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Assessing readiness, implementation, and effects associated with a comprehensive framework designed to reduce school violence: A randomized controlled trial

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Abstract

Researchers from the University of Colorado Boulder’s Center for the Study and Prevention of Violence (CSPV) partnered with educators in 46 middle schools to implement Safe Communities Safe Schools (SCSS). SCSS seeks to prevent and reduce behavioral incidents, address mental and behavioral health concerns, and increase prosocial behavior in the school setting through three core program components: developing a functioning multidisciplinary school team, building capacity around data use, and selecting and implementing evidence-based programs. The study explored research questions in three areas: readiness (whether schools met baseline criteria and experienced changes in readiness over time), implementation (whether the SCSS model was implemented as intended; whether it is feasible, acceptable, and effective when implemented schoolwide), and associated outcomes (effects on school climate, safety, related behavioral and mental health indicators, and academic outcomes). To explore questions in these three areas, CSPV and external evaluators from American Institutes for Research conducted a mixed-methods randomized control trial with a staggered implementation design using qualitative data (open-ended questions on implementation surveys, focus groups) and quantitative data (staff and student school climate data, attendance/truancy rates, suspension rates, and academic achievement data). The study found that (1) the participating schools met the pre-developed readiness criteria and reported some improvements in readiness constructs over time; (2) some components of the model were implemented as intended and were acceptable and effective (from the educators’ perspective), but increased knowledge, understanding, and skills were limited to school team members; and (3) there were mixed impacts on school climate, safety, behavioral and mental health indicators, and academic outcomes, with outcomes varying (to some extent) by implementation characteristics. This report discusses the study’s findings and their implications for criminal justice policy and practice.

Purpose

Young people continue to be affected by violence in their homes, neighborhoods, and schools, even though violence was declared a public health concern 39 years ago (Dahlberg & Mercy, 2009). In 2018, there were an estimated 404,691 nonfatal violence-related assault injuries for youth ages 10 to 24 (Centers for Disease Control and Prevention [CDC] & National Center for Injury Prevention and Control, 2019b), and homicide was the third leading cause of death for all youth aged 10 to 24 years (CDC & National Center for Injury Prevention and Control, 2019a).

Mass shootings in the U.S. have increased since 2000, and 2019 had the highest number of mass shootings in any year since 2014 when the Gun Violence Archive started its count (Silverstein, 2020). Adolescents and young adults have committed some of the more horrific shootings in schools. Twenty-four mass shootings have occurred in Colorado during the past six years, killing 26 and injuring more than 90 and resulting in high levels of exposure to violence and trauma (Roberts, 2019)

School violence has a host of precipitating factors. According to the 2019 Youth Risk Behavioral Surveillance System (YRBSS), 20% of students had been bullied on school property, 22% had been in one or more physical fights, and 19% had seriously considered suicide. Additionally, 7% had stayed home due to concerns about safety at school, at least once in the last 30 days (Centers for Disease Control & Prevention, n.d). While these threats to students rarely make national headlines, they erode their well-being, potential, and achievement.

Middle school is a critical time to reinforce effective school-based violence prevention efforts. This time period occurs just prior to an increase in youth violence (ages 15-18), during key physical and developmental changes (e.g., puberty), when peer influences increase and adolescents feel vulnerable. Pro-social bonding also declines in middle school. This transition can mark the beginning of an anti-social trajectory that leads to school failure and dropout. Prevention science indicates that *schools* represent a key social context that can increase the *risk* for violence or increase *protection* from it, especially middle schools. Yet, we lack effective school-based interventions for middle school students. A compelling body of research indicates that a positive school climate can help students navigate the

adolescent transition but exactly how or in what ways is less clear. In response to the tragedy This study was designed to understand more about the aspects of school climate that can decrease youth’s risky behavior and increase their engagement in prosocial behaviors through implementing a comprehensive school safety framework.

Additionally, research consistently finds that a comprehensive approach to school safety, which integrates the best scientific evidence and solid implementation strategies, offers the greatest potential for preventing youth violence and promoting mental and behavioral health. However, schools and communities continue to encounter enormous challenges in articulating, synthesizing, and implementing the complex aspects of a comprehensive approach to safety. Building the readiness of schools to implement a comprehensive approach to school safety provides an actionable mechanism for clarifying, prioritizing and addressing factors that may enhance or undermine their school safety goals. Readiness is defined as an organization’s willingness and ability to put a particular program or innovation into action (Scaccia et al., 2015, p. 2), and the readiness of individuals and organizations can be evaluated prior to and during the implementation process. For a comprehensive approach to be successful, the implementers must want to implement the programs, have the capacity to do so, have the tools to support the work, and implement the programs and strategies with fidelity and self-reflection.

The Safe Communities Safe Schools (SCSS) model is a theory-driven, comprehensive, actionable school safety framework that addresses school-specific needs and barriers to implementing a comprehensive approach to school safety. SCSS was first developed by multiple stakeholders following the Columbine tragedy in Colorado in 1999. The model offered schools a process for improving school safety and climate by integrating the Columbine Commission’s recommendations, violence prevention efforts, evidence-based programs, and prevention science approaches. In this study, researchers from the University of Colorado Boulder’s Center for the Study and Prevention of Violence updated and expanded the SCSS model to incorporate the most recent advances in research to help improve schools’ capacity to systematically implement school safety recommendations by (1) developing staged processes to build

schools' organizational readiness and capacity including staff emotional competence and well-being, (2) creating user-friendly, scalable tools for delivering the SCSS model, and (3) providing the necessary training, technical assistance, and coaching to successfully implement the SCSS Model.

