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Review

Specific language impairment: a convenient label for whom?

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Abstract

Background: The term 'specific language impairment' (SLI), in use since the 1980s, describes children with language impairment whose cognitive skills are within normal limits where there is no identifiable reason for the language impairment. SLI is determined by applying exclusionary criteria, so that it is defined by what it is not rather than by what it is. The recent decision to not include SLI in DSM-5 provoked much debate and concern from researchers and clinicians.

Aims: To explore how the term 'specific language impairment' emerged, to consider how disorders, including SLI, are generally defined and to explore how societal changes might impact on use the term.

Methods & Procedures: We reviewed the literature to explore the origins of the term 'specific language impairment' and present published evidence, as well as new analyses of population data, to explore the validity of continuing to use the term.

Outcomes & Results and Conclusions & Implications: We support the decision to exclude the term 'specific language impairment' from DSM-5 and conclude that the term has been a convenient label for researchers, but that the current classification is unacceptably arbitrary. Furthermore, we argue there is no empirical evidence to support the continued use of the term SLI and limited evidence that it has provided any real benefits for children and their families. In fact, the term may be disadvantageous to some due to the use of exclusionary criteria to determine eligibility for and access to speech pathology services. We propose the following recommendations. First, that the word 'specific' be removed and the label 'language impairment' be used. Second, that the exclusionary criteria be relaxed and in their place inclusionary criteria be adopted that take into account the fluid nature of language development particularly in the preschool period. Building on the goodwill and collaborations between the clinical and research communities we propose the establishment of an international consensus panel to develop an agreed definition and set of criteria for language impairment. Given the rich data now available in population studies it is possible to test the validity of these definitions and criteria. Consultation with service users and policy-makers should be incorporated into the decision-making process.

Keywords: specific language impairment, language impairment, child language.

What this paper adds?

What is already known on this subject?

The term 'specific language impairment' (SLI), in use since the 1980s, describes children with language impairment whose cognitive skills are within normal limits where there is no identifiable reason for the language impairment. The latter is determined by applying exclusionary criteria.

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What this paper adds?

We review how and why SLI came into use and examine the evidence for and against its use. We conclude the term 'SLI' was proposed and used prior to evidence from population studies being available. Subsequent research has provided little evidence that supports the continued use of the current definition and the exclusionary criteria. To address these shortcomings we propose a set of short-term changes and recommendations for the future.

Introduction

The term 'specific language impairment' (SLI) has been in common use for many years. When the draft of the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was released for comment in 2012 it contained a proposal to include the SLI category. The American Speech–Language–Hearing Association (ASHA) responded, recommending that SLI not be included stating it was 'controversial, not available in the vast majority of clinical settings, widely used in research but consensus on the robustness and validity of the category has not been reached' (ASHA 2012, p. 14). The omission of SLI from the DSM-5 (American Psychiatric Association 2013) caused much debate. We argue this was the right decision. Not only is there a paucity of evidence regarding the accuracy and precision with which SLI is diagnosed in children, but also there is good reason to believe that the classification is unacceptably arbitrary.

This paper is divided into three parts. The first part considers how historical, theoretical and societal factors have influenced the 'art' of diagnosis such that SLI gained and maintained currency from the 1980s to the present day. The second part uses published evidence, as well as new analyses of population data, to suggest that the term SLI should be discontinued. The third part proposes alternatives for discussion and debate.

Part 1: How and why SLI gained currency

When clinicians diagnose diseases or disorders their intention is to assign an individual's symptoms to a particular category which is distinct from others and which is informative with respect to aetiology, treatment and prognosis. In the case of developmental disorders, where the underlying aetiological mechanisms, nature of variability within the population and developmental course of a given set of symptoms are poorly understood, the process of diagnosis can become one of 'carving nature at the joints' (Pickles and Angold 2003). The diagnoses adopted at a given point therefore represent the product of a process of 'pattern finding' driven by the available data and prevailing theoretical models and societal issues with respect to normality and difference. The emergence of SLI therefore is understandable within the historical, theoretical and societal context in which it was first

coined. However, current evidence and theory suggest that it is now time to move on.

SLI and its antecedents

Historically, descriptions of language difficulties were influenced by different professional groups and their theoretical perspectives, the evolving health and education systems, and the methodological approaches applied to understand child language difficulties. Relevant professional groups can be loosely separated into the disciplines of medicine, linguistics, speech pathology and developmental psychology.

One of the earliest references to child language difficulties was in 1822 when Gall, a physician, described children who had specific problems with language in the absence of other conditions (Gall 1835). Many case reports and descriptions followed, drawing attention to a group of children with language difficulties in the presence of apparently normal non-verbal intelligence. These observations predate the use of formal tests for verbal or non-verbal abilities. Instead, the early descriptions were made by physicians with an interest in language development as a symptom (figure 1).

The early terminology focused primarily on children whose expressive language output was severely restricted and included 'congenital aphasia' (Vaisse 1866). Language subgroups were gradually recognized, as was the differentiation between expressive and receptive skills (Liebmann 1898). In the early 1900s the use of terms such as 'congenital word deafness' (McCall 1911), 'delayed speech development' (Froschels 1918), 'congenital auditory imperceptions' (Worster-Drought *et al.* 1929) and 'congenital verbal auditory agnosia' (Karlin 1954) reflected a growing awareness that language difficulties were not confined to production. A prevailing view emerged that language difficulties were neurological in origin, and terms such as 'developmental aphasia' and 'developmental dysphasia' were adopted from adult pathologies. In the latter half of the 20th century Psycholinguistic and Nativist theories of language acquisition posited modular cognitive architectures wherein the language acquisition process was seen as entirely separable from other aspects of development. The aetiological 'level' of explanation therefore moved from neurobiological to linguistic or psycholinguistic descriptions of isolated impaired language mechanisms, the underlying

can be applied because optimal diagnostic indicators have not yet been identified and tested in epidemiological studies (Meehl 1992, 1999).

Once appropriate signs and symptoms have been considered the next challenge is to classify those signs appropriately, assigning one diagnosis and excluding others. However, language difficulties are core symptoms of many other neurodevelopmental disorders (e.g. autism, Fragile X syndrome) and co-occur at levels higher than chance in others (e.g. ADHD, dyslexia).

Our understanding of the nature of ‘co-morbidity’ varies as to the level at which shared mechanisms are posited to exist: are they genetic, neurobiological or cognitive? (Williams and Lind 2013). Myers (2013) recently commented that ‘genes don’t respect our diagnostic classification boundaries’, suggesting that as we learn more about the genetic and neurological bases of neurodevelopmental disorders our current classification systems are being called into question.

Societal changes and the use of SLI

Societal changes

The diagnostic criteria for language impairment emerged against a backdrop of major societal changes that in turn shaped our views of what constitutes a disability and/or impairment. A person with a language problem would not have been considered disabled and unemployable in much of the 19th and first half of the 20th centuries when ‘blue collar’ manual jobs dominated. However, as the white-collar workforce has increased so has the requirement for good oral and written communication skills (Ruben 2000).

Globally, workforces have changed over the past 60 years with a sharp rise in individuals employed in services industries contrasted with a decline in employment in production industries. In 1966, almost half of Australia’s workforce was made up of ‘blue collar’ workers—e.g. tradesmen, production process workers and labourers (44%), farmers, fishermen and loggers (12%). In 2011 just 8% of the workforce were ‘blue collar’ worker, whereas the most common occupations were professionals (22%) and clerical and administrative workers (15%) (Australian Bureau of Statistics 2013). Language skills have become critically important for the workforce and for economic prosperity. However, these skills have their origins early in life.

Population measures of language in early childhood have increased our understanding of how restricted language can be early in childhood. Tools such as the Australian Early Development Index (AEDI), completed by teachers for all children in their first year of full-time schooling (aged 5–6 years), provide a population census of early childhood development including children’s physical, social, emotional, language and cognitive

and communication skills. The 2009 and 2012 censuses showed that children with poorer language skills were found in each socio-economic quintile reminding us that language difficulties are found across social strata (Goldfeld *et al.* 2014).

Population studies have tracked social, employment and educational outcomes in children with LI into adolescence and adulthood including the BCS70 (Law *et al.* 2009, Schoon *et al.* 2010a, 2010b), the Ottawa cohort (Beitchman *et al.* 2008, Johnson *et al.* 2010, Young *et al.* 2002), and the Iowa cohort (Tomblin 2008). Analyses of the BCS70 and Ottawa cohorts found that individuals whose language scores fell at least 1 SD below the mean at age 5 years had poorer behavioural and psychosocial adjustment, and poorer literacy and educational attainment than children with scores above that threshold. The Iowa cohort has comprehensively explored the effect of LI (–1.25 SD) on children’s abilities to meet ‘socially defined functional expectations’ (Tomblin 2008, p. 95) as they transition into adulthood. At 16 years of age, young people who met this criteria for LI in kindergarten were more likely to exhibit the following characteristics: receipt of specialist educational provision, lower scores for reading comprehension, higher rates of functional illiteracy, poorer teacher rated school performance, mathematical reasoning, parent rated social skills, levels of social activity and participation, higher levels of isolation, higher rates of clinically significant rule breaking, poorer self-worth, and higher rates of depression, compared with their typically developing peers.

So why consider SLI in the context of changing economic and social environments? First, employers now demand their workforce have good oral and written language, which in turn has implications for skill development for our school leavers with language difficulties. Second, social disadvantage is significantly related to language outcomes (see Part 2). Third, societal changes have altered how we view language difficulties; language impairment recognized and level of disability experienced is also acknowledged.

Summary: Part 1

SLI is a term that emerged in the 1980s and rapidly came into common use in both clinical and research settings. It was much favoured by researchers who for very good reasons prefer neat homogenous groups—the exclusionary criteria applied in the diagnostic category permit this narrowing of the phenotype. The evidence underpinning Gall’s first description through to the emergence of the term SLI was based on clinical experience and the descriptions of single or groups of clinical cases. Later linguistic and psychological theories influenced theoretical approaches and terminology. Critically, the introduction

of the term SLI in the 1970s was not informed by data from populations of children. The ground-breaking epidemiological studies conducted by Joseph Beitchman and Bruce Tomblin (Beitchman *et al.* 1986, Tomblin *et al.* 1996) were not published until the 1980s and 1990s.

The World Health Organization (WHO) in 1948 proposed that health be defined as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (World Health Organization 1946). In the absence of a clear understanding of aetiology this focus on the relationship between abilities and 'real world' outcomes such as education and well-being could provide a more meaningful and valid approach to the diagnosis of language impairment for clinical purposes. It is timely to re-examine the evidence underpinning the decisions around the use and definition of SLI. Part 2 below utilizes data from a series of prospective, longitudinal population studies to reappraise the definition and classification of children with language difficulties.

Part 2: Discontinuing the use of SLI: evidence from population studies

In part two we test the criteria used to describe SLI beginning with the exclusionary criteria and then examining potential markers for SLI.

Discrepancy between verbal and non-verbal performance

There has been ongoing debate about whether it is essential that there be a discrepancy between verbal and non-verbal ability in order to attract a diagnosis of SLI (Plante 1998, Lahey 1990). Findings from epidemiological studies suggest the discrepancy is not well supported and others argue that it is not conceptually sound (Karmiloff and Karmiloff-Smith 2002). Here we present data from two epidemiological studies, one conducted in the state of Iowa in the United States (Tomblin *et al.* 1996) and the other from Melbourne in Victoria, Australia (Reilly *et al.* 2010) that examine the language and non-verbal cognitive profiles of children. The study samples, participants and measures are summarized in table 1.

The 603 eight-year-olds were drawn from the larger cross-sectional epidemiological study of SLI ($N = 2,009$) conducted by Tomblin *et al.* (1996) in the Iowa study. Language measures were combined to form a language composite score (for further details about the measures and procedures, see Tomblin *et al.* 2003). Data are also presented on 1556 four- and 1197 seven-year-old children from the Early Language in Victoria Study (ELVS), a prospective longitudinal study of 1,910 children recruited in infancy (for further details, see Reilly

et al. 2010). For each dataset non-verbal performance measures were plotted against the relevant language measures. Recognized cut-points used to determine language impairment (>1.25 SD below the mean) and low non-verbal performance (>1 SD below the mean) were used to form four groups and included children with:

- Typical language: language (≤ 1.25 SD below the population mean) and non-verbal IQ within the normal range (score ≥ 85). See symbol '+' in figures 2 and 3.
- SLI: language impaired (>1.25 SD below the population mean) and non-verbal IQ in the normal range (score ≥ 85). See symbol '•' in figures 2 and 3.
- Non-specific LI (NSLI): language impaired (> 1.25 SD below the population mean) and non-verbal IQ low (score < 85). See symbol 'x' in figures 2 and 3.
- Low non-verbal IQ: language within normal range and low non-verbal IQ (score < 85). See symbol '■' in figures 2 and 3.

The scatterplots are remarkably similar despite the fact that the datasets originated from different countries; the studies used different language and non-verbal IQ measures and the children were aged 4, 7 and 8 years respectively. The children varied across the full range of both measures. Many children clustered around the cut-points and were within 1 point or so of the intersecting lines; moving the cut-points in any direction would mean classifying groups of children differently. For some this would result in them moving into and out of impaired groups. A small number of children had extreme language scores; interestingly the longitudinal ELVS data indicate that the variability may decrease by 7 years of age (compare figures 3a and c with b and d). Children with SLI had significantly higher mean language scores and higher non-verbal scores than the children with NSLI. Thus, they differed in the severity of the language impairment.

