

## **The development of executive functions among preschoolers: A longitudinal study in Arabic**

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**Research topic:** My study deals with the development of the three core components of executive functions (EFs) (i.e., working memory (WM), inhibition, and shifting) and characterizes their precursors among native Arabic-speaking children.

**Why is my study unique?** The links between EFs and academic achievements will be characterized in the very early phases of reading development. This issue has never been addressed longitudinally in Arabic-speaking children. Because of the unique diglossic situation of native Arabic-speaking children and the particular features of this language's writing system, providing new insights into the interplay between EFs and literacy development in diglossic Arabic is a topic of major theoretical and pedagogical interest.

**Analyses and findings:** Thus far, the first two phases (kindergarten and 1<sup>st</sup> grade) of this longitudinal study, which builds on the Safra Center's longitudinal research project, have now been completed. EF measures will again be collected from the same participants by the end of the 2<sup>nd</sup> grade.

A preliminary factor analysis conducted on the children's scores in all EF tests sought to verify to what extent these measures load into the three domains discussed in the literature. This analysis showed that all measures loaded into three factors, with the first clearly tapping WM (25.62% explained variance). The two other factors each added about 12% explained variance, the third clearly tapping inhibition (Table 1).

**Relevance for educational practice.** Building solid knowledge on the interrelationships between the different constructs of EF and assessing their contribution to academic achievement will certainly help initiate intervention programs focusing on fostering EFs and thus literacy development in the critical early phases of reading, writing, and numeracy acquisition.

<i>Measures</i>	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>
<i>Corsi Frog (Fwd)</i>	<b>.67</b>		
<i>Digit Span (Bwd)</i>	<b>.66</b>		
<i>Corsi Frog (Bwd)</i>	<b>.65</b>		
<i>OCTC</i>	<b>.61</b>		
<i>Digit Span (Fwd)</i>		<b>.71</b>	
<i>HTKS</i>		<b>.70</b>	
<i>CSOT</i>		<b>.61</b>	
<i>Stroop RT</i>			<b>.76</b>
<i>Stroop Acc.</i>			<b>.66</b>
<b>Eigenvalue</b>	<b>2.30</b>	<b>1.10</b>	<b>1.06</b>
<b>% of variance</b>	<b>25.62</b>	<b>12.27</b>	<b>11.85</b>

**Table 1:** The result of the factor analysis on EFs.

Abbreviations: ***OCTC*** - Object classification task for children; ***HTKS*** - Head-toes-knees- shoulder; ***CSOT*** - Children's size ordering task; *Stroop Animal (RT effect: RTs to incongruent minus congruent condition)* and *Stroop Animal (Acc. effect: Accuracy in incongruent minus congruent condition)*.