The Effects of School-wide Positive Behavior Support on Middle School Climate and Student Outcomes

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Abstract

This study investigated the effects of school-wide positive behavior support (SWPBS) on middle school climate and student outcomes. Data consisted of more than 300 teacher responses and 10,000 student responses in two middle schools in the western United States. This study used a quasi-experimental (non-equivalent two-group, pretest-posttest) design. One school implemented a SWPBS intervention over a period of four years, while the other served as a control. The SWPBS intervention included school-wide teaching of social skills, praise notes from teachers to students, posting of school rules, proactive screening for students at risk for emotional and behavioral disorders, and referrals of at-risk students for targeted interventions. The treatment school showed statistically significant improvements in teacher ratings of school climate, while the control school tended to stay the same or worsen. Statistically significant decreases were also evident in students' tardiness, unexcused absences, and office discipline referrals when compared to the control school. Implications and limitations of this study are addressed.

Introduction

The education literature has recognized the importance of school climate in establishing effective schools (Pritchard, Morrow, & Marshall, 2005). This may be due, in part, to the encompassing impact of climate on a school, influencing students, teachers, administrators, and even major stakeholders (Deal & Peterson, 2009). For example, school climate can impact teacher productivity, performance, collaboration, communication, satisfaction, and burnout (Conley & Muncey, 1999; DuFour, 2007; Grayson & Alvarez, 2008; Kruse & Louis, 1997). Climate can also energize and elicit support from parents and community (Deal & Peterson, 2009).

Research has emphasized positive effects of a healthy school climate on student outcomes. School climate has been shown to influence grade point average (GPA), standardized test scores, reading levels, academic writing, and school adjustment (Brand, Felner, Seitsinger, Burns, & Bolton, 2008; Esposito, 1999; Garrison, 2004; Pritchard et al., 2005). School climate has also been associated with reduced occurrences of student misbehavior such as

drug use, aggression, antisocial behavior, absences and suspensions, school violence, internalizing and externalizing behavior problems, and student delinquency (Aveyard et al., 2004; Brand et al., 2008; Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Haynes, Emmons, & Ben-Avie, 1997; Kuperminc, Leadbeater, Emmons, & Blatt, 1997; Shann, 1999; Sprott, 2004). School climate has also influenced emotional and psychological factors such as optimism, student aspirations, psychological well-being, and academic self-esteem (Brand et al., 2008; Ruus et al., 2007; Plucker, 1998). There seems to be an obvious consensus in the literature that developing a healthy school climate needs to be a priority for effective schools (Muijs, Harris, Chapman, Stoll, & Russ, 2004; Sterbinsky, Ross, & Redfield, 2006).

The term *school climate* is difficult to define, with several contrasting conceptual frameworks occurring throughout the literature (Schoen & Teddlie, 2008). Broadly defined, school climate is a "set of internal characteristics that distinguishes one school from another and influences the behavior of its members" (Hoy & Hannum, 1997, p. 291). This study defines school climate in a similar comprehensive way, including the total environmental quality of the school. We agree with Van Houtte (2005) that school climate is as much a psychosocial phenomenon as it is a physical situation. In addition to stakeholders' perceptions of the physical aspects of the school facilities and the programs and resources available to students and staff, their perception of climate includes the nature of instructional management, the perceived support of parents and teachers, and the relationships among staff, students, and the community (Hansen & Childs, 1998; Taylor, West, & Smith, 2006).

The need for a healthy school climate is especially important in secondary school settings where student behavior and discipline problems are often more challenging than in elementary classrooms (Briggs, 2009; Langdon & Preble, 2008; Sugai et al., 2000). For example, bullying and victimization are much more likely to occur in secondary schools (Bradshaw, Sawyer, & O'Brennan, 2007; Langdon & Preble, 2008). Research also indicates that behavioral and emotional problems among adolescents have substantially increased over the past 25 years (Collishaw, Maughan, Goodman, & Pickles, 2004). Adolescents are at an increased risk for developing mental health disorders including anxiety, depression, and antisocial behaviors (Alloy & Abramson, 2007; Berk, 2003). Academic adjustment has also been

found to decrease over time for students transitioning into secondary schools (Alspaugh, 1999).

