Efficacy of the *Responsive Classroom* Approach: Results from a Three Year, Longitudinal Randomized Control Trial

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Background / Context:

Elementary school classroom are inherently social. Teachers interact with students and students relate socially with their peers as a normal course of learning and social development. Despite the social nature of student learning and the classroom experience, the explicit objective of schools is to enhance academic achievement, not necessarily strengthen students' social and emotional skills. Surprisingly, most teacher education programs spend little to no time focused on teachers' relational skills, despite research on teachers' sensitive and responsive relationships with students (Roorda, Koomen, Spilt, & Oort, 2011). Most teachers leave their teacher preparation program feeling unprepared in classroom management (van Tartwijk & Hammerness, 2011). As a result, many teachers struggle in their efforts to facilitate effective communication and interactions within their classroom, resulting in behavior problems, disengagement, and reduced student achievement.

Social and Emotional Learning (SEL) interventions have been developed to structure social interactions within classroom and teach students social and emotional skills designed to promote academic learning in school and beyond (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Universal school-based efforts that teachers deliver to their students in classrooms represent the most prevalent type of SEL intervention. The purpose of SEL interventions is to boost social and emotional school competencies to help students perform well in educational settings (Zins & Elias, 2006).

Despite the prevalence of SEL interventions and increased research on those interventions (e.g., Durlak, et al., 2011), surprisingly few have been subject to rigorous randomized controlled efficacy trials examining their impact on student achievement. As a result, policy-makers and school decision makers are left with too little information upon which to make decisions. On the forefront of the minds of many decision-makers is the question: Will we diminish children's academic achievement if we place increased emphasis (and allocate more time toward) children's social and emotional learning? This question is worth asking. Classroom research suggests that prioritizing nurturance at the expense of academic learning does not create the academic press necessary to produce children's achievement outcomes (Lee & Smith, 1999; Shouse, 1996). Further, recent work calls into question the assumption that improved social skills cross over to benefit academic skills (Duncan et al., 2007). As a result, we turn attention toward the *Responsive Classroom® (RC)* approach, an SEL intervention used by more than 90,000 teachers nation-wide. The *RC* approach is designed to create classroom environments that are more community-oriented, productive, and academically engaging, thus emphasizing both social and academic learning. The operational logic model, depicted in Figure 1, describes how the presence of training and coaching in the *RC* approach may lead to teachers' use of more *RC* practices, enhanced teacher emotional support and classroom organization, improved student motivation and engagement, and ultimately, gains in student achievement.

Purpose:

The purpose of this paper is to describe the main findings from an IES-funded randomized controlled trial (RCT) of the *RC* approach, a social and emotional learning intervention designed to improve the capacity of teachers to create caring, well-organized classroom environments to support social and academic learning. Three questions were addressed using a longitudinal design. First, what is the impact of the *RC* approach on student achievement over three years? Second, to what degree does teachers' fidelity of implementation (in third, fourth, and fifth grade) mediate the relation between assignment to the *RC* condition and fifth grade achievement? Third, to what extent is the fidelity of implementation mediation

relation between *RC* condition and fifth grade achievement different for children who qualify for free and reduced lunch (FRPL) compared to those who do not.

Setting

        This study included 24 elementary schools in an ethnically and socioeconomically diverse school district. District policy required all elementary schools to select an approach to foster social and emotional learning. Schools were ethnically diverse (43% Caucasian, 17% Asian, 11% Black, 24% Hispanic, 7% Other); 26.21% of students qualified for FRPL.

Participants

        Twenty-four schools were selected based on demonstrated interest in the *RC* approach. Schools were stratified on percent of students eligible for FRPL and racial/ethnic composition and randomized into intervention (n=13) and waitlist control (n=11) conditions.

