

## Editorial: New frontiers in the scientific study of developmental language disorders

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### Abstract

Developmental language disorders (DLD) are common and have far-reaching developmental consequences. Nevertheless, public awareness of DLD is poor, and one goal of this special issue is to showcase a set of papers that provide a clear and coherent message about the nature and impact of DLD, and the potential of intervention to mitigate these impacts. In this editorial, we highlight seminal papers JCPP has published on language disorders over the last 40 years. Many of the issues raised then are still relevant now; however, the papers that comprise this special issue exemplify how far the field has come in achieving consensus on terminology and diagnostic criteria, and producing highly consistent findings on the stability and impact of DLD, and the potential for language change in response to targeted interventions. The editorial concludes with a road map for future research and clinical priorities that includes the need for randomised controlled trials that specifically address the impact of co-morbidities on response to treatment, impacts of intervention on broader developmental outcomes, and the experiences of adults with DLD.

Developmental language disorders are very common, affecting approximately two children in every classroom (Norbury et al., 2016). They increase risk of adverse academic (Tomblin et al., 2000), social (Mok et al., 2014) and emotional/behavioural outcomes (Yew & O'Kearney, 2013). As well as being significant in themselves, language disorders are also a core and/or a co-occurring feature of other neurodevelopmental and mental health conditions which constrain both developmental course and treatment response of affected individuals. JCPP is proud of its rich history of publishing influential papers on the causes, consequences and co-occurrences of language disorder. This heritage stretches back to the early 1970s, with Cantwell, Baker & Rutter's seminal paper on the similarities and differences between developmental language disorder and autism (Cantwell, Baker, & Rutter, 1978). The publication of this special issue confirms our commitment to this vital field of enquiry. Our aim in commissioning these important papers was to help map out some of the key themes that we believe will dominate the field in the coming 5–10 years.

The first paper focuses on conceptual and terminological issues. Public awareness and understanding of language disorder is poor. This is perhaps because researchers have not spoken with a clear and consistent voice when communicating their findings. In particular they have used a wide range of terms over the years to describe children who are not developing their native language as expected (Bishop, 2010). This is exemplified by Bishop's (1992) paper on the Underlying Nature of Specific Language Impairment. This paper's first paragraph gives a brief history of terminology in the field and concludes "most specialists in the UK and USA prefer the more neutral terms 'developmental language disorder' or 'specific language impairment' (SLI) and it is the latter that will be adopted here (pg 3)." Despite this confident statement there is still disagreement, 25 years later, over what is the most appropriate set of terms to use. Our first paper reports a consensus statement on this matter by the international CATALISE consortium of 59 clinicians, educators and representatives from parent/charitable organisations (Bishop et al., p. 1068–1080). It concludes that 'developmental language disorder' (DLD) is the term that should be adopted going

forward. This term reflects our growing understanding that for most children, language impairments are not 'specific' and often co-occur with deficits in nonverbal cognitive ability, attention and social competence. Replacing 'impairment' with 'disorder' underscores the functional impact that is often associated with language deficit, and is consistent with other nomenclature, for example, attention deficit hyperactivity disorder and autism spectrum disorder. CATALISE aims to improve public awareness and research discovery by ensuring common terms and descriptors.

The next four papers in this issue detail the developmental course and potential impacts of persistent language disorders. McKean et al. (2017) and Norbury et al. (2017) detail longitudinal trajectories of children with language disorder during the primary school years. The cohorts and statistical techniques employed differ considerably in the two papers and yet the results are strikingly similar. Language is remarkably stable from school entry and language problems are stubborn and persistent; in other words, children with low language scores at the beginning of formal education continue to have low language scores at the age of 11, with little evidence of 'narrowing the gap' with peers with more advanced language skills (see also Bornstein et al. 2016). In fact, McKean et al. found that between ages 4 and 11, only 2% of children showed an improving language trajectory and these were almost all children learning English as an additional language. One positive message from these studies is that individuals with severe and complex disorders did not fall further behind as might be expected. The McKean et al. (p. 1081–1091) and Norbury et al. (p. 1092–1105) studies raise interesting scientific questions about the malleability of the neurodevelopmental processes underpinning language growth and on the face of it seem to argue against early language problems as due to a delay in development (that will be eventually resolved over time). From a clinical perspective they also question the scope and value of existing approaches to the initial detection and subsequent remediation of language problems.

