio-emotional functioning suggesting that factors other than language ability are more of a play for this group of children.

The present thesis also made novel contributions by highlighting the importance of taking into account the role of characteristics which are intrinsic to children (in the present thesis that would be social cognition and prosocial behaviour), as well as characteristics which relate to the familial and social environment. Although there was a general consensus between parents and teachers on the difficulties experienced by children with SLI, the results of the present study revealed significant variations between parents and teachers which existed only for the SLI Group. This implies that children's difficulties with socio-emotional functioning can be better described and understood only when considering the very complex relationship between intrinsic within-child characteristics, children's experiences as well as the influence of the environment and its demands on children's socio-emotional functioning.

9.10 IMPLICATIONS FOR INTERVENTION AND GENERAL PRACTICE

Several of the findings from the present study are worthy of further exploration and suggest numerous important clinical implications. Results from the two questionnaires clearly indicate that in the case of children with SLI there is a need to focus on improving socio-emotional functioning skills and pragmatic language ability in tandem with targeting children's language weaknesses.

Performance on the social cognition tasks indicated that children with SLI experience a lack of social knowledge that does not appear to be causally related to their language impairment. This was in agreement with other recent studies (Farmer & Oliver, 2005; Botting & Conti-Ramsden,

2008). Therefore, it would be important to focus on interventions that facilitate the use of language in social situations to provide these children with the opportunity to improve their social communication skills and understanding of others' mental states, which will eventually have an impact on the way that they socially and emotionally adjust to their home and school environment. Research has shown that the age of the child tends to determine the nature of the intervention as many clinicians shift from teaching children specific linguistic skills to teaching them how to use language as they grow older (Law et al., 2008). Interventions that target not only teaching of linguistic skills but also socially relevant language objectives have been highlighted in the research for some time now (Hadley & Schuele, 1998) and need to be introduced systematically in the packages of support provided to children with SLI of all ages. The findings of the present study have provided clear evidence and the rationale for targeting social communicative competence and focusing on social verbal interactions with peers and significant others with children with SLI.

There are also important implications for the teachers within the school environment. Results from the present study highlight the fact that parents express more concerns about children's socio-emotional functioning compared to teachers. School staff should aim to develop an increased awareness of language impairments, learn how to effectively identify and manage students that display poor socio-emotional functioning skills and be more alert of possible links between language impairment and poor socio-emotional functioning. It is documented in the literature that as a result of only limited training, teachers lack the knowledge and understanding of the various kinds of additional special educational needs children with language impairments may have and the significant impact of language impairment on children's general functioning (Dockrell & Lindsay, 2001).

The different profiles of children with SLI and the great heterogeneity in their strengths and areas of need suggest that a more dynamic approach is needed when developing interventions which takes into account the presence of both compensating and restricting factors within each child with SLI. In addition there is a need for better communication between parents, teachers, and the children themselves. According to the data from the questionnaires, parents and teachers view children's abilities in a different way and both views are valuable in order to better understand children's needs and should be communicated more effectively to build a

holistic profile of the child's abilities. Greater communication between the child's two most important contexts is likely to result in a more effective intervention that is adapted to the child's individual needs.

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APPENDIX A: PILOT STUDY

1.1 Introduction

In Appendix A, the pilot study is presented. A description of the participants, followed by the aims, methods and results of each task is systematically described. The results from the pilot study are then summarised and discussed. Finally, the researcher outlines difficulties faced throughout the pilot study and considers the implications for the design of the main study.

1.1.1 Rationale for the Pilot Study

In the first three chapters, it was demonstrated that children with SLI are likely to present with difficulties in the area of socio-emotional functioning. Specifically, children with SLI are reported to have difficulties understanding other people's intentions, expressing and regulating their emotions and negotiating and resolving conflicts. The children's language skills denote that they are likely to have difficulties in all of these aspects of their social interactions when verbal information needs to be processed. Also, the more general processing limitations that are associated with SLI (see section 1.5) are likely to influence their socio-emotional functioning according to the additional cognitive demands of tasks assessing children's social cognition.

As stated in chapter 4, the aim of this thesis was to explore the extent to which children with SLI present with difficulties in the area of socio-emotional functioning and investigate whether children with SLI in different developmental stages present with different difficulties in their socio-emotional functioning. Although there is already accumulating research pointing to the fact that failure to follow typical trajectories in language and communication is an indicator of potential difficulties with socio/behavioural aspects of development, there are many gaps and methodological limitations to overcome.

The aim of this thesis was to consider and investigate an additional within child factor that might serve to moderate or exacerbate the influence of language impairment on children's social interactions. This factor might work to a child's advantage or disadvantage and can determine social outcomes. Of the many potentially influential factors, one particularly viable candidate is discussed in the pilot study: social cognition.

In the main study, children's social cognition skills will be investigated by making comparisons between different task conditions and with children of the same age and non-verbal cognitive ability. Comparisons will also be made with children matched for language ability, the aim being to suggest whether additional processing limitations in the children with SLI affected their performance on the experimental tasks.

However, the pilot study was carried out first with typically developing children only, using methods based on tasks previously used with language impaired children and deaf children but of older age. This was done in order to: generate more specific research questions to be investigated in the main study, investigate limitations and methodological difficulties and finally develop an appropriate assessment protocol for the main study.

1.2 Pilot Study

1.2.2 Participants

Twenty children from two primary schools within an inner London borough participated in the pilot study. In each school, 10 children consisted of two groups: the younger group and the older group.

The participants were typically developing children from the Reception / Year 1 Class and Year 2 Class, ranging in age from 5 to 7 years and nine months. The youngest of the participants was 5 years and 1 month and the oldest was 7 years and 9 months. The mean age of the participants was 6 years 7 months.

Table A1

Details of the Participants in the Pilot Study

Class		School A	School B	Total
Reception / Year 1	N	5	4	9
	Mean Age	5:4	6:3	5:8
Year 2	N	5	6	11
	Mean Age	7:5	7:3	7:4

In the main study, two groups of children will be examined: one group of children below 8 years (up to 96 months old), and one group of children 8 years and above (above 97 months old). The researcher selected these two age groups for the pilot study so as to include children who were young enough that their social cognition skills could be investigated, but who could be expected to perform similarly to the language impaired children. Therefore, these two age groups aimed to serve the role of language-matched children, and it was hoped that in so doing useful information would be gathered on how language impaired children would perform.

1.2.2 Overview of the tasks

Children were presented with a series of twelve tasks. Testing sessions lasted approximately fifty minutes in total and took place in a quiet room in each school. In order to maximise children's concentration and attention, the researcher met with each child twice in sessions of approximately twenty-five minutes each. The sessions were tape recorded. Transcriptions were derived from the tapes after the sessions.

The first set of tasks tested children's theory of mind understanding. These required children to recall their own false beliefs and to predict or explain a character's action or emotion. The second set of tasks was comprised of another three tasks aiming to assess children's emotional regulation abilities. The third set of tasks was comprised of two scenarios testing children's negotiation strategies. Finally, the fourth set was comprised of four scenarios, which tested children's conflict resolution abilities.

The order of the tasks was:

A. Theory of Mind Tasks

1. Unexpected Location task
2. Misleading container task
3. Emotion Explanation task

B. Emotional Regulation Tasks

1. Recognition, identification and labelling of emotions task
2. Understanding causes of emotions, and expression and communication of emotions task
3. Emotional Regulation ability task

C. Negotiation Strategies Tasks

1. Negotiation Strategies Story One
2. Negotiation Strategies Story Two

D. Conflict Resolution Tasks

1. Conflict Resolution Story One
2. Conflict Resolution Story Two
3. Conflict Resolution Story Three
4. Conflict Resolution Story Four

1.2.3 Details of the tasks

1.2.3.1 Unexpected Location Task – A1

Aim

The first task included questions designed to tap children's ability to recall their own false beliefs and to explain a character's action or emotion on the basis of a mistaken belief. A story with puppets was used, based on the modification of the test used by Peterson and Siegal (1995), which was itself a modification of Baron-Cohen et al.'s (1985) adaptation of Wimmer and Perner's (1983) test. This task had two versions and required from the children to explain a character's action in terms of a false belief.

The essence of the test is that correct performance requires an understanding, by the subject, of the fact that how a person behaves depends on what that person believes to be the case, even if that belief is, in fact, false.

Materials

The materials used were a block, a yellow box, a pink box, and two puppets.

Procedure and Scoring of Data

In version one, the story involved a character who took the block, placed it in a particular location (for half the subjects this location was the yellow box, and for the others the pink box), and then left the scene. The second character then removed the block from its first location, put it in the second location, and also left the scene. The first character then returned and the child was asked where this character would look for the block.

Version two of the test was similar to version one, but with the use of the third location (researcher's pocket). That is, the story and the procedure were as for the version one except that the second character put the block in the researcher's pocket. In this case, there were thus three possible answers to the false belief question: the pocket, the yellow box, or the pink box, of which either the second or third (depending on the initial location of the block) was correct.

In order to make valid conclusions that children's difficulty with the task is related to a specific difficulty with understanding false belief, independent of any more general test-related problems such as difficulties in answering questions, understanding instructions, or in following or remembering the sequence of events in the story task, the researcher followed Peterson and Siegal's (1995) procedure of asking within-task control questions. The within-task control questions tested children's ability to respond appropriately to questions, to understand the events in the story, and to remember the sequence of events related, but do not require an understanding of false belief. If, on the false belief test, the child indicated the correct (first) location, two control questions were asked. The first concerned where the block really was (the so called 'reality' question), and the second where the first character put the block initially (the so called 'memory' question). If the child failed to give the correct answer to the false belief question, however, the reality question became redundant and so only the memory question was asked. These control questions were asked after both version one and version two of the test.

Instructions for the Story

The test procedure entailed the child being seated opposite the researcher at a table, on which, in front of the researcher, were the two puppets, the yellow box, and the pink box. In version one of the test, the researcher introduced the two puppet characters: "This is John and this is Mary". The child's attention was also drawn to the yellow box and the pink box and to the fact that both were empty. For half of the subjects, the first puppet character was John; for the others, it was Mary. For half of each of these subgroups of subjects, the first location was the pink box; for the other half, it was the yellow box. The story proceeded as follows: "John (Mary) has a block. He (she) puts the block in the yellow box (pink box). Then he (she) goes away": the first puppet character was made to leave the scene and was concealed under the table. The researcher then brought in the second puppet character and manipulated her (him) to act out taking the block from its initial location and putting it in the second location: "Mary (John) comes and takes the block and puts it in the pink box (yellow box)". This second puppet character was then made to leave the scene and was also concealed under the table: "Mary (John) goes away". The researcher then brought back the first character: "Now John (Mary) comes back", and asked the child for the false belief question: "Where will John (Mary) look for

the block?”. A correct response to this question was followed by the researcher asking the reality question “Where is the block really?”, followed by the memory question “Where did John (Mary) put the block first?”. If the child gave an incorrect response to the false belief question, the researcher asked only the memory question.

