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Influence of Bilingualism in Simple Arithmetic

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It has been widely hypothesized that while doing arithmetic individuals use two distinct routes for phonological output. A direct route requires exact arithmetic which is thought to have been linked to language dependent areas of the brain. In addition, an indirect route thought to be language independent is active during arithmetic approximation that relies on visuo-spatial skills. The arithmetic double route has been incorporated on the triple code model that consists of Visual Arabic code for identifying string of digits, magnitude code for knowledge in numeral quantities, and verbal code for rote arithmetic fact. Our goal is to investigate whether language experience has an effect on the processing of exact/approximation math using bilingual participants who have access to two languages. We will measure the 2 groups monolinguals/bilingual processing speed to complete the 2 tasks Exact/Approximation in 2 codes Arabic digit/Verbal. We hypothesized a faster reaction time in exact arithmetic task in comparison to approximation due to it being language dependent. We expect a positive correlation between self rated language proficiency and exact arithmetic in verbal code. We also expect a main effect for the task Exact vs. Approximation independent of the input code when the stimulus was presented in either Arabic digit and/or verbal codes. Results from this study have implications in understanding the importance of the input code when processing numbers. Further neuroimaging studies need to be compiled to investigate brain activation during simple arithmetic when bilinguals use verbal or Arabic digit coding.