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Predictors of reading comprehension ability in primary school-aged children who have pragmatic language impairment

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ABSTRACT

Purpose: Children who have pragmatic language impairment (CwPLI) have difficulties with the use of language in social contexts and show impairments in above-sentence level language tasks. Previous studies have found that typically developing children's reading comprehension (RC) is predicted by reading accuracy and spoken sentence level comprehension (SLC). This study explores the predictive ability of these factors and above-sentence level comprehension (ASLC) on RC skills in a group of CwPLI.
Method: Sixty nine primary school-aged CwPLI completed a measure of RC along with measures of reading accuracy, spoken SLC and both visual (pictorially presented) and spoken ASLC tasks.
Results: Regression analyses showed that reading accuracy was the strongest predictor of RC. Visual ASLC did not explain unique variance in RC on top of spoken SLC. In contrast, a measure of spoken ASLC explained unique variance in RC, independent from that explained by spoken SLC. A regression model with nonverbal intelligence, reading accuracy, spoken SLC and spoken ASLC as predictors explained 74.2% of the variance in RC.
Conclusions: Findings suggest that spoken ASLC may measure additional factors that are important for RC success in CwPLI and should be included in routine assessments for language and literacy learning in this group.

1. Introduction

1.1. Pragmatic language impairment

Pragmatic language impairment (PLI) is a developmental language disorder in which children show a disproportionate difficulty with pragmatics and social communication compared to relatively good ability in the structural aspects of language such as grammar, vocabulary and phonology (Bishop, 2000). Children who have pragmatic language impairment (CwPLI) are typically verbose, have difficulty staying on topic and possess poor turn-taking skills (Adams, 2001; Bishop & Adams, 1989). They have difficulties with above-sentence level language tasks including narrative organisation, inferential

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comprehension and comprehension of discourse (Botting & Adams, 2005). The objective of the present study was to identify predictors of reading comprehension in CwPLI and explore the contribution of above-sentence level tasks (an area of difficulty for this group) to reading comprehension ability.

PLI is a heterogeneous disorder in which there are wide variations in social communication and language skills. Children present with some of the features of language impairment observed in specific language impairment (SLI) including receptive language difficulties, word finding difficulties and semantic errors as well as some of the pragmatic communication difficulties of high functioning autism (Bishop, 2000; Bishop & Norbury, 2002). However, CwPLI can typically be distinguished from children with high functioning autism because they do not have impairment in all three aspects of the autism triad due to the absence of restricted and repetitive behaviours in the former group (Bishop, 1998; Bishop & Norbury, 2002; Gibson, Adams, Lockton, & Green, 2013; Leyfer, Tager-Flusberg, Dowd, Tomblin, & Folstein, 2008). The term 'social (pragmatic) communication disorder' (SCD) has recently been used in DSM-5 (American Psychiatric Association, 2013) to describe this group of children. SCD is categorised in DSM-5 as a subtype of language impairment with a similar set of features as those described by Bishop (2000) in her definition of PLI. In the current study, the term 'children who have PLI (CwPLI)' will be used to describe children with a pattern of pragmatic and social communication needs similar to those described by Bishop (2000) and the SCD profile in DSM-5.

The diagnostic overlaps between PLI and SLI and autism remain unresolved. Therefore, we are not seeking to position PLI as a diagnostic category or 'clinical condition' but argue that there are children presenting to speech and language therapy services whose primary difficulty is in pragmatics (with or without some relatively mild structural language problems). These children require an intervention approach that is distinct from children with purely structural language difficulties. The persistent social and communication difficulties experienced by CwPLI extend beyond spoken language into academic attainment; for example, Freed, Adams and Lockton (2011) reported that a significant proportion (41%) of CwPLI have reading comprehension (RC) difficulties and these children generally require long-term support for learning in the classroom (Botting & Conti-Ramsden, 1999). Establishing an experimental group of CwPLI is therefore important to ascertain information about predictors of RC in this group given the potential educational implications of persistent poor RC. This may, in turn, indicate appropriate directions for intervention. The present study therefore sought to identify what factors function as predictors of RC in this group.

1.2. Reading comprehension

RC ability is thought to be underpinned by a number of language and cognitive skills including reading accuracy (the ability to decode or recognise individual words), spoken language comprehension, vocabulary and processing skills (Cain & Oakhill, 2006; Oakhill, Cain, & Bryant, 2003). According to the Simple View of Reading, RC is the product of two skills, reading accuracy and linguistic comprehension (Gough & Tunmer, 1986). Therefore previous research has examined the influence of skills such as reading accuracy and spoken sentence level comprehension (SLC) on RC.

Reading accuracy is an important predictor of RC and the two skills are highly correlated in children with typical language development (CwTLD) (Gough, Hoover, & Peterson, 1996; Nation & Snowling, 1997) and children with SLI (CwSLI) (Botting, Simkin, & Conti-Ramsden, 2006). If reading accuracy is slow or inaccurate then a child may have to devote most of his/her attention to extracting the meaning from individual words. This may use up most of the reader's processing capacity, leaving few resources for higher level comprehension skills such as integration and inference (Bishop, 1997; Snyder, Caccamise, & Wise, 2005). However, children with poor reading accuracy (as seen in children with dyslexia) can have good RC by employing their semantic and syntactic skills to support ineffective decoding strategies (Bishop & Snowling, 2004; Snowling, 2000). Conversely, studies have also shown that children with a specific deficit in RC (often referred to as 'poor comprehenders') can have decoding skills within the normal range (Nation & Norbury, 2005).

Researchers have found strong links between RC and tests of spoken SLC such as the Test for Reception of Grammar, 2nd Edition (TROG-2; Bishop, 2003b) in CwTLD (Oakhill et al., 2003; Stothard & Hulme, 1992) and CwSLI (Botting et al., 2006). In children with autism spectrum disorders (CwASD), who are generally reported to have good reading accuracy skills, RC is associated with poor oral language skills including SLC (Nation, Clarke, Wright, & Williams, 2006; Nation & Norbury, 2005). Poor comprehenders were found to be impaired relative to a control group, matched for age and reading accuracy, on the TROG-2 as well as measures of semantic skills, sentence recall and past tense elicitation (Nation, Clarke, Marshall, & Durand, 2004).

The Simple View of Reading (Gough & Tunmer, 1986) proposes that poor RC is due to poor word reading, poor oral language or both. The predictive ability of reading accuracy and spoken SLC on RC has not been examined in CwPLI, although Freed et al. (2011) reported a significant correlation ($r = .81$) between reading accuracy and RC in CwPLI. Therefore, the first aim of the present study is to investigate the proportion of variance in RC that can be explained by reading accuracy and spoken SLC in CwPLI and to examine whether this is in line with research with CwTLD.

It has been suggested that tests that assess language at the word or sentence level may underestimate children's language difficulties in more complex language tasks such as telling stories (Bishop, 2004). Whilst previous research has explored the influence of reading accuracy and spoken SLC on RC, there has been a lack of research into the influence of above-sentence level comprehension (ASLC) skills for language impaired groups and particularly in CwPLI. Therefore the second aim of the present study is to examine the predictive ability of ASLC to RC in CwPLI.