The SCSS model seeks to prevent and reduce behavioral incidents, address mental and behavioral health concerns, and increase prosocial behavior in the school setting through (1) developing a functioning school-based team, (2) building capacity around data use, and (3) selecting and implementing evidence-based programs (EBPs). These core components serve to develop a school's capacity to address school violence and promote positive school climate by creating internal infrastructures (e.g., teams), increasing school members' knowledge and skills (e.g., understanding of how to use data), as well as helping schools select and implement appropriate evidence based programs with fidelity. Using a two-year, staggered-implementation randomized control trial with 46 middle schools, our study addressed four broad research questions (RQs):

- (1) Do schools have initial readiness and increase their readiness to implement the SCSS model over time?
- (2) Is the SCSS model implemented as intended in this set of schools?
- (3) Is the SCSS model feasible, acceptable, and effective when implemented schoolwide?
- (4) What is the effect on school climate, safety, related behavioral and mental health indicators, and academic outcomes for youth and staff in schools randomized to receive the SCSS model, compared to youth and staff in schools randomized to the waitlist control group; and how do these impacts vary by variation in implementation?

Project Design and Methods

We conducted a staggered-implementation randomized control trial (see Table 1). Project subjects included educators at 46 middle schools, the students in these schools, and (indirectly) their families and broader community. Cohort 1 included 10 schools and Cohort 2 included 36 schools. Schools were assessed for initial readiness and were supported to increase capacity to implement SCSS throughout the project period. Groups of schools within each cohort began receiving SCSS in different

years so that all schools received at least 1 year of SCSS treatment by the project’s end. The study examines outcomes only at years 1 and 2. Longer term follow-up through year 4 would be ideal (the SCSS model was conceptualized to take 4 years to implement), but was not possible using this design due to the loss of the control group and length of grant period (a 4-year grant with 1 year of planning).

Table 1. Study Design

	2016–17 (Y1)	2017–18 (Y2)	2018–19 (Y3)	2019–20 (Y4)
Cohort 1: treatment schools (N = 5)	TY1	TY2	TY3	TY4
Cohort 1: control schools (N = 5)	C	C	TY1	TY2
Cohort 2: treatment schools (N = 18)		TY1	TY2	TY3
Cohort 2: control schools (N = 18)		C	C	TY1
N of treatment schools	5	23	28	46
N of control schools	5	23	18	0
Total N of schools	10	46	46	46

Note: TY = treatment year, C = control

Data Sources

To address issues related to readiness (RQ1), CSPV team members conducted readiness feasibility visits for recruitment, and school-based teams completed a 90-item readiness assessment annually. As shown in Table 2, six types of implementation data were collected and analyzed to address implementation fidelity (RQ2 and RQ3): (1) SCSS training documents, (2) mid-year and (3) end-of-year surveys completed by program facilitators of the school’s selected evidence-based program, (4) observations of classroom-based evidence-based programs, (5) implementation ratings completed by CSPV implementation managers, and (6) structured focus groups with school-based teams. Several types of outcome data were collected and analyzed to address SCSS impacts on student and school outcomes (RQ4), including (1) student and (2) staff climate survey data assessing risk and protective factors and violence indicators, and (3) school record data assessing daily attendance and truancy rates, suspension rates, and academic achievement test scores (reading and math).

Table 2. Research Questions, Outcomes, and Data Sources

Research Questions	Outcomes	Data Sources
Initial Readiness and Change in Readiness Over Time		
1. Do schools have initial readiness and increase their readiness to implement SCSS over time?	<ul style="list-style-type: none"> • Motivation • General capacity • Innovation specific capacity 	<ul style="list-style-type: none"> • Readiness feasibility visits • Annual 90-item survey
Quality of Implementation and Feasibility of SCSS		
2. Is the SCSS model implemented as intended in this set of schools?	<ul style="list-style-type: none"> • Fidelity • Feasibility • Acceptability • Perceived benefit 	<ul style="list-style-type: none"> • SCSS training documents • Mid-year facilitator surveys • End-of-year facilitator surveys • Classroom observations • Implementation ratings • Structured school focus groups
3. Is the SCSS model feasible, acceptable, and effective when implemented schoolwide?		
Impact on Target Outcomes		
4. What is the effect on school climate, safety, related behavioral and mental health indicators, and academic outcomes for youth and staff in schools randomized to receive the SCSS model, compared to youth and staff in schools randomized to the waitlist control group; and how do these impacts vary by variation in implementation?	<ul style="list-style-type: none"> • School climate (teacher support, respect for authority, respectful climate, trusting relationships) • School and staff capacity to address mental health needs • Peer norms and beliefs • Health and wellness • Problem behaviors/violence indicators • Attendance/truancy rates • Suspension rates¹ • Reading and math test scores 	<ul style="list-style-type: none"> • School records (attendance/truancy, suspensions) • Colorado Measures of Academic Success (2018–19) and PARCC reading, writing, and mathematics (2016–2017) • Adapted YRBS/school climate staff surveys <ul style="list-style-type: none"> • Adapted YRBS/school climate student surveys

Data Analysis

School readiness to implement SCSS and change in readiness during the project period (RQ1) was assessed with a mixed-methods approach. First, CSPV staff rated five aspects of readiness during readiness feasibility visits,² aggregated these ratings, and then discussed discrepancies to choose the group of schools to participate in SCSS. Second, initial and changes in readiness (measured by the 90-

¹ The Colorado Department of Education (CDE) provided school-level data through their public-facing website, and individual-level through a data-sharing agreement. School-level attendance rates reflected the total number of student days attended divided by the total number of days school was in session. School-level truancy rates reflected the total number of student days unexcused divided by the total number of days school was in session. School-level suspension rates included total, in-school, and out-of-school suspensions divided by the total number of students in that school. Individual-level academic achievement was assessed using Colorado Measures of Academic Success (CMAS; for 2018 and 2019) and Partnership for Assessment of Readiness for College and Careers (PARCC; for 2016 and 2017) reading and math test scores.

