

The contribution of handwriting and graphomotor skills to spelling: A longitudinal study from kindergarten to second grade among Hebrew-speaking children

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Research topic: One of the most important foundations for writing and reading proficiency is spelling and the graphomotor skills that underpin accurate, fluent, and legible writing (Bahr, Elaine, Silliman, & Berninger, 2009; Graham, Harris, & Chorzempa, 2002; Pollo, Treiman, & Kessler, 2007). The purpose of the present study is to investigate the links between preschool (kindergarten) handwriting and graphomotor skills and their predictive relationship to 1st and 2nd grade spelling in the Hebrew abjad.

The study poses the following research questions:

- 1) What is the concurrent association between graphomotor measures (orthographic and non-orthographic) and letter knowledge in preschool? We hypothesize that both graphomotor measures will correlate positively with traditional letter knowledge measures in which children are simply asked to identify the name of a printed letter, or to select a named letter from a set of printed letters. However, the relation between orthographic graphomotor measures and letter knowledge will be stronger simply due to the shared orthographic component.
- 2) What is the predictive contribution of preschool handwriting measures (orthographic and non-orthographic) to 1st and 2nd grade spelling performance (spelling production and non-motor spelling choice)? We hypothesize that kindergarten orthographic knowledge will predict both spelling measures owing to the orthographic component. We also hypothesize that pure graphomotor measures will predict later spelling *production* (dictation) due to the common graphomotor component. Uniquely, I also expect to see a contribution of the pure graphomotor measures to the non-motor spelling measure (orthographic choice, owing to the role of motor-kinesthetic information in literacy learning (see Shahar-Yames & Share, 2008).

Why is my study unique? Uniquely, this study aims to isolate the graphomotor aspect of handwriting and spelling (in Hebrew) by comparing spelling outcome measures that do and do not depend on written production.

Analyses currently underway: Over one thousand Hebrew-speaking children have been followed from kindergarten to 1st grade in the Safra longitudinal study. These children have been tested on a variety of measures assessing graphomotor skills (Beery-VMI copying, an invented letter task, pure copying of Chinese characters) and early orthographic knowledge (name writing, letter

retrieval (written production), letter naming, letter recognition, orthographic choice, word-likeness, spelling production (dictation)). Correlations, multiple regression, and Structural Equation Modeling will be used to analyze the data.

Significance of the research and relevance for education: Answers to the questions raised above have significant educational importance, especially for young children for whom multi-sensory teaching methods relying on the motor-kinesthetic component of handwriting are likely to promote spelling skills, particularly in the case of disabled readers/writers. This kind of teaching may be able to provide additional associative links for accurate spelling beyond letter-sound knowledge. Because Hebrew spelling is a particularly challenging activity for young and older children alike, the motor-kinesthetic component might be a crucial factor.