Version two of the test then followed immediately. The procedure for this was similar to that for version one, but with the following changes. The first character was now the one the child had previously had as the second character, the first location was the one the child had previously encountered as the second location, and the second character always put the block in the researcher’s pocket.

The children were deemed to have passed the false belief test if they passed both version one and version two of the test; and with each version, not only did the false belief question have to be answered correctly, but also both control questions.

Results

Ten out of twenty children passed both version one and version two of the Unexpected Location task. Seven out of ten children who passed the task were Year 2 children, suggesting that younger children found the task more difficult to understand.

Conclusion

The results indicated that only half of the participants were able to pass both versions of the task. The implications of the linguistic demands, but also of the additional requirements of the task needed to be considered for the main study, and will be discussed later on in this Appendix when the implications of the findings for the main study will be considered.

1.2.3.2 Misleading Container Task – A2

Aim

This task was used to establish children’s understanding of false beliefs. Children heard a story that involved a character surprising a friend based on Perner et al. (1989) and slightly

simplified to reduce repeats of prompt and control questions. The story involved a misleading familiar sweets container that actually held pencils.

Materials

A Maltesers container and pencils.

Procedure and Scoring

The task involved a misleadingly familiar Maltesers container that actually held pencils. After discovering the unexpected contents ('What's this?' 'What do you think it's in here?'), children were asked what a naïve classmate would say on first seeing the closed container and what their own initial belief had been ('What do you think X boy/girl would say if we ask him what's in the Maltesers?' 'What did you think at first was in the box?').

Correct responses to both these test questions were required for a pass, in order to keep the odds of chance success to the minimum.

Results

Nineteen out of twenty children answered correctly to both test questions. The one child who failed to answer the second question ('What did you think at first was in the Maltesers?') was from the young group.

Conclusion

This baseline task showed that children were able to understand a false belief. The fact that the majority of the children were successful in this task has implications for the appropriateness of the task for the main study, and consideration needed to be given as to whether it was age-appropriate for older primary children.

1.2.3.3 Emotion Explanation Task – A3

Aim

The third task consisted of six short stories aiming to examine children's understanding of emotions, their ability to link emotions with specific social situations as well as the extent to which children are able to explain these emotions. In particular, the task aimed to examine the extent to which children refer to mental states rather than to situational factors as the causes of other people's emotions. In order to further pursue that aim, the researcher also asked the children to explain, besides the typical emotions, the character's atypical emotions. Explanations based on situational factors are not always sufficient to explain an atypical emotion – additional explanation based on the character's experience of the situation and his beliefs and desires, is needed.

Materials

The material consisted of six stories (designed by Rieffe and Meerum Terwogt, 2000) that described emotion-eliciting situations. Two stories were designed to provoke happiness, two to provoke sadness or anger, and two to provoke fear. Cartoon pictures of the characters were presented to children to facilitate their understanding.

Procedure

After hearing each story, participants were asked how the character would feel and why (question 1 and 2). If participants failed to identify an emotion, they were asked: 'Do you think (character's name) feels happy, sad, angry or afraid?'. The order of the suggested emotions was randomised to avoid biased responses. Once participants had predicted and explained an emotion, the researcher said that the character felt differently and named an atypical emotion. The atypical emotions (happiness, anger, or fear) were fixed. The researcher asked participants to explain this atypical emotion (question 3).

In order to make participants familiar with the emotional concepts that would be used in the stories, children were asked if they sometimes felt happy, sad, angry or afraid, and if they could give an example of such an occasion. The researcher helped children who found it difficult to provide examples.

Instructions for the Stories

1. This is Walter. Walter has a dog that he usually plays with. But today, Walter's dog is not very well and he lies in his basket.

- How will Walter feel when his dog is not very well?
- And why will Walter feel (sad)?
- Yes, I would have thought so too. But Walter does not feel (sad). Walter feels afraid now that his dog is not very well. How come Walter feels afraid?

2. This is Nadia, Nadia is lying in bed because she is going to sleep. The lights in her room are already switched off. Suddenly, Nadia hears a strange voice.

- How will Nadia feel when she hears this strange noise?
- And why will Nadia feel (afraid)?
- Yes, I would have thought so too. But Nadia does not feel (afraid). Nadia feels angry when she hears the strange noise. How come Nadia feels angry?

3. This is Mark. Mark comes home from school and his mother says: 'Mark I have a nice surprise for you' and she gives him a little present. He does not know what is inside the package.

- How will Mark feel when he gets the package?
- And why will Mark feel (happy)?
- Yes, and I would have thought so too. But Mark does not feel (happy). Mark feels angry now that he got the package. How come Mark feels angry?

4. This is Madeline. Madeline comes from school. It is already dark outside, but the lights in the house are not turned on yet. Suddenly, Madeline sees someone standing in the living room. It is too dark for Madeline to see who it is.

- How will Madeline feel when she sees this person?
- And why will Madeline feel (afraid)?

- Yes, I would have thought so too. But Madeline does not feel (afraid). Madeline feels happy when she sees that person. How come Madeline feels happy?

5. This is Sheila. Sheila sees that her friends outside are playing hide and seek. Sheila goes outside to join them.

- How will Sheila feel when she walks outside to play with her friends?
- And why does Sheila feel (happy)?
- Yes, I would have thought so too. But Sheila does not feel happy. Sheila feels afraid now she is going outside to play with her friends. How come Sheila feels afraid?

6. This is Linda. Linda's father and mother had said that they would go to the zoo. But now Linda's mother says that they cannot go and that they will have to stay at home.

- How does Linda feel now she hears that she will not be going to the zoo, but has to stay at home?
- And why does Linda feel (angry, sad)?
- Yes, I would have thought so too. But Linda does not feel (angry, sad). Linda feels happy now that she isn't going to the zoo and is staying at home. How come Linda feels happy?

Scoring

In order to ascertain the extent to which children attributed mental states to the character in the emotion explanations, responses were assigned to one of four categories designed by Rieffe and Meerum Terwogt (2000):

1. *Fact beliefs*: This category was applied when the participant referred to the character's beliefs about the situation.
2. *Desires and preferences*: This category was applied to answers that referred to the character's desires. Value beliefs, that is, beliefs that do not refer to reality but to someone's preferences, also fell into this category.

3. *Situational*: Answers that only elaborated on the situation or referred to another situation without reference to a character's mental state fell into this category
4. *Missing*: Responses fell into this category if the participant had not predicted the typical emotion

Results

Most of the children predicted and explained correctly the prototypical or expected emotion, although children in the young group made fewer correct predictions than children in the older group. Children found more difficulty in predicting the emotion in story 4. The expected emotion prediction was afraid, but 6 out of 20 children said that the girl would be angry.

When looking at children's emotion explanations, 9 children gave situational responses, 2 children referred to the character's desires or preferences and 6 children referred to the character's beliefs about the situation. Three children gave no response. Children who did not answer or used situational responses were all from the younger group and there was a definite developmental trend whereby older children used more fact beliefs in their explanation than younger children in the sample.

Specific Difficulties and Recommendations for the Main Study

For this task, several linguistic issues needed to be considered for the main study. During testing, some children named an emotion of the same sense but used different wording (for example: cross instead of angry). Therefore, there was a need for the researcher to have a list of synonymous words in order to further investigate emotion labelling.

Also, children had difficulty remembering the names of the key people in the stories. Therefore, replacing names with 'a boy' or 'a girl' was deemed necessary so as to facilitate children's understanding and minimise confusion.

Finally, on some occasions it was clear that children did not fully understand the story. There was a need for the researcher to read the story twice before asking the questions so as to

ensure children's understanding. It was also decided to use drawings of the main events of the story rather than just a drawing of the character in order to facilitate children's understanding and processing of verbal information.

1.2.3.4 Recognition, Identification and Labelling of Emotions – B1

Aim

This task was used to establish whether children could recognise, identify and appropriately label basic emotions: happiness, sadness, anger and fear. It was expected that the children would succeed on this task for several reasons. The four emotions are the most common ones and children are typically assumed to be familiar with them. The task involved minimal verbal processing. Therefore the task was intended to be a relatively easy task to provide a baseline indication of children's skills.

Materials

The materials were four cartoon drawings portraying happy, sad, angry and frightened expressions.

Procedure

Children were shown the four felt faces portraying happy, sad, angry and frightened expressions. They were asked to identify these expressions, first expressively, by naming ("Can you tell me what does this boy / girl feel?"), and then receptively, by pointing to the expression the researcher named ("Which of these children feel happy / sad / angry / frightened?").

Results

All the children correctly identified and labelled the emotion of happiness, sadness and anger. Thirteen out of twenty children identified the emotion of fear, and nine out of twenty children correctly labelled the emotion of fear.

Specific Difficulties and Recommendations for the Main Study

For the pilot study, cartoon drawings were used for this task. These needed to be replaced with photographs so as to ensure that children could appropriately recognise and identify and label facial expressions.

There was also a need for two different sets of emotion pictures: one set for the first question ('Can you tell me what does this boy / girl feel?') and one set for the second ('Which of these children feel happy, angry, sad, scared?'), the aim being to avoid confusion of the children who labelled emotions incorrectly at the first question.

Again, there was a need for a list of synonymous emotion words so that the response of the children, who correctly recognised and identified the emotion but labelled it differently (for example: afraid instead of frightened, cross instead of angry), would be deemed correct.

Conclusion

This baseline task showed that these children were able to identify, recognise and label the four basic emotions, but with a specific difficulty in identifying the emotion of fear. In order to investigate whether this is also the case for children with SLI and to consider any possible developmental patterns, the task would therefore be used for the main study.

1.2.3.5 Understanding Causes of Emotions and Expression of Emotions – B2

Aim

Short stories were presented to the children where the main character faced various situations. This task aimed to measure whether children understand what causes an emotion and how people express emotions to others around them, and also measures their ability to link emotions with specific social situations.

Materials

The materials used were four felt faces portraying happy, sad, angry and frightened expressions, based on pictures by Reed (2001). While presenting the stories, the researcher showed the children pictures of key events of the story to support their understanding.

Procedure and Scoring

The children heard the researcher telling a story. After listening to each story, the children had to choose from a selection of pictures the face that showed what the character was feeling. Four emotions were presented: happy, sad, angry, and frightened.

The children's answers were coded with: 0 (neither the right emotion nor the same sense: positive or negative), 1 (not the right emotion but the same sense), 2 (the right emotion).

Instruction for the Stories

- Happy: Today is Dan's birthday. He is having a party with his friends. Dan is going to blow out all the candles on his cake.

How does Dan feel?

- Angry: David had a fight with his brother. Their mum told them to stop.

How does David feel?

- Sad: Jack's cat has died. He loved his cat and misses him. Jack looks at the empty basket the whole day.

How does Jack feel?

- Frightened: Wendy sometimes wakes up in the middle of the night. Wendy does not like being in an empty room in the dark.

How does Wendy feel?