The ways educators approach the wide spectrum of student challenges and the environment they create largely determine how well students learn and perform in the classroom (Buck, 1992; Deal & Peterson, 2009). Generally, schools that respond with reactive, punitive methods of discipline do not encourage appropriate behavior and tend to create school climates that focus on not getting caught (Horner, Sugai, Todd, & Lewis-Palmer, 2005). A more proactive and preventative approach to school-wide behavioral problems is positive behavior support (PBS).

Positive Behavior Support

PBS is a systems model for behavior management that advances beyond punitive, reactive responses to undesired behaviors by employing an applied method of teaching, positively reinforcing, and continually expanding an individual's behavioral repertoire (Carr et al., 2002). Linked to functional behavioral assessment, PBS is a practical, lifestyle approach focused on improving overall quality of life through strategies that develop appropriate social behaviors and help achieve learning outcomes (Sugai et al., 2000; Warren et al., 2006). Originally developed as an alternative to aversive interventions for students with developmental disabilities (Durand & Carr, 1985), PBS is now used as a behavioral tool to augment the ability of families, schools, and communities to apply empirically supported methods to increase success and personal satisfaction in academic, employment, social, recreational, community, and family environments (Carr et al., 2002; Sugai et al., 2000). As application of PBS has broadened, a new framework called *school-wide positive behavior support* (SWPBS) has emerged and is being successfully implemented at various levels by schools, districts, and states both nationally and internationally (Muscott et al., 2004; Hetzroni, 2003).

School-wide Positive Behavior Support
SWPBS applies the concepts of PBS to all students in a school, incorporating a three-tiered model to design interventions or prevention strategies (Horner & Sugai, 2002). SWPBS is based on the assumption that approximately 80% of students respond to *universal* or primary level interventions, which explicitly teach and reinforce behavioral expectations to all students in a school. *Targeted* or secondary level interventions provide specific services and support to the estimated

10–15% of students who may have been labeled as *at risk* and projected to benefit from services such as small-group instruction in social skills. A more intensive *individual* or tertiary level support provides highly focused assessment and intervention to the approximately 1–5% of students who don't respond to less intensive services, including those with educational disabilities.

The guiding principles of SWPBS focus on prevention of behavioral problems, continuous behavioral support for all students, real application in natural school settings, consistent improvement based on collected data, and systemic organizational change (Carr et al., 2002; Sugai et al., 2000). SWPBS consists of several components, which include (a) organizing and training a SWPBS support team, (b) defining behavioral expectations, (c) teaching behavioral expectations, (d) implementing systems to encourage expected behaviors and discourage inappropriate behaviors, and (e) collecting data to make decisions and evaluate effectiveness (Horner et al., 2005).

SWPBS schools, in comparison to non-SWPBS schools, have been found to produce more strategies that are supportive, corrective, and assistive in deescalating behavioral issues with youth rather than reverting to punitive methods (Medley, Little, & Akin-Little, 2008). Generally, schools that are unfamiliar with alternative methods react to problem behaviors through punishment in the form of office discipline referrals (ODRs), zero-tolerance policies, and school suspensions. SWPBS is focused more toward modeling and rewarding positive behavior rather than relying on punishment or exclusion approaches to behavioral problems, approaches that often hinder rather than encourage a healthy school climate (Sugai & Horner, 2008) and do not typically create teaching opportunities that promote pro-social behavior (Skiba & Peterson, 2000). Reactive approaches to discipline can disrupt the educational setting, increase the potential for academic failure of at-risk students, and interrupt valuable instructional time (Kitsantas, Ware, & Martinez-Arias, 2004). In fact, research has shown that reactive and punitive methods of school discipline are related to increased levels of student vandalism, aggression, and antisocial behavior (Meyer, 1995; Meyer, Butterworth, Nafpaktitis, & Sulzer-Azaroff, 1983). Data suggest that when SWPBS is implemented in schools, discipline problems are typically reduced. For example, a Maryland statewide initiative in 78

schools found that, after SWPBS implementation, elementary schools experienced a 43% overall reduction in ODRs, while middle schools saw a 33% overall reduction (Barrett, Bradshaw, & Lewis-Palmer, 2008).

