Understanding poor comprehenders in different orthographies: Universal versus language-specific skills

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Despite an emerging focus on poor comprehenders in recent reading research, a number of unresolved issues concerning the cognitive and linguistic underpinnings of this disorder remain. In this special issue, we bring together a set of six papers examining the strengths and weaknesses of different types of poor comprehenders across multiple languages, including English, French and Chinese. Key findings of these studies show that certain oral language skills, such as morphological awareness and syntactic awareness, are related to reading comprehension deficits in different languages, suggesting their universality. Intriguingly, dissociability and co-occurrence of reading comprehension difficulties have been identified in bilingual children whose L1 and L2 are quite disparate, with some bilinguals exhibiting reading comprehension deficits in a single language, while others display these deficits in both languages. These issues and their implications for future research are further discussed.

Comprehension is the goal of reading (Snow, 2002). However, approximately 7–10% of school-aged children experience reading comprehension difficulties despite age-appropriate vocabulary skills and fluent and accurate word reading (Cain, 2007; Yuill & Oakhill, 1991). These children are identified as poor comprehenders, also sometimes called unexpected poor comprehenders (Catts, Adlof, & Weismer, 2006; Tong, Deacon, Kirby, Cain, & Parrila, 2011). In recent years, poor comprehenders have emerged as a central focus of reading research with a growing number of studies exploring the linguistic and cognitive weaknesses of poor comprehenders in English (e.g., Catts et al., 2006; Tong, Deacon, & Cain, 2014; Tong et al., 2011). Consequently, we know very little about the universal properties of cognitive processing systems used for reading comprehension in alphabetic writing systems other than English. Thus, the goal of this special issue is twofold: to bring together research that examines poor comprehenders across alphabetic and non-alphabetic writing systems and to provide a more comprehensive understanding of the cognitive and linguistic underpinnings of reading comprehension. In what follows,
we provide a brief overview of the articles included in this issue, highlighting several important findings and their implications for future research.

A highlight in this issue is to clarify universal versus language-specific aspects of poor comprehenders. First, poor comprehenders emerge across a wide age range within both alphabetic and non-alphabetic languages. Specifically, we have shown that reading comprehension difficulties occur in English monolingual children (MacKay, Levesque, & Deacon, 2017) and adults (Cartwright, Bock, Coppage, Hodgkiss, & Nelson, 2017), as well as in bilingual L2 children learning either English or French (D’Angelo & Chen, 2016; Zhang & Shulley, 2017). Furthermore, poor comprehenders can have co-occurring difficulties across their two languages. This pattern emerged for children learning disparate languages, such as English and Chinese (Choi, Tong, & Deacon, 2016), and for those learning similar ones, such as English and French (D’Angelo & Chen, 2016). Spencer and Wagner (2016) verified this pattern in their meta-analysis of 16 different studies of poor comprehenders who are second-language learners. At the same time, we bear in mind that these difficulties do not always overlap. Choi et al. (2016), for example, demonstrated that there are children with reading comprehension difficulties that are specific to only one of their two languages.

Another highlight lies in identifying that certain metalinguistic and cognitive skills are crucial to understanding reading comprehension difficulties. One such universal skill is oral language comprehension. Spencer and Wagner’s (2016) meta-analysis demonstrates that oral language deficits are universal to second-language learners with poor reading comprehension. These deficits are also evident in English–French bilingual poor comprehenders who exhibited impairments in English morphological awareness and inferencing (D’Angelo & Chen, 2016). Another potentially universal metalinguistic skill for reading comprehension is syntactic awareness. Cartwright et al. (2017) showed that adult poor comprehenders exhibited difficulties in syntactic awareness relative to good comprehenders, while D’Angelo and Chen (2016) have provided convincing evidence that both bilingual and monolingual poor comprehenders performed worse than average comprehenders on syntactic awareness. Additionally, in a study of Cantonese–English bilingual readers, poor comprehenders with difficulties either in English or Cantonese only had poor Cantonese lexical tone awareness but intact English lexical stress sensitivity. This finding suggests possible cross-language transfer of Cantonese lexical tone to English reading comprehension (Choi et al., 2016). Given that this finding is consistent with a recent study showing the transfer of Chinese lexical tone to English reading comprehension (Choi, Tong, & Cain, 2016), further research is needed to fully examine this psycholinguistic phenomenon.