² The five items averaged were (1) Leadership is supportive of the SCSS initiative, (2) There is a clear champion(s) for the SCSS initiative in the school, (3) Leadership recognizes and appreciates staff efforts toward successful implementation of the SCSS initiative, (4) The SCSS initiative helps this middle school meet the needs of their school, and (5) The SCSS initiative is timely given the current needs of this middle school.

item readiness assessment) were analyzed using descriptive and inferential statistics, including frequencies of initial and annual readiness constructs and independent t-tests of change between Years 1 and 2.

Implementation fidelity of the SCSS model (RQ2 and RQ3) was assessed with a mixed-methods approach to analyze extant documents, mid-year and end-of year program facilitator surveys, classroom observation data, implementation ratings, and focus group data (see Table 2). First, quantitative analyses (both descriptive and inferential) characterized variation in implementation by presenting frequencies, means, and standard deviations of item-level responses of mid- and end-of-year surveys and implementation ratings. Second, open-ended responses in mid- and end-of-year survey and qualitative interviews in year 2 were analyzed annually using standard thematic analysis and grounded theory. Emergent themes were identified in coded qualitative data using hierarchical conceptual categories linked to research questions and guided by the quantitative analyses. Code lists were refined based on additional data supported or challenged initial codes, and the final code list was developed iteratively until saturation.

SCSS effects on youth and school-level outcomes were estimated by combining data from the two cohorts for analysis of impact on outcomes in program year 1 and program year 2. We converted impact estimates to Hedge's *g* effect sizes using the pooled, unadjusted standard deviation. Because the study surveys contained multiple indicators for each construct, statistical significance testing was adjusted within construct family using the Benjamini-Hochberg correction (Benjamini & Hochberg, 1995).

For the analysis of school attendance, truancy, and suspensions, which were only available at the school level, we used regression models to estimate intervention impacts on the attendance rate, truancy rate, and the number of suspensions per 100 students at end of program years 1 and 2 (in separate models). The models included baseline measures of the outcome, school characteristics, and randomization pair fixed effects. Appendix A presents the full model specifications.

For the analysis of student achievement, we used two-level regression models to estimate intervention impacts on standardized test scores at end of program years 1 and 2 (in separate models). The

models controlled for (1) student demographics and the baseline test score measured at the end of the year prior to program year 1 at the individual level (Level 1) and (2) the treatment indicator, school characteristics, and separate fixed effects for each school randomization pair at the school level (Level 2). The year 1 models were estimated separately for Grade 7 and 8 students and the year 2 models were estimated using Grade 8 students only.³

A model controlling for baseline measures was not possible for student and staff survey outcomes because survey responses could not be linked over time; therefore, indices based on survey items were analyzed using a three-level repeated-cross-section design, with students or staff nested within time periods nested within schools. In these models, we included three time periods of data—baseline responses, year 1 responses, and year 2 responses—and estimated year 1 and year 2 impacts simultaneously. These models included: (1) student or teacher level demographics (self-reported via the survey) at the individual level (Level 1), (2) time period fixed effects at the time-level (Level 2), and (3) the treatment indicator, school characteristics, and randomization pair fixed effects at the school level (Level 3). The model included interactions between the time period and the treatment variables to estimate intervention impacts on treatment schools at the end of the first and second intervention year. Finally, the model included school and school-by-time period random effects.

Analyses Based on Variation in Implementation. To assess differences in impacts based on variation in implementation, we conducted analyses based on implementation ratings completed by SCSS team members who worked directly with the schools. They rated each school’s implementation of the first 2 core components in year 1 (convening and maintaining healthy school teams, use of data split into 2 factors: collecting school climate data and using data to guide prevention programming) and all 3 core components in year 2 (the same as rated in year 1 plus the implementation of an evidence-based program)

³ Student assessment data covered grades 6, 7, and 8. For year 1 analysis, only grade 7 and 8 students had test scores from the baseline year when they were in grades 6 and 7 respectively. For year 2 analysis, only grade 8 students had scores from the baseline year when they were in grade 6.

using an Yes/No (1/0) scale. Schools rated above a 2 in year 1 and above a 3 in year 2 were deemed *quality implementers*.

Findings

Initial Readiness and Changes in Readiness Over Time (RQ1). Analysis of readiness data indicated that selected schools had sufficient initial readiness, and that readiness increased (in some areas) during the study period. Specifically, 46 of 60 schools that applied met the readiness criteria and agreed to participate. Two years of readiness assessment data suggest that some increases in readiness occurred, with significant increases between year 1 and 2 for six of 20 readiness subscales, including staff capacity, $t(215) = 2.26, p = .03$; knowledge and skills related to SCSS, $t(221) = 3.91, p < .001$; leadership support for SCSS, $t(215) = 3.44, p < .001$; observability of the model to see short-term gains, $t(212) = 2.48, p < .001$; priority to implement SCSS, $t(212) = 2.39, p = .002$; and climate supporting SCSS implementation, $t(218) = 3.69, p < .001$. All but one of the other 14 scales increased slightly; the increases were not statistically significant. The inter-organizational relationships scale was the only scale that decreased slightly. The data also indicated that certain readiness components might not be as malleable or addressed within this type of comprehensive approach (e.g., general leadership: $M = 6.00$ in year 1, 6.11 in year 2; and resource utilization: $M = 4.39$ in year 1, 4.48 in year 2).