Although SWPBS implementation has frequently been found to be effective in elementary schools, implementation in secondary schools is a more recent endeavor. The relatively few studies that have examined SWPBS in middle school settings have found it to be successful in reducing problem behaviors. For example, when SWPBS was implemented in one urban middle school, ODRs decreased by 20%, in-school conferences by 17%, and school suspensions by 57% (Warren et al., 2006). A study examining the effects of SWPBS in five middle schools found that ODRs decreased by 36%, in-school suspensions decreased by 37%, and out-of-school suspensions decreased by 35% (Muscott, Mann, Lebrun, & Marcel, 2008). Additional studies have established that SWPBS implementation in secondary schools can be effective in reducing ODRs and suspensions (Bohanon et al., 2006; Lassen, Steele, & Sailor, 2006; Mass-Galloway, Panyan, Smith, & Wessendorf, 2008; Medley et al., 2008).

Studies have shown the impact of SWPBS in secondary schools to extend beyond reducing discipline problems, as it can contribute to a healthy learning environment. Teachers and administrators have reported that positive changes in their schools include improved student-teacher relationships (Turnbull et al., 2002; Warren et al., 2006). Additionally, when SWPBS reduces the amount of time spent on dealing with behavioral problems, time usually spent on discipline is recovered, thus improving student exposure to academic material and allowing resources to be spent on more positive learning activities (Lassen et al., 2006).

Aim of the Present Study

The present study evaluated the effects of SWPBS on school climate and student outcomes (behavior and grade point average) over four years at one middle school, using a longitudinal experimental design. Few studies have examined SWPBS at the secondary level over more than two years, and even fewer have examined the impact of SWPBS on school climate. The researchers hypothesized that school climate and student outcomes would show improvements over the four years of the intervention.

Method

Participants and Settings

This study involved two middle schools in the Western part of the United States. Both schools were from the same school district and included sixth and seventh grades, with ages ranging primarily from 11 to 13 years. The treatment middle school was contacted (convenience sample) and asked to participate in a comprehensive SWPBS implementation in partnership with a local university. The control middle school was selected based on demographic and geographic similarities to the treatment school. Table 1 displays demographic information for the treatment and control schools.

Materials and Procedures

The SWPBS intervention implemented in this study integrated several components across a continuum of behavioral support, including universal, targeted, and individual interventions. It was implemented in the treatment school over four years. This article will focus entirely on the universal intervention, which involved six elements or phases. The reader

for SWPBS implementation, as recommended by Sugai and associates (2010). The team consisted of both university faculty and middle school staff. A university faculty member assigned to be the SWPBS coordinator was on site for much of the first two years of implementation and available upon request the following two years. SWPBS team members from the treatment school included the school principal, the vice principal, a PTA member, and teachers nominated by the school principal to represent various departments.

The SWPBS team was involved in the initial planning stages and in the decision-making process throughout the four years of implementation. The planning stages involved designing the initial SWPBS plan and training the teachers. Planning continued throughout the four years of the intervention as part of the data-based decision-making process described below. The SWPBS plan included developing the school-wide curriculum, defining behavioral expectations, creating systems to reinforce expected behaviors, developing a unified evaluation system, and standardizing the measurements.

Table 1
Treatment School and Control School Demographics

Category		Treatment School		Control School	
		n	%	*n*	%
Teachers		50		56	
Students		1063		1331	
Gender	Male	548	51.6%	693	52.1%
	Female	515	48.4%	638	47.9%
Ethnicity	Caucasian	934	87.9%	1210	90.9%
	Other	129	12.1%	121	9.1%
Special Education		141	13.3%	148	11.1%
Reduced-Price Lunch		402	37.8%	366	27.5%

Note. The numbers reported are school averages over the four years of the intervention.

is referred to the following published articles for more details regarding the tier two and tier three interventions employed at the SWPBS school (Anderson, Munk, Young, Conley, & Caldarella, 2008; Conley, Caldarella, & Young, 2007; Peterson-Nelson, Caldarella, Young, & Webb, 2008).