        Student participants were followed longitudinally from the end of second grade to the spring of fifth grade. The analysis sample was comprised of 2904 students (1467 intervention and 1437 control). The two groups were equivalent in gender, FRPL eligibility (31% in intervention, 24% in control). The third, fourth, and fifth grade teachers of the student cohort were invited to participate (95% response rate). In total, 351 teachers participated. Analyses here were limited to those with classroom observation data, yielding a total of 265 teachers. Teachers were mostly female (92%) and were, on average, 41 years old with 11 years of teaching experience; 66% held Master's degrees. Teachers were primarily Caucasian (84%), but included 4% African American, 4% Hispanic, 3% Asian American teachers, 5% other. Teachers taught third ($n = 92$), fourth ($n = 88$), and fifth ($n = 85$) grade.

Intervention / Program / Practice:

        The *RC* approach represents an example of a teacher capacity-building intervention designed to provide teachers with the skills to create a caring, well-managed classroom environment to enhance students' social and emotional learning. The *RC* approach consists of seven principles and ten practices to integrate social and academic learning and teach social skills (NEFC, 2007). Examples of principles include "The social curriculum is as important as the academic curriculum;" and "To be successful academically and socially, children need a set of social skills: cooperation, assertion, responsibility, empathy, and self-control (NEFC, 2007)." Ten practices emanate from these principles. *Morning Meeting* is a daily meeting that involves a greeting to each child and teacher, an activity designed to be fun and engaging, an opportunity for a few children to share about themselves, and an interactive news and announcement chart. *Rule Creation* refers to a process of collaboration between the teacher and student to create classroom rules to be followed throughout the year. *Academic Choice* encourages teachers to provide a structured format that allows student choice in academic work. Other *RC* practices include *Interactive Modeling, Positive Teacher Language, Logical Consequences, Guided Discovery, Classroom Organization, Working with Families,* and *Collaborative Problem Solving*, as described at www.responsiveclassroom.org.

        Research Design

        The study was a longitudinal randomized controlled trial with randomization at the school-level. Intervention schools were trained in the *RC* approach. Teachers in the control group did not receive *RC* training and continued with "business as usual" approaches. Interviews and questionnaires assessed "business as usual."

Intervention Training

        Teachers in the intervention condition received training in the *RC* approach, involving two one-week long training sessions, *RC* 1 and *RC* 2, delivered in consecutive summers.

Teachers received three days of school-based coaching during each school year, *RC* books and materials, on-demand support from coaches, and timely articles on the *RC* website. School administrators at intervention schools received training and coaching.

Data Collection and Analysis

In November, 2008, schools were recruited and randomized into intervention and control conditions. In Spring, 2008, the Stanford 10 math test was administered to all second graders.

Classroom observations and teacher questionnaires were conducted in 2008-2009 for third grade teachers, 2009-2010 for fourth grade teachers, and 2010-2011 for fifth grade teachers. Five classroom observations were conducted for each teacher to measure fidelity of implementation. For each teacher, two observations were conducted during the first hour in the morning and three observations were conducted for one hour during math lessons. Research assistants rated fidelity of implementation systematically for the full 60-minute observations.

Each April, teachers were surveyed to gather further information on fidelity of implementation, teachers' years of experience, teachers' level of education, perception of their efficacy (in relation to math and instruction generally) and mathematics content knowledge.

In Spring, 2011, all fifth grade students were administered the fifth grade state standardized test, the Standards of Learning (Virginia Department of Education, 2010).

Measures

Assignment to intervention versus control condition was the key independent variable. Fidelity of implementation, aggregated to the school level, was assessed as a potential mediator. Student math and reading achievement in fifth grade was assessed as the outcome variable. Students' FRPL status was included to test for moderated mediation. Analyses included child level covariates (i.e., baseline student achievement, student demographic characteristics (ELL status, gender, FRPL, ethnicity), and test form (plain English); teacher-level covariates (years of experience, level of education, personal math teaching efficacy, mathematics content knowledge, and teachers' instructional efficacy; and school level covariates (FRPL composition, school level achievement at baseline). Measures for covariates are omitted here for brevity.

