

Orthographic Executive Functions: A Missing Component for Understanding Early Writing Ability in Chinese?

Chinese is one of the most challenging writing systems to learn due to its complex orthographic characteristics. Orthographic knowledge – the understanding of how orthographic units are structurally combined to form characters – is thus an essential foundation for early writing development. However, whether orthographic knowledge alone is sufficient for young children to handle the complexity of Chinese characters remains largely unknown. In this study, a novel concept – orthographic executive functions (EF) – is proposed to represent a crucial yet overlooked cognitive aspect of orthographic competence. We propose that successful young writers not only need to be equipped with orthographic knowledge, but they also need to exercise EF skills for coordinating such a complex system of orthographic knowledge during the process of writing. To test our hypothesis, we will develop tasks to assess four potential types of orthographic EF skills – orthographic working memory, orthographic inhibition control, orthographic cognitive flexibility, and orthographic planning – of 160 kindergarten children aged 4.5 to 6 years. If these EF skills are found to have a unique and significant contribution to children’s word writing ability after controlling for a range of writing-related factors, our findings will provide an important contribution to the theoretical understanding of Chinese early writing development.

Apart from examining the importance of orthographic EF as a unique predictor of word writing, our study also aims to examine how orthographic EF may be related to the ability to copy characters, which is traditionally considered as a necessary pre-requisite for word writing. In this study, a cross-lagged autoregressive model is proposed to systematically examine the development of orthographic knowledge, orthographic EF, and copying ability in relation to each other longitudinally from K2 to K3. Cross-lagged panel analysis will be conducted to clarify whether copying ability indeed has a causal role in facilitating the orthographic components of writing as traditionally assumed. Ultimately, the contribution of the interaction between orthographic EF skills and copying ability to word writing will be studied.

Overall, our findings are expected to provide a comprehensive understanding of the orthographic components of early word writing ability. Practical insights will be provided regarding how these orthographic components could be effectively nurtured in kindergarten children.