Results

All children correctly identified the emotion of happiness. Nineteen out of twenty children correctly identified the emotion of sadness. Sixteen out of twenty children correctly identified the emotions of anger. Fourteen out of twenty children correctly identified the emotion of fear. Even when children did not use the correct label, the labels they used were all of the correct sense (negative/positive). It was noted during testing that children in both groups spent significant more time thinking about their answers for the emotions of anger and fear in comparison to the time they spent thinking about the emotions of happiness and sadness where the answer seemed to be “automatic”.

Specific Difficulties and Recommendations for Main Study

For the children who labelled two emotions (for example scared and sad), there was a need to add one more question: ‘Do you think the girl / the boy feels more sad or more scared?’.

Finally, for the pilot study, pictures from Reed’s book (2001) were used describing a key event of the short stories. To ensure that children are able to understand causes and expression of emotions, but also that children are able to identify correctly facial expressions there was a need to use the same pictures but with blank faces and then have a set of different emotions for children to select. By presenting the stories with the character’s face being blank, and then asking children to choose between four emotions, two aims would be achieved: firstly, an assessment of children’s ability to understand causes of emotions and to link emotions with social situations would be assessed, and secondly, an investigation of the role that other cognitive factors, such as their ability to process verbal and visual information, play in their ability to do so.

Conclusion

The task showed that most children were able to understand causes and expression of the four basic emotions, and were able to link emotions with specific social situations. Most errors consisted of a failure to correctly label the emotion of fear, and this needed to be further investigated with children with SLI as well.

1.2.3.6 Emotional Regulation Task – B3

Aim

The third task aimed to measure children's emotional regulation, in particular children's ability to cope and deal with negative emotions. The story is based on a story by Rieffe and Terwogt (2006).

Procedure

A short story was presented to children where the main character faced a difficult situation. After listening to the story, the children had to answer several questions.

Instructions of the Story

This a story about a boy / girl named Tom / Claire. Tom / Claire is going to a party with his / her friend. He / she has dressed up and washed his / her hair. He / she looks great and the party promises to be a lot of fun. On his / her way there, his / her friend takes a tin of coke out of his / her pocket. He / she shakes it and opens it in a way that the coke sprays over Tom's / Claire's clothes. The coke is all over him / her. It's even in his / her hair. Tom / Claire feels very angry!

Questions:

1. What is Tom / Claire going to say to his / her friend?
2. How angry would Tom / Claire feel? (On a scale from 1 to 10 – The scale was presented visually to the children: smiley faces)
3. How will he/she react?

Results

It was clear that children had difficulty generating possible "reactions" of the characters to the situation, and needed to be prompted to think what they would do in a similar situation.

Specific Difficulties and Recommendations for the Main Study

Since children had difficulty thinking what the character in the story would do, it was decided to ask the children what they themselves would do in a situation like that. Specific behavioural responses would be presented for the children to choose from, and their responses would be timed so as to examine any additional cognitive factors implicated in their ability to do so or not.

During testing, it was noted that for Question 2, the “angry faces” (1-10) scale was confusing for the younger group. It is therefore suggested that for the main study the scale needed to be from 0-5 instead of 0-10 so as to maximise children’s understanding or not to be used at all.

Children also found the wording of some of the questions difficult to understand. For example, the younger group tended to ask for clarifications for Question 3 (How will Claire / Tom react?). Therefore, this question needed to change to ‘What would you do?’

1.2.3.7 Negotiation Strategies Task – C

Aim

The fourth set of tasks comprised of two stories looking into children’s negotiation strategies. In both stories, children are not able to reach their goal because of their mother’s false belief, and providing the mother with the missing information would help the child to fulfil their desire.

Materials

Two stories, designed by Terwogt and Rieffe (2004), were presented to the children. Both these stories tested children’s understanding of the necessity to correct false beliefs in others.

Procedure

Children were presented with two stories. After each story, children were asked what would they say to their mother.

Instructions for the Stories

Story I:

Your mother promised you that you could stay overnight with your grandma. You are looking forward. But on the morning, your mother tells you that you can't go. Granny is too tired. You feel angry and think: 'How come, if Granny were tired, I'm sure she would have told me herself'. You telephone your friend to tell him/her about it. After you have told him the story he / she says: 'But you can come and stay overnight with us, if your mum says it's ok'. The idea makes you happy again. You go to your room to pack your bag. A few moments later, your mum looks through the door and says angrily: 'Hey what are you doing? Didn't I tell you that you couldn't stay with Granny?'.

Story II:

The shop on the corner has a beautiful bike for sale. Your bike is very old and doesn't go very well. But your mum thinks that the bike in the shop is too expensive. 'Then I'll pay for it myself' you think. You empty your moneybox and count your savings, but you don't have enough. Your mother is out shopping. You go to your father and tell him your problem. He says to you: 'No problem, if you give my car a good wash, I'll give you ten pounds'. You clean his car, and he gives you the ten pounds. Happily, you go with all your money to the shop to buy that great bike. Just as you are going into the shop, your mum comes around the corner, she sees you and says angrily: 'What's this? Didn't I tell you that you couldn't buy that bike?'.

Results

Five out of twenty children gave no explanations for either story, four out of twenty children gave partial explanations for one story, nine out of twenty children gave full explanations for one story, one child gave one partial and one full explanation, and one child gave full explanations for both stories.

Fourteen out of twenty children did not express their own desire for either story, one child expressed her own desire only later in her argument for one story, two children stressed their own desire later in their argument for both stories and three children expressed once desire later in their argument and once desire first.

Conclusions

It was evident throughout the pilot study that most children did not understand the first story. It was also evident that because the stories were too long, children were more likely to struggle with the task. This had implications for children's understanding of complex language, their ability to concentrate and their ability to hold verbal information in their short term memory. Therefore, this task was not deemed appropriate for the main study, especially when considering the fact that the SLI population to be assessed experiences significant difficulties with language.

1.2.3.8 Conflict Resolution Abilities Task - D

Aim

The fourth set of tasks was designed to measure children's conflict resolution abilities. These tasks measured children's knowledge of a range of conflict resolution strategies and the ability to apply these strategies appropriately in different contexts.

Materials

The four hypothetical conflict stories were presented orally to each child and were adapted from Renshaw and Asher (1983) and Shantz and Shantz (1985). The stories were equated in length, and revised by simplifying the vocabulary and syntax. The mean length of each story is 20 words, expressed in three sentences. Each story had a male or a female character that was matched to the gender of each child. The stories were administered in random order by asking the child to pick a card on which the story was written.

Procedure

Hypothetical problem solving stories were presented orally to the children. The children were instructed as follows:

"I would like to know how boys / girls like you think about things. I'm going to tell you some things that happen to a boy / girl. Then I'd like you to think of all the things he / she can do about it. Tell me everything that comes into your head".

Immediately following each presentation, the children were instructed to retell the story to determine their understanding. Each child was then asked questions and hypothetical solutions were required. The questions were open-ended, designed to elicit conflict resolution strategies and presented in a uniform order. The responses were audio taped.

Instructions for the Stories

D1.

Joe (Joan) is Mike's (Marge's) very best friend. But now everyday Joe (Joan) plays with a new boy (girl) in school. Joe (Joan) won't play with Mike (Marge) anymore at all.

- What will Mike (Marge) do?
- Ok. That's one thing he/she can do. Let's think of lots of different things Mike (Marge) can do. What else can Mike (Marge) do?
- Is there anything else he or she can do?
- What can Mike (Marge) say in this situation?

D2.

John (Jane) wants to use the computer to play his (her) favourite game. His (her) brother (sister) Chris (Chris) is already using it. Chris hates to be interrupted when playing Nintendo.

- What will Chris do?
- OK. That's one thing he/she can do. Let's think of lots of different things Chris can do. What else can Chris do?
- Is there anything else he or she can do?
- What can Chris say in this situation?

D3.

There is a boy (girl) named Steve (Sally) on Larry's (Lisa's) block. Steve (Sally) is a big bully. Almost every day Steve (Sally) calls Larry (Lisa) names on the way to school.

- What will Larry (Lisa) do?
- Ok. That's one thing he/she can do. Let's think of lots of different things Larry (Lisa) can do. What else can Larry (Lisa) do?
- Is there anything else he or she can do?
- What can Larry (Lisa) say in this situation?

D4.

Mark (Mary) is a new boy (girl) in the neighborhood. One Saturday Bob (Bonnie) asks Mark (Mary) over to watch cartoons. After about 10 minutes, Mark (Mary) changes the channel without asking.

- What would Bob (Bonnie) do?
- Ok. That's one thing he/she can do. Let's think of lots of different things Bob (Bonnie) can do. What else can Bob (Bonnie) do?
- Is there anything else he or she can do?
- What can Bob (Bonnie) say in this situation?

Scoring

Responses to questions following the hypothetical stories were examined initially to determine the presence or absence of conflict resolution strategies and to categorise them. The strategies involved what a child would say or do in each situation (Abrahami et al., 1981; Renshaw & Asher, 1983).

Strategies were assigned to 1 of 27 mutually exclusive categories that Shantz and Shantz (1985), Selman (1979; 1980) and his colleagues (Selman et al., 1983; Selman & Demorest, 1984) used. An additional category of 'other' was created to accommodate any strategy that failed to meet the criteria for inclusion in any of the 27 existing categories.

The categories, excluding 'other', collapsed into four levels to form a developmental scale of conflict resolution ability, based upon Selman's stage model (1980) of interpersonal

understanding and conflict resolution. The levels progress from an initial developmental level of social perception in which the child fuses the social perspective of self and others to successive levels that are increasingly sophisticated in social understanding and perspective-taking. The levels are the following:

Level 0: Immediate physical solutions to conflicts: Strategies use unreflective, impulsive force to get one's goals, impulsive withdrawal or obedience to protect self (physical intervention, verbal intervention, and non-interaction).

Level 1: Unilateral solutions to conflict resolution: Strategies use wilful one-way orders to control others for one's own way or use submission to other's wishes.

Level 2: Cooperative solutions to conflicts: Strategies consciously use psychological influence to change another's mind or use psychological compliance to value one's own wishes only secondarily to another's.

Level 3: Mutual solutions to conflicts: Strategies use both self- and shared-reflections to collaboratively change both self's and other's wishes in pursuit of mutual goals.

Results

Most of the children used Level 0 and Level 1 conflict resolution strategies. For D1, sixteen out of twenty children used Level 0 and Level 1 strategies, three out of twenty children used Level 2 strategies and one child did not suggest any strategies. For D2, fifteen out of twenty children used Level 0 and Level 1, and three out of twenty children used Level 2, and two out of twenty used Level 3 strategies. For D3, nineteen out of twenty children used Level 0 and Level 1 strategies, and one child used Level 2 strategies. Finally, for D4 seventeen out of twenty children used Level 0 and Level 1, one child used Level 2 strategies and two children did not respond.

The fact that most children used simple Level 0 and Level 1 strategies to resolve conflicts may have been due to the fact that the study (Shantz & Shantz, 1985) was designed for older children of a mean age of 9 years.

Conclusion

The task did not meet the criteria of an appropriate assessment tool and was deemed inappropriate to be used with language impaired children due to the linguistic demands of the task.