Fidelity of implementation. All three fidelity measures avoided *RC* terminology to allow use in intervention and control classrooms. The Classroom Practices Observation Measure (CPOM; alpha = .88) was used to measure observed intervention adherence (citation omitted). The 16 CPOM items were coded live using a three-point likert scale. To measure teacher-reported implementation, the *Classroom Practices Teacher Survey* (omitted; [CPTS]) was used. The CPTS is a 46-item teacher-reported measure of adherence to *RC* practices (α = .91) on a 1 (*not at all*) to 5 (*extremely characteristic*) scale. The *Classroom Practices Frequency Survey* (omitted; [CPFS]) is an 11-item survey [α = .89] measuring teachers' frequency (dosage) of *RC* practices on a 1 (*almost never)* to 8 (*more than once a day)* scale.

Student achievement. To measure fifth grade mathematics and reading achievement, the paper version of the state standardized test, the Standard of Learning (SOL), was used in May of students' fifth grade year (VDOE, 2008, 2010). Number of items correct was summed and converted to a scale score ranging from 0 to 600. Students deemed not proficient in English were administered the Plain English form that equated to the standard math assessment.

Student demographic characteristics. FRPL (1=yes) was defined as $40,793 for a family of four, roughly below 180% of the federal poverty guideline.

Analytic Approach

See Tables 1 and 2 for descriptive information on student and school participants and Tables 3 and 4 for correlation coefficients for each pair of variables. We used Structural

Equation Modeling (SEM) to test the a) main effect of treatment on outcomes, b) the mediated effect of treatment on outcomes through fidelity, and c) the potential of mediated moderation, examining the extent to which the mediated effect of treatment on outcomes through fidelity is comparable regardless of students' eligibility for FRPL. Analyses were done in Mplus 6.12 (Muthén & Muthén, 1998-2010) using a maximum likelihood estimator with TYPE=COMPLEX to control for clustering. Clustering was conducted at the school level, corresponding to the level of randomization.

Findings / Results:

Pertaining to research question 1 examining the impact of the *RC* approach, treatment was not significantly related to either fifth grade math or reading achievement. The models accounted for a substantial portion of the variance in the outcomes with an R^2 of .36 for fifth grade math achievement and an R^2 of .47 for reading achievement. See Table 5.

Research question 2 examines fidelity of implementation as a potential mediator of the relation between treatment and outcomes. Treatment predicted fidelity of implementation (β = 0.87, *p*<.01). Fidelity was positively related to fifth grade math and reading (β = .21, *p*<.05; β = .26, *p*<.01; respectively). Treatment related negatively to fifth grade math and reading achievement (β = -.23, *p*<.01; β = -.24, *p*<.01; respectively). The overall test of the indirect effects of treatment, through fidelity, indicated positive statistically significant relations with fifth grade math and reading achievement (β = .18, *p*<.05; β = .22, *p*<.01; respectively). Total effects (indirect effects of treatment plus the direct effect of treatments) were small and non-significant for both outcomes. See Table 6.

Question three examines student eligibility for FRPL as a potential moderator of the meditational relation between training in the *RC* approach, fidelity, and achievement. We used two SEM models to answer the question whether the relations between fidelity, treatment, and outcomes differed for those students eligible for FRPL versus those not eligible. Models tested the interaction between FRPL and treatment status and FRPL and fidelity. Interaction paths were not significant for math or reading.

Conclusions:

First, comparison of intervention and control conditions showed no impact of the *RC* approach on students' reading and math achievement over three years (from third to fifth grade). Random assignment to the *RC* versus control condition was neither beneficial nor iatrogenic to school achievement. Second, findings show a significant indirect effect; teachers' use of *RC* practices mediated a positive relation between assignment to the *RC* approach and achievement outcomes (effect size = .21 for math, .28 for reading). The contribution of the *RC* approach becomes evident in conditions when teachers demonstrate uptake of the intervention, as evidenced by the meditational role of fidelity of implementation. Third, the mediation findings were comparable regardless of whether or not students qualified for FRPL.

