Do High School Climate Measures Predict Adolescent Socioemotional Outcomes?

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Background

Several states and cities across the country are collecting school climate data through surveying students, teachers, and parents, with the hope of improving student outcomes (Nathanson et al., 2013; Merrill et al., 2018). In Illinois, recent legislation (Senate Bill 7, PERA) has resulted in the Illinois State Board of Education (ISBE) implementing a survey to drive improvement in schools (UChicago UEI, 2018). The learning conditions survey in Illinois gathers input regarding students' and teachers' experience in school and parents' relationship with the school. However, little research to date has explored whether these factors predict changes in student socioemotional outcomes.

Research Question

In this project, we drew school climate data from Illinois public schools, where students and teachers rated five distinct domains of school climate (called the "5Essentials"). We linked these school climate measures to student-level data collected for an early childhood intervention evaluation (see Raver et al., 2011). Using this data, we tested whether the specific dimensions of school characteristics predicted student-reported socioemotional strengths and health-related risky behaviors.

Research Design

Our data were drawn from a longitudinal evaluation of an early childhood intervention program, the Chicago School Readiness Project (CSRP). As part of this ongoing evaluation, we have followed students into adolescence, and collected information regarding their school enrollment and socioemotional outcomes during high school.

We linked student-level data to publicly-available data from Illinois on school-level climate. In our sample, 306 students enrolled in 152 schools that had non-missing school climate data, and 149 of these schools were in the Chicago Public School district (CPS). The "5Essentials" school climate data (UChicago UEI, 2016) included five unique dimensions of school quality. First, *Ambitious Instruction* represents the degree of academic challenge and student engagement. *Effective Leaders* measures the level of effectiveness of leaders, principals and teachers working together towards sustained school improvement. *Collaborative Teachers* examines teachers' commitment and professional development through collaboration. *Involved Families* assesses the relationship between school staff and students' families. Finally, *Supportive Environment* evaluates the level of school safety and supportiveness (UChicago UEI, 2016).

Student-level "risks" and "strengths" survey data was collected during the 2016-2017 school year, when the average participant was in 10th grade (mean age = 15.61 years). Student socioemotional strengths ($\alpha = 0.63$) represents an aggregated measure consisting of items relating to participation in extracurricular activities as well as students' civic engagement in school and community settings (Diemer et al., 2014). The health-risk behaviors measure ($\alpha = 0.83$) constitutes items on unintentional injuries, violence, substance use, and sexual behavior (Riesch et al., 2006).

Each school's 5Essentials scores were merged with CSRP student-level data by school ID (306 students had valid 5Essentials scores and self-reported strengths and risks measures).

Analysis and Results

We began by testing whether the survey items administered by the ISBE cohere to five separate factors using a confirmatory factor analysis model. We tested the model fit of each factor of the 5Essentials for the 21 items available, and found a high correlation ($r = 0.91$, $p < 0.01$) between two of the 5Essentials aggregate factors, *Effective Leaders* and *Collaborative Teachers*. Therefore, to avoid collinearity, the *Collaborative Teachers* factor was dropped from the analysis. We also found adequately fitting models of school characteristics that provided a good fit to the school climate data of the four remaining school factors, *Ambitious Instruction, Effective Leaders, Involved Families,* and *Supportive Environment* (CFI = 1, 0.95, 1 and 1, respectively).

Table 1 contains descriptive information for our key study measures. In Panel A, we present descriptive characteristics for the four school climate measures included in our analysis. Each essential score is the average of all of the items for that dimension. Each item score is compared to the benchmark and put on the 1-99 scale, so that every twenty points is exactly one standard deviation wide and has a different category (e.g. Very Strong (80-99), Strong (60-79), Neutral (40-59), Weak (20-39), and Very Weak (1-19); see UChicago UEI, 2018). Panel B includes correlations among these school characteristics, which were moderate in magnitude. Finally, Panel C shows descriptive characteristics of student self-reported "risks" and "strengths" in high school. On average, CSRP students participated in 40 percent of the activities indicative of socioemotional strengths, and in 28 percent of the health related risky behaviors.

