



## Psychosocial co-morbidities in adolescents and adults with histories of communication disorders



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### ABSTRACT

**Background:** Few studies have considered the long-term psychosocial outcomes of individuals with histories of early childhood speech sound disorders (SSD). Research on long-term psychosocial outcomes of individuals with language impairment (LI) have frequently failed to consider the effects of co-morbid SSD. The purpose of this study was to compare individuals with histories of SSD-only versus SSD with LI on these outcomes and to examine the contributions of other comorbid conditions including reading disorders (RD) and Attention Deficit Hyperactivity Disorder (ADHD).

**Methods:** Participants were adolescents aged 11–17 years ( $N = 129$ ) and young adults aged 18–33 years ( $N = 98$ ). Probands with SSD were originally recruited between 4 and 6 years of age and classified into SSD-only and SSD + LI groups. Siblings of these children were also assessed at this time and those without SSD or LI were followed as controls. Outcome measures at adolescence and adulthood included ratings of hyperactivity, inattention, anxiety, and depression, as well as internalizing, externalizing, social, and thought problems. Adult outcomes also included educational and employment status and quality of life ratings. Regression modeling was performed to examine the association of SSD, LI, RD, and ADHD with psychosocial outcomes using Generalized Estimating Equations.

**Results:** In the adolescent group, LI was associated with poorer ratings of psychosocial problems on all scales except depression. Histories of SSD-only, RD and ADHD did not independently predict any of the adolescent psychosocial measures. In contrast, LI in the adult sample was not significantly associated with any of the behavior ratings, though RD was related to higher ratings of hyperactivity and inattention and with higher parent ratings of internalizing and externalizing symptoms and thought problems. SSD did not predict any of the adult measures once other comorbid conditions were taken into account. **Conclusions:** Poor adolescent psychosocial outcomes for individuals with early childhood SSD were primarily related to comorbid LI and not to SSD per se. At adulthood, comorbid RD and ADHD may influence outcomes more significantly than LI.

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*Abbreviations:* SSD, speech-sound disorder; LI, language impairment; RD, reading disorder; ADHD, attention deficit-hyperactivity disorder.

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## 1. Introduction

Speech sound disorders (SSD) are the most common communication disorder reported in preschool children with approximately 16% of children affected at age 4 (Campbell et al., 2003). Although the speech errors of many preschool-age children resolve, 4% of 6-year-old children continue to exhibit articulation and phonological errors (Shriberg, Tomblin, & McSweeney, 1999). Many children with SSD have comorbid language impairment (LI) and may be at risk for reading disorders (RD) and attention deficit-hyperactivity disorders (ADHD) as well. Shriberg et al. (1999) reported 11–15% comorbidity of SSD with LI (SSD + LI) at 6 years of age. Children with SSD are also at risk for RD, with an estimated 18% of children with SSD-only and 75% of children with SSD + LI demonstrating RD at school age (Lewis, Freebairn, & Taylor, 2000). LI and ADHD are often comorbid, with rates of comorbidity reported to be 30%–50% in children seen in ADHD clinics (Tannock & Schachar, 1996). Despite the high co-morbidity of these disorders, their relationship to the long-term psychosocial outcomes of children with histories of early communication disorders is not well understood. Most studies that have followed children with SSD-only and SSD + LI have not accounted for co-morbid diagnoses in the assessment of psychosocial outcomes. The goal of this study is to compare adolescent and young adult psychosocial outcomes for individuals with early childhood SSD-only versus SSD + LI while also accounting for effects of other comorbid conditions.

### 1.1. Psychosocial outcomes for individuals with LI

Studies of children with LI – many of whom also had SSD – indicate adverse psychosocial outcomes relative to control groups, including poorer peer relationships, increased victimization, and more problems in social competence, adaptive functioning, emotional and self-regulation (Durkin & Conti-Ramsden, 2010). Children with LI are also at risk for mental health difficulties (e.g., somatic symptoms or problems with depressed, anxious, or angry mood), which may contribute to higher rates of unemployment and lesser educational attainment in adulthood (Johnson, Beitchman, & Brownlie, 2010; Law, Rush, Schoon, & Parsons, 2009).

Previous findings suggest that both the subtype of LI and the comorbid conditions accompanying it may impact psychosocial outcomes at adolescence. In a study of 71 15- to 16-year-old adolescents, Snowling, Bishop, Stothard, Chipchase, and Kaplan (2006) reported that youth whose LI resolved by 5 years had a good outcome with few psychiatric disorders. In contrast, youth with expressive language disorders were associated with attentional problems, combined receptive and expressive language disorders with social difficulties, and low IQ, and global language deficits with both attentional and social difficulties.

A recent systematic literature review of 19 studies composed of 553 children confirmed these findings (Yew & O'Kearney, 2013). Children with LI were twice as likely to report psychosocial disorders including internalizing symptoms (anxiety, mood disorder, and depression), externalizing symptoms (conduct disorder, oppositional defiance disorder, and antisocial personality) and ADHD than children with typical language development. Males were found to be more at risk for conduct disorders and depression than females. However, there was insufficient evidence to demonstrate a strong link between LI and one specific psychosocial problem, possibly related to heterogeneity within the LI impaired group and to failure to consider effects of comorbid conditions.

### 1.2. Psychosocial outcomes for individuals with SSD

Most studies have attributed poor outcomes of individuals with early communication problems to LI and have not considered comorbid SSD independently from LI. An early study by Baker and Cantwell (1982) that examined speech disorders separate from LI, reported high rates of psychiatric disorders as defined by the DSM-III for children who had LI without accompanying speech disorder (95%). Rates of these disorders were lower for children with combined speech and language disorders (45%) and speech disorders only (29%). The findings of Baker and Cantwell (1982) are difficult to interpret as children varied considerably in age (1–15 years) and the speech disorders group included children with diagnoses of stuttering and voice disorders, as well articulation disorders. Children with SSD-only were not separated from those with other disorders in examining psychiatric outcomes. Felsenfeld, Broen, and McGue (1994) documented lower levels of educational attainment and occupational status in adults with histories of SSD compared to adults without histories of SSD. However, they also failed to separate the individuals with SSD-only from those with SSD + LI and it is thus difficult to know the extent to which these outcomes were related to SSD versus LI.

One of the few larger longitudinal studies that investigated psychosocial outcomes in children with SSD with and without LI (Beitchman, Brownlie, & Wilson, 1996; Beitchman et al., 2001; Johnson et al., 2010) recruited children at 5 years of age and followed them at 12, 19, and 25 years of age. At age 5 years, children with isolated speech disorders were as likely as children with combined speech and language disorders to present with psychiatric disorders, specifically ADHD and anxiety disorders. At 12 years, children with combined speech and language disorders presented with the highest rate of psychiatric disorders (57%), followed by children with language disorders only (42%). Children with histories of speech disorders only had the fewest psychiatric disorders (26%). At 19 years of age, individuals with early LI demonstrated increased rates of anxiety disorders compared to controls. The speech only group did not differ from controls at 19 years. At 25 years, individuals who had a history of LI demonstrated poorer communication, cognitive/academic, educational attainment and occupational status than individuals with histories of SSD-only. Children in the SSD-only group were more likely than those

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