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# Fine-Grained Temporal Measures of RAN Reveal Functional (In)Efficiency in Reading Fluency

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**Abstract**

Rapid Automatized Naming (RAN) is a robust predictor of reading fluency, yet its overall predictive power is typically assessed through global measures that obscure fine-grained cognitive processes. This study examines visuo-verbal coordination using established temporal measures (Eye-Voice Span, Fixation-Speech Interval) alongside two novel metrics: single-item FSI and Disengagement Time (DT). One hundred six children completed reading fluency and phonological awareness tasks (ENI), nonverbal reasoning and vocabulary tests (Shipley-2), plus five adapted RAN templates (visual, semantic, phonological interference; high and low familiarity) while eye movements and speech were recorded simultaneously. Results showed differential sensitivity across templates and measures. The phonological interference template exhibited the strongest associations with temporal measures. FSI emerged as the most consistent reading predictor across conditions, followed by the novel measures. Conversely, EVS showed limited, condition-specific associations. Ultimately, these findings suggest coordination among visual, phonological, and articulatory processes reveals functional limitations underlying both rapid naming and reading fluency.



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