

Executive Function and Attention Control in Bilingual and Monolingual Children: A Systematic Review

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Abstract : It has been proposed that early bilingual experience confers a number of advantages in the development of executive control mechanisms. Although the literature provides empirical evidence for bilingual benefits, some studies also reported null or mixed results. To make sense of these contradictory findings, the current review synthesizes recent empirical studies investigating bilingual effects on children's executive function and attention control. The publication time of the studies included in the review ranges from 2010 to 2017. The key searching terms are bilingual, bilingualism, children, executive control, executive function, and attention. The key terms were combined within each of the following databases: ERIC (EBSCO), Education Source, PsycINFO, and Social Science Citation Index. Studies involving both children and adults were also included but the analysis was based on the data generated only by the children group. The initial search yielded 137 distinct articles. Twenty-eight studies from 27 articles with a total of 3367 participants were finally included based on the selection criteria. The selective studies were then coded in terms of (a) the setting (i.e., the country where the data was collected), (b) the participants (i.e., age and languages), (c) sample size (i.e., the number of children in each group), (d) cognitive outcomes measured, (e) data collection instruments (i.e., cognitive tasks and tests), and (f) statistic analysis models (e.g., t-test, ANOVA). The results show that the majority of the studies were undertaken in western countries, mainly in the U.S., Canada, and the UK. A variety of languages such as Arabic, French, Dutch, Welsh, German, Spanish, Korean, and Cantonese were involved. In relation to cognitive outcomes, the studies examined children's overall planning and problem-solving abilities, inhibition, cognitive complexity, working memory (WM), and sustained and selective attention. The results indicate that though bilingualism is associated with several cognitive benefits, the advantages seem to be weak, at least, for children. Additionally, the nature of the cognitive measures was found to greatly moderate the results. No significant differences are observed between bilinguals and monolinguals in overall planning and problem-solving ability, indicating that there is no bilingual benefit in the cooperation of executive function components at an early age. In terms of inhibition, the mixed results suggest that bilingual children, especially young children, may have better conceptual inhibition measured in conflict tasks, but not better response inhibition measured by delay tasks. Further, bilingual children showed better inhibitory control to bivalent displays, which resembles the process of maintaining two language systems. The null results were obtained for both cognitive complexity and WM, suggesting no bilingual advantage in these two cognitive components. Finally, findings on children's attention system associate bilingualism with heightened attention control. Together, these findings support the hypothesis of cognitive benefits for bilingual children. Nevertheless, whether these advantages are observable appears to highly depend on the cognitive assessments. Therefore, future research should be more specific about the cognitive outcomes (e.g., the type of inhibition) and should report the validity of the cognitive measures consistently.

Keywords : attention, bilingual advantage, children, executive function

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