1.2.4 Summary and Discussion of Pilot Study findings

A. Theory of Mind Tasks

When the findings from the different Theory of Mind tasks were compared, they showed differences in the children's theory of mind ability according to what the task required. Errors were made on the more linguistically demanding tasks, and when the additional requirements of the tasks were greater. Children tended to make errors when the story presented was longer, when there were no visual aids to support their understanding and they tended to forget the information that had been requested. For example, for the first task (A1 - Unexpected Location task), children who failed the task, did so because they failed to give a correct response to the memory control question ('Where has John put the block initially?') although they have answered correctly to the false belief questions. These findings may mean that the children were able to understand a false belief but did not have sufficient resources to also attend and remember other aspects of the task as much as they needed to. General limitations in short term verbal memory that are often associated with SLI needed to be considered for the main study as it would be likely to influence children's performance on tasks. Children had more difficulties with their ability to effectively predict and explain emotions.

B. Emotion Regulation Tasks

All the tasks in this set highlighted the fact that this was an area of strength for children, but that they had a specific difficulty with labelling, identifying and understanding the emotion of 'fear'. This was an important factor to be further researched in the main study with the SLI population.

Also, although most children were able to identify correctly and label the four basic emotions, their timed responses varied significantly and this would be of interest for the main study. By manipulating the task features accordingly, an exploration of additional cognitive factors influencing children's ability to identify, recognise and regulate emotions could be included.

C. Negotiation Strategies and Conflict Resolution Tasks

From the negotiation strategies and the conflict resolution tasks, there was an indication that children's knowledge of conflict resolution abilities and negotiation strategies was still developing. The children had difficulties in both sets of tasks, mainly due to the linguistic demands of both tasks. A different task exploring children's abilities in this area, which is however developmentally appropriate and has been used with younger children, needed to be employed instead of these.

1.3 Implications for the Main Study

Following the results from the pilot study, it was decided that children's ability to identify and label emotions, as well as their ability to understand emotions in themselves and others would be further investigated. The emotion identification and labelling tasks suggested that, although this was an area of relative strength in these children's socio-emotional development, there may be problems with particular emotions (such as the emotion of fear) and in specific aspects of emotion understanding (such as their ability to link emotions to specific social situations and to understand causes of emotions). The emotion regulation task also suggested that a more concrete way of assessing emotion regulation could provide a way to explore the effects of additional cognitive factors in children's ability to understand, express and regulate emotions. In addition, the results from the theory of mind tasks showed that children do not have particular difficulties with understanding false belief, but that problems with explaining emotions occurred. It was decided not to include tasks measuring children's negotiation strategies, but to include a separate task to test children's abilities to resolve conflicts in everyday school situations and the extent to which children use negotiation as one of the strategies to do so.

In general, the results from all the task sets illustrated the need to use more concrete and visual materials as well as to further reflect on the language used for the tasks. Finally, it was decided that a developmental perspective would be employed in relation to the assessment, and the tasks used would be of increasing difficulty so as to better identify to what extent children with SLI present with difficulties in the area of social and emotional development. By doing so, a clearer picture would be obtained as to whether children's difficulties in this area of their development represents a delay or a difference from the typically developing population and it would also allow an investigation of additional cognitive factors related to children's socio-emotional development.

The order of the tasks would be the following:

1. Labelling and Identifying Emotions Task
2. Inferring the Causes of Emotions Task
3. Emotion Explanation Task
4. Conflict Resolution Abilities Task

Details of the aims and methods of the tasks used in the main study are presented in detail in chapter 4.

1.4 Conclusions from the Pilot Study

The key aim of the pilot study was to produce more specific research questions to be investigated in the main study. This aim was achieved as the findings raised several specific issues about children's social and emotional functioning pointing to the fact that children's ability to label, identify, and understand emotions in everyday social situations was worthy of further investigation. From the results it was also decided to look further at children's ability to link emotions to specific situations, their ability to understand the causes of emotions and also their ability to predict and explain emotions in themselves and others. From the pilot study, it was also suggested to further examine children's conflict resolution strategies in everyday school situations. Finally the pilot study suggested that an investigation of other cognitive

factors, such as the timed response, might reveal effects of the language and processing problems of children with SLI.

The main study was designed to be larger than the pilot study by including a sample of participants with SLI and by including matched groups of typically developing children. This would allow comparisons to be made about the extent of difficulties in the area of social and emotional development, and discover whether additional cognitive factors play a role in the way children with SLI present in their social interactions. The children with SLI would have a specified age-range and would be selected according to objective criteria for their language and non-verbal cognitive abilities, with the aim of increasing the chance of obtaining sound and coherent findings. The overall design and areas that were looked at in the main study are outlined in chapter 4.

APPENDIX B: WITHIN GROUP COMPARISONS SLI GROUP

2.1 Introduction

The first three chapters of the thesis highlighted the gap in the literature in terms of studies looking at the socio-emotional functioning and social cognition skills of children with SLI aged 5 to 8 years of age. In order to ascertain whether there are any developmental trends on parent and teacher ratings of children's socio-emotional functioning and pragmatic language ability, the SLI participants were sub-divided into two main groups:

- Participants up to and including 96 months of age (Below 8 years)
- Participants above 97 months of age (8 years and above).

This provides the following categorisation of the sample:

- 25 children in the young group (6 years to 8 years old)
- 17 children in the older group (8:01 to 11:02 years old)

2.2 Within Group Comparisons – Questionnaire Results

2.2.1 Results of the Strengths and Difficulties Questionnaire (SDQ)

2.2.1.1 Within Group Comparisons Based on Parent Ratings

In order to address the first aim of the study to examine whether children with SLI present with difficulties in the area of socio-emotional functioning and whether there are any developmental trends on parent and teacher ratings of children's socio-emotional functioning, comparisons between the younger and older children with SLI were conducted.

Results revealed that there was a clear trend for parents to rate younger children up to 8 years of age as having more difficulties in all the SDQ subscales in comparison to older children with SLI (above 8 years of age), but the differences between the two groups did not reach statistical significance in any of the SDQ subscales or the Total Difficulties score.

Table B.1

SDQ Percentages for the SLI Group - Parents

		< 8 years	> 8 years
Total Difficulties	Normal	40.0%	70.6%
	Borderline	4.0%	.0%
	Abnormal	56.0%	29.4%
Emotional Symptoms	Normal	52.0%	82.4%
	Borderline	16.0%	5.9%
	Abnormal	32.0%	11.8%
Conduct Problems	Normal	40.0%	70.6%
	Borderline	24.0%	17.6%
	Abnormal	36.0%	11.8%
Inattention-Hyperactivity	Normal	16.0%	41.2%
	Borderline	20.0%	29.4%
	Abnormal	64.0%	29.4%
Peer Relationship Problems	Normal	40.0%	47.1%
	Borderline	20.0%	23.5%
	Abnormal	40.0%	29.4%
Prosocial	Normal	40.0%	47.1%
	Borderline	20.0%	35.3%
	Abnormal	40.0%	17.6%

Group differences for the SDQ subscales were then analysed using a MANOVA with age group (2 levels) as a between factor. The results indicated that there was a significant main group effect, Wilk's Lambda: $F(1,40) = .88$, ns , $\eta p^2 = .13$. Groups differed significantly in the Total Difficulties Score ($F(1,40) = 4.09$, $p = .05$, $\eta p^2 = .09$), and the Conduct Problems subscale ($F(1,40) = 4.25$, $p = .04$, $\eta p^2 = .09$). No statistically significant differences were found for any other SDQ subscale (Emotional Symptoms: $F(1,40) = 1.63$, ns , $\eta p^2 = .03$; Hyperactivity: $F(1,40) = 3.92$, ns , $\eta p^2 = .08$; Peer Problems: $F(1,40) = .22$, ns , $\eta p^2 = .00$; Prosocial: $F(1,40) = .32$, ns , $\eta p^2 = .00$).

Table B.2

SDQ Means (SDs) for the SLI Group - Parents

		< 8 years (N = 25)	> 8 years (N = 17)	Significant Differences
Total Difficulties	Mean	17.00	12.47	Young Group > Old Group
	SD	7.75	6.05	
Emotional Symptoms	Mean	3.32	2.35	
	SD	2.68	1.90	
Conduct Problems	Mean	3.48	2.00	Young Group > Old Group
	SD	2.45	2.00	
Inattention-Hyperactivity	Mean	6.76	5.35	
	SD	1.98	2.62	
Peer Relationship Problems	Mean	3.12	2.76	
	SD	2.35	2.38	
Prosocial	Mean	5.88	6.29	
	SD	2.14	2.51	

2.2.1.2 Within Group Comparisons Based on Teacher Ratings

The same analysis was conducted for the questionnaires obtained from the children's teachers, but no significant differences between the two age groups were found.

Table B.3

SDQ Percentages for the SLI Group - Teachers

		< 8 years	> 8 years
Total Difficulties	Normal	56.0%	58.8%
	Borderline	12.0%	17.6%
	Abnormal	32.0%	23.5%
Emotional Symptoms	Normal	76.0%	82.4%
	Borderline	4.0%	5.9%
	Abnormal	20.0%	11.8%
Conduct Problems	Normal	68.0%	76.5%
	Borderline	8.0%	5.9%
	Abnormal	24.0%	17.6%
Inattention-Hyperactivity	Normal	48.0%	58.8%
	Borderline	8.0%	17.6%
	Abnormal	44.0%	23.5%
Peer Relationship Problems	Normal	60.0%	64.7%
	Borderline	8.0%	11.8%
	Abnormal	32.0%	23.5%
Prosocial	Normal	36.0%	47.1%
	Borderline	16.0%	5.9%
	Abnormal	48.0%	47.1%

Table B.4

SDQ Means (SDs) for the SLI Group - Teachers

		< 8 years (N = 25)	> 8 years (N = 17)
Total Difficulties	Mean	13.60	11.06
	SD	7.58	8.26
Emotional Symptoms	Mean	2.96	2.47
	SD	2.59	2.98
Conduct Problems	Mean	1.96	1.82
	SD	2.40	2.48
Inattention-Hyperactivity	Mean	5.44	4.35
	SD	2.45	2.80
Peer Relationship Problems	Mean	3.24	2.41
	SD	2.35	2.34
Prosocial	Mean	4.48	4.94
	SD	2.66	2.65

Group differences for the SDQ subscales were then analysed using a MANOVA with age group (2 levels) as a between factor. The results indicated that there was no significant main age group effect, Wilk's Lambda: $F(1,40) = .91$, *ns*, $\eta^2 = .08$. As for the analysis of the categorical data, the two age groups did not differ significantly in any of the SDQ subscales or the Total Difficulties Score ($F(1,40) = 1.05$, *ns*, $\eta^2 = .02$; Emotional Symptoms: $F(1,40) = .32$, *ns*, $\eta^2 = .008$; Conduct Problems: $F(1,40) = .03$, *ns*, $\eta^2 = .001$; Hyperactivity: $F(1,40) = 1.77$, *ns*, $\eta^2 = .04$; Peer Problems: $F(1,40) = 1.25$, *ns*, $\eta^2 = .03$; Prosocial: $F(1,40) = .30$, *ns*, $\eta^2 = .008$).

