

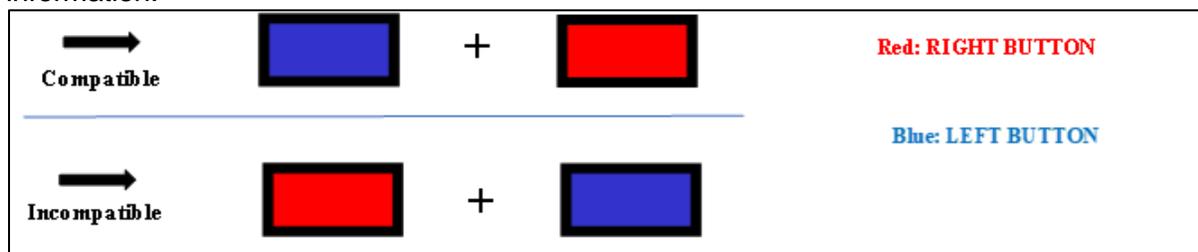
Language control in habitually code-switching bilinguals: Does cognitive control decline with code-switching

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Bilinguals use cognitive control processes to restrict interference and resolve language conflict resulting from the simultaneous activation of both languages (Wu and Thierry, 2010). It is assumed that the constant control for languages enhances the bilinguals' general cognitive control even for non-verbal interference (Bialystok et al., 2009). However, bilinguals from code-switching communities may not control for interference since they use both languages in the same sentence, suggesting that code-switchers may not have enhanced control abilities. In addition, bilingual experience is better determined by both the daily usage of languages and language proficiency. Therefore, in order to untangle the effect of bilingualism from the effect of weaker proficiency, we examine the interaction between the frequency of daily code-switching and proficiency in the non-dominant language (L2 French). 134 Algerian bilinguals who codeswitch between Arabic and French took a language survey to assess code-switching frequency and completed the Simon task to evaluate their ability to control for non-linguistic interference. We examined whether reaction times (RTs) from the Simon trials in a high-monitoring condition (50% congruent-50% incongruent) are modulated by code-switching frequency. If code-switching does not exercise cognitive control, there should not be a difference between bilinguals who code-switch more often and those who rarely code-switch.

Simon task procedure: bilinguals saw a series of boxes on the computer's screen, one box at a time. The boxes varied in color (red or blue) and location (left or right of fixation point). Participants had to respond based on the color of the box disregarding its location, by pressing a button to the left when they saw the blue box, and a button to the right when they saw the red box. Trials were congruent (the stimulus and response locations matched e.g., both left), or incongruent (the stimulus and response locations did not match, e.g., one left and the other right). Differences between RTs to congruent trials versus incongruent trials reflect the ability to inhibit irrelevant information.



As expected, bilinguals responded faster to congruent than to incongruent trials. However, RTs changed over the course of the experiment leading to a smaller Simon effect depending on the bilinguals' level of proficiency in L2 French and on their daily frequency of code-switching. While bilinguals of all proficiency levels became slower over time in the congruent trials, RTs to incongruent trials remained rather stable or numerically slightly faster. However, the interaction between proficiency and the frequency of code-switching showed that the high proficient bilinguals who were also frequently code-switching performed faster over time in the incongruent trials and consequently had the smallest Simon effect. Although high proficiency seems to have a bigger effect, group comparisons showed that high proficiency bilinguals who were not frequently code-switching did not perform differently from low proficient bilinguals who were frequently code-switching suggesting an effect of the frequency of code-switching. The interaction between proficiency and the frequency of code-switching emphasizes the role of code-switching in exercising cognitive control and monitoring abilities in bilingual speakers.