The findings have implications for future work. First, although we cannot state causality, the *RC* approach predicts positive achievement outcomes when practices are administered with fidelity. Research on SEL interventions points to the importance of school-level processes (e.g., principal buy-in) and coaching as predictors of fidelity (Wanless, et al, in press) warranting attention to these school contextual issues as part of the implementation process. Second, work is needed that examines the contribution of the *RC* approach on social and behavioral outcomes that are more closely aligned to the intervention itself. Findings will be discussed in relation to the challenges and opportunities associated with taking SEL interventions to scale.

Appendices
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Appendix B. Tables and Figures

Table 1

Descriptive statistics of variables at the child level (n=2904)

Variable	Treatment (*n*=1467)			Control (*n*=1437)		
	%	*M*	*SD*	*%*	*M*	*SD*
5th Math		526.310	74.326		534.450	67.991
5th Reading		492.300	64.843		501.210	62.706
Stanford 10		579.310	46.032		584.630	41.998
ELL Status		0.991	1.505		0.793	1.353
Female	51			47		
FRPL Status	31			24		

Table 2

Descriptive statistics of variables at the school level (n=24)

Variable	Treatment (*n*=13)			Control (*n*=11)		
	%	*M*	*SD*	*%*	*M*	*SD*
Observed Fidelity (CPOM)		1.744	0.090		1.298	0.137
Self-Report Adherence (CPTS)		3.990	0.241		3.176	0.271
Self-Report Frequency (CPFS)		2.327	0.355		1.573	0.232
Teacher Years Experience		10.395	3.807		11.748	4.017
Teacher with MS degrees	67			65		
Mathematics Teaching Efficacy		3.438	0.223		3.446	0.159
Mathematics Content Knowledge		0.020	0.396		0.082	0.290
Instructional Efficacy		4.218	0.242		4.245	0.165
FRPL (School Level)	38.64			29.59		

Table 3

Correlations of variables at the child level (n=2904)

Variable	5th Math	(A)	(B)	(C)	(D)	(E)
5th Reading (A)	0.556**					
Stanford 10 (B)	0.522**	0.581**				
ELL Status (C)	-0.329**	-0.442**	-0.456**			
Female (D)	0.027	0.051*	-0.054*	-0.055**		
FRPL (E)	-0.268**	-0.363**	-0.386**	0.459**	0.008	
Plain English	-0.280**	-0.172**	-0.167**	0.264**	-0.051**	0.105**

*p<.05, **p<.01

Table 4

Correlations and descriptive statistics of variables at the school level (n=24)

Variable Name	5th Math	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
5th Reading (A)	0.528**									
Treatment (B)	-0.271	-0.174								
Fidelity (C)	-0.251	-0.210	0.908**							
Years Experience (D)	0.324	0.088	0.178	-0.294						
% Masters degrees (E)	-0.377	-0.218	0.106	0.136	-0.239					
Mathematics Teaching Efficacy (F)	-0.161	NA	-0.019	0.049	0.166	0.376				
Mathematics Content Knowledge (G)	-0.007	NA	-0.092	-0.013	-0.164	0.164	0.059			
Instructional Efficacy (H)	NA	0.069	-0.066	-0.084	0.305	-0.042	0.418*	-0.289		
School Level FRPL (I)	-0.654**	-0.885**	0.185	0.346	-0.139	0.265	0.364	-0.172	0.040	
School Level Stanford 10	0.504*	0.784**	-0.183	-0.286	0.142	-0.202	-0.265	-0.236	0.250	-0.747**

