

Direct and Moderating Impacts of the CARE for Teachers Intervention on Student Academic Outcomes



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Background

- Teacher quality now a top priority of our national policy agenda for improving student academic achievement (Goldhaber & Hannaway, 2009; Wilson, et al., 2008)
- Teachers' interactions with children strongly linked to how children learn, with positive teacher-student interactions mitigating factors that put children at risk of poor school performance (Hamre & Pianta, 2005; Mashburn et al., 2008; Rimm-Kaufman, et al., 2005)
- Teachers' emotional support adds value to instructional support in narrowing the achievement gap among children at risk of school failure (Crosnoe, et al., 2010; Howes, et al., 2008; Pianta, et al., 2008)



Background

- Teachers play critical role in helping students feel connected to school, and student attachment to school predicts school success, especially for high-risk students (Bergin & Bergin, 2009)
- Mindfulness-based training for teachers has shown great promise in reducing teacher stress and improving well-being (Harris et al., 2015; Jennings et al., 2016; Kemeny et al., 2012; Roeser et al., 2013)
- Teachers trained to deliver mindfulness practices to students can impact student behavior and social competence (Schonert-Reichl & Lawlor, 2010)
- No studies to date examining how mindfulness-based training focused specifically on teachers impacts student outcomes



Goal 3: CARE NYC Cluster RCT

- Teacher outcomes: Replication/refinement of Goal
 2 teacher outcomes (e.g., Mindfulness)
- Classroom observation (CLASS)
- Student outcomes
 - Teacher-reported:
 - Academic Competence Evaluation Scales (ACES)
 - Social Skills Improvement System Rating Scale (SSIS)
 - Student-Teacher Relationship Scale (STRS)
 - School records:
 - Grades & test scores
 - Attendance
 - Discipline



CARE Logic Model





Research Questions

- Do students of teachers randomly assigned to the CARE for Teachers intervention have higher academic competence after one school year compared to students of teachers in the control condition?
- Does exposure to teachers in the CARE for Teachers intervention differentially benefit students at individual risk (i.e., low initial social skills) and/or contextual risk (i.e., low mindfulness teachers) relative to at-risk students of teachers in the control condition?



Student Demographic Characteristics

	Total San	ıple (<i>N</i> =	5200)	CARE	(<i>n</i> =2723))	Control	(<i>n</i> =247	7)
Variable	Mean/%	SD	Range	Mean/%	SD	Range	Mean/%	SD	Range
Student characteristics (N = 5,200)									
Age	7.70	1.86	4-13	7.91	1.91	4-13	7.48	1.78	4-13
Gender									
Female	48.8 (n=2535)			50.4 (n=1,291)			52.3 (n=1,244	4)	
Male	47.2 (n=2456)			49.6 (n=1,273)			48.7 (n=1,183	3)	
Race/ethnicity	4.00 (n=209)								
White	2.70 (n=141)			2.9 (n=73)			2.8 (n=68	3)	
Asian/Filipino	2.60 (n=134)			2.7 (n=67)			2.8 (n=67	7)	
Black/African American	23.4 (m=1215)			24.0 (n=607)			25.2 (n=608	3)	
Native American	0.60 (n=31)			0.4 (n=10)			0.9 (n=21)		
Native Hawaiian	0.10 (n=4)			0.2 (n=4)			0.0 (n=0))	
Hispanic	65.0 (n=3382)			69.1 (n=1,746)			67.9 (n=1,630	5)	
Multiple Races	0.60 (n=29)			0.8 (n=19)			0.4 (n=10))	
Was an Eng Language Learner	16.2 (n=841)			18.0 (n=454)			16.4 (n=387	7)	
Rcvd special education service	8.40 (n=435)			8.9 (n=223)			9.0 (n=212	2)	
Rcvd free or reduced Lunch Rcvd supplem reading	81.7 (n=4249)			87.9 (n=2,184)			88.1 (n=2,065	5)	
program	13.2 (n=688)			17.9 (n=387)			14.9 (n=30)	l)	
Has been suspended (Teacher)	1.80 (n=95)			3.4 (n=63)		1.7 (n=32)			
Student Mobility									
No Movement	76.9 (n=4001)			75.2 (n=2,049)			78.80 (n=1,952	2)	
Home Support for Learning	3.54	1.06	1-5	3.57	1.04	1-5	3.50	1.07	1-5
Readiness to Learn	3.9	1.08	1-5	3.93	1.07	1-5	3.86	1.09	1-5



Teacher-Reported Student Measures

- Academic Competence Evaluation Scales (DiPerna & Elliott, 2000)
 - Engagement (3 items, alpha = .92)
 - "Please rate how frequently the student exhibits the following behaviors: Asks questions about tests and projects" (1=Never to 5=Almost Always)
 - Motivation (3 items, alpha = .94)
 - "Please rate how frequently the student exhibits the following behaviors: Persists when task is difficult"

(1=Never to 5=Almost Always)



Teacher-Reported Student Measures

- Academic Competence Evaluation Scales Cont. (DiPerna & Elliott, 2000)
 - Reading Competence (3 items, alpha = .97)
 - "Please rate the student's academic skills in comparison with the grade level expectations at their school at the beginning of the school year? Reading Comprehension."

