

## Eye-movements during Reading in Children with Hearing Loss

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Learning to read is difficult for children with hearing loss. Being native speakers of a sign language, they effectively read in a foreign language. Moreover, they cannot rely on the phonological codes and must rely exclusively on spelling (Bélanger 2013). At the same time, deaf readers also exhibit some eye movement patterns typical for proficient readers: developed peripheral vision allows them to discern more characters to the right of the current fixation compared to hearing readers (Bélanger 2015). Because of that, children with hearing loss might be able to catch up in reading speed with typically developing hearing children.

This study compares reading patterns between children with hearing loss and typically developing children. We analyzed eye movements while reading in Russian primary school children with (N = 7, Mage = 8.86; data collection is ongoing, target N = 20) and without hearing loss (N=38, Mage=8). Children with hearing loss communicate in Russian Sign Language (RSL) on the daily basis from birth or early age. All children read 33 sentences comprising the child version of the Russian Sentence Corpus (Korneev et al. 2017) and answered two-choice comprehension questions after 10 sentences. Children with hearing loss additionally took part in a vocabulary test and solved Raven's Colored Progressive Matrices.

Children with hearing loss demonstrated significantly lower results in a vocabulary test than their peers without hearing loss. As for Raven's Colored Progressive Matrices, five participants who completed the test had the results within the normative range for their age. In the eye-tracking task, children with hearing loss exhibited many characteristics of more efficient readers most likely due to the more developed peripheral vision and greater parafoveal preview: they had a saccade landing position closer to the center of the word, higher probability of skipping a word and lower probability of fixating a word more than once. They slowed down on longer words less than hearing participants and had shorter single fixation durations and gaze durations (no difference in other duration measures). They also had comparatively high comprehension question response accuracy (87%, compared to 92% in typically developing children).

Eye-tracking results seem to suggest that developed peripheral vision and greater parafoveal preview allow children with hearing loss to catch up in reading speed and even outperform typically developing children. Higher probability of skipping a word and a lower probability of fixating a word more than once characterize children with hearing loss as proficient readers. Low vocabulary level in children with hearing loss may be due to the fact that they read in a foreign language, but low vocabulary does not seem to significantly impair reading in this population.

### References

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