2.3 Results from the Children's Communication Checklist – Second Edition

2.3.1.1 Within Group Comparisons Based on Parent Ratings

In order to establish whether there were differences in what the parents reported between the two age groups, a MANOVA was conducted with age group (2 levels) as a between factor. These indicated that the two age groups (younger and older participants with SLI) did not differ significantly in the Pragmatic Composite, the General Communication Composite score, the Social Interaction Deviance Composite score (Wilk's Lambda: $F(1,30) = .57$, *ns*, $\eta^2 = .42$).

For all the CCC-2 subscales the same pattern was repeated whereby there was no significant main age group effect apart from the Speech Scaled Score (Speech: $F(1,30) = 6.03$, $p < .02$, $\eta^2 = .16$; Syntax: $F(1,30) = 1.26$, *ns*, $\eta^2 = .04$; Semantic: $F(1,30) = .31$, *ns*, $\eta^2 = .01$; Coherence: $F(1,30) = .10$, *ns*, $\eta^2 = .004$; Inappropriate Initiation: $F(1,30) = 1.10$, *ns*, $\eta^2 = .03$).

.03; Stereotyped Language: $F(1,30) = .39$, *ns*, $\eta p^2 = .01$; Use of Context: $F(1,30) = .31$, *ns*, $\eta p^2 = .01$; Nonverbal Communication: $F(1,30) = 2.32$, *ns*, $\eta p^2 = .07$; Social Relationships: $F(1,30) = .12$, *ns*, $\eta p^2 = .004$; and Interests: $F(1,30) = .59$, *ns*, $\eta p^2 = .02$).

Table B.5

Mean CCC-2 Scaled Scores for the SLI Group (parent ratings)

		< 8 years (n = 20)	> 8 years (n = 12)	Group Difference
A. Speech	Mean	2.80	4.67	Younger Group < Older Group*
	SD	1.62	2.67	
B. Syntax	Mean	1.65	2.58	
	SD	2.60	1.56	
C. Semantics	Mean	3.00	2.67	
	SD	1.86	1.55	
D. Coherence	Mean	3.25	3.42	
	SD	1.51	1.16	
E. Inappropriate Initiation	Mean	9.10	8.42	
	SD	1.97	1.37	
F. Stereotyped Language	Mean	5.35	5.67	
	SD	1.34	1.43	
G. Use of Context	Mean	4.50	5.00	
	SD	2.09	2.92	
H. Nonverbal Communication	Mean	4.90	6.17	
	SD	2.29	2.25	
I. Social Relations	Mean	3.35	3.67	
	SD	2.41	2.49	
J. Interests	Mean	8.70	8.00	
	SD	2.71	2.00	
Pragmatic Composite	Mean	35.90	36.92	
	SD	9.76	8.70	
GCC	Mean	34.55	38.58	
	SD	11.39	7.30	
SIDC	Mean	15.35	12.92	
	SD	12.92	6.66	

2.3.2.2 Within Group Comparisons Based on Teacher Ratings

In order to establish whether there were differences in what the parents report between the two age groups, a MANOVA was conducted with age group (2 levels) as a between factor. These indicated that the groups did not differ significantly in the Pragmatic Composite, the GCC score, the SIDC score or any of the CCC-2 subscales (Wilk's Lambda: $F(1,39) = .81$, *ns*, $\eta p^2 = .18$).

For all the CCC-2 subscales the same pattern was repeated whereby there was no significant main age group effect for any of the CCC-2 subscales (Speech: $F(1,39) = 1.33$, *ns*, $\eta p^2 = .03$.; Syntax: $F(1,39) = 1.37$, *ns*, $\eta p^2 = .03$; Semantic: $F(1,39) = .04$., *ns*, $\eta p^2 = .001$; Coherence: $F(1,39) = .93$, *ns*, $\eta p^2 = .02$; Inappropriate Initiation: $F(1,39) = .30$, *ns*, $\eta p^2 = .008$.; Stereotyped Language: $F(1,39) = .02$, *ns*, $\eta p^2 = .001$; Use of Context: $F(1,39) = .006$, *ns*, $\eta p^2 = .000$; Nonverbal Communication: $F(1,39) = .06$, *ns*, $\eta p^2 = .002$; Social Relationships: $F(1,39) = .24$, *ns*, $\eta p^2 = .006$; and Interests: $F(1,39) = 1.71$, *ns*, $\eta p^2 = .04$).

Table B.6

Mean CCC-2 Scaled Scores for the SLI Group (teacher ratings)

		< 8 years (n = 24)	> 8 years (n = 17)
A. Speech	Mean	3.71	5.00
	SD	3.52	3.55
B. Syntax	Mean	2.54	3.76
	SD	3.61	2.75
C. Semantics	Mean	4.08	3.94
	SD	2.28	1.85
D. Coherence	Mean	4.17	4.82
	SD	2.35	1.81
E. Inappropriate Initiation	Mean	8.88	8.41
	SD	2.47	2.85
F. Stereotyped Language	Mean	6.17	6.06
	SD	2.42	1.56
G. Use of Context	Mean	4.71	4.65
	SD	2.21	2.87
H. Nonverbal Communication	Mean	4.67	4.88
	SD	2.69	2.66
I. Social Relations	Mean	4.21	3.76
	SD	3.09	2.41
J. Interests	Mean	10.58	8.47
	SD	6.19	2.80
Pragmatic Composite	Mean	38.00	36.24
	SD	12.51	11.48
GCC	Mean	37.67	41.53
	SD	19.07	11.29
SIDC	Mean	12.08	8.00
	SD	10.29	9.40

2.4 WITHIN GROUP COMPARISONS – EXPERIMENTAL TASKS

2.4.1 Task A: ‘Labelling and Identifying Emotions’ Task Results

2.4.1.1 ‘Labelling Emotions’ – Within Group Comparisons

Table B.7

Percentages of Correct Emotion Labelling By Age Group

	< 8 Years	> 8 Years
Labelling Happiness	96.0%	100%
Labelling Sadness	92.0%	88.2%
Labelling Anger	68.0%	88.2%
Labelling Fear	32.0%	17.6%

Pearson’s chi-square tests revealed that there was no significant association between the two age groups and whether children with SLI were able to label any of the four basic emotions.

2.4.1.2 ‘Identifying Emotions’ – Within Group Comparisons

Table B.8

Percentages of Correct Emotion Identification By Age Group

	< 8 Years	> 8 Years
Identifying Happiness	96.0%	100%
Identifying Sadness	64.0%	76.5%
Identifying Anger	76.0%	76.5%
Identifying Fear	68%	76.5%

Pearson’s chi-square tests were performed for every emotion and revealed that there was no significant association between the two age groups and whether children with SLI were able to identify the four basic emotions under investigation.

2.4.1.3 Total Scores – Within Group Comparisons

Table B.9

Total Emotion Labelling and Total Emotion Identification Scores By Age Groups

	Age Group	Mean	SD
Total Labelling Score	< 8 Years (N=25)	2.84	.898
	> 8 Years (N=17)	2.94	.659
Total Identification Score	< 8 Years (N=25)	2.96	1.172
	> 8 Years (N=17)	3.29	1.047

Two independent *t*-tests were performed for the Total Scores and revealed no differences between the age groups, $t(40) = -.39, ns$, $t(40) = -.94, ns$.

2.4.2 Task B - 'Inferring the Causes of Emotions' Task Results

Table B.10

Percentage of Correct Responses By Age Group

	< 8 Years (N=25)	> 8 Years (N=17)
Happiness	76.0% (N = 19)	94.1% (N = 16)
Sadness	52.0% (N = 13)	52.9% (N = 9)
Anger	56.0% (N = 14)	58.8% (N = 10)
Fear	36.0% (N = 9)	17.6% (N = 3)

A series of Pearson's Chi-Square tests pointed out that there were no significant associations between the two age groups and whether or not children with SLI were able to infer the causes of emotion-eliciting context in the case of any of the four emotions investigated.

2.4.3 Task C – ‘Emotion Explanation’ Task Results

Total Typical (Expected) Emotion Prediction Scores

Table B.11

Means, (SDs) and Range of Total Emotion Prediction Scores By Age Group

	< 8 Years (N=25)	> 8 Years (N=17)
Mean	3.64	4.82
(SD)	1.28	1.23
Range	1 – 6	1 – 6

Independent *t*-tests were performed and showed that, on average, the younger SLI participants were less successful in predicting the correct emotion ($M = 3.64$, $SE = .25$) than older SLI participants ($M = 4.82$, $SE = .30$). This difference between the two age groups was statistically significant $t(40) = -2.97$, $p < .005$.

Typical and Atypical Emotion Explanation – Within Group Comparisons

In order to compare the ability of the two age groups in explaining typical (expected) and atypical (unexpected) emotions, independent *t*-tests were performed. These revealed that on average, the younger SLI participants were less successful in explaining typical emotions ($M = .92$, $SE = .18$) than the older SLI participants ($M = 1.24$, $SE = .25$). However, the difference between the two age groups was not significant $t(40) = -1.04$, *ns*.

Furthermore, when the two age groups were compared for their ability to explain atypical (unexpected) emotions, it was revealed again that the younger SLI participants were less successful in doing so ($M = 1.28$, $SE = .24$) than the older SLI participants ($M = 1.82$, $SE = .31$). Again, the difference between the two age groups was not statistically significant $t(40) = -1.37$, *ns*.

Finally, independent *t*-tests were performed for the Total Mental State Attribution Score for the two age groups and revealed that the younger SLI participants were less successful in using mental state terms in explaining a character’s emotions ($M = 2.20$, $SE = .39$) than the older SLI

participants ($M = 2.88$, $SE = .41$), but that the difference between the two groups was not statistically significant $t(40) = -1.15$, *ns*.

2.4.4 Task D – ‘Conflict Resolution Abilities’ Task Results

An independent *t*-test was performed for the Total Conflict Resolution Score for the two age groups. This revealed that the younger SLI participants adopted less efficient conflict resolution strategies to the four hypothetical scenarios presented ($M = 10.28$, $SE = 1.14$) than older SLI participants ($M = 13.29$, $SE = 1.23$). However, the difference between the two age groups was not found to be statistically significant $t(40) = -1.74$, *ns*.

2.5 GENERAL SCORES DERIVED FROM THE FOUR SOCIAL COGNITION EXPERIMENTAL TASKS

2.5.1 Total Emotion Prediction Score

An independent *t*-test was performed in order to compare the Total Emotion Prediction Score for both age groups. This revealed that on average the young SLI participants scored less on the Total Emotion Prediction Score ($M = 11.64$, $SE = .58$) than the older SLI participants ($M = 13.29$, $SE = .58$), but that the difference between the two age groups was not significant $t(40) = -1.92$, *ns*.