Quality of Implementation and Feasibility of SCSS (RQ2 and RQ3). Implementation data suggested that the majority of school teams implemented 3 of 3 core components with fidelity in year 1, and 2 of 4 core components in year 2 (see Table 3).⁴ Schools' successful adoption of a scientific approach (collecting and using data) is particularly encouraging; this has been highlighted as critical to the success of other EBPs (e.g., Communities That Care; Fagan et al., 2009). During the 2-year study period, about half (48%) of the treatment schools completed all core components (74% of schools in year 1; 48% of schools in year 2). Key implementation challenges included turnover of school leaders and school-based coordinators (4 of 23 principals and 4 of 23 school-based coordinators were new in year 2), relevance of

⁴ A score above 70%–80% indicates fidelity of implementation for several widely implemented models (e.g., Positive Behavior Intervention and Supports) (Pas et al., 2019).

the evidence-based program for student population ($M = 2.43$ on 1–4 scale), program fit ($M = 2.56$ on 1–4 scale), and perceived value of the program during implementation ($M = 2.86$ on 1–4 scale).

Table 3. Percentage of Schools Implementing Core Components of SCSS

Timepoint	Convened Healthy School Team	Collected School Climate Data	Data Guided Prevention Planning	Implemented an Evidence-Based Program
Year 1	74	91	83	NA
Year 2	57	87	74	65

Impacts on Target Outcomes (RQ4). Appendix B presents staff and student school climate response rates and means and Ns for treatment and control by data source and outcome.

Staff and Student School Climate Data. We found relatively few significant ($p < .05$) impacts of SCSS on year 1 and 2 staff and student school climate data (see Tables 4-5). The four significant outcomes for student school climate data, all in the unexpected direction and all in year 2, were on two peer norms (peer acceptability of aggression increased, $g = .12$; peer encouragement of prosocial behavior decreased, $g = -.09$), and two types of behaviors (perpetration of aggression increased, $g = .12$; truancy increased, $g = .12$)⁵. There were no significant impacts on staff climate data.

Table 4. Effects on Staff School Climate Data

Outcome Name	Year	B	SE	p	g	Year	B	SE	p	g
School Climate Indicators										
Respect from teachers	1	-0.08	0.056	0.155	-0.16	2	-0.06	0.056	0.250	-0.13
Staff morale	1	-0.08	0.061	0.205	-0.12	2	-0.04	0.062	0.492	-0.07
Teacher support	1	-0.04	0.050	0.419	-0.08	2	-0.01	0.050	0.775	-0.03
Respect for authority	1	-0.09	0.079	0.272	-0.15	2	-0.12	0.078	0.116	-0.21
Positive feelings and attitudes toward this school	1	-0.15	0.071	0.035	-0.27	2	-0.18	0.071	0.010	-0.36 +
Perceptions of safety and supervision	1	-0.09	0.065	0.144	-0.16	2	-0.07	0.065	0.302	-0.12
School systems for mental health	1	-0.07	0.047	0.140	-0.15	2	0.04	0.047	0.404	0.08
Threat assessment and information sharing	1	-0.07	0.043	0.130	-0.15	2	-0.05	0.043	0.256	-0.11
School and Staff Capacity to Address Mental Health Needs										

⁵ Index scores were constructed by averaging over the responses to items in the index. Each item was on a scale of 1 to 5. So, beta coefficients in column B can be interpreted as the difference in average responses between students in treatment and control schools on a 5 point scale.”

Outcome Name	Year	B	SE	p	g	Year	B	SE	p	g
Staff capacity to address mental health concerns: part of my role	1	0.03	0.049	0.473	0.06	2	0.04	0.049	0.413	0.07
Staff capacity to address mental health concerns: level of comfort	1	-0.02	0.052	0.681	-0.03	2	0.00	0.052	0.942	0.01
Problem Behaviors										
Perceived problem behaviors	1	0.06	0.060	0.289	0.12	2	0.07	0.060	0.234	0.14

Note: SE = standard error, g = Hedge's g, * = $p < 0.05$, + = $p < .10$

Table 5. Effects on Student School Climate Data

Outcome Name	Year	B	SE	p	g	Year	B	SE	p	g
School Climate Indicators										
Teacher support	1	-0.03	0.053	0.546	-0.04	2	-0.06	0.053	0.243	-0.08
Respect for authority	1	-0.02	0.032	0.581	-0.02	2	-0.06	0.032	0.067	-0.08
Respectful climate	1	0.00	0.047	0.988	0.00	2	-0.05	0.047	0.323	-0.07
Trusting relationships	1	-0.02	0.026	0.512	-0.03	2	-0.04	0.026	0.166	-0.06
Positive feelings and attitudes towards school	1	0.01	0.023	0.588	0.02	2	-0.05	0.023	0.050	-0.09
Social belonging	1	-0.01	0.041	0.800	-0.01	2	-0.03	0.042	0.539	-0.04
Perceptions of safety and support	1	0.01	0.026	0.632	0.02	2	0.00	0.026	0.868	0.01
Interactions with prosocial peers	1	0.00	0.047	0.970	0.00	2	-0.01	0.047	0.814	-0.01
School and Staff Capacity to Address Mental Health Needs										
Staff capacity to address mental health needs	1	0.01	0.030	0.672	0.02	2	0.00	0.030	0.933	0.00
Peer norms and beliefs										
Peer acceptability of aggression	1	0.02	0.025	0.446	0.03	2	0.07	0.025	0.004	0.12 *
Peers encourage prosocial behavior	1	0.01	0.029	0.725	0.01	2	-0.06	0.029	0.036	-0.09 *
Health and Wellness										
Peer social emotional learning	1	0.00	0.032	0.910	0.01	2	-0.05	0.032	0.089	-0.10 +
Violence Indicators										
Talked to someone about bullying	1	0.01	0.029	0.751	0.01	2	0.01	0.029	0.744	0.01
Where have you been bullied?	1	0.00	0.016	0.786	-0.01	2	0.00	0.016	0.913	0.00
Perpetration of aggression (last 12 months)	1	0.00	0.010	0.678	-0.02	2	0.03	0.010	0.009	0.12 *
Victim of aggression (last 12 months)	1	0.00	0.011	0.723	0.01	2	0.02	0.011	0.098	0.07
Bullying victimization (last 12 months)	1	0.00	0.013	0.776	0.01	2	0.01	0.013	0.476	0.03
Bullying perpetration last 2 months	1	0.00	0.006	0.556	0.02	2	0.01	0.006	0.080	0.06
Delinquency last 12 months	1	-0.01	0.009	0.369	-0.04	2	0.02	0.009	0.078	0.08
Truancy—cut or skipped class during past month	1	0.02	0.015	0.301	0.05	2	0.04	0.015	0.012	0.12 *

Note: SE = standard error, g = Hedge's g, * = $p < 0.05$, + = $p < .10$

Attendance and Truancy Rates. We found nonsignificant impacts of SCSS on attendance/truancy rates for 4 of 4 outcomes in years 1 and 2 (see Table 6).

