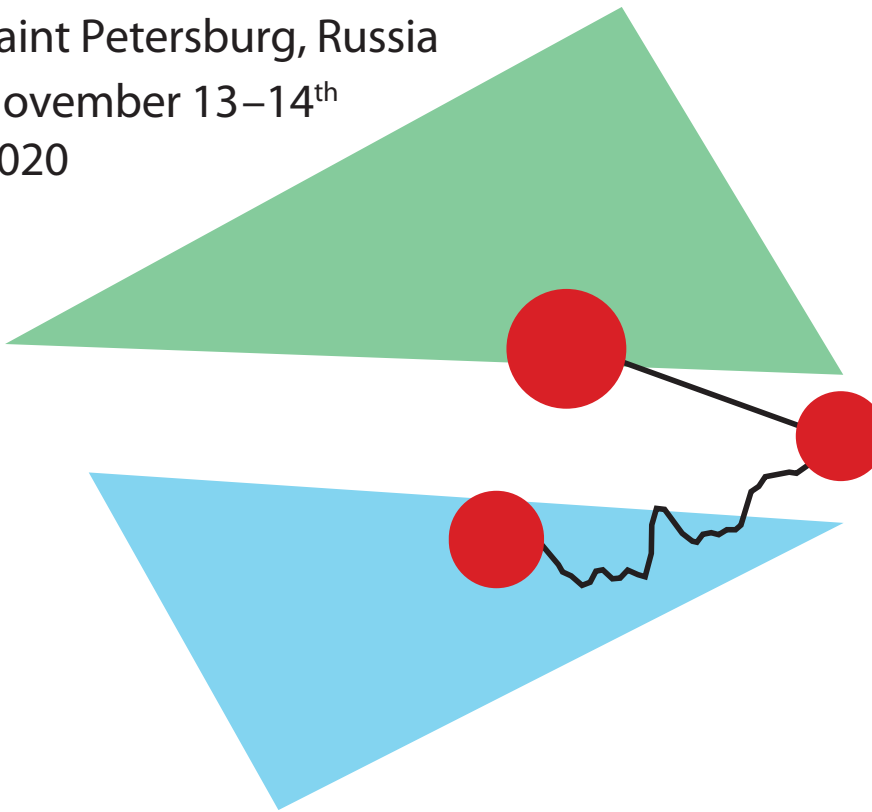
*Proceedings of the 4th International Conference on*

# *NEUROBIOLOGY OF SPEECH AND LANGUAGE*

Saint Petersburg, Russia
November 13–14th
2020



Organised by the Laboratory of
Behavioural Neurodynamics,
Saint Petersburg State University

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# Proceedings of the 4th International Conference on Neurobiology of Speech and Language

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*November, 2020*

**Edited by** Olga Shcherbakova

СКИФИЯ
ПРИНТ

*Saint Petersburg, Russia*

**Neurobiology of Speech and Language**. Proceedings of the 4th International Conference on Neurobiology of Speech and Language / Ed. by O. Shcherbakova.— St. Petersburg: Skifiya-print, 2020.— 76 p.

ISBN 978-5-98620-483-3

**Front cover** by Alexander Kirsanov

**Abstracts' compilation and verification**
by Varvara Averyanova, Ekaterina Blinova

**Management and coordination** by Ekaterina Perikova

Web page: http://cogneuro.spbu.ru

Supported by the grant of the Government of the Russian Federation
№ 14.W03.31.0010 (P.I. Yu. Yu. Shtyrov)

ISBN 978-5-98620-483-3

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**SLIDE SESSION 4**



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effectively. We also found that only the effect of word length was strongly distinguished between children with dyslexia and controls, whereas the effect of the other word properties needs to be investigated further.

This work was supported by the Russian Foundation for Basic Research (research grant № 17-29-09122).

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## Phonological and orthographic processing affect reading fluency in Russian children

Reading, as a complex cognitive skill, implies processing of visual and linguistic information. At early stages of learning to read children rely more on the phonological information, whereas more advanced readers tend to rely more on the orthographic information (Grainger et al., 2012; Ziegler et al., 2014). The aim of the present study is to investigate how phonological and orthographic processing skills as well as age influence reading fluency in Russian-speaking children.

81 Russian monolingual children at the age of 7–12 years (grades 1–5) performed three behavioral tests. First, reading fluency (i.e. the number of words read in one minute) was assessed by the Standardized Assessment of Reading Skills (Kornev, 1997). Second, the level of phonological processing was evaluated by the Changing Sound in a pseudoword test (Dorofeeva et al., 2019), in which the participants were asked to replace a specific phoneme in an auditorily presented pseudoword with another given phoneme. Third, orthographic processing was assessed by the Rapid Automatized Naming of Digits task (RAN; Denckla, Rudel, 1974), in which we recorded the amount of time spent on naming 50 digits.

Linear regression analysis of the data was performed in R (version 4.0.2). We discovered a significant correlation between reading fluency and

all the three predictors: higher phonological awareness speeded up reading ($t = 4.399$, $p < .001$), faster performance in RAN speeded up reading over and above phonological processing ($t = -3.282$, $p = .0016$), older children read faster than younger ones ($t = 4.425$, $p < .001$).

We found that both phonological and orthographic processing skills had an important impact on reading fluency in Cyrillic script for young readers. Crucially, we showed that all the three predictors, i.e. phonological skills, orthographic processing skills, and age separately influenced reading fluency. Therefore, we can conclude that reading development in Russian-speaking children is based on the development of both phonological and orthographic processing.

This work was supported by the Russian Foundation for Basic Research (research grant No 19-313-51014).