Prevalence of Speech and Language Disorders in Children

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Introduction

To communicate effectively, children must master language, the conventional code used to convey thoughts and ideas, and speech, the complex and rapid motor movements that translate such ideas into spoken words. Both language and speech are essential for sharing feelings, ideas, and information with others. Most young children acquire these communication skills effortlessly, but some experience difficulties in learning to understand and use the language they hear around them. These children have speech or language disorders, which may put them at high risk for associated learning, social, and behavioural problems (Bishop & Leonard, 2000).

How many children have speech or language disorders? This question is important to parents, professionals, policymakers, and researchers who wish to understand communication disorders and optimize assessment and intervention services for these children (Enderby & Pickstone, 2005). The answer requires estimates of prevalence, “the proportion of people in a defined population who have a particular condition at any one time” (Byles, 2005, p. 2). However, several challenges make it surprisingly difficult to obtain accurate estimates of the prevalence of various speech and language disorders in children.

First, accurate prevalence figures require an accepted definition of a particular condition and a reliable method for identifying whether or not a child is affected (Law, Boyle, Harris, Harkness, & Nye, 2000). Speech and language disorders, however, are complex developmental conditions with varied behavioural manifestations (Lubker & Tomblin, 1998). Thus, there is little consensus on how best to define and identify these disorders (Nelson, Nygren, Walker, & Panoscha, 2006). Two well-known diagnostic schemes (American Psychiatric Association, 2000; World Health Organization, 1994) include definitions and criteria for various childhood speech and language disorders. The two schemes, however, have not been scientifically validated, are not entirely consistent with each other, and differ markedly from those often used in research or clinical practice (Johnson & Beitchman, 2006).

A second challenge is that prevalence estimates must be based on large, representative, community samples to ensure that all affected children are identified. Clinical samples are not optimal for determining prevalence, as children who are referred for speech-language services are known to differ systematically from those identified in population samples (Johnson et al., 1999; Zhang & Tomblin, 2000).
Possible biases in the referral and service systems can only be uncovered when prevalence in the community has been estimated accurately.

Third, the nature of the disorders may change as children mature, thereby influencing prevalence estimates. Thus, ideally, prevalence data should be collected across the lifespan for speech and language disorders (Craig & Tran, 2005; Campbell et al., 2003).

Accurate prevalence estimates are not, however, particularly valuable in and of themselves. Rather, they provide key starting points for other important inquiries about childhood speech and language disorders (Law et al., 2000; Pickstone & Enderby, 2005). Lifespan prevalence data are valuable in understanding the natural history, course, and prognosis of these disorders. Prevalence estimates also allow for assessment of possible risk and protective factors. For example, a family history of speech and language disorders may increase risk for childhood communication disorders, whereas high quality daycare experiences may decrease risk, acting as a protective factor. Risk and protective factors provide hints on causality of the disorders, as well as on prevention or intervention strategies that might help to reduce their adverse impacts on individuals and society. The key research questions below focus on the prevalence of three common types of childhood communication disorders (language, speech sound, and stuttering). A brief description of each disorder is followed, in order, by a consideration of relevant definitional issues and a summary of available prevalence data, based on community samples in which disorders were verified with a replicable procedure.

**Key Research Questions**

1. What is the prevalence of language disorders in children?
2. What is the prevalence of speech sound disorders in children?
3. What is the prevalence of stuttering in children?

**Recent Research Results**

**Language Disorders.** Children with primary or specific language disorders exhibit problems in communicating their needs, thoughts, and intentions, despite having typical abilities in hearing, nonverbal intelligence, and general development (Leonard, 1998). These children are late in starting to talk and, subsequently, exhibit a slow rate of language growth. They may have small vocabularies, use short, incomplete sentences, and produce confusing or disorganized stories or conversations. These expressive language difficulties may be accompanied by receptive language problems, that is, difficulties in comprehending the words, sentences, stories and conversations of others. In short, children with language disorders often show language characteristics that resemble those of younger children with typical development.

In fact, the main inclusion criterion for the disorder is language performance below that expected for a child’s age on standardized tests and/or spontaneous measures of language ability. There are several problems inherent in using such a definition, based on a normal distribution of scores, to estimate prevalence (Law et al., 2000). First,
prevalence will be largely pre-determined by the specific cut-off value chosen to define disorder. For example, on a well-constructed language measure, a cut-off value of two standard deviations below the mean performance will necessarily yield a prevalence rate of approximately 2%, as expected from a normal distribution of scores. Higher cut-off values will accordingly result in higher prevalence rates (Johnson et al., 1999; Rescorla, Hadicke-Wiley, & Escarce, 1993; Weindrich, Jennen-Steinmetz, Laucht, Esser, & Schmidt, 2000). Second, this type of normative definition makes it difficult to determine whether prevalence changes with age because the same cut-off value should yield the same prevalence rate, regardless of age (Law et al., 2000). Such a definition also calls into question the appropriateness of the term “disorder”. Rather, children with language difficulties may simply represent the lower end of the normal distribution of language skills (Leonard, 1987), differing primarily in degree, rather than in kind, from their peers with typical language development (Dollaghan, 2004).