Few studies have addressed the question of whether non-verbal performance or IQ moderates the effects of intervention in children identified with SLI. In other words, do children with higher non-verbal performance (as operationally defined in SLI) respond better to focused language interventions? To date there is no clear evidence that non-verbal performance bestows any specific advantage (Cole and Dale 1986, Boyle *et al.* 2007, Adams *et al.* 2012, Wake *et al.* 2013) yet there is a difference in the way we provide therapy to children with SLI. A number of well-conducted trials for children who have speech and language-learning difficulties in the absence of other developmental conditions (i.e., applying the exclusion criteria), have

Table 1. Summary of the Early Language in Victoria Study (ELVS) and Iowa epidemiological studies including participant numbers, sample characteristics, and language and non-verbal measures

Study	Author	Sample (<i>n</i>)	Age (years)	Language measure	Non-verbal performance
ELVS (1)	Reilly <i>et al.</i> (2010)	1556	4	Clinical Evaluation of Language Fundamentals—Preschool, Second Edition (Wiig <i>et al.</i> 2004)	Kaufman Brief Intelligence Test, Second Edition (KBIT-2). (Kaufman and Kaufman 1990)
ELVS (2)		1197	7	Clinical Evaluation of Language Fundamentals—Fourth Edition, Australian Standardised Edition (Semel <i>et al.</i> 2006)	Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler 1999)
Iowa	Tomblin <i>et al.</i> (1996)	603 ^a	8	Language Composite	Wechsler Intelligence Scale for Children—Third Edition (Wechsler 1991)

Note:

^aComprised 379 with typical language and 225 children with LI.

been reviewed and shown to have positive results (Law *et al.* 2003, Cirrin and Gillam 2008). They are available in a user-friendly format (Law *et al.* 2012a) from the interactive website, the UK's Communication Trust (see <http://www.thecommunicationtrust.org.uk/schools/what-works>).

Ebbels *et al.* (2014) conducted a randomized controlled trial involving school aged children with language impairments. Non-verbal IQ was not related to progress in this trial that targeted the comprehension of coordinating conjunctions. In other words the children with SLI did not perform differently from those with NSLI. While it is possible that training more specific language skills may be reserved for those with more specific problems, many areas of language development commonly targeted (vocabulary development, listening and attention etc.) are generic. Either way a strong claim that intervention choice is sensitive to the child's non-verbal performance is no longer supported by the literature (Cole *et al.* 1990). What has become increasingly clear is that stringently applied exclusionary criteria and arbitrary cut-points have a profound impact and the case for assuming that the perceived specificity of the problem be used as a criteria for accessing services is not advisable.

Can children with SLI be defined by exclusionary criteria?

Most websites concerning SLI start with an assertion that SLI is characterized by difficulty with language that does not arise from any known intellectual, neurological, sensory or emotional deficit. Such statements seem not only outdated but also make little sense. How can a condition such as SLI not arise from a neurological deficit, if we consider a neurological deficit to mean suboptimal neural functioning? Clearly the intent in including this criterion was to exclude language problems arising from an identifiable or diagnosed congenital or acquired disorder equivalent to a circumscribed

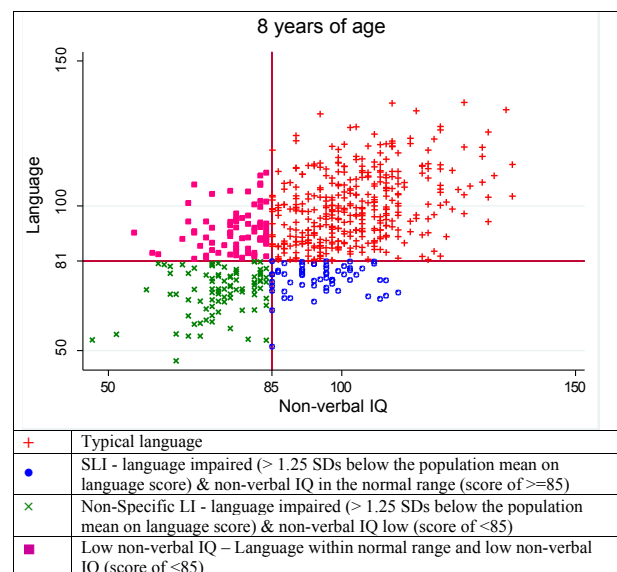


Figure 2. Language composite measure plotted against non-verbal IQ for 603 eight-year-old children in the Iowa study.

brain injury. However, advances in brain imaging techniques mean that the neurological deficits contributing to primary language deficits are now observable (see page 10). The exclusionary criteria tend to vary in research studies and clinical settings, however in the latter there is evidence they are sometimes applied stringently. In the main there seems to be general agreement that SLI should not be explained by the exclusionary criteria. However, the criteria range from factors that should be excluded upon examination (e.g. ASD, impaired hearing, structural anomalies of the oral cavity), whereas others relate to causation (e.g. neurological problems). Other criteria might be grouped as contributory such as social disadvantage, non-English-speaking background, and social and emotional conditions. However, it is not clear how they should be determined (see Leonard 1998 for detail on criteria). For example, is social

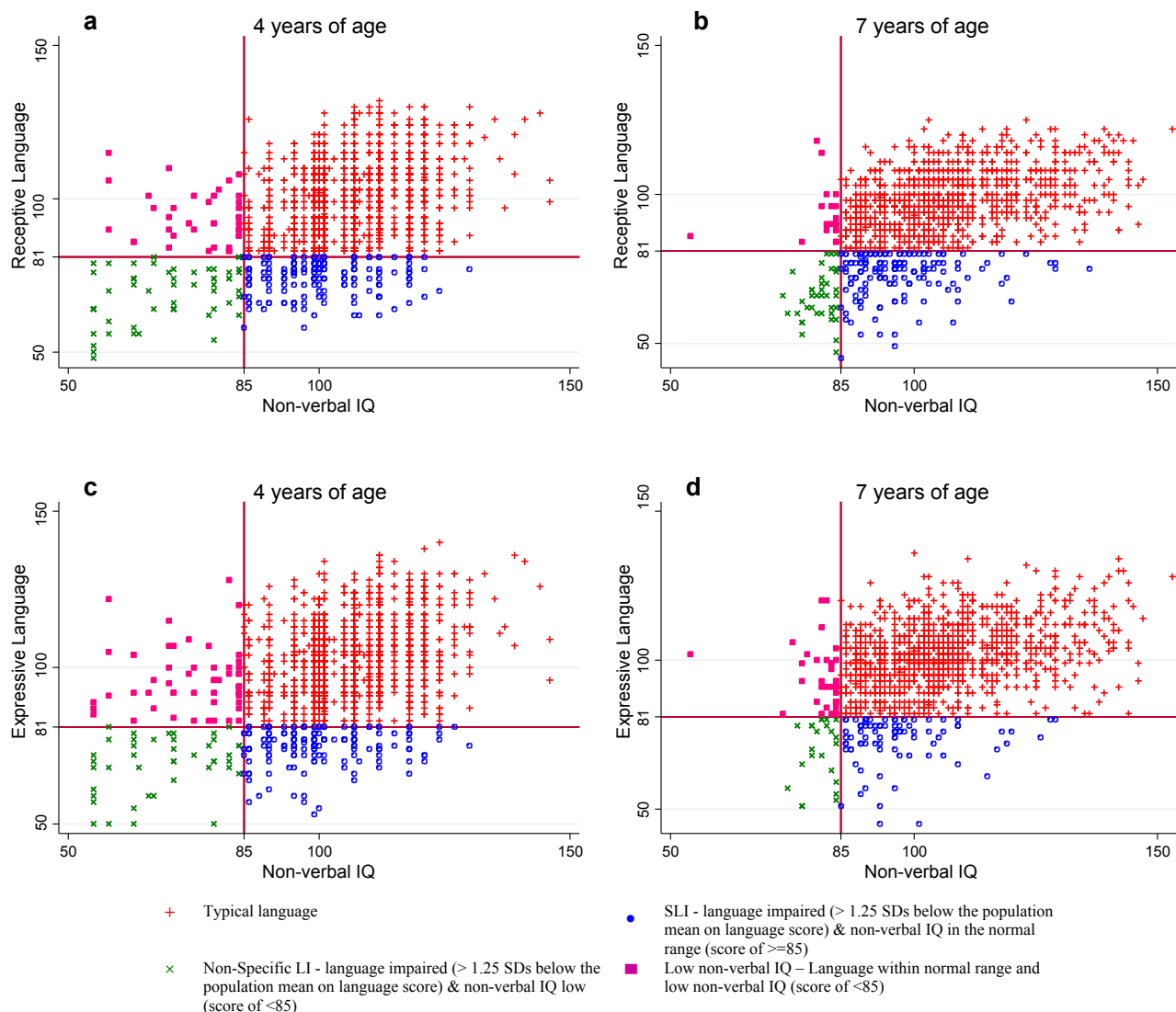


Figure 3. Receptive and expressive language standard scores for the CELF-P and CELF-4 plotted against non-verbal IQ for children in the Early Language in Victoria Study (ELVS) at age 4 years for 1556 children and at age 7 years for 1197 children.

disadvantage to be judged retrospectively, currently or both, and if so how? Can children living in socially disadvantaged conditions or those with recent otitis media be excluded from having SLI? Below we briefly examine the rationale for the most commonly used criteria.

Exclusion criterion 1: Social disadvantage

Genetic and environmental factors drive language development (Oliver *et al.* 2004) and play a role in language outcomes (Reilly *et al.* 2010). It is widely accepted that adequate social and emotional conditions must exist for a child to develop language. However, quantifying what 'adequate' means is difficult. For over 50 years researchers have consistently reported striking disparities in the rate of vocabulary development relative to disadvantage (e.g. Hart and Risley 1995). Gaps in spoken

language processing have also recently been documented such that children from disadvantaged backgrounds are 6 months behind children of the same age from more advantaged backgrounds (Fernald *et al.* 2013).

The marked social gradient for language in older children aged 5 years can be illustrated in data from three large-scale population studies from three different countries (Figures 4a–c). The measures of language and disadvantage are the British Abilities Scale—Naming Vocabulary subscale and the Index of Multiple Deprivation (IMD) respectively for the Millennium Cohort Study (MCS; $N = 15\,500$) and Growing Up in Scotland (GUS; $N = 5000$) studies (Figures 4a and b), and the Clinical Evaluation of Language Fundamentals (CELF-4) Core Language (Semel *et al.* 2006) and Socio-Economic Indexes for Areas (SEIFA) for the ELVS ($N = 1556$) (Figure 4c). In each of the graphs the boxes

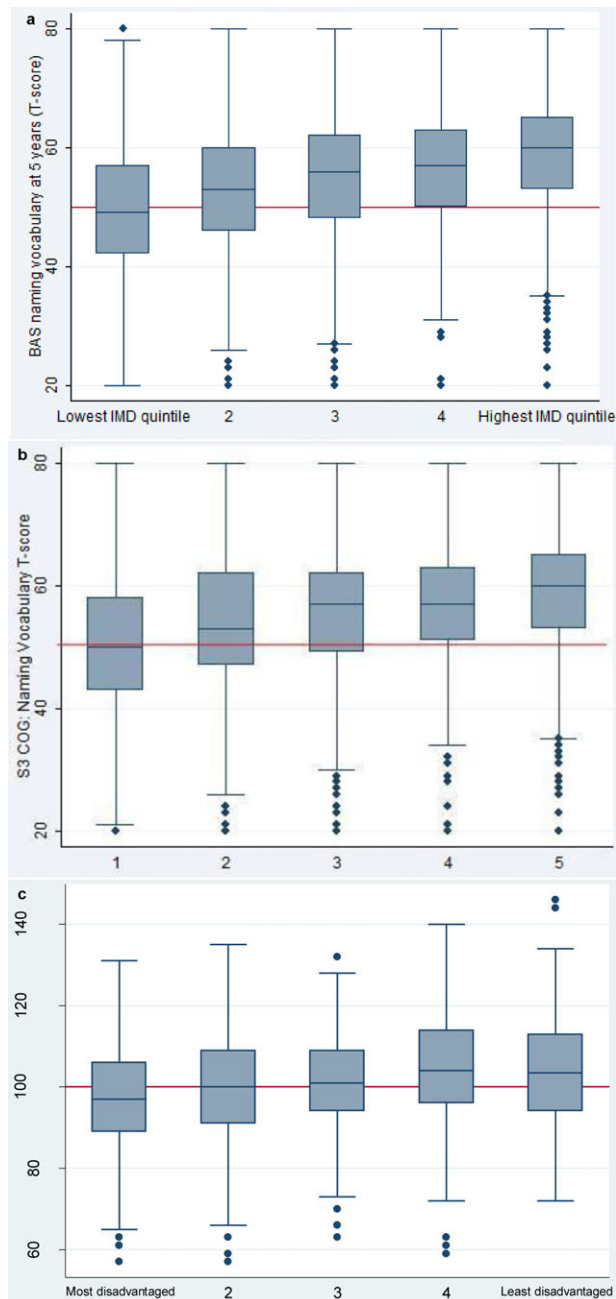


Figure 4. Data from three population studies illustrating the social gradient in language outcomes amongst 5-year-old children: (a) naming vocabulary of 5-year-old children in the Millennium Cohort Study (MCS). Children are grouped in quintiles according to the Index of Multiple Deprivation (IMD); (b) naming vocabulary of 5-year-old children in the Growing Up in Scotland (GUS) study. Children are grouped in quintiles according to the IMD; and (c) Core Language standard scores for 5-year-old children in the Early Language in Victoria Study (ELVS). Children are grouped in quintiles according to the Socio-Economic Indexes for Areas (SEIFA). For all graphs, the reference line is the standardization mean for the assessment.

represent the interquartile range of the distribution of scores for each group of children (i.e. from the 25th percentile to the 75th percentile) with the line within the box representing the median of distribution. The upper and lower adjacent values, shown using the whiskers, represent the maximum and minimum points of the distribution excluding outliers (at the 75th percentile + 1.5 times the interquartile range, and the 25th percentile - 1.5 times the interquartile range respectively). Any outliers are shown as values beyond the whiskers. For reference the standardization mean of the assessment administered to each cohort is shown on the graphs. Findings were highly consistent across the three studies. An analysis of variance (ANOVA) was conducted for each of the cohorts and was highly significant (F -test with 4 degrees of freedom, 221.7 MCS, 44.8 GUS and 11.2 ELVS, all $p < 0.001$). Individuals with very high or very low language scores are seen across the social spectrum. However, median language scores increase in a linear fashion with increasing social advantage. There is no evidence for a distinct level of social disadvantage that confers a clear risk of poor language—the box plots for the more disadvantaged quintiles spanned the language measure cut-point in all three studies. In the MCS and GUS data, but not in the ELVS data, two other trends are evident: a narrowing of the distribution of language scores with increasing social advantage and corresponding evidence of significant language ‘enhancement’ with the interquartile range of the most advantaged quintile sitting above the language cut-point. As area-level measures assess the socio-economic circumstances of the individual child’s community, the social gradient is likely to be even more striking when disadvantage is measured at the level of the immediate family (e.g. Nicholson *et al.* 2012).