Table 2 reports OLS estimates of the relation between each of the four school climate factors and tenth graders' measures of "risks" and "strengths." Importantly, for each regression model, we included controls for student gender, ethnicity, family income-to-needs ratio, mother's education, and measures of students' "risks" and "strengths" taken from middle school. Thus, coefficients can be interpreted as an indicator of the association between individual school climate characteristics and gains in each respective outcome measure between middle school and high school.

As seen in Table 2, we found evidence that several school factors were statistically significant predictors of student self-reported strengths. Students enrolled in more academically demanding schools (i.e., schools with higher scores on the effective leaders, involved families and supportive environment scales) reported moderate but statistically-significant gains in self-reported strengths since middle school (about 0.12, 0.11 and 0.12 SD's, respectively). Surprisingly, we also found that adolescents enrolled in schools with more effective leaders reported significant gains in health risks (about 0.11 SD change) over that same time period. No other school climate factor was found to be a statistically significant predictor of student-reported risks.

Conclusions

Our analysis provides evidence that school climate factors do predict some changes in health-risk behaviors and socioemotional strengths, though these changes were not strong in magnitude. Further, we found some evidence that positive school climate factors *predicted* gains in risky behavior, a finding that was not hypothesized a priori. These analyses suggest that further conceptualization of school climate factors may be needed if relations between climate

and student outcomes are expected. Future analysis will attempt to further unpack these relations by examining potential sources of heterogeneity.

Table 1

Descriptive for 5Essentials

Panel A	N (school)	Mean	Std. Dev	Minimum	Maximum
Ambitious Instruction	152	74.70	15.97	24	99
Effective Leaders	152	54.76	17.37	4	95
Involved Families	152	61.75	19.94	15	99
Supportive Environment	152	53.42	16.64	1	94

Correlations among 5Essentials

Panel B	Ambitious Instruction	Effective Leaders	Involved Families	Supportive Environment
Ambitious Instruction				
Pearson Correlation	1			
N	152			
Effective Leaders				
Pearson Correlation	0.43**	1		
N	152	152		
Involved Families				
Pearson Correlation	0.43**	0.69**	1	
N	152	152	152	
Supportive Environment				
Pearson Correlation	0.55**	0.44**	0.60**	1
N	152	152	152	152

Descriptive Characteristics for adolescents' strengths and health risk behaviors in 10th grade

Panel C	N (student)	Mean	Std. Dev	Minimum	Maximum
Total Strengths	306	0.40	0.24	0	1
Total Risks	306	0.28	0.18	0	1

Source: 2016 Illinois 5Essentials Survey; 2012 & 2017 Chicago School Readiness Project

Note: ** indicates correlation is significant at the 0.01 level (2-tailed).

On average, schools that CSRP students enrolled in rated as "Strong" for Ambitious Instruction and Involved Families factors, and rated as "Neutral" for Effective Leaders and Supportive Environment factors.

Table 2

Coefficients from linear regression models estimating adolescents' potential strengths and health risk behaviors in 10th grade

	Total Strengths				Total Risks			
Ambitious Instruction	0.07				0.06			
	(0.057)				(0.059)			
Effective Leaders		0.12*				0.11*		
		(0.055)				(0.057)		
Involved Families			0.11+				0.05	
			(0.055)				(0.057)	
Supportive Environment				0.12*				0.07
				(0.056)				(0.058)
Control	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
Observations	306	306	306	306	306	306	306	306

Source: 2016 Illinois 5Essentials Survey; 2012 & 2017 Chicago School Readiness Project

Note: + indicates $P < 0.10$; * indicates $P < 0.05$; **indicates $P < 0.01$; *** indicates $P < 0.001$

Continuous variables were standardized, so coefficients can be likened to effect sizes. Standard errors are presented in parentheses.

References

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