In terms of language-specific aspects of reading comprehension, this issue highlights that, although certain metalinguistic skills are important for reading comprehension in alphabetic languages, such as English, these skills might not be relevant in non-alphabetic languages, such as Chinese. For example, Cartwright et al. (2017) reported that, while English poor comprehenders exhibited deficits in segmental phonological awareness, poor comprehenders in Chinese showed intact performance in segmental phonological awareness. As such, we need to search for both language-specific and universal mechanisms of poor reading comprehension.

Further understanding of the language-specific aspect of reading comprehension deficits requires new investigations of the association and disassociation between L1 and L2 reading comprehension difficulties among bilingual readers whose L1 and L2 share the same alphabetic or non-alphabetic scripts. Choi et al. (2016) showed that approximately 5% of Chinese–English bilingual readers demonstrated reading comprehension deficits.
in either Chinese or English only, or both. The co-occurrence of L1–L2 reading comprehension difficulties is conceivable given that some cognitive and metalinguistic skills are prerequisite underpinnings of L1 and L2 reading (Geva & Siegel, 2000). According to Choi et al. (2016), the existence of single-language reading comprehension deficits suggests that different linguistic and cognitive abilities may underpin reading comprehension in different languages. However, we also noticed that Chinese and English are on opposite ends of the orthography continuum (alphabetic versus non-alphabetic) and they have strikingly different linguistic and orthographic structures. There are also L2 English learners whose L1s utilise the same alphabetic writing system, such as French and Spanish. Indeed, D’Angelo and Chen (2016) found that English–French bilingual poor comprehenders and English poor comprehenders exhibited similar deficits in oral language skills. D’Angelo and Chen (2016) concluded that there is remarkable similarity in the language profiles of poor comprehenders in their first and second languages. However, the dissociation and association issues were not examined by D’Angelo and Chen (2016). Thus, future research is needed to determine whether the association and dissociation between L1 and L2 reading comprehension difficulties are influenced by the L1–L2 language distance. This line of research would help to clarify the issue regarding universal or language-specific underpinnings of reading comprehension difficulties.

The six articles in this special issue point to new directions for research, with one focusing on evaluating the two most common approaches used for identifying poor comprehenders. The first relies on discrepancies (Cartwright et al., 2017; Choi et al., 2016; Zhang & Shulley, 2017), which selects children who have reading comprehension scores below a cut point and word reading scores above a cut point, both based on standard scores. The second is the regression-based approach, which considers other possible reading-related variables when selecting poor comprehenders (D’Angelo & Chen, 2016; MacKay et al., 2017). One challenge with relying solely on reading comprehension and word reading for discrepancies is that it does not take into account other possible causes of reading comprehension difficulties, such as vocabulary. There is also some variability in precise criteria. As an example, Cartwright et al. (2017) identified poor comprehenders as those scoring one standard deviation below the mean on reading comprehension and matched them on non-word reading and general cognitive ability to the control group. In contrast, Zhang and Shulley (2017) identified poor comprehenders as those scoring above the 40th percentile on word reading fluency and the 25th percentile on reading comprehension. The use of different approaches may result in different types of poor comprehenders. For example, allowing vocabulary to vary (as in Zhang & Shulley, 2017) may result in the identification of a more heterogeneous group of poor comprehenders. This possibility has gained support due to a recent meta-analysis of second-language learners with reading comprehension difficulties (Spencer & Wagner, 2016). As Spencer and Wagner (2016) pointed out, identification approaches may influence the rate at which poor comprehenders are identified, with rates ranging from 0.8% to 22%. This might, in turn, lead to over- or under-identification. More importantly, it is highly likely that poor comprehenders selected with different approaches may have different cognitive and linguistic profiles. Thus, future research investigating a standard approach for selecting poor comprehenders would be beneficial to the field and help to resolve some controversial issues.