Yet children from low socioeconomic status (SES) backgrounds are often absent from research studies exploring the nature of SLI. In the past this may have been understandable given that researchers were often explicitly aiming to prove that children’s language could be impaired even given adequate environmental stimulation and that the accepted theoretical paradigms suggested that the cause of SLI was entirely intrinsic to the child (biological, psycholinguistic or genetic); however, our view is that this should be challenged. The nature of LI in socially disadvantaged groups is now being explored (e.g. Roy and Chiat 2013). However, making a conceptual distinction between ‘real’ language impairment and children for whom the environment has caused their language impairment may be simplistic. Whilst convenient for researchers seeking to understand the biology of language, this approach does not inform the practice of clinicians faced with large caseloads of children with poor language skills and living with social disadvantage. Furthermore, the exclusion of participants from socially

disadvantaged backgrounds may miss crucial insights regarding gene–environment interactions in the ontogeny of language impairment.

Exclusion criterion 2: Episodes of otitis media

The reason for excluding children with otitis media in the last 12 months is that effusion in the middle ear might cause language delay via its associated hearing loss. When the SLI exclusionary criteria were evolving, the epidemiology of otitis media had not been conducted. Nor was it understood that language delay was often the reason otitis media was detected (i.e. the ‘innocent bystander’ effect) rather than the other way around. Several decades on, this criterion makes little sense, for three reasons.

First, otitis media with effusion (OME) is a fact of life for virtually all children, as shown by large-scale Dutch and American studies. In the Pittsburgh study 91% of all children ($N = 2053$) had developed at least one episode of OME by age 24 months (Paradise *et al.* 1997). Second, around half of all children with OME have no or very slight hearing loss, with a mean hearing loss over four frequencies 20–25 dB (range of 0–60 dB) which may be present for days, weeks or months—levels that would not generally impact on language development. A small proportion of children with OME may have moderate conductive hearing impairment that neither fluctuates nor resolves. Many of these children have other associated problems, which would themselves exclude a diagnosis of SLI (e.g. Down syndrome). Third, it has been shown that in otherwise healthy children even children with the longest duration of OME are similar in their long-term language, academic and social functioning to children with no or minimal life experience of OME, with the possible exception of children living in social deprivation (Robert *et al.* 2004, 2006).

Exclusion criterion 3: Anomalies of the oral structure and oral motor function

These criteria were designed to exclude children with conditions such as cleft lip and/or palate, where structural anomalies were thought to impact on language development (Leonard 1998). There is no empirical evidence to suggest that such structural defects per se will lead to language difficulties although they can be part of a syndrome and therefore may well impact broadly on development and language. Children with non-structural oral motor problems, (e.g. difficulty with the range, rate or coordination of movement of the orofacial musculature) were also excluded, as the difficulty producing speech sounds might lead to problems with language development. Current evidence suggests that oral motor difficulties can be dissociated from and oc-

cur co-morbidly with both developmental speech sound disorders and language impairments (Bunton 2008, Sellsie *et al.* 2005), and that there is not a direct relationship between these factors.

Exclusion criteria 4: Being bilingual

In a global society it is difficult to imagine how bi- or multilingualism can be an exclusionary criteria, although globally there is a significant problem as language tests tend to be administered in English and the norms are almost always based on monolingual samples. Even when bilingual norms have been developed they are rarely broadly applicable due to the hugely varying levels and types of language exposure labelled as ‘bilingualism’. Whilst population studies endeavour to include children from a broad range of backgrounds they too have been limited by tests that are usually developed for English speakers and many parents from non-English speaking backgrounds may not be able to take part or consent to participate given their own restrictions in speaking English. Regardless of testing difficulties, an exclusionary criterion of bilingualism seems outdated in today’s context and there is no evidence to indicate that being bilingual should preclude one from a diagnosis of SLI. These dilemmas point to a need to develop diagnostic approaches, which reflect the diversity of our modern societies.

Exclusion criterion 5: Autism spectrum disorders (ASD)

The relationship between SLI and ASD has been of interest for many years. Whilst some have argued for a strong relationship between the two conditions and proposed an overlapping group comprising children with ASD and LI or autism and language impairment (ALI) (Tager-Flusberg and Joseph 2003) others have acknowledged similarities but disagreed that there is an overlapping group (Bishop 2000). In addressing the comorbidity of autism and SLI, Tomblin contended that some children with ASD have poor language skills and that both SLI and ASD may be co-morbid. He questioned how helpful it was to continue to argue about whether they are truly distinct disorders when they both emerge from complex developmental systems and are bound to share some common aetiological pathways and therefore overlapping features. We are a long way from understanding what these common biological systems might be and for this reason Tomblin (2011) concluded that ASD should continue to be considered as a distinct group. Both professional and discipline specific views sometimes result in boundary disputes about these conditions and ultimately further challenge how we best deliver services to affected children. An ideal way to

disentangle these ideas is via epidemiological studies that include populations of children with these overlapping disorders.

What evidence exists for inclusionary criteria?

We have demonstrated that there is limited evidence to support the use of exclusionary criteria. An alternative might be to consider the evidence supporting markers that permit the specificity of a diagnosis of SLI or inclusionary criteria.

Biological markers

Neural markers

Over the past 15 years the development of advanced quantitative magnetic resonance imaging (MRI) techniques such as voxel-based morphometry, functional MRI and tractography have confirmed sub-macroscopic anomalies in brain structure and function in language regions of children with SLI (Weismer *et al.* 2005, Badcock *et al.* 2012, De Fossé *et al.* 2004, Gauger *et al.* 1997, Jäncke *et al.* 2007, Preis *et al.* 1998). There is general consensus that children with SLI lack the anticipated leftward asymmetry of brain structure and function of regions subserving language—in other words, that there has been a failure for specialization for language in the left hemisphere of the brain (e.g. De Fossé *et al.* 2004, Gauger *et al.* 1997, Preis *et al.* 1998, Herbert *et al.* 2005, Leonard *et al.* 2006). However, these differences in brain structure and function cannot be used as true biological neural markers for SLI because current knowledge is based on very small cross-sectional studies of children with SLI and typical language. The groups have well-defined inclusionary and exclusionary criteria such as is required in such experimental case-control models. The inclusion of children with language-specific deficits and an absence of performance IQ deficits unsurprisingly generate differences in language-specific regions of the brain. Rather than being biologically driven markers as such, these results arguably reflect group differences only. To demonstrate neural markers specific to SLI, an MRI study examining a large longitudinal population-based cohort representative of children with SLI, LI and without language impairment in the normal population is required.

Genetic markers

One of the primary arguments for maintaining a notion of SLI is that children can have impaired language that arises from language-specific genetic mechanisms. These mechanisms could exist at the cognitive, neurobiological and/or genetic levels and would be reflective

of encapsulated language modules such that genes specific to language would influence the function of neural systems specific to language that in turn give rise to the computational machinery necessary for language. The notion of SLI as a distinct form of language impairment that is genetically influenced has received widespread support from the theoretically driven influence of leaders in language sciences such as Chomsky (1986), Pinker (1991, 1994) and van der Lely (1997). This view was given more support when data from the KE family were interpreted as showing a very specific language deficit involving grammar (Gopnik 1990) and thus were described as SLI. The affected members of this family were later found to have a mutation in the *FOXP2* gene and thus this gene was associated with language and SLI (Pinker 2001). Currently, however, mutations in *FOXP2* have not been associated with SLI in the general population nor have individuals with *FOXP2* abnormalities been found to have deficits limited to grammar or language in general, with motor speech difficulties being a dominant feature of the profile (e.g., see Turner *et al.* 2013 for a table reviewing the phenotypic literature).

If the language skills of children with SLI have a particular genetic makeup that predisposes them to having deficits within language-specific mechanisms, then it should be possible to use methods of behavioural genetics to show this. Indeed this has been explored by examining whether language ability in children who are twins can be associated with unique genetic sources or, alternatively, whether much of the heritability found for language overlaps with non-verbal IQ. Bishop (1994) first addressed this by examining the heritability of children with SLI where the degree of difference between language ability and non-verbal IQ was varied. In doing so, she found that heritability of language actually increased when the discrepancy criterion was relaxed. From these data and others, Bishop questioned whether children with SLI comprised a separate group of language learners.

Subsequently, three important papers have extended this line of inquiry, all working within the same large sample of 4-year-old twins. Critically, the size of the sample (310 twin pairs) allowed the authors to examine the degree to which the covariance between language and non-verbal IQ was the product of common genes (301 twin pairs were included in the analysis). Colledge *et al.* (2002) found that most (63%) of the genetic influence on language overlapped with the genetic influence on non-verbal IQ; in other words, it is likely that most of the genes involved in language were not unique to language. When examining a similar question but focusing only on 436 singletons with poor language abilities (combining SLI with NSLI), Viding *et al.* (2003) again showed that the majority (60%) of the heritability of language overlapped with the heritability of non-verbal

IQ. Finally, Hayiou-Thomas *et al.* (2005) studied 356 twin pairs and replicated Bishop's earlier study by showing that language skills were more heritable in the NSLI than the SLI group. Furthermore, they again found evidence of genes common to language impairment and non-verbal IQ in both groups, particularly when non-verbal IQ was limited to scores over 70.

In summary, the behavioural genetic literature presents fairly consistent evidence against the notion that children with SLI have a unique genetic makeup that involves genes that have specific effects on language modules. Going even further, it casts doubt as to whether language-specific genetic factors are likely to play any major role in determining low language.

Clinical behavioural markers

A number of candidate behavioural markers have emerged for SLI, the most widely cited being deficits in non-word repetition (Bishop *et al.* 1996), sentence repetition (Conti-Ramsden *et al.* 2001), and finite verb morphology (Rice and Wexler 1996). It is certainly the case that group studies comparing performance on these tasks demonstrate that children meeting classic diagnostic criteria for SLI have significantly poorer performance than their age-matched peers. However, we would argue that these significant group differences are not sufficient grounds upon which to characterize a deficit in these abilities as clinical or behavioural 'markers' for SLI. Rather, we suggest they are they are *indicative* rather than *definitive* and are associated with *poor language in general* rather than *SLI in particular*.

These markers are said to deliver high levels of diagnostic accuracy as measured by their sensitivity and specificity (Archibald and Joanisse 2009, Gray 2003, Conti-Ramsden *et al.* 2001). However, these claims are based on studies that employ matched group designs wherein a sample of children with SLI is compared with a matched, typically developing control group. This approach is problematic. First, it does not include children with other developmental disorders and co-morbid impairments to test the task's ability to identify SLI *exclusively*. Second, and more importantly, matched group designs are inappropriate for testing a diagnostic tool's sensitivity and specificity. These metrics are not simply a function of the reliability of the diagnostic tool but also of the prevalence of the disorder in the population being tested. Methodologies that include 30–50% of children with SLI in their samples (i.e. matched group designs) artificially inflate the sensitivity of any test and do not represent a tool's functioning in a population sample, wherein the prevalence would be approximately 7% (Tomblin *et al.* 1997). It is also important to note that a number of these candidate 'behavioural markers' are also found in children with non-specific language dis-

orders including children with Down syndrome (Eadie *et al.* 2002), autism (Roberts *et al.* 2004), non-SLI (Rice *et al.* 2004), dyslexia (Pennington and Bishop 2009), learning disability (Poloczek *et al.* 2014, Schuchardt *et al.* 2011), and in second language learners (Paradis and Crago 2000).

Profiles and outcomes for children with SLI: same or different?

Do children with SLI have observable differences in their lifecourse trajectories and outcomes from other children with non-specific impairments that would warrant retaining this distinction for prognostic or intervention purposes? To understand the profiles and outcomes of children with language difficulties longitudinal studies are required. First, we present data on early language pathways and then examine whether the outcomes for children with SLI differ from those with NSLI.

Language pathways

Increasingly there is recognition that language development in the pre-school period is characterized by periods of accelerated development, slow development and catch-up growth sometimes described as pathways or trajectories (Rice 2004, Ukoumunne *et al.* 2012). Here we present data suggesting that this fluidity may continue for some children into the early school years. Language change scores for children who were assessed face to face at 4 years of age and again at 7 years in the ELVS using CELF-P2 (Wiig *et al.* 2004) and CELF-4 (Semel *et al.* 2006) are shown in table 2. Language impairment was defined as a score more than 1.25 SD below the mean. The children were grouped as follows:

- Language within normal limits at 4 and 7 years (75.6%).
- Language impairment at 4 but not 7 years (6.2%).
- Language impairment at 7 but not at 4 years (8.4%).
- Language impairment at 4 and 7 years (9.8%).

