Title: Access to a Responsiveness to Intervention Model: Does Beginning Intervention in Kindergarten Matter?

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Background / Context:
Description of prior research and its intellectual context.

Students exhibit risk at different time points and on different dimensions of reading. For example, many students have reading difficulties based on poor letter knowledge or phonemic awareness in kindergarten and would be included in a kindergarten risk sample; however, other students perform adequately on these kindergarten skills and still demonstrate difficulties decoding words in first grade. These students, whose reading difficulties stem from integration of multiple skills, would not be included in the risk pool identified with kindergarten measures; however, they are included in the more fluid, school-developed models of RtI (Marston, Muyskens, Lau, & Canter, 2003; Mellard, McKnight, & Woods, 2009; Tilly, 2003).

Identifying students for Tier 2 in kindergarten provides more opportunity for early intervention before difficulties become severe; however, kindergarten screening tools are less reliable indicators of reading problems than measures of actual reading a year later. The grade at which RtI begins may have implications for how to interpret success rates. If students in kindergarten succeed with intervention, it is not clear if they were really at risk and required intervention or simply less experienced or exposed to key reading skills and simply required a year of general reading instruction. If students are identified only in kindergarten, students whose reading difficulties emerge later may be missed.

Lovett and Steinbach (1997), Rashotte, MacPhee, and Torgesen (2001), and O’Connor et al. (2002) developed and delivered reading intervention to students at three or more grade levels and found no grade-level effect on reading improvement. Conversely, Dion, Brodeur, Gosselin, Campeau, and Fuchs (2010) compared effects of enhanced Tier 1 instruction that began in kindergarten or first grade and found that students benefited more from the earlier start to evidence-based instruction, although the effect was only for the lowest-skilled students. Tier 2 intervention was not part of that study’s design.

Purpose / Objective / Research Question / Focus of Study:
Description of the focus of the research.

The goal of this study was to offer access to intervention—as needed—in kindergarten or first grade, not necessarily to compare the effects of different dosage or duration of ongoing Tier 2 intervention, which has been done in other studies. For struggling students, access to RtI in kindergarten might either eliminate their reading difficulty altogether or reduce the difficulties they experience in first grade.

In particular, the study asks:
(a) Does access to Tier 2 intervention in kindergarten or first grade improve reading outcomes over untreated students at the end of Grade 2?
(b) Do outcomes differ between students who are ELL or native English speakers?
(c) Do placements in special education for students with high-incidence disabilities differ across kindergarten access to RtI, first grade access, and an untreated control group?

**Setting:**
*Description of the research location.*

This study took place in grades K, 1 and 2 of five elementary schools in two school districts in Southern California. Student participants began with three cohorts—kindergarten, first grade, and second grade students—with approximately 410 students in each initial cohort. The schools served children whose free and reduced lunch status ranged from 56% to 95% (California Department of Education, 2008) and many children were learning English (California Department of Education, 2008). With only a few exceptions, the first language for students who were ELLs was Spanish, and the proportion of ELL students ranged from 38.24% to 60.17% across schools.

**Population / Participants / Subjects:**
*Description of the participants in the study: who, how many, key features, or characteristics.*

Students were classified as K access if they (a) were kindergartners in Year 1 and (b) attended one of the three schools where RtI intervention began in K. Students were classified as Grade 1 access if they (a) were first graders in Year 1 and (b) attended one of the three schools where RtI intervention began immediately, or (c) kindergartners in Year 1 and (d) attended one of the two schools where RtI intervention was delayed until first grade. Thus, the K access cohort of students received Tier 2 treatment as kindergartners and/or first and/or second graders, depending on when and for how long their scores indicated risk. The Grade 1 access cohort of students received Tier 2 as needed in first and/or second grade when scores made them eligible.

Of the 819 K–1 students who began the study, 38% of students with K access and 41% with Grade 1 access to RtI had left the study by the end of second grade through attrition (families moving out of the participating school catchment areas), leaving 226 students with K access and 386 students with Grade 1 access to RtI by the end of Grade 2.

Among the final longitudinal sample of students who qualified for and received intervention at some point between kindergarten and second grade, 75 students were from the kindergarten access cohort and 139 were from the first grade access cohort. These students represent 33% and 36%, respectively, of the students available from these two cohorts.

**Intervention / Program / Practice:**
*Description of the intervention, program, or practice, including details of administration and duration.*

The Tier 2 intervention consisted of small group (two or three students) instruction for 20 minutes in kindergarten and 25 to 30 minutes in first and second grade, four times per week. The intervention was offered from September through April of the academic year and delivered by project staff during the regular school day. Students were pulled from their general education
classroom according to classroom schedules such that Tier 2 instruction supplemented, rather than supplanted, English language arts instruction or ELL programming.