(1=Far Below Grade Level to 5=Far Above Grade Level)

- Math Competence (3 items, alpha = .98)
 - "Please rate the student's academic skills in comparison with the grade level expectations at their school at the beginning of the school year? **Computation**."

(1=Far Below Grade Level to 5=Far Above Grade Level)



Teacher-Reported Student Measures

- Social Skills Improvement System (SSIS, 10 items, alpha = .94) (Gresham & Elliott, 2008)
 - "Please read each item and think about this student's behavior during the past two months. Then, decide how often the student displays the behavior: Stays calm when disagreeing with others." (1=Never to 4=Almost Always)
- Readiness to Learn (1 item)
 - "How frequently does this student arrive on time and ready to learn?" (1=Never to 5=Almost Always)
- Home Support for Learning (1 item)
 - "How would you characterize the level of support for learning in this child's home?" (1=Very Poor to 4=Very Good)



DOE Student Records

- Age
- Gender
- Race/ethnicity
- Free or reduced lunch status
- Individualized education plan status
- English language learner status



Teacher Self-Reported Mindfulness

- Mindfulness Aggregate (44 items, alpha = .68), based on EFA and CFA with all continuous teacher outcomes
 - Five-Facet Mindfulness Questionnaire (Baer, Smith, & Allen, 2004) (1=Never or Rarely True to 5= Very Often or Always True):
 - Observe: "When I'm walking, I deliberately notice the sensations of my body moving."
 - Describe: "I'm good at finding words to describe my feelings."
 - Awareness: (reversed) "When I do things, my mind wanders off and I'm easily distracted."
 - Non-React: "I perceive my feelings and emotions without having to react to them."
 - Non-Judge: (reversed) "I criticize myself for having irrational or inappropriate emotions."
 - Interpersonal Awareness (Frank, Jennings, & Greenberg, 2015) (1=Never True to 5=Always True)
 - "I notice how changes in my class's mood affect my mood."

Procedures Timeline



Repeated procedure for Cohort 2



Data Analyses

- Treatment vs. control contrasts using HLM (SAS)
 - Students clustered in teachers/classrooms
 - Covariates: cohort, pre-test, age, gender, race/ethnicity, ELL status, IEP status, reduced/free lunch, ever suspended, student mobility, home support for learning, and readiness to learn
 - Moderation tested using latent classes of moderators (Mplus)
 - Used LCA to identify classes of children with distinct patterns of baseline student- and teacher risk (i.e., Student Social Skills, Teacher Mindfulness)
 - Estimated mixed model predicting student outcome within latent classes controlling for a set of student covariates
 - Covariates: cohort, pre-test, age, gender, race/ethnicity, IEP status, reduced/free lunch, ever suspended, and readiness to learn



Means and SDs by Intervention Status

		Contro	l		CARE	
Measures	N	Mean	SD	N	Mean	SD
Engagement Pre	2129	3.20	1.06	2228	3.36	1.05
Engagement Post	2103	3.42	1.06	2194	3.53	1.11
Motivation Pre	2087	3.02	1.12	2223	3.14	1.11
Motivation Post	2097	3.18	1.13	2209	3.27	1.18
SSIS Pre	2122	3.00	0.64	2247	3.01	0.63
SSIS Post	2102	3.07	0.66	2208	3.06	0.69
Reading Pre	2098	2.31	0.80	2196	2.30	0.80
Reading Post	2074	2.66	0.92	2211	2.71	0.90
Math Pre	2011	2.35	0.77	2104	2.30	0.76
Math Post	2043	2.71	0.86	2185	2.72	0.86
Mindfulness Pre	106	3.55	0.42	118	3.55	0.43
Mindfulness Post	101	3.56	0.46	109	3.68	0.49



CARE Impacts on Teacher-Reported Student Outcomes (Direct Effects)

	Est	SE	df	t	p-value	ES
Engagement	0.156	0.074	189	2.10	0.037*	0.10
Motivation	0.106	0.075	189	1.41	0.159	0.08
Reading Competence	0.069	0.058	193	1.18	0.241	0.02
Math Competence	0.008	0.058	182	0.14	0.893	0.06

Note: *p<.05



LCA Fit Indices for Baseline SSIS

#					
Classes	5 Log-likelihood	BIC	AIC	LMR p value	Smallest Class, % (n)
1	-51129.155	102426.1	102298.3		
2	-40520.205	81300.5	81102.4	<.0001	36.3 (1,597)
3	-34387.196	69126.8	68858.4	<.0001	19.9 (874)
4	-33298.635	67041.9	66703.3	0.2610	12.5 (552)

Note. Bold indicates best fitting model. Percentages in far right column represent the distribution of the smallest class of participants. Lower values on the Bayesian information criteria (BIC), and Akaike information criterion (AIC) indicates the best fitting model, whereas the Lo-Mendell-Rubin (LMR) adjusted likelihood ratio tests whether the addition of another class would improve mode fit.