Non-verbal performance scores were relatively stable as measured by subtests from the Kaufman Brief Intelligence Test, Second Edition (KBIT-2) (Kaufman and Kaufman 1990) at 4 years and the Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler 1999) at 7 years. Language change scores for the typical group (group 1) and for the children with language impairment at 4 years and 7 years (group 4) show there were relatively minor changes. However, for groups 2 and 3 there was considerable change in language scores. Note particularly the sharp drop in the mean receptive

Table 2. Changes in receptive and expressive language between 4 and 7 years

Assessment measure	Children's language group at ages 4 and 7 years ^a							
	Typical language at 4 and 7 years (<i>n</i> = 857 ^b)		Language impairment at 4, typical language at 7 years (<i>n</i> = 70)		Typical language at 4, Language impairment at 7 years (<i>n</i> = 95)		Language impairment at 4 and 7 years (<i>n</i> = 111) ^c	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Receptive language standard score</i>								
At age 4 (CELF-P)	103.6	10.9	79.0	7.6	93.4	8.9	75.9	8.5
At age 7 (CELF-4)	99.5	9.4	93.4	7.5	75.8	8.2	72.1	11.1
Change from age 4 to 7 years	-4.1	11.2	14.4	9.0	-17.6	11.9	-3.8	10.9
<i>Expressive language standard score</i>								
At age 4 (CELF-P)	106.1	11.3	81.6	9.8	96.8	8.8	78.9	9.7
At age 7 (CELF-4)	103.5	10.0	92.7	8.2	89.5	10.4	76.7	12.1
Change from age 4 to 7 years	-2.6	9.3	11.1	11.8	-7.2	9.8	-2.2	11.1
<i>Non verbal IQ</i>								
KBIT matrices standard score at age 4	107.7	11.2	98.2	13.3	101.0	10.2	91.9	16.5
WASI performance IQ score at age 7	107.6	14.5	102.8	12.0	96.1	10.8	93.2	10.5

Notes:

^aTypical language is defined as not low language on expressive and/or receptive score; language impairment is defined as greater than 1.25 SDs below the mean on expressive and/or receptive score.^b*n* = 853 for WASI score.^c*n* = 110 for KBIT score, 109 for WASI score.

language scores of the children from 93.4 (SD = 8.9) to 75.8 (SD = 8.2) in group 3. These data show that irrespective of non-verbal performance, a group of children do change language abilities and may well move from being classified as typical to impaired and from impaired to typical.

Language and psychosocial outcomes

The following section presents data from three independent population studies focusing on different outcomes and covering early childhood through to adulthood. The first study focused on the characteristics of the language impairment, the second on psychosocial outcomes, and the third on adult mental health, literacy and employment. The consistent finding in each study is that a distinct SLI group does not appear to exist.

Dollaghan (2004) studied 620 participants from a larger sample (*N* = 6000) recruited for an ongoing study of otitis media in a socio-demographically diverse population in Pittsburgh, USA. Otitis media was found in the larger study to have a negligible effect on language outcomes (see Paradise *et al.* 2000, 2001, 2003 for details). Therefore, Dollaghan (2004) focused on the subgroup of children who had a history of otitis media who were being seen for face to face developmental assessments at 3 and 4 years of age. The language scores of children at both ages were evenly distributed and Dollaghan concluded there was no evidence to support the hypothesis that children with SLI were a qualitatively distinct group.

The Iowa Longitudinal Study (Tomblin and Nippold 2014, Tomblin 2008) aimed to determine whether

the psychosocial outcomes of children determined to have SLI (performance IQ > 85) and NSLI at around 6 years of age differed later in childhood. The Achenbach Child Behavior Checklist (CBCL) and the Teacher Report Form (TRF) were administered in 4th grade (10 years of age) and 10th grade (16 years of age). Children with poor language (both SLI and NSLI) were more likely to have statistically significantly greater levels of behaviour problems as reported by their teachers and parents than the typical controls. Although the NSLI tended to have even higher levels of problems, the differences between the two groups with language difficulties were not significant. At age 16, the adolescents themselves also completed the Achenbach Youth Self Report (YSR). The results were somewhat different in that fewer group differences were seen; however, this was largely due to an elevated self-report of problems in the typically developing group. Regardless of performance IQ children with language difficulties were less socially skilled. These data show that poor language skills at school entry do confer elevated risk for psychosocial problems both in the middle and end of the school years; however, this risk is not altered by the child's performance IQ.

The relationships between social disadvantage and language in the longer-term was examined in the 1970 British Cohort Study (BCS70). Adult outcomes were determined for children found to have SLI and NSLI at 5 years of age (determined by low vocabulary; see Law *et al.* 2009 for full description). Having SLI or NSLI at 5 years predicted adult literacy difficulties, mental health problems and low employment, with low employment (but not literacy or mental health) significantly more

likely to be present in the SLI group. Interestingly, compared with the typical developing group, the risk of poor literacy in adulthood was greater for children with a history of NSLI (4.3 times greater) compared with SLI (1.6 times greater). This does not mean that every child with low vocabulary had difficulties in adulthood, only that they were at statistically higher risk of being vulnerable in a variety of areas even when a range of other social and developmental factors had been taken into consideration (Law *et al.* 2009).

Taking the specific out of SLI: are there implications for children and families?

It is critical to consider whether using or not using the acronym SLI as a diagnosis has any bearing on the families of the children concerned. Very little is known about what the families think. Linda Lascelles, chief executive officer (CEO) of Afasic in the UK, wrote about how the parents of children with special needs cope with terminology (Lascelles 2013). Commonly used terms such as language delay, she wrote, can imply to parents that their child has a transient problem and will grow out of it, whereas parents may feel that terms such as SLI and language disorder have no currency outside the world of speech therapy. Lascelles commented that parents feel frustrated that there is not a more 'medical-sounding' label, which we interpret to mean a more powerful label with greater impact. Lascelles concluded with a thought-provoking comment: 'Because SLI is a speech and language therapy diagnosis, children who no longer receive therapy are, almost by definition, no longer considered to have the condition' (Lascelles 2013: 19).

Does terminology matter to clinicians and how they practice? Clark *et al.* (2013) reporting on a survey of speech and language therapists (SLT, $n = 96$) from 11 of the 14 health boards in Scotland highlighted that the SLTs used a range of different terms in different ways in different contexts. Whilst 85% of the respondents said they used the term SLI, they also reported using other terms interchangeably. Clark *et al.* called for a professional debate about the use of a universal term to put language problems on the agenda, increase their social and political profile, and to 'help bring them in from the cold' (p. 21). Dockrell *et al.* (2006) explored the terms used by SLTs in England and Wales and found similar variation. One SLT interviewed summed up the variation by asking: 'Is there any way we could agree nationally as to what we call this group of children?' (p. 430). Just 24/39 interviewees reported there was an agreed definition and term used in their services. Dockrell *et al.* highlighted a tension between the diagnostic criteria used to determine a child's eligibility for services and the needs-based approach adopted in the education system.

In parts of Australia and Ireland (and possibly elsewhere) SLI exclusionary criteria developed for research have been adopted and used to determine eligibility for services and the allocation of classroom resources. In one set of criteria SLI is defined as language ability more than 2 SDs below the mean with non-verbal IQ score of 90 or above. The exclusionary criteria are applied stringently such that the LI should not be accounted for by any of the conditions previously discussed including environmental deprivation (e.g. as a result of family dysfunction or mental health issues), cultural and/or linguistic factors and exposure to adverse environmental factors. In addition, the child should have a history of an ongoing problem with an expectation of continuation during school years.

These examples leave us wondering exactly who would be eligible for services. The application of such stringent criteria narrow the entrance to services with many children deemed ineligible because their language impairment is not 'specific' or impaired enough. Given the lack of empirical evidence to support the existence of the SLI category whether defined using relatively loose or stringent criteria, we argue that the continued use of the term SLI may in fact be disadvantaging children with NSLI and those from socially disadvantaged backgrounds.

Summary Part 2: moving away from exclusionary criteria

SLI is literal in its connotation. The term suggests the problem is only specific to language and its components and this does not account for the myriad of associated difficulties. This is understandable given that the term was coined prior to valuable data being available from prospective longitudinal studies. Instead early data were derived from largely clinical samples, or children who were studied because they exhibited SLIs and were then matched to comparisons with typical language. This helped differentiate and draw attention to a group of children with a primary language deficit. However, the definition is based on arbitrary and largely untested cut-points and the exclusionary criteria are not well defined and do not take into account the rich information now available in population studies.

We are sympathetic to the argument that a diagnostic label is important to ensure language problems are recognized and a prerequisite for service provision, however there is limited evidence that this is the case. The reverse might also be true and therefore perpetuate the diagnostic mythology. Bishop (2010) reported on the relatively small amount of funding awarded by the National Institutes of Health (NIH) over nine years to research on SLI (US\$125 million) compared with autism (US\$2000 million) and wondered if this was because of confusion about the term

SLI. We support the need for universally agreed terminology that can be used to raise the profile of the problems children face with language and ensure they and their families receive the appropriate support. This is highly dependent on rigorous research from epidemiological studies as opposed to highly selected samples.

Part 3: Alternatives and recommendations

Generating evidence about how best to prevent language impairment and provide intervention for children with language difficulties is paramount. This is challenging at the best of times but is significantly more difficult when the field lacks a clearly defined and agreed phenotype based on best evidence from population studies. So what alternatives are there? Doing nothing is not an option given the shortcomings outlined above. The question to be answered is: Can the current SLI criteria be modified to provide a *functional* (rather than diagnostic) classification system that can be utilized by researchers and clinicians? We propose a series of short- and longer-term recommendations. The short-term recommendations can be achieved relatively quickly because they are limited to addressing the shortfalls in the existing definition and criteria with information from population studies. In the longer-term we outline a set of principles for future classifications of childhood language difficulties that might best meet the needs of all children.

Short-term recommendations

Recommendation 1: Adopt the term 'language impairment'

Part 2 of this paper examined the evidence for an SLI taxon, specifically the discrepancy between verbal and non-verbal skills with the latter being within the normal range. Given that there is no evidence from population studies to support the SLI diagnostic grouping we recommend that the word 'specific' be removed and the term language impairment (LI) be adopted. We do not recommend use of the term 'language delay' due to its implicit interpretation of transience as highlighted by Lascelles (2013) discussed above. We also do not recommend the use of 'language disorder', which resembles SLI in also conveying an implicit notion of problems that arise from language-specific causes.

Given that the cut-points for defining language impairment would appear to be arbitrary, and that no reliable genetic, biological or behavioural 'marker' of LI exists, how then should clinicians decide who is in need of intervention for low language abilities? Given our current level of understanding, the most rational approach is to identify an individual as having LI when their level of language abilities affects their ability to meet societal expectations in social, employment and educational domains; either having concurrent effects or the potential to affect the individual in future (Tomblin 2008).

To determine such a cut-point for LI, data should be examined from large-scale, longitudinal population studies that assess individual functioning across broader quality of life, activity and participation measures as well as language, identifying the level at which language difficulties significantly impact on broader social inclusion and participation. This paper presented compelling evidence from three longitudinal population studies showing that social, employment and educational outcomes in adulthood were poor for those with LI in childhood.

We recommend that the cut-point for determining LI be more than 1.25 SD given that this is the point at which LI impacts on a child's ability to meet 'socially defined functional expectations' (Tomblin 2008, p. 95). The risks of poorer outcome are graded by degree of language impairment rather than being categorical and the 1 SD cut-point is also associated with longer-term risk. Therefore, we recommend that children scoring at more than 1SD below the mean cut-point are monitored and supported if negative sequelae develop.

Further, we urge governments and researchers involved in large-scale longitudinal population cohorts to continue to measure both child language and the child's broader quality of life, activity and participation, retaining consistent measures where possible to increase our understanding of different language trajectories. As illustrated above, the impact of language deficits on life functioning varies as societies change over time. Thus, thresholds for determining the level at which language impairment is likely to result in later life difficulties will need to be reviewed periodically against contemporary data.

LI should be defined as language ability that is more than 1.25 SD below the population mean on standardized language tests and we see no reason to use explicit IQ eligibility criteria to dictate service eligibility. For children with LI and with/without co-occurring neurodevelopmental conditions (e.g. ADHD learning disability, Fragile X syndrome) the degree to which the child's LI would be the focus for intervention and the intervention approaches chosen would vary depending on the individual's profile and the holistic needs of the child.

Recommendation 2: Abandon the exclusionary criteria

We found limited evidence to support the continuation of the SLI exclusionary criteria. They fail to acknowledge the role that contributory factors, such as social disadvantage, play in language outcomes. Whilst the exclusionary criteria are convenient for experimental research they do not reflect the real world where symptoms and conditions may overlap and co-morbidity may emerge over time. The one exception is in the case of neuroimaging research. In the short-term elucidating the neural underpinnings of language difficulties may be best explored in groups where the confounds of IQ, impaired hearing and other factors are excluded.

Recommendation 3: Adopt inclusionary criteria

Recent evidence from population studies (Ukoununne *et al.* 2012, Law *et al.* 2012b) suggest that during the preschool years (1–4 years) language pathways are fluid and as a result children may move in and out of impaired groups. It was shown above that fluctuations continue into the school years albeit affecting fewer children. Just a few points may change a child's categorization. For this reason we suggest some caution be applied to the use of the LI diagnosis based on an assessment conducted at one time point, particularly in the preschool years. It may therefore be preferable to consider a diagnosis of LI when language has been shown to be impaired at two time-points (a minimum of 12 months apart). In the meantime research should be directed urgently to determine whether there are characteristics that identify those children whose language is likely to fluctuate compared with children whose language trajectories appear stable. That is, those who remain within normal limits or those with consistently low language. These data raise some interesting questions. In the case of improving language trajectories, i.e. where language is low but appears to resolve, could intervention be delayed without harm to the child?