In this regard, we know that very often language disorder goes undetected, and thus untreated. For example, Cohen et al. (1998) reported that approximately one third of adolescents presenting at child and adolescent mental health clinics have previously undiagnosed language disorder. In the current special issue, Hughes et al. (p. 1106–1113) demonstrate that this is also true in youth justice settings, with 40% of young offenders showing language deficits and approximately one quarter meeting clinical criteria for language disorder. Few of these young people had been treated for language disorder prior to arrest, and the impact of language disorder on the ability to comply with police interviews and rehabilitation programmes is clearly outlined by Hughes et al. These same vulnerabilities make young women with language disorder particularly vulnerable to child sexual abuse, as reported by Brownlie et al. (p. 1114–1121). They interviewed adults with a history of mild-moderate language disorder; all participants were from the Ottawa cohort, one of the first epidemiological cohorts of children with language disorder. These women were more likely to report prior sexual abuse (43%) and more severe accounts of abuse than women with typical language histories (16%). Of course not all young people with language disorder will experience youth offending and child sexual abuse; nevertheless these findings are important reminders that poor language can compromise children's ability to understand the social situation, reason about possible risks and consequences, and talk their way out of a troubling situation. Reporting adverse events in a detailed and coherent manner may also prove challenging, and difficulties understanding and responding to questions may come across as adversarial. All four of these studies point to earlier opportunities to mitigate risk and the need for long-term monitoring of children with language disorder.

There is a dearth of large-scale RCTs of clinically referred children, many of whom will have comorbid deficits in cognition, attention and social competencies. Such studies are urgently needed in order to answer vital questions about critical periods for maximum language change, and the impact of comorbidities on response to treatment.

The preceding four papers beg the one million dollar question – ‘what can be done to improve language and developmental outcomes for those most at risk?’ This challenge is taken up by the next three papers that use randomised, controlled trials (RCT) to elucidate possible avenues for change. McGillion et al. (p. 1122–1131) target families experiencing economic disadvantage – a key risk factor for language disorder. They employed a brief parent training programme to increase parent contingent talk with toddlers. After 1 month, parents in the intervention group provided more contingent responses to their children's talk than peers in an alternative intervention group. They also reported that their children were using more words than control peers. Unfortunately, these gains were not maintained 12 months post-treatment. The study is promising in not only demonstrating that parental change is possible but also critically demonstrates the need for ongoing support, as the nature of language learning itself changes as children become more linguistically competent. Fricke et al. (p. 1141–1151) and Hagan, Lervag & Lervag (p. 1132–1140) address language intervention in educational contexts. Both studies demonstrate robust, although modest, increases in language capacity across a range of language measures for preschoolers with low language scores. Critically, children with the most severe language impairments showed language gains that were similar in magnitude to those with more mild deficits. However, there was little evidence of transfer to other skills such as literacy at this age. In addition, both papers emphasise that even modest improvements require prolonged and intensive effort, a point explored in more detail by the excellent commentary provided by McCartney (p. 1152–1154). Overall, the relatively small and transient therapeutic gains documented in these high-quality RCTs highlight just how challenging remediation of language disorder is and really drive home the message that further therapeutic innovation is needed.

Developmental language disorders often occur in the context of other neurodevelopmental conditions. The final two papers update issues concerning the overlap between language disorder and autism spectrum disorder in novel ways. Hopkins et al. (p. 1155–1165) use an ingenious experimental method to demonstrate that individuals with autism spectrum disorder show typical use of lexical alignment, or the propensity to use the same words as conversation partners to refer to objects with potentially ambiguous objects. It is always good to document areas of communicative strength in autism, and Hopkins et al. consider factors that underpin these communication skills. It is generally thought that lexical alignment relies on good executive control; that did not appear to be the case here as participants with ASD had executive deficits relative to peers. Instead, the authors argue that good semantic skills may support this pragmatic skill, at least in this highly structured setting. Mandy et al. (p. 1166–1175) provide a first systematic investigation into application of Social (Pragmatic) Communication Disorder (SPCD), a controversial diagnostic category introduced in DSM-5 (see Norbury, 2014 for critical review). Their findings indicate that rather than a ‘distinct’ diagnostic entity, SPCD may represent a qualitatively similar, but milder form of autism spectrum disorder. Nevertheless, identification of pragmatic deficits that yield functional impact should facilitate access to clinical services that may attenuate some of the negative sequelae of pragmatic language disorders (cf. Cohen, Farnia, & Im-Bolter, 2013).

The scientific study of developmental language disorders has definitely come a long way over the past 25 years. Looking forward we have identified the emergence of three key themes that we believe should characterise research in the next 25 years. First, there is a dearth of large-scale RCTs of clinically referred children, many of whom will have comorbid deficits in cognition, attention and social competencies. Such studies are urgently needed in order to answer vital questions about critical periods for maximum language change, and the impact of comorbidities on response to treatment. Second, while a number of intervention studies consider the impact of language intervention on related skills such as literacy, few have considered the cascading impacts of language improvement on other areas of functioning such as social, emotional, and behavioural development and mental health. Finally, JCPP has led the way in publishing studies of adult outcomes for children with severe DLD (e.g. Clegg, Hollis, Mawhood, & Rutter, 2005; Howlin, Mawhood, & Rutter, 2000). Times have certainly changed with regard to the educational experiences of these children and investigations of the long-term outcomes of children with language disorders coming through the mainstream school system are vital. We know very little about the prevalence and impact of DLD in adults and the sorts of community support that are available and effective. Language is a core component of human capital and it is in society's interests that research continues to find the most effective methods of increasing language competencies and minimising the impacts of DLD. We look forward to continuing to publish cutting edge research that does just that.

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