

Abstract Title Page
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Title: Testing causal impacts of a school-based SEL intervention using Instrumental Variable techniques

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Abstract Body

Limit 4 pages single-spaced.

Background / Context:

Description of prior research and its intellectual context.

Children's social-emotional skills, such as conflict resolution and emotion regulation, have been linked to a number of highly regarded academic and social outcomes (e.g., Graziano, Reavis, Keane, & Calkins, 2007; Trentacosta & Shaw, 2009). The rich body of research linking social-emotional skills and children's positive outcomes has spurred the design of numerous school-based interventions aimed at building those skills (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Rigorous evaluations of those interventions typically test direct impacts on children's outcomes. But the intervening mechanisms whereby interventions drive changes in learning environments—and ultimately in children's skills—remain largely unexplored, particularly with techniques that support causal conclusions. A better understanding of the processes mediating the impacts of interventions on children's learning environments would inform the design of more fine-tuned and cost-effective interventions.

Purpose / Objective / Research Question / Focus of Study:

Description of the focus of the research.

The current study presents preliminary results from a causal test of the theory of change of RULER, a universal school-based approach to social and emotional learning (SEL) (Brackett et al., 2011). Specifically, we examine RULER impacts on the quality of classroom climates, the hypothesized setting-level mediating mechanism linking RULER to improved student outcomes. These analyses will provide a more precise understanding of the pathways through which RULER, a specific SEL program, contributes to children's positive development, and will also expand our understanding of the intervening mechanisms underlying effective educational interventions more generally.

Setting:

Description of the research location.

Data for this study come from the first randomized control trial (RCT) of The RULER Approach. The RCT took place in 62 primary schools in the Roman Catholic Diocese of Brooklyn in Brooklyn and Queens, NY.

Population / Participants / Subjects:

Description of the participants in the study: who, how many, key features, or characteristics.

The effective sample for these analyses includes 24 classrooms (12 in each treatment condition) nested in 19 schools. At baseline, schools in the full sample ranged in size from 178 to 656 students ($M = 325.92$, $SD = 97.06$), and the number of students per teacher ranged from 17 to 35. Between 5.05 % and 100 % of students were minorities ($M = 66.85$ %, $SD = 32.30$ %), and between 0 % and 94.67 % received free/reduced lunch ($M = 23.34$ %, $SD = 32.30$ %). 40.0 % of teachers had worked toward or completed a master's degree, 36.2 % earned BAs, and 23.8 % did not specify.

Intervention / Program / Practice:

Description of the intervention, program, or practice, including details of administration and duration.

RULER is a multi-year approach available for Kindergarten through eighth grades. It consists of a comprehensive professional development program and classroom curricula that leverage emotions in the learning environment (Brackett et al., 2011). Teachers and other school staff receive training on the approach, and develop knowledge and skills to create more organized, and intellectually and emotionally supportive learning environments. Students build skills for recognizing, expressing, and managing emotions across learning tasks in the context of a standard academic curriculum.

According to RULER theory of change, RULER is first expected to cause improvements in classroom emotional support, which are in turn expected to drive changes in classroom organization and instructional support (Hagelskamp, Brackett, Rivers, & Salovey, 2013). Improved classroom environments ultimately are expected to improve student outcomes.

Research Design:

Description of the research design.

School principals were introduced to the project in January 2008. Out of 70 principals in attendance, 66 volunteered their fifth- and sixth-grade English language arts (ELA) classrooms to participate in the evaluation. To ensure a balanced design, participating schools were randomly divided into pairs. Each member of the pair was then assigned to the treatment or comparison condition using a random number generator. Two treatment and two comparison schools dropped out after randomization, for a total of 62 schools, 155 classrooms, and 3,824 students.

Baseline comparisons on key school-level variables revealed statistically significant differences between conditions on school size (with RULER schools being smaller in size than comparison schools) and classroom organization (with RULER schools having lower levels of classroom organization than comparison schools). These two variables were adjusted for in all analyses.

Data Collection and Analysis:

Description of the methods for collecting and analyzing data.

Data Collection. University-approved informed consent procedures were observed throughout the project. Baseline data collection took place in March 2008, and follow up data were collected twice per year in the 2008-2009 and 2009-2010 academic years. Observational assessments, teacher surveys, and student surveys were collected at each wave. The current study focuses on observational assessments of classroom processes, which we describe next.

Measures.