Whatever the solution these recommendations should be considered within a public health paradigm that adopts a staged approach to prevention and intervention. Law *et al.* (2013) described the need for such a model and this is particularly relevant in this context given the volatility of LI particularly in the early years and the graded nature of the long-term risk associated with LI. In such a model children with one failed test or with a score falling between 1 and 1.25 SD below the mean may be deemed at risk and receive a specific approach such as secondary prevention/intervention (e.g. targeted intervention), whereas children whose language pathways indicate persistent language difficulties receive tertiary prevention intervention (e.g. specialist interventions). Current service delivery models that rely on a diagnosis to access services are not sustainable and can no longer be supported empirically.

Longer-term recommendations

In the longer-term we propose a focus on the development of models of language competence that incorporate a robust understanding of the social determinants of health and well-being, the school and family environments, and the underlying biological and genetic bases of disability (Law *et al.* 2012a). Supporting children and young people with language difficulties will require responsive health and education service models that change and adapt to the child and young person's needs and are particularly cognizant of the fact that young people require specialist educational approaches that are

also ongoing and responsive (Cross 2011). The needs of children and young people with language difficulties change with age. By the time secondary school is reached the primary problem may no longer be language. Furthermore, the range of challenges that individuals with language problems will face across their lives means that no single agency will be responsible. Multiple agencies and many different professionals will be involved at different stages. Future models should take these evolving needs into account and align these with responsive services that grow with the child and young person from infancy through to secondary school and beyond.

It has been 15 years since the NIH convened a working party to discuss the SLI phenotype (Tager-Flusberg and Cooper 1999). At that time it recommended examination of the validity of the SLI exclusionary criteria used to diagnose SLI and the requirement for IQ to be within the normal range. We have argued there is limited evidence from population studies to support the continued use of either. We recommend using existing global collaborations to bring together researchers and clinicians with the goal of building consensus about LI and the inclusionary criteria. We invite professional bodies to engage in the discussion and debate; and extend an invitation to service users as well as policy-makers to build consensus on the topic such that the outcome can be demonstrated to lead to better outcomes for children and not merely satisfy academics. We suggest that the future focus be on the following:

- Develop and refine LI definitions and inclusionary criteria based on rigorous testing in existing population studies.
- Identify questions relevant to the clinical, research and policy settings. Some may be answered by existing studies and others will form an agenda for future research.
- Develop frameworks for understanding the changing needs of children and young people with LI that acknowledge:
 - the broad social and educational implications of LI;
 - the need for close multi-agency working across the health–education divide;
 - the changing needs of children and young people; and
 - outcomes relating to activity and participation and quality of life in addition to a child's impairment.

It is indisputable that the language skills developed in the first 5 years of life and consolidated throughout children's educational life play a critical role in determining life opportunities. Children and their families deserve to have their problems in this important domain of functioning recognized and responded to in ways that

are equitable and consistent with the best available scientific knowledge. We have argued here that while the term SLI has been a convenient label in the past, contemporary evidence shows that it has reached its use-by date. It is clearly no longer defensible scientifically. If diagnosis is 'the crucial process that labels patients and classifies their illnesses, that identifies (and sometimes seals!) their likely fates or prognoses, and that propels us toward specific treatments in the confidence (often unfounded) that they will do more good than harm' (Sackett *et al.* 1991, p. 3), then it is our duty to ensure that our diagnostic practices are informed by the best current scientific evidence.

We have therefore suggested here that the term 'language impairment' be adopted going forward on the basis of agreed definition of low language skills, with a dropping of previous exclusionary criteria. We further recommend that researchers and clinicians work together to develop a consensus on cut-points and inclusionary criteria that reflect both contemporary knowledge and are useful for identifying service needs. Responsive services, staged to meet the challenging fluctuations that are now apparent in early childhood, and developed within a public health framework are urgently required. The evidence underpinning our understanding of the complexities of disrupted language developmental will need to be continually reviewed. Convenience, irrespective of its source should not drive our decision-making.

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Commentary

Classificatory purposes and diagnostic concepts

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Abstract

It is argued that the current state of affairs on terminology is unsatisfactory. It is suggested that the way ahead needs to be determined by consideration of the purposes of classification and the key concepts that should shape diagnosis.

Main text

Both papers in this special issue (Reilly *et al.* and Bishop) are tremendously helpful in summarizing the empirical research findings on specific language impairment and on the ways in which language impairment terms have been used clinically and for research. The basis for decisions on the way ahead is clearly laid out. Nevertheless, I have some concerns over the solution put forward by Reilly *et al.*

First, both papers slip into statements about diagnosing 'children'. In my opinion, that is unacceptable. Diagnoses, surely, must refer to the disorders or patterns shown by a child. It is demeaning to imply that the diagnosis incorporates all that matters about that individual. That is particularly the case when research findings have shown that language impairment at age 4 years often proves to be transient rather than persistent (Bishop and Edmundson 1987, Snowling *et al.* 2006). Reilly *et al.*'s solution is to suggest that a diagnosis be made only when language impairment has been present at two time points at least a year apart. That appears to involve a dereliction of duty by the clinician whose advice to parents would have to be that no diagnosis can be made until another 12 months have gone by. A careful broad-ranging clinical assessment can go a substantial way in coming to a provisional decision on the likelihood of persistence (Rutter 1972).

The next need is to consider the purpose of classification. In the American Psychiatric Association's (2013) DSM-5 it is required to meet both the clinical and research needs. However, that is not possible because the former requires a clinical conceptualization whereas the latter requires following a rigid set of rules on the number of specified criteria that must be met. The World Health Organization's *International Classification of Diseases* (1992) is preferable in its recognition that both clinical and research classifications are needed but they require a different approach in each. However, ICD-11 is still a work in progress that is not likely to be completed

for at least another 2 years. Nevertheless, DSM-5 is explicit that the diagnosis of a disorder is not tantamount to a need for treatment. Some individuals meeting diagnostic criteria may not need treatment and some whose features fall below the threshold for diagnosis may need treatment and should not be denied it. While that is undoubtedly correct and appropriate it does not help in deciding how to diagnose a language disorder.

Before turning to that issue, it is necessary to ask whether it might be best to leave things as they are. Bishop argues that would be unsatisfactory because so many different terms are being used, with no clear indication whether they mean the same problem or a range of rather different problems. I agree. Reilly *et al.* also argue that a change is imperative because the inclusion and exclusion criteria lack empirical validity. Again, I agree. So we must turn to the concepts and their implications.

Reilly *et al.* appear to dodge that issue and simply argue for the use of 'language impairment' as the diagnostic term—going on to recommend that performance at least 1.25 SD below the population mean should provide the cut-off point, although they recognize that this is necessarily rather arbitrary. They urge that all previous exclusionary criteria should be abandoned (on the grounds that none that has been used has been satisfactory). Bishop, by contrast, seems open to the use of a 'developmental' descriptor. In my view, something of that kind is essential. Surely, no one would want language disorders acquired in adult life (as, for example, as a result of a stroke or some neurodegenerative disorder) to be included (see Karmiloff-Smith 1998 for a detailed argument on this point).

Are there other descriptors that should be added? I think not. 'Specific', as commonly used now (as with SLI) implies a 'pure' language impairment, and that is not supported by any of the available evidence. To exclude cases with a specific pathogenic genetic cause sounds reasonable at first sight because the concept is

of a multifactorial causation. Nevertheless, in my opinion, that is best dealt with in an accompanying descriptive text rather than through some exclusionary criterion.

The same applies to other possible exclusionary terms such as social disadvantage or profound deafness or profound intellectual impairment, at least so far as clinical usage is concerned. For research purposes, however, it will usually be necessary to have a set of rules to deal with the matter.

Reilly *et al.* suggest that rigorous testing of definitions and cut-offs should be undertaken in existing population studies. In my view, the concepts need to be agreed as the first step. They cannot be derived from the empirical findings. As Popper (1963) put it, definitions need to be read from right to left, rather than the other way round. In other words, it is not sensible to ask 'what does language impairment mean?'. As Humpty Dumpty argued, words mean whatever you want them to mean (Carroll 1871). The issue is 'what is the concept?' and

then the question is 'what term do you want to use to describe it?'

The testing is also less straightforward than it might seem at first sight. To begin with, there is a far from perfect agreement among tests of language. Which do you advise to be used and why? Secondly, the findings will be hugely influenced by the particular populations studied. Should it include, for example, cases of autism? Once more, the choice of population needs to be guided by the concepts, and not by some preference for 'normal' populations.

I congratulate Reilly *et al.* and Bishop on providing just the sort of empirical evidence needed to decide on the diagnostic terms to be preferred and on how it should be defined. I agree with most of what they suggest and, in this commentary, I have concentrated on the few points on which I differ somewhat.

Michael Rutter has no relevant interests but in the past he was a member of both ICD-11 and DSM-5 committees; e-mail: michael.rutter@kcl.ac.uk

Replacing one imperfect term with another

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Abstract

Many researchers in the area of SLI are already using a broader definition of SLI, and do not use this term as a declaration that their study participants have a pure profile. The effort to acknowledge this broader outlook through the alternative term 'language impairment' would create more problems of boundary confusion than it would solve.

Main text

I agree with Reilly and colleagues that the label 'specific language impairment' is often applied to children who show subtle weaknesses in areas that go beyond language, and that these children cannot be empirically distinguished from those children who would match the original 'pure' profile of SLI. However, I disagree that an interim solution to this issue is to remove the word 'specific' and use instead the term 'language impairment'. My position is shaped by two observations. First, researchers in the area of SLI are already using a broader definition of SLI in practice, and adopt SLI to distinguish their participants from those who fall into traditional clinical categories, not as a declaration that these participants have a pure profile. Second, the effort to acknowledge this broader outlook through the alternative term 'language impairment' would create more problems of boundary confusion than it would solve.

The boundary for SLI has already been expanded

Since at least the 1970s, SLI researchers had been documenting weaknesses in non-linguistic areas such as symbolic play and mental imagery, which already cast doubt on the meaning of a nonverbal IQ of 85. The problems with 85 became more obvious with the work of Tomblin and colleagues, who, in the process of trying to determine the prevalence of SLI (as traditionally defined), found little reason to distinguish children with language impairments according to IQ level. Other characteristics were likewise found to be non-categorical. Based on this information and related data from other labs, Tager-Flusberg and Cooper (1999) (and their panel of which I was a member) recommended that SLI researchers determine whether the narrow criteria are scientifically justified. For reasons mentioned in the target article, we have found no strong evidence for retaining the narrow criteria. Consequently, many studies in the current SLI literature employ the looser criteria.

In making their case, Reilly *et al.* sometimes characterized the current state of affairs in a manner that I found unusual. For example, the neurological criteria discussed in SLI studies pertain to ruling out neurological damage or disease. Findings of less typical neuroanatomical configurations, or a different pattern of activation in functional imaging, or reduced amplitudes in electrophysiological measures are perfectly compatible with the notion of SLI. As noted by Leonard (1998), 'there must be physical evidence of SLI. In the world as we know it, every volitional behavior has a neurophysiological counterpart' (p. 154).

Reilly *et al.* also cite certain factors that are often controlled as if they are part of the definition of SLI. They are not. The notion of SLI is certainly applicable to bilingual children, and children from lower SES groups can certainly exhibit SLI. Indeed, studies of some of these children (e.g., bilingual French–English-, Spanish–English-, and Turkish–Dutch-speaking children) are beginning to appear in the SLI literature.

I should also point out that the use of a significant (e.g., 1 SD) discrepancy between language and nonverbal IQ scores predates the appearance of the term 'specific language impairment' in the literature. Furthermore, this large-discrepancy criterion is no longer common in SLI research, and, from my experience in the United States, the clinical agencies that continue this misinformed practice have never employed the term 'specific language impairment'.

In defence of 'specific language impairment'

I believe that the subtle problems in non-linguistic areas are now considered part of the SLI phenotype. Put differently, we have accepted the point that the children whose profiles do not fit the 'pure' profile of SLI of the earlier literature are not demonstrably different and can be included in studies of children with SLI. Paradoxically, where a line is drawn despite a fuzzy boundary is in the use of 'impairment'—as in the authors' retention of this word in 'language impairment'. Inspection of the authors' figures 2 and 3 reveals that there is no clear psychometric basis for separating the children into impairment and non-impairment groups.

We do so for practical reasons—to single out children that we believe should be given extra assistance. The use of SLI also has a practical basis—to identify children with language deficits who do not fall into categories such as intellectual disability, traumatic brain injury or autism spectrum disorder.

So why 'SLI' rather than some plausible alternative label? One alternative seen in the literature is 'primary language impairment'. This label avoids creating an im-

age of a pure profile, though it implies that at least one secondary impairment exists. Yet I believe that the weaknesses often seen in conjunction with the language deficit are not of sufficient magnitude to justify terms such as 'motor impairment' or 'cognitive impairment'. And if a weakness in another ability area (e.g., nonverbal cognition) did warrant an 'impairment' classification, the scientific basis for regarding the language impairment as 'primary' would not be clear.

Despite its flaws, the use of 'SLI' holds an important advantage. As Bishop notes, this term is employed in far more instances in the published literature than alternative terms. This was also apparent to me (Leonard 2014). For example, based on a Google Scholar search, 695 publications from 2009 to 2013 had 'specific language impairment' in their title whereas the *combined* total for the four alternative candidates noted by Bishop was only 73. As Bishop appropriately argued, 'changing a label should not be undertaken lightly, as it can break links with previous knowledge' (p. 394).

