



Comorbid motor deficits in a clinical sample of children with specific language impairment



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ABSTRACT

The aim of the present study was to compare the motor function of a clinical sample of children with specific language impairment (SLI) to a language-matched comparison group that had not been referred for SLI assessment. A typical language comparison group with similar nonverbal IQ was also included. There were approximately 35 children in each group, aged 9- to 10-years-old, and the children completed a range of standardised language, motor and literacy measures. The results showed that the SLI group scored significantly lower than the language-matched and typical language comparison groups on all of the motor and literacy measures. We conclude that language factors alone are insufficient to explain the extensive comorbid motor and literacy deficits shown by the children with SLI in this study. We suggest that the clinical diagnosis of SLI may be influenced by the presence of additional developmental difficulties, which should be made explicit in assessment procedures, and that intervention strategies, which address the broad range of difficulties experienced by children with a clinical diagnosis of SLI, should be prioritised.

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1. Introduction

According to the DSM-IV-TR criteria (American Psychiatric Association, 2000), specific language impairment (SLI) may be diagnosed when language abilities are significantly below age expectations but where non-linguistic developmental abilities are within age expectations (a marked discrepancy between language scores and nonverbal IQ on standardised tests). In addition, the language difficulties must interfere with academic achievement or occupational achievement or social communication; individuals with an acquired language disorder, or an autism spectrum disorder (ASD), or hearing problems, or those who have been brought up in a linguistically impoverished environment are excluded.

A number of studies have raised concerns that significant numbers of children with language difficulties remain undiagnosed. In an epidemiological survey of 7218 children attending kindergarten, Tomblin, Records, Buckwalter, Zhang, and Smith (1997) found that only 29% of children who met the criteria for SLI on a standardised test battery had previously been identified. Cohen, Davine, Horodezky, Lipsett, and Isaacson (1993) used a range of language measures to screen 288 children (aged 4–12 years), who had been referred to psychiatric services for behavioural or emotional problems, and found that 34% of the children had an unsuspected language impairment. In a further study of 380 children (aged 7–14 years), who had also been referred to child psychiatric services, Cohen, Barwick, Horodezky, Vallance, and Im (1998) found that 40% had a language impairment that had not been suspected. Bishop and McDonald (2009) used a combination of standardised language tests and parental reports in a study involving 245 twin children (aged 9–10 years), and found that more than half

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of the children identified as language impaired, using a discriminant function analysis, had never been referred to a speech and language therapist.

Bishop and McDonald (2009) also found that non-referred children with language problems had literacy problems, which were as marked as those of the children who had been referred for assessment. There is considerable evidence to show that early language skills are predictive of later literacy attainments (e.g., Scarborough, 2005). In contrast, Cohen et al. (1998) found that children with language impairments who were not referred for assessment had relatively stronger literacy skills than those children who had been referred. They point out that the non-referred children were significantly behind their peers with typical language development but significantly ahead of the referred children on a number of academic achievement measures (Cohen et al., 1998). The relative disconnect between language ability and literacy attainment in this latter study suggests that the development of literacy may also be influenced by other non-linguistic factors.

In addition, a number of studies have shown that SLI is not 'specific' and that comorbidities are common (Dyck & Piek, 2010; Gillberg, 2010; Hill, 1998; Kaplan, Wilson, Dewey, & Crawford, 1998; Manor, Shalev, Joseph, & Gross-Tsur, 2001). In particular, there is growing evidence that many children with SLI experience some level of motor difficulty (Hill, 2001; Lingam et al., 2010; Rechetnikov & Maitra, 2009; Webster et al., 2006). It is not known if the presence of motor difficulties (usually undiagnosed) plays an indirect role in the process of referral for language assessment or to what extent motor and language development are interrelated in children with language impairments.

The emergence of language and motor skills in young children has been described predominantly as involving separate and distinct developmental pathways, but based on an underlying common progression in cognitive functioning (e.g., Bloom, 1993; Lenneberg, 1967). More recently, some theorists have suggested that the acquisition of new motor skills in the first 18 months of life, such as object placement or crawling, plays an important role in the 'soft assembly' of language function (Iverson, 2010). In addition, there is some evidence from longitudinal studies that gross and fine motor skills in the first year of life may be predictive of cognitive, including language, outcomes in later childhood (Hansen, Joshi, & Dex, 2010).

The primary aim of the present study was to compare the motor function and core literacy attainments of a clinical sample of children, who had been diagnosed with SLI, to a language-matched comparison group of children, who had not been referred for language assessment. A comparison group with typical language attainments and a similar level of nonverbal IQ was also included. The children in the comparison groups were selected from schools in an area of social disadvantage as previous work has suggested that these children are at risk of language problems, which remain undiagnosed (Bishop & McDonald, 2009; Cohen et al., 1998). The negative impact of social disadvantage on early language development has been highlighted in other work (e.g., Ginsborg, 2006; Walker, Greenwood, Hart, & Carta, 1994). We also compared the levels of core literacy skills in the clinical versus non-clinical groups as there is some confusion in the literature regarding the impact of language difficulty on academic attainments in children with language problems who have not been referred for language assessment.

The present study asked two key questions:

- (1) Do children who are diagnosed with SLI experience significantly more motor problems than children with language difficulties who have not been referred for language assessment?
- (2) Do children with SLI have significantly lower levels of core literacy skills than children with language difficulties who have not been referred for language assessment?

2. Methods

2.1. Design and participants

An independent groups design was used with three groups constructed on the basis of receptive (and expressive) language ability and nonverbal IQ. All of the children were recruited from 3 schools in the Greater Belfast district, and were aged 9- to 10-years-old.

The clinical SLI group had been given a formal diagnosis of specific language impairment (SLI) and attended a special school for children with speech and language difficulties. The criterion for entry to the school was a score below the 2nd percentile on overall language ability as measured by the Clinical Evaluation of Language Fundamentals (CELF-4) (Semel, Wiig, & Secord, 2006). All of these children had a formal statement detailing their speech and language difficulties.

We selected a language-matched comparison group (of the same age), matched to the SLI group on receptive (and expressive) language and nonverbal IQ, from two large primary schools in an area of social disadvantage. A typical language comparison group (of the same age) with typical language attainments, and matched to the SLI group and language comparison group on nonverbal IQ, was also selected from the same primary schools.

The nonverbal IQs of all of the children were greater than 70; children scoring below 70 are likely to have global impairments including motor deficits (Green et al., 2008). Entitlement to free school meals was used as a measure of social disadvantage, and the proportion of children receiving free school meals in the total primary school population in Northern Ireland at the time of the study was 22% (Department of Education, Northern Ireland, 2010/2011). The proportions of children entitled to free school meals in the SLI, language-matched and typical language comparison groups were 29%, 69% and 66% respectively.

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