

The relationship between early mathematical and literacy skills among Arabic speaking kindergarten children and their contribution to mathematical and reading achievement in first grade

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Research topic: My research investigates the connection between early literacy skills and numeracy skills in kindergarten and their contribution to academic skills in 1st grade among native Arabic speakers. The specific research questions are:

- 1) Which of the mathematical subskills in preschool best predict early math achievement in school (1st and 2nd grades) among native Arabic speakers?
- 2) What is the connection between early mathematical skills and early language skills in preschool and in 1st grade?
- 3) Which mathematical skills in kindergarten predict reading skills in 1st and 2nd grade?
- 4) Which literacy skills in kindergarten predict mathematical skills in 1st and 2nd grade?

Why is my study unique? To our knowledge, this is the first study on the co-development of early literacy and numeracy skills among native Arabic-speakers.

Analyses and findings: Preliminary Pearson's correlation analyses evaluated the association among kindergarten variables. The results revealed that different early mathematical skills among kindergarteners are related to each other but can be divided into 4 distinct factors.

In the future, I will conduct Structural Equation Modeling (SEM) to evaluate the predictive value of early mathematics skills in understanding outcome variables, including early literacy skills, in kindergarten, and mathematical achievement and reading in 1st grade, after controlling for general covariates (non-verbal IQ and working memory). In addition, a repeated-measures ANOVA will be conducted on the mathematical measures in order to examine the development of these abilities from kindergarten to 1st grade.

Relevance for educational practice: The findings of this study are relevant for the diagnosis of learning difficulties, because understanding the development of mathematical skills can help diagnose mathematical learning disabilities among Arabic speakers in the future as well as help develop intervention programs. The information from this study can also be used as a guide for teachers in their selection of appropriate interventions for children at risk.