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Phonological Memory and Naming Speed Predict Response to Intervention in Elementary School-Aged Children with Word-level Reading Difficulties

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Abstract

Background: We examined the predictors of response to intervention (RTI) in an individually administered program based on the Orton-Gillingham method. The study used a single-group design with intervention and pre- and post-testing.

Method: Prior to intervention, 50 children with word-level reading difficulties aged 5 to 12 were administered measures of phonological awareness, naming speed, and phonological memory. They also were given, both prior to and following intervention, eight reading and spelling measures.

Results: Participants made significant gains in all reading and spelling measures ($p < .001$). Regression analyses indicated that, after controlling participants' age, number of sessions, and pre-test scores, pre-intervention phonological memory predicted growth in most reading and spelling outcomes (ps ranging from .05 to .001) and naming speed predicted growth in rate, fluency, and sight word efficiency ($ps < .05$).

Conclusion: Phonological awareness did not predict growth in any outcome, suggesting that programs which successfully target it eliminate its predictive power. Weaknesses in phonological memory and naming speed may be preventing some children from benefitting from interventions such as this one. Suggestions for mitigating these effects and implications for future research and interventions are discussed.

Keywords: Dyslexia; Orton-Gillingham; Phonological awareness; Phonological memory; Naming speed; Response to intervention

Introduction

Word-level reading difficulties are experienced by many elementary-school aged children, and when serious and persistent are synonymous with dyslexia [1]. Estimates of the prevalence of dyslexia vary considerably, from 3% to 17%, depending on the criteria employed [1]. In this paper we use the terms word-level reading difficulties or disabilities, and dyslexia interchangeably, referring to children who demonstrate word-level reading and spelling achievement that is well below their age- and grade-level expectations. Many children with dyslexia can benefit from remedial instruction [1], but some may require very extensive and intensive intervention. Because schools often may not have the resources needed, many parents engage the help of private clinics or tutors.

Despite a proliferation of research on the mechanisms that underlie reading impairment in dyslexia, relatively little has focused on predictors of response to intervention (RTI). It is important to understand the characteristics of children who are more or less likely to be successful in given programs, to select children for particular interventions and provide clues about how to improve those programs. We focus on elementary school-aged children in one program based partly on the Orton-Gillingham approach and on three predictors: phonological awareness, naming speed, and phonological memory. We use these to predict improvements in word reading accuracy, fluency, reading comprehension, and spelling. We begin by reviewing research on these predictors, then research on predicting RTI. Lastly, we examine the Orton-Gillingham approach.

Predictors of Reading

The predictors that we focus upon are phonological awareness, naming speed, and phonological memory. Because individual differences in these variables predict reading achievement [1-4], these differences may also explain why some children are slower-responders or non-responders to intervention programs [5,6]. It is important to determine which