Does the Response to Intervention Approach Improve Academic and Disability Outcomes?

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Background

- Response to Intervention (RTI) is a multi-step approach to providing early and progressively intensive intervention and monitoring within the general education setting:
  1. Research-based instruction and behavioral support
  2. Screening of all students to identify those who may need systematic progress monitoring, intervention, or support
- In 2006, the Individuals with Disabilities Education Act required states to use the RTI approach to identify and serve children with disabilities.
- No research has evaluated RTI on a national scale.

Objective

This study investigates the impacts of the RTI approach on children's disability status and academic outcomes in a nationally representative sample as schools adopted RTI between kindergarten and fourth grade.

RQ: In elementary school, does the RTI relate to children's academic outcomes and disability status?

Data

Early Childhood Longitudinal Study-Kindergarten, a nationally representative sample of 12,615 children followed from fall kindergarten to fourth grade in the United States in 2011.

Policy variable:

- RTI implementation derived from the school administrator's survey ("Does school currently use RTI?") in spring of first, second, third, and fourth grade waves.

Outcome variables:

- Direct assessments of mathematics & reading skills (IRT scale scores), collected at each wave.
- Disability status is a composite variable coded 1 if the parent answered "yes" to at least one of the questions about diagnosis (indicating a diagnosis of a problem was obtained) or therapy services (indicating the child received services) and the questions about the specific diagnoses, collected at all spring waves.

Control variables:

- Time-varying individual-level data (e.g., age) from the classroom teacher questionnaire and the parent questionnaire, and school-level data (e.g., school size) from the school administrator questionnaire.

Analysis sample:

- Restricted the analytic sample to students not in private schools and no missing values in dependent and independent variables and applied sample weights at 4th grade.

Table 1. Regression Results of RTI on Children with Disability and Academic Outcomes

	Response to intervention used	
	Model 1	Model 2
Dependent variable		
Child identified with disability	-0.03*** (-0.01)	-0.03*** (-0.01)
Math Outcomes	-0.01 (-0.01)	0.01 (-0.01)
Reading Outcomes	-0.01 (-0.01)	-0.02 (-0.01)
Child level controls	no	yes
School level controls	no	yes
Sample weight at 1st grade	yes	yes
Child observations	10470	9014
Total observations	40586	30048

Notes: Math and readings scores are standardized. Robust Huber-White standard errors adjusted for clustering are in parentheses.
*p<.05. **<.01. ***<.001.

Table 2. School-level descriptive statistics at spring of first grade by RTI status

	RTI schools		Non-RTI schools		
	Mean	SD	Mean	SD	p-value of difference
School Location					
Rural	0.21		0.15		0.04*
City	0.34		0.51		-0.06*
Urban	0.07		0.06		-0.01
Suburb	0.39		0.27		0.04*
School and District characteristics					
District poverty level	20.64	(0.39)	21.66	(0.99)	-0.00
School Size >500 students enrolled	0.59		0.53		0.13***
School received Title 1 funds	0.73		0.69		0.05
School provided ESL services	0.51		0.31		0.13***
Percentage of students receiving 504 Plan	0.73	(0.06)	0.67	(0.16)	0.01
Percentage of students receiving free and reduced-price meals >75%	0.23		0.27		0.08*
Percentage of students non-white > 75%	0.21		0.19		0.01
Percentage of students in special ed. > 10%	0.26		0.27		0.09**
Observations	811		131		

Notes: p-values represent the level of significance calculated from a series of t-tests comparing the mean values of each variable listed between the analysis non-RTI and the RtI sample schools. The sample schools were adjusted by using primary sample unit at fourth grade from the ECLS-K. All variables are dichotomous except for the district poverty level and percentage of students receiving a 504 Plan.

Research Method

The study uses a child fixed effect model to exploit two different sources of variation:

1. There exists within-school variation, as not all schools implemented RtI between kindergarten and fourth grade, so children from different schools are subjected to different approaches (i.e., RTI and non-RTI schools).
2. The variation within children across time as policies changed, leaving some children exposed to RtI but others not (i.e., some schools implemented RTI earlier than others, leaving some children unaffected by RTI at these schools in the earlier years).

- Child fixed effects accounts for unobserved time-invariant child factors that are correlated with child outcomes and the adoption of RTI.
  - Included time-varying child- and school-level controls to check the robustness of results.

Conclusions and Implications

- Children exposed to RTI are 3 percentage points less likely to be identified with a disability by the end of fourth grade than children not exposed to RTI.
- RTI did not influence children's academic achievement in math or reading.
- RTI did positively impact children's math achievement for children with disability in early childhood (i.e., kindergarten and 1st grade)
- RTI did not impact children's math and reading outcomes when math- and reading-specific RTI treatments were included as the key independent variables.
- The study provides the first evidence of larger scale evaluations to inform the national trend of schools using RTI to improve student outcomes.
- The findings for the effect of RTI on disability status provide insights about the important function of implementing the RTI as a means to reduce misidentification of disability.
- The results for RTI on disability status might also indicate that the implementation of RTI is overall effective
  - i.e., once children were identified as disabled and received services, the number of children with disabilities decreased in RTI schools compared to non-RTI schools by the end of fourth grade.

Acknowledgements

The authors thank Greg Duncan, Carol Connor, and Elizbeth Peña for their helpful comments on this project.