Students were provided with Tier 2 intervention as their scores on screening measures indicated risk (i.e., in fall or winter during any grade in which the student had access to the RtI model). In this study, when students scored above the risk cut points for 6 weeks, they returned to Tier 1; however, we monitored their reading growth in Tier 1 and returned them to Tier 2 if they failed to thrive with the general education instruction alone.

Students in the historical control group (n = 391) received no experimenter-designed Tier 2 intervention. We established with school personnel that students would be eligible for any school-based intervention deemed appropriate, including special education and tutoring programs, regardless of experimental condition. However, aside from special education services, no additional interventions were available for second grade historical control students when they were in kindergarten or first grade. In second grade, pull-out remedial services were offered to poor readers in the control in three of the five schools, which consisted of 25–minute small-group (about 6 students) reading instruction 4 days per week from the school’s reading coach using *Reading Mastery II* (Engelmann & Bruner, 1995).

**Research Design:**
*Description of the research design.*

This was a 3-year longitudinal study. Schools in Year 1 were assigned randomly from matched pairs to begin the RtI model in kindergarten or first grade. Students in the five schools who were in second grade in the first year of the study formed our control group. Student outcomes at the end of Grade 2 were compared with those of students in the same schools who were second graders in Year 1, the historical control group.

**Data Collection and Analysis:**
*Description of the methods for collecting and analyzing data.*

For Sample Selection: *Peabody Picture Vocabulary Test–3rd Edition* (PPVT; Dunn & Dunn, 1997) was used to describe receptive language in English for all students. DIBELS subtests in all grades and Word Identification Fluency in grade 1 were used to test students for intervention services and monitor their responsiveness in fall and winter.

Outcome Measures: Outcomes were measured at the end of second grade. DIBELS ORF measures reading rate and accuracy. Subtests of the *Woodcock Reading Mastery Tests–NU* (WRMT; Woodcock, 1998), and the *Gray Oral Reading Test–4* (GORT-4; Wiederholt & Bryant, 2001) were used as outcome measures at the end of second grade.

Fidelity was monitored through daily activity logs. Average fidelity ratings were above 89 percent for all grade-specific curricula.

The team could not use a growth model because the historical control group had only grade 2 data while the treatment group had K, 1 and 2 data. It used MANOVA on beginning and end of Grade 1 reading achievement for students at risk, using access to Tier 2 intervention in K or
Grade 1 as the between variable. To test for second grade effects of K or Grade 1 access to RtI, MANOVAs followed by pairwise comparisons (using Bonferroni adjustments) were conducted between students at risk in each of the two treated samples and the historical Grade 2 control.

Findings / Results:
Description of the main findings with specific details.

Our Tier 2 sample received intervention as needed (approximately the lowest 25% at each measurement cycle), but only about 12% of the sample participated in Tier 2 continuously during the 2 or 3 years they had access to the RtI model.

Beginning in K gave students a boost that lasted through the beginning of Grade 2, but this advantage diminished between the treated samples over the second grade year. At the end of first grade, K access to Tier 2 improved reading outcomes over Grade 1 access by over one third of a standard deviation on the WRMT. By the end of second grade, the difference because of K access was less than one fourth of a standard deviation and was no longer significant.

In the K access cohort, 45% of students who received Tier 2 met exit criteria by the end of second grade, compared to 26% of students with Grade 1 access. Of the students identified as at risk at the beginning of Grade 2 in the historical control, only 2% met the exit criteria at the end of the year. These statistics suggest that earlier intervention shrinks the proportion of students who remain in high-risk groups for reading difficulties.

The most dramatic comparison between the K and Grade 1 cohorts is the number of students who were found at risk for RD for the first time in second grade. A total of 62 children from the Grade 1 cohort who did not meet criteria in first grade were eligible for Tier 2 by the beginning of second grade; these students’ scores were above the cut points for Tier 2 intervention at all time points across Grades K–1. By contrast, only 13 students from the K cohort qualified for the first time in second grade.

Conclusions:
Description of conclusions, recommendations, and limitations based on findings.

Two limitations are of note. First, Kindergarten measures are less reliable indicators of reading risk than are measures in first grade (L. S. Fuchs, 2003; O’Connor & Jenkins, 1999; Speece, 2005). Because we worked with the most severely at-risk students, the problem of overidentification was minimized.

Although the teachers were mainly the same across all three cohorts, the effects reported here may be in part the result of a systemic change in teachers’ awareness of reading difficulties in participating schools, which could also account for the differences between students’ reading ability in special education in the cohorts with and without access to RtI. This possibility warrants further research attention.
Appendix A. References