Forming the SWPBS team.
A team was formed to concentrate on building the school's capacities

Training conducted by the SWPBS team for teachers and staff consisted of three half-day meetings before the implementation of SWPBS, monthly meetings during the first year of implementation, and periodic (i.e., semiannual) training sessions at faculty meetings throughout the remaining three years. The initial half-day and monthly sessions involved introducing PBS, training teachers and staff on the school-wide curriculum, and standardizing the procedures to

be used in the treatment school. The subsequent periodic training meetings were held to ensure proper implementation and to facilitate teacher buy-in. Teacher buy-in was established through presenting best practices, holding professional development trainings, and providing reinforcement (e.g., school funding, help with students with troubling behaviors, gift cards for completing questionnaires). Rather than creating a manualized treatment, the SWPBS team planned a variety of procedures and practices to define and teach behavioral expectations, reinforce expected behaviors, make data-based decisions, and implement school-wide screening.

Defining behavioral expectations. Behavioral expectations and target social skills were defined by the SWPBS team during the planning phase, based on perceptions of school needs. All students were expected to understand and follow the expectations and practice the social skills. The seven rules or behavioral expectations were as follows:

1. We treat everyone with respect.
2. We show appreciation.
3. We include others in our work and play.
4. We are good to each other.
5. When we make a mistake, we fix it and learn from it.
6. Faculty and staff will help us achieve success.
7. Everyone has a responsibility to create and maintain a peaceable school environment.

The following target social skills were included in SWPBS implementation:

- Following instructions
- Getting the teacher's attention
- Listening
- Accepting consequences
- Apologizing
- Showing appreciation
- Resisting peer pressure

Teaching behavioral expectations. School-wide instruction on the behavioral expectations consisted of monthly 20-minute lessons taught by classroom teachers: 10 minutes directly teaching and practicing the social skill, 5 minutes viewing a video of students performing the social skill, and 5 minutes discussing the social skill. These lessons involved reviewing defined expectations, teaching topics related to the expectations, providing social skills instruction, and presenting other skill-building or self-management lessons. Additional school-wide instruction took

place as school rules were posted and administrative interventions were employed for teaching students with discipline problems.

Reinforcing expected behaviors. A student Peace Committee was formed to help with the implementation process and to design posters to display the school rules. A reinforcement system using praise notes was implemented during the third year of SWPBS, which included teacher-to-student and student-to-student praise notes. Teachers wrote and distributed praise notes to students who exhibited desired behaviors and entered a copy of each praise note in weekly prize drawings. School-wide assemblies and celebrations, including a school play demonstrating examples of desired behaviors, took place periodically throughout the four-year intervention to positively reinforce desired behaviors.

Making data-based decisions. The SWPBS team met periodically to review and discuss the academic and behavioral data (absences, GPAs, ODRs) to focus and adjust the SWPBS implementation accordingly. Meetings with all faculty enabled team members to share data, collaborate on best practices, and reemphasize the SWPBS philosophy. The SWPBS team collected and reviewed additional data, such as periodic teacher and student surveys measuring perceptions of the intervention, and encouraged feedback from staff members with suggestions for improvement.

Implementing school-wide screening. To identify students in the school who needed more intensive interventions, school-wide screening was conducted. At the conclusion of each school year, teachers at the treatment middle school and feeder elementary schools screened students who would be enrolled in the treatment middle school the following school year. The screening instrument used was the Systematic Screening for Behavior Disorders (SSBD) (Walker & Severson, 1992), which uses a rating scale to evaluate all the students in the school (see Caldarella, Young, Richardson, Young, & Young, 2008 for more details). Students identified by the SSBD as at risk were referred to participate in a more intensive targeted intervention focused on teaching academic, social, and self-management skills (see Anderson, Munk, Young, Conley, & Caldarella, 2008; Conley, Caldarella, & Young , 2007; Peterson-Nelson, Caldarella, Young, & Webb, 2008 for more details). These interventions for at-risk students continued throughout the four years of SWPBS implementation.