2.5.2 Total Mental State Attribution Score

A further independent *t*-test was performed for the Total Mental State Attribution Score. The younger SLI participants used less mental state terms to explain emotions ($M = 2.20$, $SE = .39$) than the older SLI participants ($M = 2.88$, $SE = .41$). Again, the difference between the two age groups was not found to be statistically significant $t(40) = -1.15$, *ns*.

2.5.3 Social Cognition Composite Score

Finally, the two age groups were compared on their Social Cognition Composite. It was found that the composite score of the young SLI participants was lower ($M = 24.12$, $SE = 1.54$) than the older SLI participants ($M = 29.47$, $SE = .92$). The difference between the two groups was found to be statistically significant $t(40) = -2.97$, $p < .005$.

APPENDIX C: SUMMARY OF LANGUAGE IMPAIRMENT CRITERIA USED IN THE MAIN STUDIES

Table C.1

Criteria of Language Impairment Used in Main Studies

Study	Aim	SLI Participants' Details	Identification of LI
Rice et al. 1993	To explore attitudes toward children with limited linguistic competence	2.4.2 6 children: 3 boys, 3 girls Age range: 50-65 months	All children demonstrated normal intelligence as measured by the Kaufman Assessment Battery for Children (K-ABC) One child demonstrated performance in the low average range No physical or visual handicaps Hearing within normal limits Multiple articulation errors on the Goldman-Fristoe Test of Articulation Failure to master at least three age-appropriate phonemes or speech errors that adversely affected their intelligibility in conversational speech A score below one SD on the Peabody Picture Vocabulary Test-Revised A score below the 25 th percentile on the Reynell Developmental Language Scale-Revised MLU below the predicted range for CA
Redmond & Rice, 1998	To investigate teacher and parent ratings of socio-behavioural development of children known to have SLI as preschoolers and a group of control children matched for age	17 children with SLI: 6 girls, 11 boys Recruited for a longitudinal	Previously identified as language-impaired by a certified SALT Receptive language performance on the PPVT-R 1 or more SD below the mean

		study and participated in the study for approximately 2 years	
Craig & Evans, 1989	To examine the turn-exchange behaviours of children with SLI in adult-child interactions and compare to those of children of similar chronological ages or language structure levels.	5 children: 5 boys Age range: 8:08 – 13:11	Expressive language performance 1 SD or more below age expectations as measured by a calculation of MLU from a sample of at least 150 utterances Normal intellectual functioning as measured by the Columbia Mental Maturity Scale at an age deviation score of 85 or higher Passing score on a probe screening for articulation competency Normal hearing acuity as measured by a hearing screening test. Based on Stark and Tallal's (1981) criteria Passed a hearing screening test No history of clinically significant behavioural, emotional or neurological problems Performance IQ of at least 85 on the WISC-R or on the Leiter International Performance Scale Based on Stark and Tallal's (1981) criteria Passed a hearing screening test. A score below 1 SD on the PPVT-R Score below the 25 th percentile on the receptive portion of the Reynell An MLU below the predicted range for CA Lack mastery of at least two age-appropriate grammatical phonemes A score below 1 SD on the PPVT-R Score below the 25 th percentile on the receptive portion of the Reynell Possess an MLU below the 16 th percentile for CA or lack mastery of at
Craig & Washington, 1993	To characterise the access behaviours of children with SLI and to compare them to those of children with normal language skills.	5 children: 3 boys, 2 girls Age range: 7:00 – 7:06	
Hadley & Rice, 1991	To describe preschoolers' conversational responsiveness in an integrated classroom setting	4 children: 4 boys Age range: 42-56 months	
Rice et al., 1991	To examine the social interactions of speech- and language-impaired children	6 children: 5 boys, 1 girl Age range: 3:8 – 5:7	

McAndrew, 1999	To examine the proposition that the high level of emotional and behavioural problems in language disordered children is due to their low self-esteem.	14 children: 8 boys and 6 girls Age range: 8-14 years	least two age-appropriate grammatical phonemes Intellectual functioning was not to be below the low average level LI assessed by speech therapists No details about cut-off points No details regarding language assessment are provided
Gagnon & Nagle, 2004	To examine relationships between peer interactive play and social competence in a sample of preschool children considered at risk for academic difficulties	85 children: 43 boys and 42 girls Age range: 50 to 66 months	
Durkin & Conti-Ramsden, 2007	To compare friendship quality in 16-year-old adolescents with and without SLI	120 adolescents with SLI Drawn from the wider longitudinal study (the Conti-Ramsden Manchester Language Study) Age range: 15.2 – 16.9	All participants met the criteria for SLI at least at one time point (7, 8, 11, or 14 years) prior to the final data collection at age 16 Performance IQ of 80 or more and at least one concurrent standardised language score > 1SD below the population mean at one of the longitudinal assessment stages. No sensory-neural hearing loss English as a first language
Fujiki et al., 1996	To examine the social skills of children with SLI	19 children with SLI From mainstream primary schools No formal diagnosis of emotional or behavioural disorder Enrolment in the SALT caseload for language intervention .	No record of a medical condition likely to affect language Nonverbal or performance IQ score of 80 or above on a formal measure of intelligence (WISC-R for 13 subjects, WISC-III for 3 subjects, the Test of Nonverbal Intelligence for 2 subjects and the Matrix Analogies Test for 1 subject). The resulting mean performance/nonverbal IQ was 94 (ranging from 80-115). Unremarkable audiological status as indicated by a pure-tone hearing screening administered by a SALT Diagnosis of SLI based on a formal measure of language production and/or comprehension. For 10 subjects, a receptive and/or productive score of 85 or lower on the CELF-R was used as a basis for diagnosis.

Gertner et al., 1994	To examine the relationship between linguistic competence and social status	12 children with SLI: 9 boys, 3 girls Age range: 46-70 months	For 6 subjects, a receptive and/or productive score of 85 or lower on the Test of Language Development 2, Primary was used for diagnosis. For 2 subjects, diagnosis was based on a total language score below 35 on the Language Processing Test. For 1 subject, the diagnosis was based on performance more than 1 SD below the mean on two subtests of the Illinois Test of Psycholinguistic Abilities, one subtest of the CELF-R and the Peabody Picture Vocabulary Test-Revised Score 1 or more SD below the mean on the PPVT-R Score 1 or more SD below the mean on the receptive and/or expressive portions of the Reynell Possess an MLU 1 or more SD below the mean for CA Lack mastery of at least 2 age-appropriate grammatical morphemes Score below the 16 th percentile on the Goldman-Fristoe Test of Articulation
2.4.3			
Hoffman & Gilliam, 2004	To investigate information processing limitations underlying SLI using a dual-processing paradigm	24 children with SLI. 18 boys and 6 girls Age range: 96 – 128 months	Normal nonverbal cognitive abilities as demonstrated by performance SS at or above 85 on the Test of Nonverbal Intelligence-2 nd Edition 1.3 SDs or more below the mean on 2 or more subtests of the CELF-3 Normal hearing No history of environmental deprivation, behavioural-emotional disorder or gross neurological impairment
Bishop & Adams, 1991	To compare a group of children with SLI with a control group on a referential communication task in which the child was asked to describe a picture from an array of eight similar items so that the listener could identify it.	54 children with SLI Recruited from residential schools or language units for children with SLI	Summed scaled score on 2 Wechsler Intelligence Scale for Children-Revised Performance subtests 13 or over Not suffering from dysarthria or severe phonological problems Able to pass at least 6 blocks on the TROG

				Performance well below normal limits on at least 1 out of 8 language measures (Phonology, Naming, Story MLU, Story Semantics, Grammatical Errors, TROG, WISC-R Verbal Comprehension, Conversational Inappropriacy)
Shatz et al., 1980	To examine language disordered children's responses to sentences that can carry directive import under varying contextual conditions	5 children: 2 girls and 3 boys Enrolled in a Speech and Hearing Centre Age: 5 or 6 years old		No diagnosis of 'mental retardation' No hearing impairment No physical difficulty No neurological difficulties Significant language delay diagnosed by at least two professionals
Donlan & Masters, 2000	To examine linguistic and cognitive correlates of social skill in a clinically selected sample of children with communication disorders	32 children: 25 boys, 7 girls Age range: 5:00-10:04 From an ICAN school catering for children with a broad range of communication deficits		No further details in the paper about criteria of language impairment. Non-verbal cognitive skills indicative of learning ability equivalent to the general population in a mainstream school No physical, behavioural or emotional problems Some children had additional language difficulties as seen in the context of high-functioning autism
Courtright & Courtright, 1983	To compare language-disordered and normal children in terms of their ability to interpret emotional meaning from the vocal cues of an adult speaker	25 children Age range: 3:1 – 7:3		Some had severe problems with expressive language No 'mental retardation' No hearing impairment No neurological impairment Diagnosed as moderately-to-severely disordered in their expressive language skills No further details in the study regarding criteria for LI

Section 2.5

Cantwell et al. 1979	To evaluate for psychiatric disorders speech- and language- delayed children	Drawn from a community speech and hearing clinic. 300 children Age range: 2.0 to 15.9 years Mean age: 5.7 years	Children received an extensive speech and language evaluation including a hearing evaluation, the Goldman-Fristoe Test of Articulation, the PPVT, the Carrow Test of Auditory Comprehension of Language, the Illinois Test of Psycholinguistic Abilities and an analysis of a free speech sample. Cut-off points not specified in the study Mean performance intelligence score (as measured by WISC or WPPSI) at 107.5
Baker and Cantwell, 1987	To examine the psychiatric, linguistic and educational status of group of speech/language disordered children 4 to 5 years after initial presentation at a community speech clinic.	216 boys and 84 girls Age range at follow-up: 6.5 to 20.00 years of age Mean age: 9.1 years	
Cantwell & Baker, 1980	To examine what is the prevalence and what are the types of psychiatric and behavioural disorders seen in children with speech- and language difficulties	250 language-delayed and psychiatrically disturbed children Drawn from a Neuropsychiatric Institute	
Section 2.5.1.2			
Richman et al., 1975	To survey the prevalence of behaviour problems in 3-year-old children living in a London Borough.	Drawn from a Family Register which consists of families living in the Borough with a child born after March 1969 705 families 20 children with a language delay	Language was assessed by an interviewer who used a simple screening language procedure and rated the complexity of the child's syntax during the entire interview
Stevenson & Richman, 1976	To study the behaviour and development of a large number of 3-year-old children	Drawn from a Family Register which consists of	Language delay was assessed by an interviewer using the first 20 items of the Pre-School Version to the English Picture Vocabulary Test

