



Review article

The relative contributions of speechreading and vocabulary to deaf and hearing children’s reading ability



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ABSTRACT

Background: Vocabulary knowledge and speechreading are important for deaf children’s reading development but it is unknown whether they are independent predictors of reading ability.

Aims: This study investigated the relationships between reading, speechreading and vocabulary in a large cohort of deaf and hearing children aged 5 to 14 years.

Methods and procedures: 86 severely and profoundly deaf children and 91 hearing children participated in this study. All children completed assessments of reading comprehension, word reading accuracy, speechreading and vocabulary.

Outcomes and results: Regression analyses showed that vocabulary and speechreading accounted for unique variance in both reading accuracy and comprehension for deaf children. For hearing children, vocabulary was an independent predictor of both reading accuracy and comprehension skills but speechreading only accounted for unique variance in reading accuracy.

Conclusions and implications: Speechreading and vocabulary are important for reading development in deaf children. The results are interpreted within the Simple View of Reading framework and the theoretical implications for deaf children’s reading are discussed.

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1. Introduction

Despite having intelligence scores in the normal range, the majority of deaf children have poorer reading outcomes than their hearing peers (e.g. [Conrad, 1979](#); [Kyle & Harris, 2010](#); [Lederberg, Schick, & Spencer, 2013](#); [Wauters, van Bon, & Tellings, 2006](#)). Large scale studies report that deaf school leavers have reading ages far behind their chronological ages (see [Qi & Mitchell, 2011](#) for a review) and reading skills seem to develop at only a third of the rate of hearing children ([Allen, 1986](#); [Kyle & Harris, 2010](#)). There is a consistent picture of underachievement in reading skills which can have long-lasting effects upon future employment opportunities. It is therefore imperative to gain a better understanding of which cognitive and language skills are important for reading development in deaf children and the complex relationships between these abilities. Recent research has suggested that speechreading (silent lipreading) and vocabulary are longitudinal predictors of deaf children's reading development ([Kyle & Harris, 2010, 2011](#)), and that speechreading is also predictive of reading ability in hearing children ([Kyle & Harris, 2011](#)). However, the relative contribution of these two skills to reading is unknown; therefore the main aim of this study is to examine whether speechreading and vocabulary are independent predictors of reading in deaf and in hearing children.

The predictors of reading ability, and the often complex relationships between predictors, are well documented in hearing children. One of the most widely-acknowledged predictors of early reading is phonological knowledge and skills (e.g. [Adams, 1990](#); [Castles & Coltheart, 2004](#)). Children with better phonological awareness (the ability to detect and manipulate the constituent sounds of words) and greater knowledge about the relationships between letters and sounds tend to make the most progress in reading in the early stages (see [Castles & Coltheart, 2004](#); [Goswami & Bryant, 1990](#)). However, it is also well known that different cognitive and language based skills are predictive of different components of the reading process, i.e. letter-sound knowledge and phonological skills are most predictive of word recognition and word reading whereas higher order language skills such as grammar and syntax are most predictive of reading comprehension (see [Catts & Weismer, 2006](#); [Muter, Hulme, Snowling, & Stevenson, 2004](#); [Oakhill, Cain, & Bryant, 2003](#); [Storch & Whitehurst, 2002](#)). Vocabulary is generally thought of as being most important in the beginning stages of reading where it predicts initial word recognition (e.g. [Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003](#); [Verhoeven, van Leeuwe, & Vermeer, 2011](#)) and emerging comprehension skills (e.g. [Anderson & Freebody, 1981](#); [Ricketts, Nation, & Bishop, 2007](#); [Roth, Speece, & Cooper, 2002](#)); however, research suggests that vocabulary knowledge also plays an important role in later reading skills (e.g. [Senechal, Ouellette, & Rodney, 2006](#); [Verhoeven et al., 2011](#)).

The question of whether phonological skills are important, or even necessary, for deaf children's reading skills is a matter of ongoing debate. In summary, the research evidence is very mixed. Some authors find evidence for the role of phonological skills in deaf children's reading (e.g. [Campbell & Wright, 1988](#); [Dyer, MacSweeney, Szczerbinski, Green, & Campbell, 2003](#); [Easterbrooks, Lederberg, Miller, Bergeron, & Connor, 2008](#)) while many others report a very small or non-significant relation (e.g., [Hanson & Fowler, 1987](#); [Kyle & Harris, 2006](#); [Leybaert & Alegria, 1993](#); [Mayberry, del Giudice, & Lieberman, 2011](#); [Miller, 1997](#)). These discrepancies hold true even when traditional phonological awareness assessments are adapted to make them more deaf-friendly, i.e. by representing the items pictorially. A recent meta-analysis of the literature concluded that there was little evidence that deaf individuals use phonology in their reading ([Mayberry et al., 2011](#)). In their analyses [Mayberry et al. \(2011\)](#) included 25 studies that looked at the relation between reading and phonological coding and awareness in deaf individuals, ranging from young children to adults and from across the spectrum of language and communication preferences (sign/speech). The resulting effect sizes for the relationship between reading and phonological awareness ranged from $-.13$ to $.81$ with a mean of $.35$. This means that on average, across the 25 studies, 11% of the variance in reading skills in deaf participants was explained by phonological abilities. This figure refers to the contribution of spoken phonology to reading for deaf participants. It should be noted that signed languages are also phonologically structured, albeit with different parameters (e.g. [Brentari, 1999](#); [Sandler & Lillo-Martin, 2006](#)). [Corina, Hafer, and Welch \(2014\)](#) recently reported a positive correlation between phonological awareness of American Sign Language and phonological awareness of English. Furthermore, [McQuarrie and Abbott \(2013\)](#) reported a correlation of $.47$ between phonological awareness in American Sign Language (ASL) and reading. However, as yet there is no evidence for a direct causal relationship between the knowledge of sign language phonology and reading.

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