Table 6. Effects on Daily Attendance and Truancy Rates

Outcome Name	Year	B	SE	p	g	Year	B	SE	p	g
Attendance	1	0.01	0.005	0.277	0.24	2	0.00	0.005	0.949	0.02
Truancy	1	0.00	0.004	0.261	-0.19	2	0.00	0.004	0.439	-0.15

Note: SE = standard error, *g* = Hedge's *g*.

Suspension Rates. As shown in Table 7, there were mixed impacts of SCSS on in-school, out-of-school, and total suspension rates in years 1 and 2: there were 2 significant findings (decreased year 1 total suspension rates, *g* = -.34 and in-of-school suspension rates, *g* = -.46) and 4 nonsignificant findings.

Table 7. Effects on Total, In-School, and Out-of-School Suspension Rates

Outcome Name	Year	B	SE	p	g	Year	B	SE	p	g
Total Suspension	1	-11.99	4.820	0.026	-0.34 *	2	5.44	9.463	0.575	0.14
In School Suspension	1	-10.18	3.312	0.008	-0.46 *	2	-1.19	6.237	0.852	-0.05
Out of School Suspension	1	-5.62	3.504	0.131	-0.30	2	4.74	5.215	0.380	0.23

Note: SE = standard error, *g* = Hedge's *g*, * = *p* < 0.05

Academic Achievement Test Scores. As shown in Table 8, we found mixed impacts of SCSS on reading and math test scores in years 1 and 2. There were positive impacts on 3 of 3 reading outcomes (year 1 Grade 7 and Grade 8 reading test scores, *g* = .10 and *g* = .12, respectively; and year 2 Grade 8 reading test scores, *g* = .11) and nonsignificant impacts on 3 of 3 math outcomes (year 1 Grade 7 and Grade 8 math test scores and Year 2 Grade 8 math scores).

Table 8. Effects on Reading and Math Academic Achievement Test Scores

Outcome Name	Grade Year	Year	B	SE	p	g	Year	B	SE	p	g
Reading	7	1	0.10	0.021	0.000	0.10 *	2				
	8	1	0.12	0.023	0.000	0.12 *	2	0.11	0.025	0.000	0.11 *
Math	7	1	0.03	0.020	0.076	0.04 +	2				
	8	1	-0.01	0.027	0.739	-0.01	2	0.01	0.024	0.795	0.01

Note: SE = standard error, *g* = Hedge's *g*.

Differences in Outcomes Based on Variation in Implementation. To understand variation in outcomes based on fidelity of implementation, we performed analyses using only the sample of *quality*

implementing schools and their matched pairs. The results of these analyses were similar to those for the total sample, but with fewer significant results for outcomes (four and two fewer significant results for student school climate and suspensions, respectively), and one additional positive finding for grade 7 math in year 1.

Implications for Criminal Justice Policy and Practice in the U.S.

The SCSS model showed promise during the study’s two-year timeframe. We saw increases in readiness, and adoption of the data-driven approach by the teams. Given that full implementation of an EBP typically takes 2–4 years (Hawkins et al., 2008; Framework 2: Implementation Stages, 2020), the study was not long enough (or sufficiently delayed after implementation) to assess effects on school climate or behavioral indicators. Longer projects and or/projects that look at intermediate outcomes (e.g., students’ perceptions of safety, increased attendance, achievement) that could then impact the longer term behavioral outcomes would be beneficial to fund. There were also significant challenges related to the EBPs (e.g., poor fit with particular programs and leadership/staff turnover). The limited findings on climate and other outcomes should be considered with this in mind. These findings are consistent with other research that has shown the challenges of interventions influencing school climate—for example, high quality learning environments and institutional features have been linked to students’ behavior but in more interactive or indirect ways (Wang & Degol, 2016).

Our findings suggest several implications for criminal justice policy and practice. First, the multi-phase readiness approach used here (conducting feasibility visits and using pre-determined criteria, based on readiness, to select schools for comprehensive approaches) offers lessons that are translatable and applicable for other comprehensive schoolwide efforts. Readiness assessments provide actionable information for program implementers, guiding decisions about training and technical assistance that can build implementation capacity. Second, after programming is introduced, implementation data can improve schools’ ability to effectively bring the SCSS model to scale schoolwide. Implementation data in this study demonstrated that the SCSS model builds the school-based team members’ readiness and capacity to implement the framework, but that this increased knowledge did not extend far beyond that

team. Several factors likely contributed to this issue, including turnover of school leadership and staff and concerns about the relevance, fit, and perceived value of the EBP. Future studies should explore how to promote better adoption of the SCSS model at the school level over a longer period of time. Third, the mixed program impacts highlight that this kind of comprehensive, schoolwide intervention produces change one piece at a time, rather than in all areas at once. We need a deeper understanding of the most effective scope and sequence for comprehensive change efforts and of the implementation change process, given that a school's bandwidth allows adoption of only certain components at one time. This study suggests that it is feasible within a 2-year period to support a school in developing a functioning school-based team, conducting resource mapping, and using results from that (and other data sources) to select, train staff for, and start to implement an EBP (but not reach full implementation). The timeline has important implications for others implementing comprehensive frameworks and deciding what outcomes to use to monitor short- and long-term progress (both of a comprehensive framework and a specific evidence-based program). Comprehensive frameworks like SCSS hold promise for increasing staff capacity and building the infrastructure needed to improve school climate and reduce school violence—but they require engagement and commitment of key staff, and sufficient time for change to occur.