Boundaries would be even fuzzier with the use of 'language impairment'

Our field once went through a phase during which, in an attempt to avoid the 'medical model', rather imprecise terms were applied to children with language deficits. One had to dig deeply to discover whether the participants approximated children with SLI or were instead exhibiting intellectual disability or autism. Although we have moved beyond that phase, adopting a general term such as 'language impairment' will introduce new problems. Consider two questions of current relevance that might be asked: Do children with attention-deficit/hyperactivity disorder (ADHD) and a language impairment have the same language profile or the same source of language difficulty as children with SLI? Do children with autism spectrum disorder (ASD) and a language impairment have the same language profile or the same source of language difficulty as children with SLI? If we remove 'specific' we have: Do children with ADHD/ASD and a language impairment have the same language profile or the same source of language difficulty as children with language impairment? To make sense, we must say instead: 'as children with language impairment who do not have ADHD/ASD' (note that the alternative 'as children with language impairment only' might be confused with traditional SLI). Is this an improvement? I fear that our ability to communicate with the public and other disciplines will be made even more difficult if we adopt a generic label such as 'language impairment'.

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SLI—not just a semantic issue

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Abstract

Difficulties with the definition of SLI are shared with other neurodevelopmental disorders. Although a functional definition of language impairment (LI) could meet service needs, it remains important to identify its primary or 'core' features. The definition should recognize that LI can be observed in pure form ('selective') or co-occur with other risk factors in order to clarify targets for intervention.

Main text

Reilly and colleagues propose that the term 'specific language impairment' (SLI) should be abandoned because there is no evidence for a circumscribed category of language disorder in children whose cognitive skills are within normal limits. Exclusionary criteria, they argue, should be relaxed and the term replaced by 'plain' language impairment (LI) with *inclusionary* criteria agreed through international consensus. There is much to recommend their argument given the evidence presented. There is, however, a lack of clarity surrounding the behavioural definition of this common disorder. Although current knowledge precludes the identification of biological markers of LI, it is imperative to define its essential features and dissociate them from co-occurring symptoms. Indeed, advances in the field depend upon clarification of the phenotype (or phenotypes) of LI; more critically, without this understanding we lack a theoretical framework to guide language intervention.

A key issue for the definition of LI is that it is heterogeneous and often co-occurs with other disorders. In this respect, it is no different from other neurodevelopmental disorders which are typically heritable, show early onset and persist through the life span (Thapar and Rutter 2014). Importantly, however, these disorders *can* exist without co-morbidities—historically, this is how they came to be described. Although discrepancy definitions have fallen out of use, the data Reilly *et al.* show confirm that language impairment can be observed among children with good IQ; similarly, while many children with LI experience reading difficulties, not all do. The same can be said for autistic features. In short, the current definition of SLI with exclusionary criteria may not be correct, but this says more about difficulties surrounding the classification of neurodevelopmental disorders in general than about SLI in particular. To the extent that there is a degree of 'selectivity' associated with SLI, this should be reflected in the definition.

DSM-5 has solved the problem of the lack of clear boundaries between the disorders of dyslexia, dysgraphia

and dyscalculia by banding them together under a category of 'Specific Learning Disorder'. The strength of this strategy is that it recognizes frequent co-morbidities but also accommodates the fact that core components of individual disorders differ (e.g., phonological deficits in dyslexia and non-verbal number deficits in dyscalculia). The obvious weakness is that these learning disorders are separated in the classification system from Language Disorder, which is listed among Communication Disorders, and yet a language disorder is frequently the root cause of a learning disorder (Snowling and Hulme 2012). The classification of childhood disorders of language and cognition may ultimately need revision to recognize not only the frequent co-occurrence of two distinct disorders, but also homotypic co-morbidities (Caron and Rutter 1991), such as the developmental continuities between LI and learning disorders. In short, development needs to be incorporated into the definition of LI to circumvent the problem of children moving between categories as they develop and to highlight associated language-learning impairments.

Thus, while the need for consensus surrounding the definition of 'SLI' is accepted, this should go beyond identifying the cut-off at which it appears to be associated with the risk of poor outcome, to defining core features. There is clearly no one SLI. However, if it is assumed that multiple risk factors accumulate toward a threshold for diagnosis, there is every reason to continue to search for core cognitive and linguistic profiles. As Bishop (2006) proposed in this regard, it is helpful to search for heritable endophenotypes of LI—risk factors for the disorder observed not only in affected probands but also in unaffected relatives or those whose language difficulties have resolved. These may combine with additional genetically determined risk factors (e.g., endophenotypes for related disorders) or be aggravated by environmental risks (e.g., social disadvantage) to lead to functional impairments on a continuous dimension.

Finally, Reilly *et al.* highlight the strong social gradient associated with language. Alluding to

gene–environment interaction, they correctly conclude that social disadvantage does not ‘cause’ LI. However, individual differences in social status *are* associated with brain differences (Hackman and Farah 2009). Moreover, it is important to make explicit that through inter-generational processes, parents with ‘poor language’ may create less than optimal linguistic environments for their offspring. In our own work we have found that such parents are much less aware of their own ‘dyslexia’ than more advantaged parents. It cannot be assumed therefore that they are poised to advocate for their children’s needs. Thus, to convince policymakers of the primary (and in this sense *specific*) needs of children with LI is a moral imperative. In arguing against the term ‘SLI’ care should be taken not to throw the baby out with the bath water.

So should we abandon the term SLI? On balance, we should not. As Bishop’s companion paper states, SLI

is the term most often used by researchers and surely research should guide practice? More generally, oral language is a critical foundation for learning and to ensure engagement with classroom instruction. Children with language impairments are at high risk of educational failure and hence poor career prospects; the cost to the nation is significant not least in terms of unemployment and adult well-being. Globally, professionals need to speak to policymakers with a single voice to make a case for the identification of children whose language skills are not at the level required for them to engage with education regardless of terminology. The analogy with dyslexia is useful: researchers understand that this disorder primarily affects decoding and is associated with phonological deficits, but lay understanding is different. Arguably, what matters is that governments are aware of ‘dyslexia’ and that legislation demands arrangements are made for affected individuals.

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What’s in a name? Some thoughts on Reilly *et al.*

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Abstract

This commentary reflects on some issues which arise from the short- and long-term recommendations made by Reilly *et al.* from a clinical perspective in the diagnosis of specific language impairment (SLI). It also highlights the ethical dilemma of the removal of the diagnostic label for those children and families, young people and adults living with SLI.

Main text

There is no doubt that the diagnosis of specific language impairment has raised lots of challenges for the practising speech and language therapists (SLT) in the UK and beyond for many years and for families in accessing speech and language therapy services (Bishop 2004, 2009, Conti-Ramsden *et al.* 2012). The current lack of consensus has the effect of limiting the applicability of research into this complex impairment in the clinical context and at a service access policy level and has led to the removal of the diagnostic category from the DSM 5 (ASHA 2012: 14). The counter-indications of continuing to use the current exclusionary criteria are explained and evidenced in Reilly *et al.*’s paper leading to a similar conclusion; that in the short-term specific language impairment (SLI) should no longer be used and that the term ‘language impairment’ (LI) should be adopted in its place and that in the longer-term, we need to develop new criteria through systematic testing and

through global collaboration, that reflects our current knowledge of the impairment (Reilly *et al.*).

I would suggest, however that the removal of the term ‘specific’ does not solve the challenges for the clinician in the identification of this group of children and in the subsequent decision-making process in relation to the type and level of intervention these cases require. The effect is a broadening of the diagnostic category thereby adding more clinical confusion. Although causation is not easily identified for this group, the clinical reality is that the profile of the child who is currently diagnosed with SLI does present differently to the child where the aetiology *is* known, e.g. as a result of a hearing impairment, reduced language stimulation etc. We do know clinically that a distinction between these different types of profiles of need is essential in planning effective intervention, appropriacy of school placement etc.

Reilly *et al.* do not elucidate on why it is so urgent that we need to consider short-term actions in this

process and decommission one diagnostic label, replacing it with a provisional, less specific one. By doing so are we not, in effect, abandoning a whole clinical and research history before we know how to rewrite it? What of the impact of removing the diagnostic term for the children and families, young people and adults who have been diagnosed with this label and for whom it is inextricably linked to their self-identity and their perceptions of their disability? Is it ever appropriate to remove a diagnostic label as a 'short-term' measure from an ethical perspective? Even if we were in the comfortable position where we were categorical in our consensus as to what to replace it with, through years of systematic research into each inclusionary or exclusionary criterion so that it truly and unequivocally reflected the profile of this population, to change a diagnostic label needs to be seriously considered and managed for those who are living with the diagnosis.

In terms of proposed new criteria, Reilly *et al.* suggest a cut-off point of -1.25 SDs in language scores to be applied in the diagnosis of LI on two subsequent tests a year apart. She also recommends the incorporation of an element of participation in the diagnosis of LI or the functional impact of the impairment on the child or young person's life. Given that the profile of SLI does change over time, it feels important to incorporate an element of time into the criteria and a level of measure of impact of the impairment is also a requisite in the diagnostic process. However, the problems related to the use of a static language measure alone remain regardless of the cut-off point chosen. We know that within the SLI profile, it is often the impact of the interaction of the *combination* of the areas of difficulty that tell us more about prognosis and therefore the intervention need rather than the *degree*. Certainly, when we have to argue at Special Educational Needs Disability tribunals about these complex cases, static language measures are used but only to tell us that language has not been learned. That is not the whole story. We have to argue *why* it has not been learned, i.e. what is the combination of language learning processes that are impaired which result in this low score and what is the likely implication of these combinations. For the school-aged child, for example, these would be in terms of access to the cur-

riculum and the development of literacy. Additionally, we need to argue what the likely response to intervention will be. Two children with a diagnosis of language impairment (LI), i.e. scoring below -1.25 SDs may present with similar vocabulary scores but one of these may be as a result of a combination of semantic and phonological processing disorders whereas the other may be as a result of reduced language stimulation. They both arguably need intervention but the prognosis is different for both as is the intervention model and type required. We therefore need to incorporate criteria around *language learning ability* and *response to intervention* into the way we diagnose SLI in order really to move forward in reliably identifying this group.

There is consensus around the need to review the current criteria of SLI and that these need to be considered in the longer-term by setting out an action plan to systematically test out the boundaries of the diagnostic category. I also wholly support the idea that this can only be achieved successfully through global collaboration. In terms of our diagnostic label, however, what of the argument for the *replacement* of a qualifying term that precedes the term 'language impairment' in order to continue to be able to set this clinical group apart? Are our expectations simply too high in terms of what a new qualifier can add? Should we expect a diagnostic label to be context/time bound, reflecting our *current* understanding of the nature of the disorder and therefore by definition potentially be subject to on-going change? Bishop suggests four options in terms of diagnostic label—one being to continue to use the term SLI with the meaning of idiopathic in relation to causation rather than specific in the sense of difficulties existing in the language domain without the presence of any others. Perhaps this is the best option for now whilst we test out changes needed in the diagnostic criteria. However even if we achieve all of our aims in resolving the confusion around the criteria for diagnosing this client group and agree a label which we are happy fully encompasses what we know of the nature of the impairment, one question remains unaddressed; who owns a diagnosis once it has been given and therefore who ultimately has the right to take it away?

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Redefining language impairment: researchers must play their part too

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Abstract

Reilly and colleagues have made a compelling case for the field to move away from the diagnostic category of specific language impairment. An important step is for researchers to acknowledge the heterogeneity of language impairment rather than rail against it. I argue that a failure of the research community to embrace a new paradigm will reflect a significant failure of leadership.

Main text

Reilly *et al.* have produced a timely summation of the taxonomic history of developmental language impairment. As the authors discuss, the gap between the diagnostic label that is currently most widely in use, specific language impairment (SLI), and the behavioural and biological reality is cavernous. Not only is there little scientific evidence that SLI represents a diagnostically relevant phenotype, but the *raison d'être* of this diagnosis—to provide clinical benefits to those affected with language impairment—appears to be left unfulfilled by a title that describes few children accurately and provides confusion to clinicians and policy-makers.

The paper was an invigorating read in that it articulates the anxieties felt by many over the 'SLI' label, clearly outlines the evidence for why it must be abandoned, and provides recommendations for short- and long-term action. I wholeheartedly agree that an immediate switch to the term 'language impairment' (LI) and the adoption of well-defined inclusionary rather than exclusionary criteria, are important first steps in addressing the current state of discord. The longer-term goal of shifting health and educational services from a diagnostic-based funding paradigm to a model based on the level of functional impairment is clearly optimal for a broad phenotype such as LI.

Reilly *et al.* highlight the importance of global collaboration in bringing consensus to terminology and criteria. Cooperation between national professional bodies and the engagement of clinicians and policy-makers are vital to the accuracy, relevance and uptake of any new criteria. I would also argue that researchers play an equally important role in this endeavour, particularly in terms of leadership. Rightly or wrongly, the broader community often looks to researchers for greater understanding about complex issues such as the classification of neurodevelopmental difficulties. It is therefore critical that the worldwide network of researchers understand the reasons for a potential reclassification of SLI to LI, and appreciate the importance of moving beyond the

status quo. I anticipate that a key challenge in achieving this goal is convincing researchers to embrace the heterogeneity of LI.