		<p>families living in the Borough with a child born after March 1969</p> <p>705 families</p> <p>20 children with a language delay</p>	<p>(EPVT) and an assessment of comprehension (Brimer and Dunn, 1962).</p> <p>The children were also asked to name seven pictures from the EPVT plates – a measure of expressive vocabulary.</p> <p>Lastly, the interviewer rated language structure by noting the presence or absence of five features of speech throughout the interview. These were taken from the Reynell Developmental Language Scales (RDLS) expressive language scales.</p> <p>The Griffiths Scales provided a measure of non-verbal ability 'Talking' was defined as using six words, either singly or in combination, and appropriately, such that they could be understood by another adult</p>
Silva et al., 1982	<p>In order to examine the predictive significance of early developmental delays, the prevalence of low IQs and/or reading difficulties at age seven in those who experienced early delays was examined in comparison with those whose early development was not delayed.</p> <p>872 seven year old children were investigated in respect to motor development, language and reading development, intelligence and some behavioural problems</p>	<p>1,037 children assessed as three year olds and 954 of these assessed within approximately one month of their seventh birthday</p> <p>872 seven year old children: 453 boys and 419 girls</p> <p>84% of the 1037 children who were studied as three year olds in the Dunedin Multidisciplinary Child Development Study</p>	<p>Articulation was assessed by a SALT using the Dunedin Articulation Check (DAC)</p> <p>Language development was assessed using the Auditory Reception and Verbal Expression subtests of the Illinois Test of Psycholinguistic Abilities</p> <p>Intelligence was assessed using eight subtests of the Wechsler Intelligence Scale for Children (WISC)</p> <p>A three year old was considered to have language delay if he or she scored at or below the nearest score on the Reynell scales that corresponded to the fifth percentile on either the verbal comprehension or verbal expression scales</p>
Silva et al., 1987	<p>To describe follow-up studies at ages 7, 9 and 11 years of children who were language-delayed at age 3.</p>	<p>Initial sample: 1037 children enrolled in the Dunedin Multidisciplinary Child Development Study</p> <p>951 7 year old children (492 boys and 459 girls)</p> <p>953 9-year old children</p>	

Beitchman et al., 1986	To establish the prevalence of speech and language disorders in kindergarten children (5 years of age) for the English language school children in the Ottawa-Carleton region	919 11-year old children 142 children identified as having speech/language disorder: 90 boys and 52 girls Community sample	Stage 1: initial 30-minute speech and language interview conducted by trained screeners. Stage 2: intensive testing by qualified speech and language therapists.
Beitchman et al., 1996a	To examine the 70year psychiatric outcome of 202 speech/language impaired and control children selected from a community sample of age 5 years	91 children: 30 girls and 61 boys Age 5 years	Language impairment – age 5 (one or more) i) TOLD Spoken Language Quotient (SLD) – 1 SD below mean ii) Any TOLD language subtest (not including Word Articulation and Word Discrimination) – 2SD below the mean iii) Peabody Picture Vocabulary Test-Revised – 1 SD below mean iv) Goldman-Fristoe-Woodcock Auditory Memory Tests – 1 SD below mean on both content and sequence subtest Speech impairment – age 5 (one or more) i) Test of Language Development – Word Articulation subtest – 2 SD below the mean ii) TOLD Word Discrimination subtest – 2 SD below the mean iii) Evidence of a voice disorder, stuttering or dysarthria Similar criteria were used to determine speech and language impairments at ages 5 and 12.5 years. The only difference was the use of TOLD-2 at follow-up
Lindsay & Dockrell, 2000	To identify the range of additional problems experienced by children with SLI in different educational contexts To consider the relationship between these problems and the child's current language status and To consider the child's self-esteem and the extent to which self-esteem is associated with the primary language problem or other associated difficulties.	69 children: 17 girls, 52 boys Aged 7± 8 years (Year 3) Mean age: 8:3 Children had been identified as having SLI when in Year 3	Language was assessed using the Test of Reception of Grammar for receptive language ability, the British Picture Vocabulary Scale and the Naming Vocabulary BAS II for expressive language ability, the Bus Story: length and information, and the Phonological Assessment Batter (PhAB) Non-verbal cognitive ability was assessed using the Matrices subtest of the BAS II All the language scores were significantly lower than non-verbal ability scores.

Lindsay et al., 2007	To examine the stability of BESD in children with SLI and the relationship between BESD and the language ability	<p>59 from two local education authorities and 10 from regional special schools for children with severe speech and language difficulties</p> <p>69 children with SLI: 17 girls and 52 boys.</p> <p>Mean age: 8:3</p> <p>22 children attending special schools and 47 were in mainstream schools.</p> <p>68 of these children were followed-up for reassessment at ages 10 and 12.</p> <p>At the age of 12, 19 children were in special schools and 50 were in mainstream.</p> <p>Part of a longitudinal study drawn from 2 LA.</p>	<p>At 8 and 10 years, the Test of Reception of Grammar was used to assess children's understanding of syntax.</p> <p>Receptive vocabulary was assessed by the revised British Picture Vocabulary Scale.</p> <p>At 8 years only, expressive language was assessed by the Bus Story.</p> <p>At 10 years, expressive language was assessed by the expressive language subtests of CELF-R.</p> <p>At 10 years, the CCC pragmatic composite impairment score was used as a measure of pragmatic language ability.</p> <p>Non-verbal cognitive ability was assessed by administering the British Ability Scales II Matrices subtest and all children were found to be within the average.</p> <p>All the language scores were significantly lower than non-verbal ability scores.</p> <p>Children with severe hearing loss, moderate learning difficulties, ASD or EAL were excluded</p>
Snowling et al., 2006	To assess the psychosocial adjustment in adolescence of young people with history of speech-language impairment, and investigate specific relationships between language deficits and psychiatric disorders.	71 young people (aged 15–16 years) with a preschool history of speech/language impairment.	All participants showed a statistically significant difference between their language and nonverbal cognitive ability in the initial study.

Clegg et al., 2005	<p>To determine the range of cognitive deficits in adult life among individuals diagnosed in childhood as having DLD</p> <p>To examine the interrelationships among cognitive features</p> <p>To delineate any changes in cognitive functioning that take place during early adult life</p> <p>To examine psychosocial functioning further into adult life</p> <p>To investigate the impact of language ability on independence</p>	<p>Participants were initially recruited as a part of a longitudinal study at the age of 4 years.</p> <p>17 male adults Initially identified through 6 special units (attached to hospitals) and 6 special schools</p> <p>Age range: 33:0 – 38:1 years</p>	<p>Performance IQ of at least 70</p> <p>Severe delays in receptive and expressive language</p> <p>No identifiable aetiology</p>
Conti-Ramsden & Durkin, 2008		<p>Longitudinal and follow up data from 120 adolescents with a history of SLI: 72.5% male, 27.5 female</p> <p>Part of the Conti-Ramsden Manchester Language Study.</p> <p>Age range: 15:2 – 16:9 years of age</p>	<p>All adolescents met criteria for SLI at least at one time point (7, 8, 11 or 14/16 years).</p> <p>Performance IQ of 80 or more and at least one concurrent standardised language test score > 1SD below the population mean at one of the longitudinal assessment stages</p> <p>No sensorineural hearing loss</p> <p>English as a first language</p>
Whitehouse et al., in press	<p>To compare the adult psychosocial outcomes of children with SLI, PLI and ASD</p>	<p>19 adults with a history of SLI</p> <p>Mean age: 24:08</p> <p>All participants took part in research as children</p> <p>35 adults with a history of SLI: 28 men and 7 women</p>	<p>No record of a medical condition likely to affect language</p> <p>When in childhood, participants were given an SLI diagnosis if a child scored at least 1 SD below the mean on 1 or more standardised language assessments, but had a nonverbal IQ within normal limits.</p>
Tomblin et al., 1992	<p>To evaluate a set of behavioural measures of language and cognitive performance with respect to their ability to distinguish</p>		<p>The SLI group were seen as children</p>

	adults with a history of SLI from normal adult language users and, using a discriminant analysis procedure, to establish a diagnostic standard for the interpretation of these measures. To obtain a descriptive information concerning the language and cognitive status of adults with and without histories of SLI.	Age range: 17 to 25 years Mean age: 21.56	All subjects had nonverbal IQs above 80 based upon standardised intelligence tests
Section 2.5.2			
Shriberg & Kwiatkowski 1994	To provide a clinical profile of 178 children with developmental phonological disorders	64 children: 64% boys and 36% girls Age range: 3:0 to 6:1 Community speech and hearing clinic 99 children Mean age: 5 years 8 months	Standardised and no standardised measures in the following six categories: hearing, speech mechanism, speech production, language comprehension, language production, history and behaviour No hearing impairment Speech was evaluated by means of the Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 1969) Language was evaluated by the PPVT, the Test for Auditory Comprehension of Language (Carrow, 1973), the Illinois Test of Psycholinguistic Abilities (Kirk, McCarthy, & Kirk, 1968) and an analysis of a free speech sample.
Baker et al. (1980)	To compare children with pure speech disorders to children with disorders of both speech and language		Speech was evaluated by means of the Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 1969) Language was evaluated by the PPVT, the Test for Auditory Comprehension of Language (Carrow, 1973), the Illinois Test of Psycholinguistic Abilities (Kirk, McCarthy, & Kirk, 1968) and an analysis of a free speech sample.
Caulfield et al. (1989)	To examine parent-child interaction and behaviour problems in children with developmental expressive language disorder.	34 normally developing children and 34 Expressive Language Delayed children Mean age: 27.2 months Each group consisted of 28 boys and 6 girls English speaking language	Cut-off points not specified in the study. Children with a hearing impairment or neurological impairment were excluded Expressive language SS at least 2.5 SDs below the mean for CA as measured by the Expressive One-Word Picture Vocabulary Test (Gardner, 1981) Receptive language and non-verbal cognitive ability scores no more than 1 SD below the mean on the PPVT-R (Dunn & Dunn, 1983) and the Leiter International Performance Scales (Leiter, 1976).
Vedeler, 1996	Case Study: To investigate whether a 5-year-old boy diagnosed as having socio-emotional problems differs from his peers in	1 male child	Reynell Developmental Language Scales

	communicative performance		Age: 4:6 years old Referred for socio-emotional problems 38 children with a variety of communication disorders Mean age: 103.6 months All participants had received a Statement of SEN as a result of a language communication difficulty	Normal intelligence (IQ = 98) although not clear from the study which intelligence test was used The assessment of the children's communication skills and cognitive abilities was not carried out specifically for the research and, therefore, a variety of methods of assessment had been used. Information about the children's diagnosis and assessments were obtained by systematic and exhaustive searching through the children's files held by the psychological services.
Farmer and Oliver (2005)	To ascertain whether two checklists, Bishop's (1998) Children's Communication Checklist and Goodman's (1997) Strengths and Difficulties Questionnaire, would discriminate between groups of children diagnosed as having autism, autistic spectrum disorder/Asperger's syndrome, pragmatic difficulties and children with other types of specific language impairment. To investigate whether specific aspects of pragmatic difficulties can be identified as relating to difficulties in peer relationships. To investigate whether ratings of pragmatic difficulties are related solely to difficulties in social relations or whether other aspects of socio-emotional adjustment are also affected.		108 children with a history of Speech Sound Disorder and children: 23 children with SLI (14 boys and 9 girls) and 85 children without SLI (49 boys and 36 girls). Age range: 4:8 – 7:4 years Mainstream sample	Children were administered the Sounds-in-Words subtest of the Goldman Frisbie Test of Articulation (GF) – children who did not have a history of speech therapy were required to score below the 30 th percentile on the GF
McGrath et al., 2008	To replicate the results of Beitelman et al (1998) and extend the conclusions by considering speech and language subgroups in a group of children with Speech Sound Disorder		2 Groups: 19 children with SLI: 10 girls and 9 boys and 19 children matched for age Age: 7:0-10:0 year olds	Certified by a SALT At least 1.5 SD below average on CELF-R and fell within the normal range of performance IQ (between 90 and 120) on the WISC-R English as their primary language
Marton et al. (2005)	To investigate the relationship between social pragmatics, social self-esteem and language in children with SLI		6 children with SLI	Nonverbal or performance IQ above 85 on a formal IQ test
Brinton et al. (1998b)	To examine the negotiation skills of children with SLI			

