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Language balance and switching ability in children acquiring English as a second language

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ABSTRACT

This study investigated whether relative lexical proficiency in Dutch and English in child second language (L2) learners is related to executive functioning. Participants were Dutch primary school pupils of three different age groups (4–5, 8–9, and 11–12 years) who either were enrolled in an early-English schooling program or were age-matched controls not on that early-English program. Participants performed tasks that measured switching, inhibition, and working memory. Early-English program pupils had greater knowledge of English vocabulary and more balanced Dutch–English lexicons. In both groups, lexical balance, a ratio measure obtained by dividing vocabulary scores in English by those in Dutch, was related to switching but not to inhibition or working memory performance. These results show that for children who are learning an L2 in an instructional setting, and for whom managing two languages is not yet an automatized process, language balance may be more important than L2 proficiency in influencing the relation between childhood bilingualism and switching abilities.

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Introduction

Learning two languages instead of one language might affect not only language acquisition and processing but also cognitive development, especially in the domain of executive functions. It has been shown, for instance, that bilingual children outperform monolinguals on tasks requiring cognitive flexibility and inhibition skills (Barac, Moreno, & Bialystok, 2016; Poarch & van Hell, 2012). Here we examined whether the balance in first language (L1) and second language (L2) proficiency in child L2 learners is related to executive functioning.

Executive functioning is an umbrella term for a set of processes that together foster cognitive skills that are needed for goal-directed behavior itself as well as for reflection on one's own behavior (Diamond, 2013). In general, three key processes are identified (Miyake et al., 2000): (a) inhibition, the ability to control one's attention in order to replace preliminary responses by more deliberate ones; (b) switching (or shifting), the process that fosters flexibility and adaptation to changed circumstances, including the ability to behave according to different rules or demands; and (c) verbal and nonverbal working memory, the capacity to hold information in mind and to manipulate it. Executive functions develop during childhood and do not fully mature until early adulthood (Diamond, 2013). The development of executive functions may be positively influenced by different factors, including socioeconomic background, intelligence (Diamond, 2013), and, according to some, bilingualism (Adesope, Lavin, Thompson, & Ungerleider, 2010; Bialystok, 2009).

One of the most widely accepted theories about the relation between bilingualism and cognitive development is the inhibitory control model (Green, 1998). This model proposes that control of the lexico-semantic system is more demanding for bilinguals than for monolinguals because bilinguals need to control two languages that are simultaneously active. Monitoring the competing semantic activation between words requires goal maintenance, conflict monitoring, and, specifically for bilinguals, suppression of interference from the other language. According to this model, dealing with this linguistic competition strengthens bilinguals' linguistic control as well as behavioral-related control processes, in particular executive functions (Green, 1998; Green & Abutalebi, 2013).

Recently, however, the latter has been challenged (de Bruin, Treccani, & Della Sala, 2015; Paap & Greenberg, 2013; Paap, Johnson, & Sawi, 2015). Whereas some studies have failed to find any bilingual advantages in inhibition (Duñabeitia et al., 2014), switching (Paap et al., 2017), working memory (Ratiu & Azuma, 2014), or attentional control mechanisms (Antón et al., 2014; Duñabeitia et al., 2014), others have reported that children growing up bilingually from birth do show more developed inhibitory skills (Barac et al., 2016), conflict resolution (Poarch & van Hell, 2012), working memory (Morales, Calvo, & Bialystok, 2014), and attentional control (Poarch & Bialystok, 2015). These inconclusive findings indicate that it is still not clear which specific bilingual groups show advantages in executive functioning, when such differences manifest themselves, and in which specific components. This study aimed to address all three of these issues.

Executive functioning in L2 learners

Gathercole et al. (2014) presented simultaneous bilingual children and adults with card-sorting and Simon tasks. Participants were either monolingual or bilingual (English dominant, Welsh dominant, or balanced in language use). For kindergartners and primary school children, no general bilingual advantage was found. The authors suggested that for simultaneous bilinguals, language switching may be an automatic and effortless process. They theorized that this may be different for L2 learners (i.e., sequential bilinguals) because linguistic selection requires a greater level of control in this group, which in turn strengthens their executive functions.

Indeed, in contrast to Gathercole et al.'s (2014) findings for early bilinguals, findings with bilinguals who are in the process of learning an L2 indicate that there is a relation between language balance and executive functioning performance (Blom, Küntay, Messer, Verhagen, & Leseman, 2014; Thomas-Sunesson, Hakuta, & Bialystok, 2018). Thomas-Sunesson et al. (2018) suggested that, if we assume that managing ongoing linguistic competition between two languages results in executive functioning benefits, those who are more equally proficient in both languages, and hence have the most experi-