Another controversial definitional issue is whether children with a language disorder must demonstrate nonverbal intelligence within the normal range. The appropriateness of this criterion has been questioned on both conceptual and psychometric grounds (Francis, Fletcher, Shaywitz, Shaywitz, & Bourke, 1996; Lahey, 1990). Prevalence estimates are affected, with somewhat higher rates of language disorder found when normal nonverbal intelligence is not required (Johnson et al., 1999; Law et al., 2000; Tomblin, Records, Buckwalter, Zhang, Smith, & O’Brien, 1997). Prevalence issues are further complicated by questions related to co-morbidity or overlap among language disorders, other communication disorders, and other developmental disorders (Bishop & Snowling, 2004; Conti-Ramsden, Simkin, & Botting, 2006; Kaplan, Dewey, Crawford, & Wilson, 2001; Lubker & Tomblin, 1998, Rice, Warren, & Betz, 2005). Unfortunately, few studies have addressed these important co-morbidity questions in community, as opposed to clinical, samples.

Law and colleagues (2000) conducted a systematic review of research (up to 1997) on the prevalence and natural history of childhood speech and language disorders. Not surprisingly, they noted that prevalence estimates for language disorders varied widely, depending on the age of the children sampled and the criteria used to identify cases.

In a recent community study, Horwitz, Irwin, Briggs-Gowan, Heenen, Mendoza, and Carteet (2003) estimated the prevalence of expressive language disorder in young children 18 to 39 months of age. Prevalence rates were 13.5% at 18 to 23 months, 15% at 24 to 29 months, and 18% at 30-39 months. The 24-month value is within the range of values reported for that age by Rescorla et al. (1993) using various criteria. The 36-month value is higher than those of earlier studies that employed more stringent criteria at this age (Law et al., 2000).

Two community studies provided estimates of the prevalence of language disorders in 5-year-old children. Beitchman, Nair, Clegg, and Patel (1986) found a prevalence of 12.6% for language disorders, using a definition that did not exclude other developmental disabilities or require nonverbal intelligence within the normal range. Tomblin et al. (1997) reported a prevalence of 7.4% for specific language disorders (i.e., with exclusion of other disabilities and a requirement for nonverbal intelligence in the
normal range). For 6- and 7-year-old children, Law et al. (2000) noted median prevalence estimates of 5.5% and 3.1%, respectively. However, they also cautioned that it is not straightforward to make comparisons across studies because of the different criteria used to identify language disorders.

Childhood language disorders are difficult to identify reliably in very young children (Dale, Price, Bishop, & Plomin, 2003). However, language disorders that are identified in the later preschool years show high rates of persistence (Beitchman, Wilson, Brownlie, Walters, & Lancee, 1996; Law et al., 2000; Tomblin, Zhang, Buckwalter, & O'Brien, 2003). Moreover, children with these language disorders are at high risk for long-term adverse outcomes, including reading and other academic difficulties (e.g., Catts, Fey, Tomblin, & Zhang, 2002; Young et al., 2002) and psychosocial problems (e.g., Tomblin, Zhang, Buckwalter, & Catts, 2000; Beitchman et al., 2001).

**Speech Sound Disorders.** Young children may also exhibit problems in learning to pronounce various speech sounds correctly. These speech sound disorders do not usually have an identifiable cause, such as sensory (e.g., hearing), structural (e.g., cleft palate), or neurological (e.g., cerebral palsy) problems. Children with speech sound disorders show a slowed rate of speech acquisition, but often follow a relatively typical sequence of sound development (Shriberg & Kwiatkowski, 1994). Listeners may find their speech difficult to understand.

The identification of speech sound disorders also entails complex and controversial definitional issues. As in the case of childhood language disorders, different criteria and measures have been employed to estimate prevalence (Law et al., 2000). The literature includes several schemes for identifying subtypes of speech sound disorders (e.g., Broomfield & Dodd, 2004b; Shriberg, Lewis, Tomblin, McSweeny, Karlsson, & Scheer, 2005), but none has been consistently adopted.

Law et al. (2000) also summarized prevalence studies of speech sound disorders up to 1997. They found no studies for children younger than age 5. Median estimates of prevalence for 5-, 6-, and 7-year old children were as low as 2.3% and as high as 14.5%, probably reflecting the varied methods for identifying cases.