			<p>Age range: 8-12 years</p> <p>Mainstream placement with a minimum 2 years enrolment in SALT</p>	<p>Typical hearing status</p> <p>Language impairment based on comprehension and production SS of at least 1 SD below the mean on receptive and expressive components of the CELF-R</p> <p>No formal diagnosis of neurological problems, behaviour problems or articulation impairment</p> <p>English as a first language</p> <p>Nonverbal or performance IQ above 85 on a formal IQ test</p> <p>Typical hearing status</p> <p>Language impairment based on comprehension and production SS of at least 1 SD below the mean on receptive and expressive components of the CELF-R</p> <p>No formal diagnosis of neurological problems, behaviour problems or articulation impairment</p> <p>English as a first language</p> <p>A score of more than 1 SD below the mean on the Comprehensive Assessment of Spoken Language (Carrow- Woolflok, 1999).</p> <p>A SS above 80 on the Universal Nonverbal Intelligence Test (Bracken & McCallum, 2003).</p> <p>Nonverbal or performance IQ score of 80 or above on WISC-R for 13 participants, on the Wechsler Intelligence Scale for Children III for 3 participants, the Test of Nonverbal Intelligence for 2 participants, and the Matrix Analogies Test for 1 participant</p> <p>Diagnosis of SLI based on a receptive and/or productive score of 85 or lower on the CELF-R, or the Test of Language Development-2 or on the Language Processing Test or on the Illinois Test of Psycholinguistic</p>
Brinton et al. (1998a)	To investigate the ability of children with SLI to participate in cooperative learning groups.		<p>6 children with SLI</p> <p>Age range: 8-12 years</p> <p>Mainstream placement with a minimum 2 years enrolment in SALT</p>	
Brinton et al. (2007)	To examine the ability of children with SLI and their typically developing peers to judge when an experienced emotion should be dissembled (hidden) in accord with social display rules		<p>19 children with SLI: 11 girls and 8 boys</p> <p>Mean age: 9:1</p> <p>19 children with SLI</p> <p>Mean Age: 122.84 months</p>	
Fujiki et al. (1996)	To examine the social skills of 19 school children with SLI and 19 CA-Matched peers			

Conti-Ramsden and Botting (1999)	To examine the characteristics of 7-year-old children attending language units in England	242 children: 186 boys and 56 girls 26 children in the study were additionally exposed to a language other than English at home	Abilities. Test for Reception of Grammar (TROG) Naming Vocabulary subtest of the BAS Goldman-Fristoe Test of Articulation The Bus Story Raven's Matrices
Chapter 3			
Section 3.2.4.2			
Leslie & Frith, 1988	To establish that autistic children have severe and specific difficulty with understanding mental states.	12 children with SLI: 9 boys and 3 girls Attending a special school Age range: 6:11 to 9:11	British Picture Vocabulary Scales: Mean 6.9 No further details are provided about identification of language impairment in the paper
Perner et al., 1989	To explore theory of mind skills of children with autistic disorder	12 children: 2 girls and 10 boys From a special school for SLI children Age range: 6:11 to 9:11	BPVS range: 5.5 to 8.7 (mean 6.9) Severe delay in language comprehension but no further detail about identification of language impairment is provided in the paper
Ziatas et al., 1998	To examine the relationship between the development of theory of mind and the development of belief terms think, know and guess	12 children with SLI Attending special schools	25-point or greater discrepancy in performance and verbal intelligence measures but no further details are provided about which tests were used to identify the SLI Group.
Shields et al., 1996	To examine some aspects of social cognition in groups of children with phonologic-syntactic disorder, semantic-pragmatic disorder, a group of children with high-level autism, a group of normal children	10 children with phonologic-syntactic syndrome 10 children with semantic-pragmatic syndrome	Rapin and Allen's criteria for phonologic-syntactic syndrome and semantic-pragmatic syndrome No diagnosis of autism No signs of brain pathology

			Educated in facilities for children of normal intelligence	
Johnston et al., 2001	To investigate the use of cognitive state predicates by children with SLI, comparing their performance to both language and mental age peers		Age range: 7 to 11 years 26 children	Language age at least 1 year lower than both chronological age and mental age at the Curtiss-Yamada Comprehensive Language Evaluation test Performance IQ at least 85 (Leiter International Performance Scales) Normal hearing acuity Monolingual Standard American English background No manifestations of autism or other emotional pathology No oral structural or motor impairments No frank neurological deficit
Gillott et al., 2004	To investigate theory of mind impairments in children with language disorder		15 children with SLI (phonologic-syntactic): 13 boys and 2 girls Age range: 8-12 years 8 attended mainstream schools, 7 attended a specialist school for children of average intelligence and language disorders	Children from the group with SLI received their diagnosis prior to the study by a SALT from an SLI team. No further details about language impairment are provided in the study.
Botting & Conti-Ramsden, 2008	To investigate what are the language, social cognition and social skills profiles of older adolescents with and without SLI To examine whether functional social outcomes differ across the		134 adolescents Mean age: 15:10	Adolescents were classes as currently impaired if, at the time of the study (16 years of age) met the following criteria for SLI: Performance IQ (WISC-III) of 80 or more and concurrent expressive or

Farmer (2000)	<p>groups</p> <p>To explore what role do language, social cognition and social skill play in the functional social outcome and, within the SLI Group, what predicts poor functional social outcomes</p> <p>To explore the links between the development of language and the development of social cognition</p>	<p>Recruited at 7 years of age as part of the Conti-Ramsden Machenster Language Study</p> <p>Group 1 – Children with SLI educated in a special school for children with speech, language and communication needs. Mean age = 132.5 months, N = 8 boys</p> <p>Group 2: children with SLI who were being educated in two language units attached to two mainstream primary schools. Mean age = 129.3. N = 8 (7 boys, 1 girl)</p>	<p>receptive language standard score (CELF-R) less than 85</p> <p>A total of 85% of the adolescents had current language difficulties indicated by scores at least 1 SD below the mean on standardised tests of expressive and/or receptive language</p> <p>Mean SS of the whole group of children with SLI on BPVS was 80.94 (SD12.90).</p> <p>Mean SS on CELF-R Sentence Recall Subtest was 4 (SD 2.73)</p> <p>All children have been identified at preschool age by a SALT and an EP as experiencing difficulties with receptive and expressive language</p> <p>All SLI children had nonverbal IQs within the normal range WISC(III)-R. Average non-verbal IQ = 97, SD = 11.5</p> <p>Exclusion of children with a diagnosed ASD or semantic-pragmatic disorder.</p>
Holder & Kirkpatrick, 1991	<p>To investigate the accuracy and time required for children with and without learning disabilities to interpret emotions when restricted to information from facial expressions, and the accuracy of those interpretations</p>	<p>Section 3.3.4.2</p> <p>96 children with learning disabilities were selected for this study on the basis of being formally identified by their school districts as having a specific learning disability with no other exceptionality in learning.</p> <p>48 boys, 48 girls</p> <p>Two age groups ages 8 to 10 and ages 11 to 15.</p>	<p>No further detail is provided in the paper regarding language profiles of participants</p>

Dmitrovsky et al., 1998	To examine the ability to interpret facial expressions of affect in differentiated subgroups of children with learning disabilities and their nondisabled peers	76 children with learning disabilities: 54 boys and 22 girls	Diagnosis as learning disabled by the school district psychological services based on: <ul style="list-style-type: none"> • Testing on a Hebrew version of the WISC-R, Bender-Gestalt Test, Figure Drawings and achievement tests • Achievement test scores at least 2 years below grade level • Absence of extreme behavioural or attentional difficulties • Absence of frank neurological problems • Residence in Israel for at least the past 4 years
Ford & Milosky (2003)	To examine whether children with LI have difficulty identifying facial expressions and to investigate whether they can integrate facial expression knowledge with other verbally and/or visually presented information in order to make a social inference	12 children with LI Mean age: 5.9 years of age 6 boys and 6 girls	A performance composite score of at least 85 on the nonverbal subsets of Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1983) At least 1 SD below the mean (below 85) on the comprehension subset of the CELF-P.
Creusere et al., 2004	To investigate whether reported difficulties in language-impaired children's ability to identify vocal and facial cues to emotion could be explained at least partially by nonparalinguistic factors	26 children with SLI: 6 girls, 20 boys Mean age: 5:01 English-speaking children	Children with SLI had been identified by a certified speech-language therapist; they were receiving at the time of the study speech and language therapy services; they passed a hearing screening at 25dB for 500Hz and 20 dB for 1000, 2000 and 4000 Hz, and scored above 75 on the Kaufman Assessment Battery for Children.
Spackman et al. 2006	To examine the ability of children with LI to infer the emotions elicited by specific social situations	43 children with LI Mainstream sample CA between 5 and 8 or between 9 and 12 years	Non-verbal or performance IQ above 80 Diagnosis of LI by the school SALT Performance at least 1 SD below the mean on a formal measure of receptive and/or expressive language. No formal diagnosis of emotional or behavioural disorder No hearing impairment
Section 3.4.3.3			
Horowitz et al., 2005	To describe behavioural sequences in conflicts between children with typically developing language (TL) and between children with LI.	11 children: boys Attending a preschool	Typical audiological development status Normal development according to the Griffith Mental Developmental

		<p>setting for LI children</p>	<p>Scales</p> <p>Normal non-verbal performance scores according to Leiter International Performance Scales-Revised</p> <p>Confirmed receptive and expressive speech and language impairment according to a battery of tests administered by a qualified SALT and a qualified psychologist (PPVT-R, RDLIS-R, TROG, SIT) but the individual language test scores were not provided in the study.</p> <p>No developmental disabilities or neurological/psychiatric diagnosis.</p>
<p>Marton et al., 2005</p>	<p>To examine the relationship between social pragmatics, social self-esteem, and language in children with SLI and their age-matched peers (7-10 years of age).</p>	<p>19 children with SLI: 10 girls and 9 boys.</p> <p>Receiving speech and language therapy</p> <p>Included in mainstream education</p> <p>English as a first language</p>	<p>Diagnosed by a SALT</p> <p>At least 1.5 SD below the age average on the CELF-R</p> <p>Within the normal range of performance IQ (between 90 and 120) on the WISC-R</p> <p>Passed a hearing test</p> <p>No articulatory errors, motor, emotional or physical handicaps.</p>