

## Investigating the Effect of Orthographic Transparency on Phonological Awareness in Bilingual Children with Dyslexia

**Authors :** Sruthi Raveendran

**Abstract :** Developmental dyslexia, characterized by reading difficulties despite normal intelligence, presents a significant challenge for bilingual children navigating languages with varying degrees of orthographic transparency. This study bridges a critical gap in dyslexia interventions for bilingual populations in India by examining how consistency and predictability of letter-sound relationships in a writing system (orthographic transparency) influence the ability to understand and manipulate the building blocks of sound in language (phonological processing). The study employed a computerized visual rhyme-judgment task with concurrent EEG (electroencephalogram) recording. The task compared reaction times, accuracy of performance, and event-related potential (ERP) components (N170, N400, and LPC) for rhyming and non-rhyming stimuli in two orthographies: English (opaque orthography) and Kannada (transparent orthography). As hypothesized, the results revealed advantages in phonological processing tasks for transparent orthography (Kannada). Children with dyslexia were faster and more accurate when judging rhymes in Kannada compared to English. This suggests that a language with consistent letter-sound relationships (transparent orthography) facilitates processing, especially for tasks that involve manipulating sounds within words (rhyming). Furthermore, brain activity measured by event-related potentials (ERP) showed less effort required for processing words in Kannada, as reflected by smaller N170, N400, and LPC amplitudes. These findings highlight the crucial role of orthographic transparency in optimizing reading performance for bilingual children with dyslexia. These findings emphasize the need for language-specific intervention strategies that consider the unique linguistic characteristics of each language. While acknowledging the complexity of factors influencing dyslexia, this research contributes valuable insights into the impact of orthographic transparency on phonological awareness in bilingual children. This knowledge paves the way for developing tailored interventions that promote linguistic inclusivity and optimize literacy outcomes for children with dyslexia.

**Keywords :** developmental dyslexia, phonological awareness, rhyme judgment, orthographic transparency, Kannada, English, N170, N400, LPC

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