Dependent Measures
School climate. Teachers completed two measures of school climate in this study: the PBS-Supplemental Questionnaire (PBS-SQ) and the Indicators of School Quality (ISQ) (Taylor et al., 2006). The PBS-SQ was designed by the researchers specifically to measure components of school climate that are most closely aligned to SWPBS. Items include students' use of appropriate social skills, helpful and equitable environment, community involvement, and teacher praise and encouragement. The questionnaire contains 18 items, each with a 5-point Likert scale ranging from 1 *(strongly disagree)* to 5 *(strongly agree)*. The psychometric properties of this measure are reported in the results section.

The ISQ contains 30 items grouped into seven categories that assess school climate: *parent support, teacher excellence, student commitment, school leadership, instructional quality, resource management,* and *school safety*. Teachers respond to each statement using a 5-point Likert scale, ranging from 1 *(strongly disagree)* to 5 *(strongly agree)*. The ISQ has been shown to be a valid and reliable measure, with the appropriate categories significantly predicting student achievement and providing objective measures of school climate (West, Taylor, Wheatley, & Charlton, 2008). Alpha reliability coefficients for the ISQ categories range from .78 to .97 (Taylor et al., 2006).

Student outcomes. During the four years of the SWPBS intervention, school-wide data were collected at both the treatment and control schools. These data incorporated both academic (GPA) and student behavior (tardiness, unexcused absences, and ODRs) variables. GPA was calculated based on the traditional 4.0 scale used in the United States. Tardiness and unexcused absences were recorded for each of the seven daily class periods; reported data represent the mean number of tardies or unexcused absences per period per student. The ODRs mentioned in this study represent those referrals resulting from disorderly conduct (e.g., inappropriate language, physical aggression, dress code violation, property damage, theft, cheating, drug possession, vandalism). To control for differing student populations, ODRs represent the average number of referrals per student for the school year.

Data Collection
Teachers from both schools completed the PBS Supplemental Questionnaire (PBS-SQ) and the Indicators of School Quality (ISQ) toward the end of each school year. A total of 345 teachers responded to the PBS-SQ, and 315 teachers responded to the ISQ, resulting in response rates of 81.4% and 74.3%, respectively. School outcome data were collected for 10,766 students enrolled in the two middle schools during the four years of SWPBS implementation. Data for both students and teachers were collected anonymously over the four years of the study, and the numbers reported in Table 1 do not represent the actual number of participants. A high percentage of teachers participated multiple times across the four years, but approximately half the students turned over each year. The averages reported in Table 1 represent a more realistic estimate of the number of participants.

Design and Analysis
This study used a quasi-experimental (non-equivalent two-group, pretest-posttest) design with an untreated control group. To evaluate the effects of SWPBS on school climate and student outcomes, the researchers used analysis of variance to examine differences across the four years of the intervention. Specifically, linear trend contrasts were used to examine these changes, since researchers hypothesized there would be steady improvements in the dependent variables. To determine the significance of the changes relative to the control school, interactions effects were also evaluated. Effect sizes were calculated using Cohen's *d*, comparing the means from the first year of the SWPBS intervention with those from the final year.

Results

School Climate
PBS-Supplemental Questionnaire (PBS-SQ). Rather than analyzing the individual items of the PBS-SQ, principal components factor analysis with subsequent varimax rotation was conducted to reduce the items into meaningful factors (see Table 2). A three factor solution was selected based on the scree plot, telescoping determinant plots, and the relatively clean factor loadings (Shatzer, Bubb, Lauritzen, & Brown, 2008). The three resulting factors explained 59.4% of the variance in teacher responses, and each had eigenvalues greater than one. The factor loadings for the 15 included items were all greater than 0.50. Factor loadings for three of the items were relatively low (below 0.50) and loaded evenly on more than one factor. For these reasons, the three items ("School prepares students for future," "Teachers believe praise is important," and "Students receive written praise") were eliminated from further analyses. The item "School uses positive means for student cooperation"

Table 2
Factor Loadings and Reliability Alpha Coefficients for the Three PBS-SQ Factors

Items	Factor 1 (α = .90)	Factor 2 (α = .82)	Factor 3 (α = .76)
Students show respect for each other.	0.82		
Students use appropriate social skills.	0.81		
Students share responsibility for making school safe.	0.75		
Students are motivated to use appropriate social skills.	0.66		
Students learn important social skills.	0.64		
Everyone at school treats others with positive regard.	0.62		
Behavior problems are dealt with appropriately.	0.57		
School develops links to community.		0.83	
School involves families.		0.79	
Students have opportunities to express feelings.		0.51	
Adults invite discussions of safety.		0.51	
School uses positive means for student cooperation.	0.44	0.51	
Student with special needs receive special help.			0.80
School identifies needs of high-risk students.			0.76
School strives for academic success.			0.65

Note. Only factor loadings greater than 0.40 are shown.

had similar loadings on two factors, but was included with Factor 2 because of the higher loading and the better conceptual fit.