References

- Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society Series B Methodological*, 57(1), 289–300.
- Centers for Disease Control and Prevention. (n.d.). Youth risk behavioral surveillance system, United States, 2019. Morbidity and Mortality Weekly Report, 61, 1-168. Retrieved from <https://nccd.cdc.gov/youthonline/App/Results.aspx?LID=CO>
- Centers for Disease Control and Prevention, & National Center for Injury Prevention and Control. (2019a). *10 leading causes of death, United States, 2018, all races, both sexes, age 10–24*. https://www.cdc.gov/injury/wisqars/LeadingCauses_images.html
- Centers for Disease Control and Prevention, & National Center for Injury Prevention and Control. (2019b). *Violence-related all injury causes nonfatal injuries and rates per 100,000, 2018, United States, all races, both sexes, ages 10 to 24. Disposition: All cases*. <https://www.cdc.gov/injury/wisqars/>
- Dahlberg, L. L., & Mercy, J. A. (2009). History of violence as a public health issue. *AMA Virtual Mentor*, 11(2), 167–172. <https://doi.org/10.1001/virtualmentor.2009.11.2.mhst1-0902>
- Fagan, A. A., Hanson, K., Hawkins, J. D., & Arthur, M. W. (2009). Translational research in action: Implementation of the Communities That Care prevention system in 12 communities. *Journal of Community Psychology*, 37(7), 809–829.
- Hawkins, J. D., Brown, E. C., Oesterle, S., Arthur, M. W., Abbott, R. D., & Catalano, R. F. (2008). Early effects of Communities That Care on targeted risks and initiation of delinquent behavior and **substance use**. *Journal of Adolescent Health*, 43(1), 15–22.

Roberts, M. (2019). *Inside Colorado's 24 Mass Shootings During the Last Six Years*. Westword.

<https://www.westword.com/news/colorado-mass-shootings-from-2013-to-2019-11438884>

Silverstein, J. (2020). *There Were More Mass Shootings than Days in 2019*. CBS News.

Retrieved from <https://www.cbsnews.com/news/mass-shootings-2019-more-than-days-365/>

Wang, M. T., & Degol, J. L. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review*, 28(2), 315-352.

Framework 2: Implementation Stages. (2020, August 15).

Retrieved from <https://nirn.fpg.unc.edu/module-1/implementation-stages>

Pas, E. T., Johnson, S. R., Debnam, K. J., Hulleman, C. S., & Bradshaw, C. P. (2019). Examining the relative utility of PBIS implementation fidelity scores in relation to student outcomes. *Remedial and Special Education*, 40(1), 6–15.

Appendix A.

The model for achievement analysis is as follows:

$$y_{is}^t = \beta_0 + \beta_1 Treat_s + \beta_2 By_{is}^0 + x1'_{is}\beta_3 + x2'_s\beta_4 + \sum_{p=2}^{23} \delta_p Pair_s^p + \varepsilon_{is}$$

where y_{is}^t represents the outcome of student i in school s in time t , $Treat_s$ is an indicator for whether school s is a treatment school, y_{is}^0 is the student's score in the baseline year, $x1'_{is}$ is a vector of student characteristics (ELL status, special education status, gender, race/ethnicity, FRL eligibility), $x2'_s$ is a vector of school-level characteristics (school size [small, medium, large], student-teacher ratio, percent FRL eligible, race/ethnicity percentages), $Pair_s^p$ is an indicator for whether school s is in randomization pair p , and ε_{is} is the error term.

The repeated-cross-sections model used in the study to analyze survey responses from students and staff is as follows:

$$y_{ist} = \beta_0 + \beta_1 Treat_s + \beta_2 Post1_t + \beta_3 Post2_t + \beta_4 Treat_s * Post1_t + \beta_5 Treat_s * Post2_t + x1'_{ist}\beta_6 + x2'_{st}\beta_7 + \sum_{p=2}^{23} \delta_p Pair_s^p + \gamma_s + v_{st} + \varepsilon_{ist}$$

where y_{ist} represents the outcome of individual i (students or staff) in school s in time t , $Post1_t$ and $Post2_t$ are indicators for year 1 and year 2, respectively, $Treat_s$ is an indicator for whether school s is a treatment school, $x1'_{ist}$ is a vector of individual characteristics obtained from the survey, $x2'_{st}$ is a vector of school-level characteristics (school size [small, medium, large], student-teacher ratio, staff-student ratio, percent FRL eligible, race/ethnicity percentages), γ_s is a school random effect, v_{st} is a cohort (school-by-year) random effect, and ε_{ist} is the error term. The individual characteristics, $x1'_{ist}$, in the student analysis include gender, race/ethnicity indicators, and grade-level indicators. The individual characteristics, $x1'_{ist}$, in the staff analysis include gender, job category indicators (administrative, teacher, nurse, psychologist, teaching assistant, or police), years of school experience indicators (less than one year, 1–5 years, 6–10, 11–15, 16–20, 21 years or more), district tenure indicators (less than one year, 1–5

years, 6–10, 11–15, 16–20, 21 years or more), age group (less than 25 years old, 25–35, 36–45, 46–55, 56 years or older).