*$p<.05$, **$p<.01$

Table 5

Main effect model of treatment on 5th grade math and reading achievement

Variable Name	Math Achievement			Reading Achievement		
	B	SE	β	B	SE	β
Child Level						
Stanford 10	1.196**	0.109	0.551	0.773**	0.048	0.486
ELL Status	-1.454	1.946	-0.022	-7.887**	1.484	-0.159
Gender (Female)	14.137**	4.447	0.073	14.511**	2.898	0.102
FRPL	-12.765**	4.649	-0.059	-13.125**	3.776	-0.083
Plain English Test	-44.707**	11.705	-0.083	-29.758**	9.338	-0.075
School Level						
Treatment Status	-7.571	5.639	-0.039	-2.492	4.600	-0.018
Years of Experience	0.992	1.063	0.037	-0.355	0.551	-0.018
% with Masters Degrees	2.654	23.111	0.004	-5.043	16.494	-0.010
% FRPL (school level)	-0.235	0.175	-0.057	-0.302*	0.136	-0.099
Stanford 10 (school level)	-1.213**	0.367	-0.201	0.000	0.225	0.000
Personal Math Teaching Efficacy	-22.679	14.174	-0.046	NA	NA	NA
Mathematics Content Knowledge	0.963	9.187	0.003	NA	NA	NA
Instructional Efficacy	NA	NA	NA	-4.473	8.670	-0.013

Note. Intraclass correlations for schools were .04 and .14 for fifth grade math and reading achievement respectively. R^2 =0.341 for math achievement. R^2= 0.474 for reading achievement.
*p<.05, ** p<.01

Table 6

Mediation model of treatment on 5th grade math and reading achievement through Fidelity

Variable Name	Math Achievement			Reading Achievement		
	B	SE	β	B	SE	β
Child Level						
Stanford 10	1.184**	0.107	0.547	0.756**	0.046	0.476
ELL Status	-1.488	1.970	-0.022	-7.896**	1.454	-0.160
Gender (Female)	13.413**	4.396	0.070	13.696**	2.947	0.097
FRPL	-13.155**	4.763	-0.061	-13.640**	3.777	-0.086
Plain English Test	-43.666**	11.756	-0.081	-29.355**	9.486	-0.074
School Level						
Treatment Status	-43.224*	17.984	-0.225	-34.277**	7.792	-0.242
Fidelity	19.651*	9.584	0.209	18.398**	3.723	0.257
Years of Experience	1.584	0.944	0.059	0.225	0.513	0.011
% of Masters Degrees	13.263	22.718	0.020	0.412	14.402	0.001
% FRPL (school level)	-0.464*	0.186	-0.112	-0.485**	0.107	-0.159
Stanford 10 (school level)	-1.363	0.329	-0.226	-0.078	0.176	-0.018
Personal Math Teaching Efficacy	-24.338*	11.817	-0.049	NA	NA	NA
Math Teaching Knowledge (MKT)	-4.813	11.049	-0.016	NA	NA	NA
Teacher Instructional Strategies	NA	NA	NA	-1.230	6.285	-0.004
Predictors of Fidelity						
Treatment Status	1.779**	0.135	0.872	1.702**	0.165	0.860
Years of Experience	-0.034**	0.011	-0.119	-0.035**	0.012	-0.126
% of Masters Degrees	-0.525	0.372	-0.074	-0.231	0.359	-0.033
% FRPL (school level)	0.011**	0.004	0.256	0.010*	0.004	0.224
Stanford 10 (school level)	0.008	0.005	0.130	0.005	0.006	0.077
Personal Math Teaching Efficacy	0.165	0.353	0.103	NA	NA	NA
Mathematics Content Knowledge	0.322	0.207	0.031	NA	NA	NA
Teacher Instructional Strategies	NA	NA	NA	-0.159	0.289	-0.034
Treatment -> Fidelity -> Math	34.960*	16.965	0.182	31.308**	8.738	0.221

Note. R^2 = .891 for Fidelity of implementation. R^2 =0.341 for Math achievement. R^2= 0.455 for Reading achievement. *p*<.05, ** *p*<.01

Figure 1. Logic Model for Explaining the Potential Impact of the *Responsive Classroom* approach on Teacher Emotional Support and Classroom Organization, Student Motivation and Engagement and Student Outcomes

Intervention Components		Intervention Outcomes		
Training	Predictors	Proximal Outcomes		Distal Outcomes
Training and Coaching in the *RC* approach	Use of *RC* Practices in Classrooms	Enhanced Teacher Emotional Support and Classroom Organization	Increased Student Motivation and Engagement	Improved Student Achievement