Rapid naming skills in monolingual and bilingual children with and without developmental dyslexia

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This study aims at analyzing rapid naming skills in dyslexia and bilingualism, while also addressing the interaction between these two dimensions. Lexical access, typically measured with rapid automatized naming (RAN) tasks in which participants are asked to name as fast and accurately as possible sequences of pictures, colors, digits and letters, is generally found as markedly impaired in developmental dyslexia (Fawcett & Nicolson, 1994; Swan & Goswami, 1997). Consistently, rapid naming skills have been reported as a solid predictor of reading abilities (Kirby et al., 2008; Norton & Wolf, 2012).

Weaknesses in lexical competence are also typically observed in bilingual individuals (Bialystok, 2009; Roberts et al., 2002), although it has been suggested that difficulties are lower with high frequency stimuli and especially with digits and letters, if the bilinguals' vehicular language is tested (Gollan et al., 2005; Wood et al., 2017).

Our study aimed to address the interaction between bilingualism and dyslexia in rapid naming, which has not been tested so far. We developed and administered a task to assess rapid naming abilities in Italian of 111 of 10-year-old children, divided in 4 groups: 24 monolingual dyslexics, 24 bilingual dyslexics, 33 monolingual controls and 30 bilingual controls. All bilinguals had Italian as a L2. The participants' literacy and language skills were assessed. The RAN task comprised 4 subtests assessing rapid naming of colors, digits, letters and pictures.

Data were analyzed using a series of mixed effect models that included accuracy and log-transformed response time as dependent variables. Results showed that dyslexics, both monolingual and bilingual, were slower than controls; interestingly, however, we found a significant interaction between bilingualism and dyslexia in accuracy, with bilingual dyslexics performing more accurately than monolingual dyslexics. A significant effect of task was also found. More particularly, both groups of dyslexics were slower than controls in naming pictures, colors and digits, showing however a similar (ceiling) accuracy with no differences among groups. In letter naming, instead, both groups of dyslexics were less accurate than controls; in addition, besides the fact that dyslexics were slower than controls, we also found that bilinguals were significantly faster than monolinguals, pointing to an advantage of bilingualism that extends to dyslexia as well.

In conclusion, it is confirmed that lexical access is impaired in dyslexia, with dyslexic children being always slower than controls and also less accurate in letter naming. Moreover, no bilingual deficit was reported in this task: bilinguals always performed similarly to monolinguals and they even showed a higher speed in naming letters in their vehicular language. Finally, bilingual dyslexics performed similarly to monolingual dyslexics with digits, colors and pictures, and they were even faster with letters, confirming that bilingualism does not have a negative effect on dyslexia.

References

Bialystok, E. (2009). Bilingualism: The good, the bad, and the indifferent. *Bilingualism: Language and Cognition*, *12*(1), 3–11.

Fawcett, A. J., & Nicolson, R. I. (1994). Naming speed in children with dyslexia. *Journal of Learning Disabilities*, *27*(10), 641–646.

Gollan, T. H., Montoya, R. I., Fennema-Notestine, C., & Morris, S. K. (2005). Bilingualism affects picture naming but not picture classification. *Memory & Cognition*, *33*(7), 1220–1234.

Kirby, J. R., Desrochers, A., Roth, L., & Lai, S. S. V. (2008). Longitudinal predictors of word reading development. *Canadian Psychology/Psychologie Canadienne*, *49*(2), 103–110.

Norton, E. S., & Wolf, M. (2012). Rapid Automatized Naming (RAN) and Reading Fluency: Implications for Understanding and Treatment of Reading Disabilities. *Annual Review of Psychology*, *63*(1), 427–452.

Roberts, P. M., Garcia, L. J., Desrochers, A., & Hernandez, D. (2002). English performance of proficient bilingual adults on the Boston Naming Test. *Aphasiology*, *16*(4–6), 635–645.

Swan, D., & Goswami, U. (1997). Picture Naming Deficits in Developmental Dyslexia: The Phonological Representations Hypothesis. *Brain and Language*, *56*(3), 334–353.

Wood, C. L., Bustamante, K. N., Fitton, L. M., Brown, D. M., & Petscher, Y. (2017). Rapid Automatic Naming Performance of Young Spanish–English Speaking Children. *Languages*, *2*(3), 13.