Another area for future research lies in examining whether cognitive skills, such as executive functions and working memory, are universal in accounting for reading comprehension difficulties across multiple languages. Upon reviewing these articles, it has become clear that poor comprehenders in English exhibit weaknesses in certain cognitive skills. For
example, Cartwright et al. (2017) showed that adult English poor comprehenders demonstrated significant problems in two specific cognitive flexibility tasks: graphophonological-semantic and syntactic-semantic. Also, Zhang and Shulley (2017) showed that child English poor comprehenders have impaired verbal working memory but have intact non-verbal and phonological short-term memory. As these two studies focused only on poor comprehenders in English, future research may examine these factors in poor comprehenders of other languages. Such work would help clarify whether these cognitive skills are universal indicators of reading comprehension difficulties.

A related area of interest lies in clarifying the shared and unique contribution of cognitive skills, such as cognitive flexibility and specific aspects of metalinguistic awareness, to reading comprehension difficulties. It is widely known that reading comprehension is a complex goal-directed behaviour that involves the coordination of a range of cognitive and metalinguistic skills (Cain, 2010). We also learned from the study by Cartwright et al. (2017) that certain cognitive and metalinguistic awareness skills are interrelated and mutually reinforce each other. For example, in their study, adult English poor comprehenders’ difficulties in cognitive flexibility are not accounted for by graphophonological awareness or syntactic awareness. But the difference between poor and good comprehenders on these metalinguistic awareness tasks was attenuated by cognitive flexibility. In our view, the relationship between cognitive and metalinguistic skills such as executive functions and syntactic awareness is a puzzle to be unravelled. It remains unclear whether the observed deficit in reading comprehension in adults originates from early cognitive skill deficits. New investigations are needed to further disentangle the relationship between cognitive skills and metalinguistic awareness.

Although oral language skill deficits are evident in poor comprehenders across languages, little is known about which aspects of oral language comprehension skills really account for poor reading comprehension. As an example, Mackay et al. (2017) showed that only a specific measure of derivational morphological structure awareness differentiated poor from average comprehenders in English. Interestingly, the picture is much more complex in the study by D’Angelo and Chen (2016). Among English monolingual children, only English vocabulary and English inference sufficiently distinguished poor from average comprehenders. In contrast, among English–French bilingual children, poor and average comprehenders differed in terms of English inference and French semantics and inference, but not in vocabulary, semantics and syntactic awareness. In contrast, Zhang and Shulley (2017) reported that poor English comprehenders (for both English-only and English language learners) exhibited difficulties in vocabulary and all aspects of morphological awareness on an incidental word learning task. Also, poor comprehenders who were English language learners appeared to have more severe difficulties than did English-only learners. However, adult English poor comprehenders showed difficulties in both graphophonemic awareness and syntactic awareness. It seems that oral language weaknesses exhibited by poor comprehenders vary across measures. This was also recognised by Spencer and Wagner (2016), who pointed out that different aspects of oral language measures may vary in their predictive ability. Thus, unpacking the oral language comprehension deficits of poor comprehenders necessitates the use of a wide range of measures for evaluating each aspect of oral language skills, including vocabulary, grammar and pragmatics.

In conclusion, the six articles in this special issue advance our understanding of certain universal and language-specific strengths and weaknesses of poor comprehenders. This issue is fundamental to the development of a universal science of reading. In particular, the inclusion of both monolingual and bilingual poor comprehenders provides a unique...
window into the basic prerequisite underpinnings of rapid reading comprehension development. Ultimately, the challenge is great as a complete understanding of poor comprehenders is incredibly difficult. Thus, these articles remind us that targeted and comprehensive research is required if we are to uncover fully the causes of this late-emerging disorder. We hope this special issue prompts exciting investigations into the nature and causes of reading comprehension difficulties across languages and that it stimulates new research to unravel universal and language-specific underpinnings of reading comprehension difficulties.

References


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