SSIS: Latent Class Probabilities

Average Latent Class Probabilities for Most Likely Latent Class Pattern by Intervention Status

	Control Group				
SSIS: 3 Latent Classes	Class 1	Class 2	Class 3		
Class 1: Low SSIS	0.972	0.028	0.000		
Class 2: Mid SSIS	0.011	0.980	0.008		
Class 3: High SSIS	0.000	0.010	0.990		
		CARE Group			
Class 1: Low SSIS	0.975	0.025	0.000		
Class 2: Mid SSIS	0.014	0.946	0.011		
Class 3: High SSIS	0.000	0.010	0.990		



SSIS: 3 Latent Classes



SOCIAL SKILLS IMPROVEMENT ITEMS



Moderated Impacts by Student Social Skills

		Est	SE	t	p-value	ES
Engagemen	t					
	Low SSIS	0.036	0.106	0.337	0.736	0.11
	Mid SSIS	0.023	0.070	0.328	0.743	0.06
	High SSIS	0.046	0.075	0.616	0.538	0.09
Motivation						
	Low SSIS	-0.003	0.091	-0.037	0.971	-0.01
	Mid SSIS	0.045	0.065	0.695	0.487	0.03
	High SSIS	0.053	0.068	0.775	0.438	0.12
Reading Co	mpetence					
_	Low SSIS	0.150	0.070	2.140	0.032*	0.08
	Mid SSIS	0.048	0.052	0.929	0.353	-0.01
	High SSIS	0.108	0.057	1.885	0.059 ^t	0.14
Math Comp	oetence					
	Low SSIS	0.077	0.071	1.095	0.274	0.04
	Mid SSIS	0.008	0.056	0.136	0.892	-0.08
	High SSIS	0.062	0.058	1.070	0.285	0.08



Treatment x Low SSIS on Reading Competence





LCA Fit Indices for Baseline Teacher Mindfulness



Note. Bold indicates best fitting model. Percentages in far right column represent the distribution of the smallest class of participants. Lower values on the Bayesian information criteria (BIC), and Akaike information criterion (AIC) indicates the best fitting model, whereas the Lo-Mendell-Rubin (LMR) adjusted likelihood ratio tests whether the addition of another class would improve mode fit.



Mindfulness: Latent Class Probabilities

Average Latent Class Probabilities for Most Likely Latent Class Pattern by Intervention Status

	Control Group		
Mindfulness: 2 Latent Classes	Class 1	Class 2	
Class 1: Low Mindfulness	0.910	0.090	
Class 2: High Mindfulness	0.090	0.910	
	CAR	E Group	
Class 1: Low Mindfulness	0.890	0.110	
Class 2: High Mindfulness	0.110	0.890	



Mindfulness: 2 Latent Classes





Moderation Impacts by Teacher Mindfulness

	Est	SE	t	p-value	ES
Engagement					
Low Mindfulness	0.132	0.088	1.50	0.133	0.14
High Mindfulness	-0.035	0.104	-0.34	0.734	0.06
Motivation					
Low Mindfulness	0.165	0.072	2.28	0.023*	0.10
High Mindfulness	-0.042	0.094	-0.45	0.650	-0.02
Reading Competence					
Low Mindfulness	0.154	0.063	2.43	0.015*	0.10
High Mindfulness	0.025	0.079	0.31	0.756	0.04
Math Competence					
Low Mindfulness	0.098	0.069	1.43	0.153	0.10
High Mindfulness	-0.037	0.084	-0.44	0.658	-0.10

Note: *p<.05



Treatment x Low Teacher Mindfulness on Student Motivation





Treatment x Low Teacher Mindfulness on Reading Competence





Summary

- CARE had direct impacts on 1 of 4 student outcomes: Engagement in Learning
- Among students with low Social Skills at baseline, students of CARE teachers had higher Reading Competence at the end of the year than students in the control condition. [Cross-domain effect for behaviorally at risk students].
- Among students with teachers low in Mindfulness at baseline, students of CARE teachers had higher end-of-year Motivation for Learning (but also higher pre-test Motivation) and higher end-of year Reading Competence than students of low Mindfulness teachers in the control condition.



Next Steps

- Exclusively teacher reported, so examine grades
 3-6 subpopulation with DOE achievement scores
- Examine cumulative student-level risk index, and assess other teacher/classroom-level risks
- Use propensity scores analysis to test:
 Fidelity of Implementation → Student
- Test mediation as per intervention logic model (CARE → Teacher/Classroom → Student)



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