The model for attendance and suspensions analysis is as follows:

$$y_s^t = \beta_0 + \beta_1 Treat_s + \beta_2 By_s^0 + x2_s' \beta_4 + \sum_{p=2}^{23} \delta_p Pair_s^p + \varepsilon_s$$

where y_{is}^t represents the outcome for school s in time t , $Treat_s$ is an indicator for whether school s is a treatment school, and y_s^0 is the baseline outcome measure observed in the year before the intervention, $x2_s'$ is a vector of school-level characteristics (school size [small, medium, large], school grade-span indicators (one for if the school included elementary school grades, one for if the school included high-school grades), student-teacher ratio, percent FRL eligible, race/ethnicity percentages), $Pair_s^p$ is an indicator for whether school s is in randomization pair p , and ε_{is} is the error term.

Appendix B

Table 1. Response Rates for Staff and Student Climate Rates by School

School Id	group	pair #	Fall 2016	Fall 2016	Spring 2017	Spring 2017	Fall 2017	Fall 2017	Spring 2018	Spring 2018	Spring 2019	Spring 2019
			Student	Staff	Student	Staff	Student	Staff	Student	Staff	Student	Staff
1.	1	1	75%	78%	79%	47%			87%	74%	80%	80%
2.	3	1	78%	85%	60%	45%			68%	70%	95%	87%
3.	1	2	79%	91%	70%	97%			78%	45%	84%	0%
4.	3	2	0%	0%	71%	49%			73%	73%	71%	78%
5.	3	3	75%	70%	81%	71%			75%	74%	70%	81%
6.	1	3	78%	72%	72%	80%			83%	71%	71%	43%
7.	1	4	80%	68%	90%	53%			95%	77%	91%	95%
8.	3	4	76%	95%	77%	85%			72%	92%	76%	83%
9.	3	5	84%	100%	87%	68%			85%	86%	90%	79%
10.	1	5	77%	74%	76%	60%			85%	95%	83%	76%
11.	2	6					0%	0%	0%	0%	0%	0%
12.	4	6					75%	81%	59%	48%	0%	85%
13.	2	7					79%	75%	80%	75%	61%	89%
14.	4	7					81%	78%	70%	70%	57%	60%
15.	2	8					78%	74%	81%	29%	75%	0%
16.	4	8					75%	55%	68%	38%	67%	1%
17.	2	9					73%	58%	73%	79%	76%	70%
18.	4	9					0%	0%	0%	0%	0%	0%
19.	2	10					96%	100%	0%	0%	0%	0%
20.	4	10					73%	95%	84%	79%	89%	100%
21.	2	11					85%	62%	81%	39%	90%	76%
22.	4	11					81%	74%	97%	77%	74%	91%
23.	2	12					76%	84%	76%	88%	83%	97%
24.	4	12					90%	85%	96%	76%	80%	66%
25.	4	13					77%	94%	72%	78%	60%	68%
26.	2	13					92%	86%	72%	83%	82%	95%
27.	4	14					72%	65%	63%	62%	52%	37%
28.	2	14					71%	83%	62%	70%	72%	72%

29.	2	15					80%	76%	86%	45%	68%	46%
30.	4	15					74%	56%	77%	12%	75%	54%
31.	4	16					59%	22%	69%	66%	55%	66%
32.	2	16					73%	100%	98%	83%	54%	70%
33.	2	17					78%	78%	76%	81%	86%	93%
34.	4	17					63%	72%	76%	94%	86%	90%
35.	4	18					52%	57%	43%	45%	85%	75%
36.	2	18					99%	73%	93%	67%	85%	91%
37.	2	19					97%	76%	95%	62%	94%	90%
38.	4	19					79%	73%	66%	78%	61%	54%
39.	4	20					0%	0%	0%	0%	16%	89%
40.	2	20					82%	94%	96%	83%	90%	84%
41.	4	21					84%	43%	96%	50%	92%	82%
42.	2	21					89%	79%	99%	100%	91%	61%
43.	4	22					74%	92%	37%	44%	51%	74%
44.	2	22					81%	80%	76%	76%	81%	100%
45.	4	23					80%	58%	73%	77%	63%	100%
46.	2	23					62%	66%	70%	100%	55%	56%

Table 2. Means and Ns for Staff School Climate Data

Outcome Name	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)
School Climate Indicators										
Respect from teachers	1	450	3.14 (0.50)	368	3.17 (0.47)	2	472	3.19 (0.50)	317	3.23 (0.49)
Staff morale	1	636	3.03 (0.65)	540	3.07 (0.60)	2	670	3.08 (0.63)	473	3.12 (0.58)
Teacher support	1	633	3.40 (0.51)	539	3.42 (0.49)	2	668	3.41 (0.52)	475	3.43 (0.52)
Respect for authority	1	602	3.00 (0.58)	496	3.00 (0.58)	2	646	2.99 (0.60)	447	3.06 (0.56)
Positive feelings and attitudes toward this school	1	669	3.04 (0.55)	559	3.02 (0.56)	2	689	3.08 (0.51)	490	3.14 (0.51)
Perceptions of safety and supervision	1	645	3.29 (0.59)	550	3.24 (0.57)	2	681	3.32 (0.59)	486	3.28 (0.57)
School systems for mental health	1	572	2.65 (0.49)	479	2.74 (0.45)	2	619	2.75 (0.50)	426	2.72 (0.44)
Threat assessment and information sharing	1	555	2.83 (0.45)	470	2.87 (0.42)	2	611	2.91 (0.45)	411	2.94 (0.47)
School and Staff Capacity to Address Mental Health Needs										
Staff capacity to address mental health concerns: part of my role	1	565	3.35 (0.58)	473	3.30 (0.59)	2	617	3.38 (0.57)	423	3.34 (0.55)
Staff capacity to address mental health concerns: level of comfort	1	566	3.38 (0.61)	473	3.38 (0.62)	2	616	3.40 (0.58)	423	3.40 (0.58)
Problem Behaviors										
Perceived problem behaviors	1	555	2.57 (0.50)	470	2.56 (0.59)	2	611	2.56 (0.49)	420	2.56 (0.54)

Note: *M*=Means, and *SD*=standard deviations.