In more recent work, Campbell et al. (2003) reported a prevalence of 15.6% for speech sound disorders in 3-year-old children in a large, diverse community sample. Shriberg, Tomblin, and McSweeny (1999) obtained an estimate of 3.8% for 6-year-old children. McKinnon, McLeod, and Reilly (2007) used a conservative identification procedure that yielded an overall prevalence of 1.06% for speech sound disorders in 10,425 Australian school children from kindergarten to grade six. The lower prevalence rates at older ages are consistent with evidence that speech sound disorders may resolve over time (Shriberg, Kwiatkowski, & Gruber, 1994).

In addition to estimating prevalence for speech sound disorders, Shriberg et al. (1999) also determined the extent to which speech sound disorders co-occurred with language disorders in their community sample. Only 0.5% of 6-year-olds had both specific speech sound disorder and specific language impairment. This rate of co-occurrence was much
lower than is typically reported in clinical samples (Broomfield & Dodd, 2004a; Shriberg & Austin, 1998). In another community sample, Beitchman et al. (1986) estimated that 4.6% of 5-year-olds had co-occurring speech and language disorders, using more inclusive definitions than those of Shriberg et al. (1999).

For speech sound disorders, long-term persistence and negative sequelae are not as common as for language disorders (Johnson et al., 1999). However, mild, residual speech problems may have subtle, negative effects on listener’s perceptions of an individual’s overall competence (e.g., Hall, 1991; Silverman, 1992). Some children with speech sound disorders may also be at increased risk for reading and other academic difficulties (e.g., Raitano, Pennington, Tunick, Boada, & Shriberg, 2004).

**Stuttering.** Stuttering is a communication disorder that affects the rhythm and continuity of speech. It is characterized by “repetitions of syllables, part or whole words or phrases; prolongation of sounds; or blocking of sounds” (Craig, Hancock, Tran, Craig, & Peters, 2002, p. 1100). Secondary characteristics may include unusual facial expressions, motor behaviours, tics, embarrassment, anxiety, and avoidance of speaking or social situations.

As with other childhood speech and language disorders, there are challenges associated with the accurate identification of stuttering. For example, it is difficult, particularly in very young children, to distinguish the repetitions and hesitations that occur regularly in typical speech from those that constitute stuttering. In older children and adults, another controversy is whether to base identification only on speech fluency characteristics or also on the presence of secondary behavioural and emotional characteristics. If the latter are included, they are often difficult to quantify in a reliable fashion and may vary widely across individuals (Bloodstein, 1995).

Craig et al. (2002) estimated the prevalence of stuttering across the lifespan in a large community sample of 4,689 Australian households that included 12,131 individuals of all ages. After hearing a description of stuttering, interviewees reported whether anyone in the household showed the characteristics of stuttering. Those identified then provided a taped sample of their speech, which the researchers used to verify the presence of stuttering.

The overall prevalence of stuttering in the entire sample was less than 1% (0.72%), an estimate relatively consistent with that from previous literature (Bloodstein, 1995). However, prevalence varied with age, from a high of approximately 1.4% for children 2 to 10 years of age to a low of roughly 0.37% for adults 51 years or older. McKinnon et al. (2007) provided a somewhat lower estimate of 0.33% for stuttering in children from kindergarten to grade 6.

High rates of co-occurrence among stuttering, speech sound disorders, and language disorders have been reported in some clinical populations (e.g., Arndt & Healey, 2001; Blood, Ridenour, Qualls, & Hammer, 2003). These results, however, should be interpreted cautiously because no community study of co-occurrence is yet available (Nippold, 2004).
Stuttering often develops in the preschool years and may resolve spontaneously, but may also persist throughout the lifespan. Individuals who stutter may be subject to negative stereotypes and be restricted in their social and vocational activities (Kroll & Beitchman, 2005).

**Future Directions**

This review highlighted two key directions for future research related to the prevalence of speech and language disorders in children. First, further theoretical and empirical work is needed to refine and validate the standards and measures used to identify children with these disorders (Wake & Reilly, 2001). Clear standards and accepted definitions are critical for accurately assessing the prevalence of speech and language disorders. Second, additional careful studies are required to identify the best early predictors of individual long-term outcomes (Nelson et al., 2006). These efforts may then lead to better strategies for prevention and management of these disorders.

**Conclusions**

A large proportion of children have speech and language disorders, which may be associated with adverse, long-term outcomes that impact on individuals, families, and communities. A challenge for our society is to foster the science required to promote better futures for these children in a world where academic, social, and economic success relies heavily on communication skills (Ruben, 2000).

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References


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