The case of autism spectrum disorder (ASD) is illustrative here. From the earliest description of autism in 1943 to the present day, there has been a widely held view that the behaviours associated with the disorder occur more often together than would be expected by chance, and therefore there will be a single cause that explains the non-random co-occurrence of these symptoms. However, like SLI, the behavioural and biological evidence never seemed to accord with this fervently held view. The behavioural heterogeneity in ASD spans the entire range of verbal and nonverbal abilities, with considerable variability also present in the level of repetitive mannerisms, motor impairments and social behaviours. Similarly, while twin studies identified that ASD is a highly heritable condition, no single causal pathway has been identified that accounts for more than 1% of affected individuals.

Yet, despite the overwhelming evidence for the behavioural and aetiological heterogeneity of ASD, for many years the research literature continued to be dominated by 'between groups' methodologies, in which people with ASD were recruited and then compared as a group against control participants on a given predictor or outcome variable. The focus was on identifying points of difference/similarity *between* ASD and controls, while the remarkable heterogeneity *within* ASD remained ignored or discounted. More recent publications have started to emphasize the importance of placing heterogeneity at the forefront of ASD research (Waterhouse 2013, Whitehouse and Stanley 2013). However, the lag in this appreciation has almost certainly slowed our understanding of the vast range of biological and cognitive profiles that exist within the autism spectrum, as well as the development of interventions that are specifically tailored towards these.

The field of LI can learn from the ASD experience. While 'SLI' provides a neat set of criteria that researchers

can use to group children, it is a diagnostic label that hides considerable behavioural and aetiological heterogeneity. Reilly *et al.* clearly highlight the shortcomings of these criteria and how researchers have been compromising validity for convenience.

Expanding the diagnostic criteria from SLI to LI—in particular, relaxing the exclusions on nonverbal impairment and social disadvantage—would likely increase the phenotypic heterogeneity among participant samples even further. Researchers need to embrace this variability rather than rail against it. This may mean shifting the research emphasis, at least in the short-term, from ‘between groups’ designs (LI versus typically developing controls) to methodologies that seek to understand the quantitative and qualitative characteristics of individuals across the LI spectrum. Of course, such a paradigm shift within the research field will not be without resistance, particularly given the current scientific climate

that craves straightforward findings that can be distilled easily to the general public. Exploring heterogeneity within the LI diagnosis will yield considerably more complex than simple findings, and researchers, journal editors and grant reviewers must be brave enough to accept this.

The duty of a scientist is to observe evidence and make further predictions based on these data. Reilly and colleagues have provided compelling evidence that SLI is neither a clinically or biologically valid diagnosis, and it is a scientist’s responsibility to heed these data. A failure of the research community to embrace a new paradigm will reflect a significant failure of leadership and present a major impediment to achieving the positives outcomes that we all desire for people with LI.

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The view from the chalk face

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Abstract

The identification of children’s language difficulties has implications for the nature and amount of additional support provided in schools. Terminology should allow for communication between professionals across health and education and with researchers. Classification should reflect the nature, degree and persistence of the language impairment and allow for changing developmental needs.

Main text

Reilly *et al.* systematically address a range of limitations with current criteria in the identification of specific language impairments (SLI) and in doing so they raise a number of challenges in moving the field forward both in terms of research and practice. The majority of their arguments are well supported by the literature and raise challenges for language researchers but also more generally about diagnostic approaches to developmental difficulties which are identified by behavioural markers (Buttner and Hasselhorn 2011).

In this commentary we focus on what might be considered an educational perspective, a perspective notably absent from both Reilly *et al.* and Bishop, despite suggestions of collaborations with other professionals. All children and young people with ‘SLI’ will be educated in schools, for the vast majority in mainstream settings. The day-to-day support of their learning and development will be provided by teachers. In these settings both the curriculum and access to additional resources will be

determined by professionals working within the educational services, in collaboration with other professionals (Dockrell *et al.* 2014).

Many of the points raised by Reilly *et al.* resonate with the context and demands of meeting children’s needs in schools. All education systems use some kind of categorical system (labelling) to assist in identifying children’s learning and social needs. This is essential for planning services, commissioning resources and supporting children’s needs. For example, in England the term ‘speech, language and communication needs’ (SLCN) is used to identify children whose primary need is with language and communication—excluding children with HI, ASD and so forth (Department for Education and Skills 2001). However, unlike many diagnostic systems, the categorization system also allows for the possibility of secondary needs. So a child might have SLCN as their primary need and behavioural, emotional and social difficulties (BESD) as their secondary need.

By corollary a child with hearing impairment would have a primary sensory impairment need but might also have a secondary need of SLCN. For many children and young people the primacy of these needs will change over time (Dockrell *et al.* 2014). Schools need to be knowledgeable about these possibilities and responsive to these changes so that appropriate resources can be accessed.

Flexible systems reflect the reality of children's development but raise challenges for commissioning of services and supporting learning in schools. To do this accurately it is important to consider identification, intervention, and the impact of language learning needs. While many students with language learning difficulties experience a range of continuing difficulties many do not. Importantly and missing from both commentaries is the role of moderating and mediating variables in influencing achievement and well-being.

So how do we identify language-learning needs? Interestingly the reviews present different approaches. Reilly *et al.* suggest that we should consider pupils who fall below 1.25 SDs below the mean on language measures—but which measure? It is well known that receptive vocabulary measures will not suffice (Gray *et al.* 1999) but which other measures are sensitive and specific? As Dockrell and Marshall (2014) argue there is a significant challenge in assessing language skills—especially in the preschool period when both raw scores as well as standard scores can decrease (Dockrell and Law 2007). Reilly *et al.* also suggest that children who score -1 SD should be monitored but who will do the initial testing, who will monitor progress and what criteria will be used to signal an intervention is needed?

From an educational perspective a clear advantage of accurate identification is that appropriate support and curriculum differentiation can be put in place. The identification of language learning difficulties provides a framework for differentiation. In addition these difficulties need also to be identified within the context of effective pedagogy (Fuchs and Fuchs 2009), where progress is limited despite *high quality* instruction. As Reilly *et al.* note, language difficulties may occur as a result of a range of within child and contextual factors so identi-

fication, assessment and intervention must take account of both domains, the interaction between within child and context, and changes in these over time. A three-tier model of universal, targeted and specialist provision which addresses children's language learning needs of different levels of severity is appropriate, comprising evidence-based tools and interventions delivered by teachers collaborating with SLTs (Dockrell *et al.* 2014).

Identification of language impairment is influenced by within-child factors including gender and age as well as absolute and relative levels of impairment; contextual factors including social disadvantage, teachers' knowledge and skills, and local policies (Strand and Lindsay 2012); and the interactions of these over time, resulting in different child trajectories (Thomas *et al.* 2009) and different profiles of impairments and needs (Meschi *et al.* 2012). The main issue, therefore, is not to diagnose a within-child impairment, whether once-off or by a repeated assessment to decide whether a child 'really' fits a diagnostic category, but rather to identify the nature, degree and persistence of the *language impairment*, along with other relevant developmental weaknesses which co-occur such as reading (Botting *et al.* 2006), writing (Mackie *et al.* 2013) and BESD (Lindsay and Dockrell 2012), as well as strengths.

Identifying language-learning difficulties for teaching and learning is crucial. Establishing inclusionary criteria will support policy and practice. Teachers offer a unique perspective on the struggles the children have in accessing the curriculum (Dockrell and Lindsay 2001); knowledge which may inform the identification of inclusionary criteria. There is a pressing need for a common language between professionals and academics. The dropping of exclusionary criteria is a positive step in this direction. Confusion in terminology impacts both on children and the services they receive, the funding of research and the interventions which are evaluated.

Recognition that the ways in which problems with language learning impact on children and young people will vary across development is also important (Carroll and Dockrell 2012). Services, both educational and health, need to be prepared to address these.

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Please! No more spaghetti . . .

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Abstract

Repeatedly debated and discussed, a powerful label is needed to reflect the needs and impact of language difficulties—not least for children and their families. Language impairment, while a relevant alternative to SLI, may present issues in determining exactly which children would be included. A dynamic approach to assessment, supported by a skilled workforce, would help the decision-making process.

Main text

In a 21st-century world saturated with communication, it is a curious paradox that we tie ourselves up in knots when we try to explain children's communication difficulties. We need a clear and compelling descriptor that children and young people, their families, practitioners and the wider world can understand and use.

Children and young people we work with rarely, if ever, describe themselves as having SLI, SLCN or any of the labels we use to describe language difficulties. Families have similar issues; in the words of a frustrated parent: 'they say he has a speech/language "need" . . . it's more than just a "need" it's a real difficulty and disability for him'.

As the leading children's communication charity in the UK, I CAN's mission is to raise awareness of the scale and impact of language difficulties. Our commentary reflects this and we welcome the chance to be part of the discussion around 'the spaghetti junction' of terminology.

Our view is that the spaghetti is not helping.

Language difficulties in children are the most frequently reported special educational need (SEN) in primary aged children in England (Department for Education 2013); more than autism and dyslexia. Yet there are fewer research studies, less public awareness, and these children often receive less support despite similar impacts on educational and social outcomes (Dockrell *et al.* 2012). Surely the absence of clear, readily understandable terminology contributes to the neglect of this key issue?

Despite being generic, speech, language and communication needs (SLCN) as a label has served us well over the last decade. In England it has taken us through the Bercow Review of Services for Children and Young People with Speech, Language and Communication Needs (Department of Children, Schools and Families 2008), and through the National Year of Communication in 2011. Despite this, the term 'communication and interaction' is proposed in the revised special educa-

tional needs (SEN) guidance in England (Department for Education 2013). This is frustrating, but whatever we end up with must make sense to decision-makers at policy level, to those who will commission our services and to young people themselves who, in the new system, must be involved in assessment and service planning from the outset. We can't continue talking in different languages if children are to get the support they need. In this respect, with so many jurisdictions, we question whether an *internationally* agreed term is a realistic possibility.

SLI as a label has *not* done it for us. Moving away from it not only reflects the developing research on the nature and needs of this population, but also the experiences of young people, their families and professionals with whom we work. Our partners and colleagues inform us that as a label SLI is rarely used and is often unhelpful; in our campaigning work, we often have to explain what SLI is; young people in our schools report to be confused by what the label means (Clegg *et al.* 2012). We welcome the consideration of a *functional* rather than a diagnostic classification, which looks at impacts of the language impairment, regardless of the specificity.

We know that with the right support children and young people with language difficulties make good progress (Clegg *et al.* 2012). Despite this, they are not necessarily getting the support they need (Dockrell *et al.* 2012). So, will the recommendations Reilly *et al.* propose make a difference to outcomes for children and young people?

'*Language Impairment*' feels a powerful label that 'does what it says on the tin'. A simple term in a world of complex communications is welcome. Already increasingly used in academia (e.g., Eisenberg and Guo 2013), it will also make sense to those we need to influence. However, there is a risk that this more 'medical' view of a child's difficulties, centred 'within child', will mean a move away from a focus on shaping environments and skilling those who work with children.

We feel there will still be confusion about the group of children we identify with language impairment. Along with others, we have favoured a Russian doll approach which sees language difficulties as sub-groups within groups allowing us a sense of size. If 'language impairment' becomes the term describing all children with language difficulties, we will need qualifiers to distinguish between 'language impairment as part of another condition' and 'language impairment as the primary area of need'. We note the term 'primary language impairment' emerging in the literature (e.g., Ebbels 2014); in I CAN schools, this concept of 'primary' or 'main area of need' has been a useful one. However, this is not always easy to determine, and relies on specialist professional judgement often based on experience as well as more objective criteria.

Assessing over two time points may allow for the developmental nature of language difficulties, but we challenge how practical this is even in the early years. A dynamic approach to assessment, which looks at *potential for learning* rather than a static level of achievement, has been shown to be useful in diagnosing language impairment as well as informing future interventions (Pena *et al.* 2007). This sits well with the 'graduated approach' proposed in the current SEN reforms in England, and the three level system to supporting children's language advocated by Dockrell *et al.* (2012) and Law *et al.* (2013) from a public health point of view. It also puts the focus

on the link with learning and the impact of language difficulties on progress for these children, points made by Bishop in proposing 'language learning impairment' as an alternative term. While this makes sense in the education system, we question its 'punch' with a wider group of stakeholders.

At the risk of adding more questions than answers, we remain optimistic about finding the Holy Grail—a single term that will both give us a powerful label and ensure that all stakeholders have an understanding of the changing nature and the impact of childhood language difficulties. We agree wholeheartedly with the need for further refinement of definitions and criteria, that these should be based within frameworks that acknowledge the changing nature of children's needs, but also based firmly on what works for children and their families.

Crucially, however, given how difficult it can be to identify often 'hidden' language difficulties, and the fact that currently the first point of contact for children will not be a specialist in language difficulties, we cannot risk over-complicating the system. The success of any system, therefore, relies on a well trained early years and school workforce coupled with the clinical expertise of speech and language therapists to tease out differences, identify key features, judge responsiveness and plan appropriate intervention.

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Language impairment: where do we draw the line?

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Abstract

Reilly *et al.* make a compelling argument against the label 'specific' language impairment and associated exclusionary criteria. Instead, a focus on inclusive diagnostic criteria and measures of functional impact are advocated. This commentary questions what inclusive criteria and measures of functional impact might look like. Relaxing diagnostic criteria will increase demand for services; evaluating how best to meet this demand is a priority for future research.

Main text

The target articles by Reilly *et al.* and Bishop demonstrate consensus in the field that our current conceptualization of 'specific' language impairment (SLI) as a selective impairment in language in the context of otherwise normal development is untenable. The evidence presented by Reilly *et al.* demonstrates the clear relationships between verbal and non-verbal abilities that make discrepancy criteria illogical at best and prevent the neediest children from receiving services at worst (cf.