Table 3. Effects on Student School Climate Data

Outcome Name	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)
School Climate Indicators										
Teacher support	1	6557	2.99 (0.80)	3781	2.99 (0.81)	2	6728	3.01 (0.79)	3695	3.03 (0.80)
Respect for authority	1	6509	3.15 (0.73)	3732	3.08 (0.75)	2	6678	3.12 (0.73)	3664	3.10 (0.74)
Respectful climate	1	6438	2.91 (0.64)	3695	2.86 (0.67)	2	6641	2.87 (0.65)	3647	2.88 (0.66)
Trusting relationships	1	5141	3.09 (0.62)	2893	3.07 (0.63)	2	5479	3.10 (0.61)	2939	3.08 (0.61)
Positive feelings and attitudes towards school	1	6822	3.15 (0.54)	3976	3.12 (0.55)	2	6942	3.10 (0.54)	3863	3.12 (0.53)
Social belonging	1	6780	2.80 (0.72)	3946	2.80 (0.73)	2	6889	2.78 (0.72)	3826	2.81 (0.72)
Perceptions of safety and support	1	6708	2.86 (0.50)	3912	2.83 (0.52)	2	6855	2.86 (0.50)	3779	2.84 (0.50)
Interactions with prosocial peers	1	6192	2.47 (1.03)	3552	2.41 (1.04)	2	6383	2.45 (0.99)	3449	2.41 (1.02)
School and Staff Capacity to Address Mental Health Needs										
Staff capacity to address mental health needs	1	5241	2.80 (0.56)	2892	2.76 (0.55)	2	5518	2.80 (0.56)	2729	2.77 (0.55)
Peer norms and beliefs										
Peer acceptability of aggression	1	6195	2.05 (0.63)	3539	2.15 (0.61)	2	6400	2.10 (0.62)	3490	2.12 (0.59)
Peers encourage prosocial behavior	1	6103	3.22 (0.72)	3501	3.14 (0.75)	2	6310	3.22 (0.71)	3444	3.21 (0.71)
Health and Wellness										
Peer social emotional learning	1	4869	2.60 (0.52)	2691	2.58 (0.53)	2	5222	2.56 (0.52)	2287	2.61 (0.54)

Outcome Name	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)
Violence Indicators										
Talked to someone about bullying	1	5755	0.53 (0.80)	3245	0.50 (0.78)	2	6037	0.50 (0.78)	3232	0.49 (0.77)
Where have you been bullied?	1	5685	0.27 (0.45)	3187	0.26 (0.44)	2	5978	0.25 (0.43)	3202	0.24 (0.43)
Perpetration of aggression (last 12 months)	1	6141	0.11 (0.19)	3518	0.13 (0.22)	2	6406	0.12 (0.20)	3490	0.11 (0.20)
Victim of aggression (last 12 months)	1	6037	0.20 (0.28)	3429	0.20 (0.28)	2	6308	0.21 (0.28)	3420	0.19 (0.28)
Bullying victimization (last 12 months)	1	5778	0.25 (0.28)	3258	0.25 (0.29)	2	6062	0.25 (0.28)	3239	0.24 (0.29)
Bullying perpetration last 2 months	1	5365	0.06 (0.18)	3002	0.08 (0.22)	2	5632	0.06 (0.17)	2478	0.07 (0.18)
Delinquency last 12 months	1	6173	0.09 (0.19)	3541	0.11 (0.21)	2	6415	0.11 (0.21)	3498	0.11 (0.21)
Truancy—cut or skipped class during past month	1	5597	0.10 (0.30)	3135	0.11 (0.32)	2	5885	0.11 (0.32)	3195	0.10 (0.31)

Note: *M*=Means, and *SD*=standard deviations.

Table 4. Means and Ns for Daily Attendance and Truancy Rates

Outcome Name	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)
Attendance	1	23	0.93 (0.02)	23	0.92 (0.03)	2	22	0.92 (0.02)	22	0.92 (0.02)
Truancy	1	23	0.03 (0.02)	23	0.03 (0.03)	2	22	0.03 (0.02)	22	0.03 (0.02)

Note: *M*=Means, and *SD*=standard deviations.

Table 5. Means and Ns for Total, In-School, and Out-of-School Suspension Rates

Outcome Name	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)
Total Suspension	1	23	33.67 (35.10)	23	34.13 (34.19)	2	22	42.67 (40.28)	22	33.13 (35.86)
In School Suspension	1	23	19.13 (25.77)	23	13.51 (16.17)	2	22	22.37 (26.18)	22	14.45 (16.35)
Out of School Suspension	1	23	14.54 (11.98)	23	20.62 (22.73)	2	22	20.30 (18.10)	22	18.68 (21.79)

Note: *M*=Means, and *SD*=standard deviations.

Table 6. Means and Ns for Reading and Math Academic Achievement Test Scores

Outcome Name	Grade	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)	Year	Tx N	Tx M (SD)	Ctrl N	Ctrl M (SD)
Reading	7	1	3019	-0.10 (1.00)	1950	-0.16 (0.95)	2				
	8	1	2961	-0.20 (0.98)	1894	-0.17 (0.97)	2	2647	-0.08 (1.00)	1716	-0.10 (0.96)
Math	7	1	2962	-0.04 (0.95)	1950	-0.19 (0.93)	2				
	8	1	2384	-0.17 (0.97)	1746	-0.09 (0.99)	2	2498	-0.10 (0.98)	1685	-0.16 (0.92)

Note: *M*=Means, and *SD*=standard deviations.