Three domains of *classroom climate* (i.e., emotional support, instructional support, and classroom organization) were assessed using the Classroom Observation Scoring System (CLASS, Pianta & Hamre, 2009). At each wave of data collection, teachers were asked to submit three videotaped classroom sessions. Coders who were blind to treatment condition, and who achieved 80% reliability, rated eight- to twenty-minute segments from each videotaped session using the CLASS. Two unique coders rated 84.5% of segments. Coders' ratings were

averaged to obtain a single score for each classroom on each of the three classroom climate domains.

Analysis. Previous SEM path analyses using the same dataset found that significant impacts in classroom organization and instructional support after two years of RULER were mediated by improvements in classroom emotional support after one year of implementation (Hagelskamp et al., 2013). The current paper employed instrumental variable (IV) techniques (two-stage least squares via *ivregress* in Stata) to conduct a causal test of that mediated path (Gennetian, Magnuson, & Morris, 2008). Specifically, random assignment of schools to the intervention was used as the instrument to examine whether changes in emotional support after one year of intervention, causally mediated changes in classroom organization and instructional supports a year later. To account for the clustering of classrooms within schools, we adjusted the standard errors of our estimates using the *vce(cluster)* command in Stata.

Findings / Results:

Description of the main findings with specific details.

Basic descriptive statistics are shown on Table 1. In line with SEM analyses, first stage results from the instrumental variable analysis show significant intervention impacts on classroom emotional support after one year of intervention ($b = .35, p < .05$). Second stage results confirm that emotional support after a year of implementation has a marginally significant causal impact on classroom organization. Unexpectedly, emotional support does not have a statistically significant causal impact on instructional support (see Table 2).

Conclusions:

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

Our results partially overlap with prior results that used a non-causal analytic approach. RULER impacts on classroom organization were mediated by impacts on emotional support, but the same mechanism did not account for impacts on instructional support.

These findings suggest that creating emotionally supportive environments is a pathway to developing more organized and productive classrooms. Teachers who take students' perspectives, and who develop warm and respectful relationships with students, are better able to establish classroom rules and routines that can eventually lead to more productive and organized learning environments. In contrast to previous findings, more emotionally supportive interactions did not account for the improved instructional supports of RULER classrooms. Other aspects of RULER, such as an emphasis on making academic content relevant to students' lives, and building students' vocabulary about emotions, may enhance instructional supports through a pathway that is independent from the emotional climate of the classroom.

Results from these analyses highlight the value of using analytical approaches that allow drawing more trustworthy conclusions from non-experimental data. The assumptions underlying IV techniques, and the implications of our findings for educational research and practice will be discussed at the session.

Appendices

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Appendix A. References

References are to be in APA version 6 format.

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- Hagelskamp, C., Brackett, M. A., Rivers, S. E., & Salovey, P. (2013). Improving Classroom Quality with The RULER Approach to Social and Emotional Learning: Proximal and Distal Outcomes. *American Journal of Community Psychology, 51*(3-4), 530–543. doi:10.1007/s10464-013-9570-x
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- Trentacosta, C. J., & Shaw, D. S. (2009). Emotional self-regulation, peer rejection, and antisocial behavior: Developmental associations from early childhood to early adolescence. *Journal of Applied Developmental Psychology, 30*(3), 356–365. doi:10.1016/j.appdev.2008.12.016

Appendix B. Tables and Figures

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Table 1
Bivariate Correlations and Descriptive Statistics for Classroom Variables

		Spring Year 1			Spring Year 2			Mean	Std. Dev.
		Emotional Support	Classroom Organization	Instructional Support	Emotional Support	Classroom Organization	Instructional Support		
Spring Year 1	Emotional Support	1						4.605	0.381
	Classroom Organization	0.6086	1					5.458	0.429
	Instructional Support	0.6822	0.6921	1				2.273	0.454
Spring Year 2	Emotional Support	0.7906	0.4917	0.6287	1			4.506	0.391
	Classroom Organization	0.6035	0.831	0.4572	0.5181	1		5.486	0.429
	Instructional Support	0.6437	0.4796	0.5966	0.8435	0.6039	1	2.222	0.492

Note. All correlations are statistically significant at $p < .05$.

Table 2
Second-Stage Results for Instrumental Variables Model of Classroom Emotional Support, Organization, and Instructional Support

Dependent variable	Estimate	SE	95% CI	R ² full model
Classroom organization	.55	.32	-.08, 1.19	0.60
Classroom instructional support	.40	.48	-.54, 1.35	0.36