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Does early exposure to spoken and sign language affect reading fluency in deaf and hard-of-hearing adult signers?

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Introduction: Early linguistic background, and in particular, access to language, lays the foundation of future reading skills in deaf and hard-of-hearing signers. The current study aims to estimate the impact of two factors – early access to sign and/or spoken language – on reading fluency in deaf and hard-of-hearing adult Russian Sign Language speakers.

Methods: In the eye-tracking experiment, 26 deaf and 14 hard-of-hearing native Russian Sign Language speakers read 144 sentences from the Russian Sentence Corpus. Analysis of global eye-movement trajectories (scanpaths) was used to identify clusters of typical reading trajectories. The role of early access to sign and spoken language as well as vocabulary size as predictors of the more fluent reading pattern was tested.

Results: Hard-of-hearing signers with early access to sign language read more fluently than those who were exposed to sign language later in life or deaf signers without access to speech sounds. No association between early access to spoken language and reading fluency was found.

Discussion: Our results suggest a unique advantage for the hard-of-hearing individuals from having early access to both sign and spoken language and support the existing claims that early exposure to sign language is beneficial not only for deaf but also for hard-of-hearing children.

KEYWORDS

reading fluency, deaf, hard-of-hearing, sign language, multimodal bilingualism, scanpaths, eye movements

1. Introduction

Although able to reach high reading proficiency, deaf readers are on average less skilled than hearing ones (Goldin-Meadow and Mayberry, 2001; Luckner et al., 2005; Kelly and Barac-Cikoj, 2007). Poorer reading in deaf individuals was initially attributed to spoken language phonology deficit (Hanson, 1989), but later research indicated that phonological activation is not necessary for proficient reading (Mayberry et al., 2011; Bélanger et al., 2012, 2013; Clark et al., 2016; Thierfelder et al., 2020; cf. Blythe et al. (2018) arguing for phonological recoding and Yan et al. (2015) as well as Yan et al. (2021) arguing for phonological preview benefit). More recently, reading skills in deaf people have been associated with different social integration background and educational methods, personal cognitive and social strengths (Marschark et al., 2015), exposure to written language (Tomasuolo et al., 2019), silent lipreading (Kyle et al., 2016), and, most importantly, early language development (Padden and Ramsey, 2000; Mayberry, 2007;