Weindrich *et al.* 2000). Co-morbidity is also the norm in developmental disorders and there is increasing evidence that genetic influences on language impairment may cross our behaviourally defined clinical boundaries (Rodenas-Coudrado *et al.* 2014). There is less agreement about what to do with the word 'specific'; Bishop makes a compelling case for retaining the label SLI with the understanding that 'specific' means idiopathic, rather than exclusive. Reilly *et al.* argue that 'specific' should be dropped, thereby removing the connotations of

cognitive referencing. Either way, both articles argue that the focus should be on inclusion, rather than exclusion, criteria. But there remains little agreement about what those inclusive criteria should be. Reilly *et al.* criticize the 'clinical markers' approach, largely because the evidence for their sensitivity and specificity come from clinical cohorts rather than representative population samples. However, these markers tend to focus on language structure and verbal memory and may be less prone to cultural bias than measures of language content or language use (Campbell *et al.* 1997).

Another problem with relying on standardized tests for diagnosis or determining service eligibility is that most scores are normally distributed, making decisions about where to draw the line between typical and impaired language fairly arbitrary. Both target articles highlight the importance of 'functional' impairment in interpreting standardized test scores. Tomblin (2006) argues that a low test score only assumes clinical significance if it is associated now or in the future with outcomes that are disvalued by our society, for instance poor academic attainment or social exclusion. But how are we to measure functional impact? And how low does a score need to be, and on what aspect of language, before it becomes problematic? Reilly *et al.* recommend a cut-off of -1.25 SD as the point at which language impairment confers functional disadvantage, but it is not clear how this score maps onto functional measures and whether it applies across the range of language abilities one might measure. For example, is a low score on expressive vocabulary as detrimental as a low score on receptive grammar? Mok *et al.* (2014) report that deficits in pragmatic aspects of language are most detrimental to peer relationships. Importantly, pragmatic language skills are notoriously difficult to assess in a standardized way, and we lack culturally valid norms for many pragmatic language skills (Norbury and Sparks 2013).

The criterion advocated by Reilly *et al.* likely derives from the Iowa Longitudinal Study (Tomblin *et al.* 1997), in which SLI status was defined at school entry as scores of -1.25 SD on two or more composite scores comprised of expressive and receptive measures of vocabulary, sentence processing and narrative ability, in the context of non-verbal ability scores within the normal range. This algorithm identified 7.4% of the kindergarten population as having SLI, and as a group, these children were at higher risk of adverse academic, social and behavioural outcome in adolescence. However, fewer than half of these children met the same diagnostic criteria a year later and only one-third had been referred for speech-language evaluation because of parent or teacher concern. Thus, at least in young chil-

dren such a cut-off is likely to identify a large number of false-positives.

One might argue that this is not a problem—supporting children at possible risk of language impairment doesn't hurt anyone, right? I would argue that when resources are scarce, it is crucial to target provision on those who are unlikely to resolve spontaneously. One mechanism for doing so is to combine standardized assessment with parent/teacher report of language in everyday settings (Bishop and McDonald 2009) or with case history information that may provide us with 'red flags' such as family history of language impairment. Another approach might be to start with measures of functional outcome. For example, teachers in the UK complete a standard educational assessment for all children at the end of the first year of formal schooling. Scores from this measure may be used to identify children achieving a 'good level of development' and those that are not meeting academic expectations (Cotzias and Whitehorn 2013). My colleagues and I (Norbury *et al.* 2014) are currently using these educational data in a population study to determine the level of language impairment that is associated with poor academic attainment. It will be interesting to see how this functional measure maps on to our current conceptions of severity.

An important avenue for future research and professional debate is how and when speech-language therapy services should intervene. Reilly *et al.* advocate a public health model of service delivery with a staged approach to intervention that includes universal, targeted and specialist provision (Law *et al.* 2013). A cut-off score of -1.25 SD would mean that approximately 10% of children would be identified as having language impairment, putting considerable pressure on specialist services. It is worth considering whether highly trained speech-language therapists need to provide universal services or whether the needs of majority of these children could be met through the education system. Developing teacher training programmes to highlight typical language development and how to identify those with likely language learning impairments, and adapting the National Curriculum to increase focus on developing oral language skills, should help to improve language and associated outcomes for many students. This may enable speech-language therapists to focus on those with severe and persistent language impairments that will require ongoing specialist support. Different models and timing of intervention can and should be evaluated using randomized controlled trials. Consistency in terminology and assessment/diagnostic criteria will enhance opportunities to apply intervention findings to clinical and educational practice.

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Changes to specific language impairment: the service perspective

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Abstract

Reilly *et al.*'s proposed changes to the term and definition of language impairment are theoretically sound but immensely challenging to services. Removing the current verbal/nonverbal discrepancy criteria without implementing an agreed prioritization system risks causing a period of confusion. Additionally the term 'language impairment' is too broad, and other options need to be considered.

Main text

We welcome this discussion and in particular Reilly *et al.*'s efforts to move towards a definition of language impairment that meets both researchers' and clinicians' requirements. The diagnosis impacts on children and young people, families, services and researchers and so input is needed from all of these groups.

Theoretically it is hard to argue against much of what Reilly *et al.* propose; and particularly as they are in broad agreement with Bishop. Much of what they say also makes sense from the clinical perspective. For instance, in our experience in the UK there has been a relaxing of entry criteria for specialist provisions for language impairment over a number of years and so for many social disadvantage, otitis media, anomalies of oral structure and oral motor functioning and learning English as an additional language does not preclude entry to specialist provision.

From a clinician's perspective it is obvious that the verbal/non-verbal discrepancy criteria for SLI has only been accepted within our profession and by no one else. Teachers and parents in particular are more interested in functional outcomes.

The emphasis on the development of inclusion criteria which is based more on the child or young person's needs is also a positive step, and fits much more with government and societal expectations.

We support the need for a clearly defined diagnosis. Whilst labelling does have potentially negative connotations, for young people with long-term conditions, understanding their condition is an important step on the way to self management. Bishop (2010) highlights that language impairment attracts little media attention and comparatively little funding for research because of the lack of clarity with labels. A clearly defined term will be beneficial to both of these causes.

Reilly *et al.* make a case that non-verbal IQ does not impact on outcomes. We accept the evidence for this but

as clinicians we are well aware that some children and young people with LI respond to treatment better than others. All children with LI are not the same and many of the approaches used in the field do make significant cognitive demands on children. More research into the responsiveness to treatment of groups of children with LI, including the role of cognition, is required so that professionals are able to make evidence based decisions and ensure that limited resources are well targeted.

Using non-verbal IQ as a criteria and the differential diagnosis of delay versus disorder have been central components of many services' prioritization systems. Removing these sends shockwaves through the profession and there is a risk that without robust diagnostic systems in place there will be significant confusion amongst practitioners. Who will we prioritize? What will be the point of differential diagnosis? Careful but urgent action is required if professionals are not to lose direction and consequent credibility with families.

Reilly *et al.* propose a -1.25 SD cut off point based on standardized assessment. This may be neat from a research perspective but in the classroom this makes less sense as a wider number of factors need to be considered. We recognize that factors such as impact are harder to standardize, but greater agreement about best practice in capturing this information is required. Additionally -1.25 SD equates to approximately 10% of all children, and even within the tiered approach proposed by Law *et al.* (2013) this is more than existing resources and processes can support.

Other conditions such as ASD/ADHD have formal routes to diagnosis as outlined by the National Institute for Health and Care Excellence (NICE). This gives them a prominence and clarity. Whilst for LI we do not have that, we do need greater guidance. A more robust diagnostic process agreed by consensus will increase quality for children and families as well as benefitting researchers. Whilst Reilly *et al.* refute the evidence for

using clinical markers, Bishop disagrees and it may be one area worth exploring in future research.

It is apparent that the term 'specific language impairment' needs to change. Even if the criteria were altered the 'specific' element naturally skews the casual listener to the current definition. There are however problems with many of the alternatives. 'Language impairment' is deficient as the term also relates to adult onset conditions and as Bishop makes the point search terms are important and a three word term is stronger. 'Primary language impairment' emphasizes language as the main area of need, but in the UK may be confused with primary schooling as well as sharing an acronym with pragmatic language impairment. If primary language impairment was adopted in diagnostic terms there could be PLI and 'secondary language impairment' or alternately PLI versus 'language impairment associated with other conditions'. This would help as a first step towards subcategorization of language impairment.

At this watershed time it is potentially an opportune time to generate a new term. Autism was first used in

1943. A new term would take some time to be understood but once established would be easily searchable and not carry any misleading connotations.

Although taking place in an academic journal the discussion of terminology is in effect a rebranding exercise. Thus it may be appropriate to apply marketing-style approaches to the development of a new term, including consultation with parents and young people.

Whatever the outcome the LI field needs broad consensus agreement across all groups. We suggest that the short- and long-term aims be developed into a robust international plan. It needs a planned approach to ensure that all in the field are aware of the direction of travel. Whilst well argued, the changes proposed are significant. Without a coordinated approach towards a clear term, definition and diagnostic pathway there is a risk that the language impairment field may suffer an extended period of confusion which will be of detriment to all, including the children, young people and families we aim to support.

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Special educational needs provision in the real world

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Abstract

This article considers research by Reilly and others into specific language impairment. On practical grounds in terms of securing support for children who need it, I accept that this classification is unnecessary and should be replaced by the term 'language impairment' with an agreed definition (provided that that recognizes gradations of impairment) and supported by large-scale longitudinal research.

Main text

I approach this paper from the standpoint of a lawyer specializing in education law, with particular emphasis on securing appropriate educational provision for children with special educational needs, including communication difficulties.

In securing appropriate provision for learning difficulties, the aim initially is to seek to persuade local authorities (LAs), if necessary with the assistance of health authorities, to put the appropriate support in place and, if this fails, to persuade a Special Educational Needs and Disability Tribunal to order the right support. Accurate identification of the difficulties in question is therefore paramount, and it is unfortunately the case that a great deal of time is spent in tribunal appeals arguing about the label to be applied to a communication problem, for

instance whether it is a delay, disorder, and whether it is specific or connected with other difficulties. As this paper points out, problems have been exacerbated because in some areas there have been no universally agreed and accepted definitions, which has meant that it is difficult to evaluate and compare research studies where the definitions of what is being researched do not coincide.

It is therefore useful to draw together studies on the issue of specific language impairment (SLI) with a view to formulating whether that is an accurate or a useful label. The exercise carried out by the authors of this paper demonstrates the difficulties which the SLI classification has caused by virtue of the fact that, since there is no agreed cut-off point, when the topic has been studied the research group can be widened or narrowed

simply by changing the criteria for identifying SLI. It appears that this may well be the cause of unnecessary disputes between experts at tribunal hearings and the like, since different opinions as to whether a child does or does not have SLI may all be entirely sincere and supported by research; and ultimately this is unhelpful to the tribunal whose task is primarily to identify what support the child needs in order to be able to progress educationally. The difficulty from a parental point of view is that LA experts tend to use criteria which lead to fewer children being identified as requiring support and thus less expense for LAs, presumably as a result of a culture imposed by current economic conditions and cuts.

Therefore the existence of definitions which legitimize or assist this may be actively detrimental to some children, and a universally agreed set of criteria in respect of language impairment will tend to reduce argument and speed up the provision of support. It may well be helpful to education and health authorities, not least in being able to plan accurately.

In terms of securing appropriate help for children, it appears artificial to try to identify children with 'pure' SLI as opposed to language impairment as part of separate difficulties or caused by physical and/or societal factors, and indeed in practical terms it is regularly the case that an SLI will in any event result in separate learning difficulties for the child in question. As is correctly pointed out in this paper, it cannot be correct to assume that any language difficulty can exist in a vacuum since, in the absence of anything else, it must at least have neurological origins. If it is the case that in practice children have been deprived of direct therapy and other support purely because their communication difficulties are not deemed to be due to SLI, then any change in professional thinking which remedies that is certainly to be welcomed.

The recognition offered by this paper of the need to reflect the real world where symptoms and conditions may overlap and co-morbidity may emerge over time is therefore very welcome. I would certainly have no quarrel with the concept of abolishing the use of the SLI term and instead adopting simply the term 'language impairment'. I would also support the discontinuation of the use of terms such as 'language delay' and 'language disorder' for the reasons offered by the authors, and also because in practical terms too much time is wasted arguing about classifications within labels of this nature.

It would certainly be helpful to have large-scale longitudinal population studies to explore this area more thoroughly, to obviate the problems referred to in the paper. I am however uneasy about the suggestion that one of the main purposes of this exercise should be to determine a rigid cut-off point for LI, whether at the recommended -1.25 SD or elsewhere. That is because,

as the paper recognizes, children can fluctuate in terms of speech development, particularly at primary age, and also because a child with a lower level of LI but other difficulties may be much more severely impacted than a child with greater LI but higher cognitive ability. Given that professional diagnoses and reports are usually read and interpreted by people with limited expertise and experience in dealing with learning difficulties, including untrained teaching assistants, LA officers and the like, there is a danger that a child who does not come with an LI label having scored above the cut-off point will receive no or little assistance. The authors recognize this to an extent by virtue of the acknowledgements that, where LI coexists with other problems, the circumstances of each child have to be considered individually; and also the recommendation that children scoring at the -1 SD cut-off point should be monitored and supported if problems develop. However, that is likely to be aspirational at best and may well lead to such children slipping through the net again. Reluctant as I am to recommend the introduction of more labels, this is an area where consideration should at least be given to acknowledging gradations of LI.

I would certainly support a public health model utilizing a staged approach to prevention and intervention of LI, and also the suggested longer-term focus on models incorporating understanding of the effect of external factors including health, society, school and family environments, and biological and genetic factors. In theory at least this should be supported by the holistic model envisaged in the Children and Families Act and can only benefit children.

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