As the seven items in Factor 1 could be interpreted as sharing elements of students' understanding and demonstrating appropriate behavior and social skills, the researchers labeled them *student pro-social behavior*. Factor 2, which contained five items dealing with the ability of the school to communicate and cooperate with key stakeholders (e.g., parents, students, community members), was labeled *school communication/collaboration*. Because the items in Factor 3 related to the ability of the school to assist all students in the learning process while striving for academic success, the factor was labeled *educational assistance*.

Linear trend contrasts revealed statistically significant trends for all three factors of the PBS-SQ for the treatment school (see Table 3). The control school did not show statistically significant changes in these factors over the four years, with the exception of student pro-social behavior, which significantly decreased. Statistically significant interaction effects were evident for all three factors, indicating that the treatment school showed increases while the control

school tended to stay the same or worsen on each of these factors. Cohen's *d* effect sizes in the treatment school were medium to large and in a positive (preventative) direction, with the largest effect size being student pro-social behavior. Effect sizes in the control school were small to medium and in a negative direction.

Indicators of School Quality (ISQ). The treatment school showed statistically significant upward trends over the four years of the intervention in all of the ISQ categories, with the exception of school safety (see Table 4). These improvements in school climate tended to have medium to large effect sizes. The control school tended to stay the same on these measures of school climate, as they did not show statistically significant trends for any of the ISQ categories. Statistically significant interaction effects were also present for the ISQ categories of teacher excellence, school leadership, instructional quality, and resource management—indicating that the treatment school showed increases while the control school tended to stay the same or worsen on each of these categories. Alpha reliability coefficients for the ISQ categories ranged from 0.67 (parent support) to 0.87 (school leadership).

Table 3
Linear Trend Results, Effect Sizes, and Interaction Effects for the PBS-SQ Factors

PBS-SQ Factors	Year 1 M (SD)	Year 2 M (SD)	Year 3 M (SD)	Year 4 M (SD)	Linear Trend (F)	Cohen's d	Interaction Effect (F)
Student Prosocial Behavior							
Treatment	3.15 (0.75)	3.56 (0.58)	3.85 (0.63)	4.12 (0.51)	46.96***	1.51	16.25***
Control	4.09 (0.41)	4.12 (0.48)	4.10 (0.44)	3.84 (0.63)	4.56*	-0.47	
School Communication							
Treatment	3.38 (0.62)	3.59 (0.51)	3.81 (0.57)	3.92 (0.51)	19.82***	0.95	6.77***
Control	3.94 (0.52)	4.12 (0.56)	3.94 (0.50)	3.83 (0.57)	1.85	-0.20	
Educational Assistance							
Treatment	3.93 (0.60)	4.01 (0.63)	4.26 (0.53)	4.31 (0.50)	10.93**	0.69	4.89**
Control	4.07 (0.67)	4.31 (0.56)	4.18 (0.48)	3.96 (0.68)	1.30	-0.16	

Note. Treatment ($n = 153$), Control ($n = 192$). *$p < .05$. **$p < .01$. ***$p < .001$.

Student Outcomes

Results of the linear trend contrasts showed a statistically significant downward trend for ODRs, tardiness, and unexcused absences in the treatment school, though effect sizes tended to be small (see Table 5). The control school also showed a statistically significant downward trend in ODRs and tardiness, though the slope of the change was not as steep as in the treatment school, resulting in a statistically significant interaction effect. A statistically significant interaction effect was also present for unexcused absences, indicating that the treatment school showed improvements while the control school tended to worsen on this variable. GPA showed a statistically significant upward trend in both the treatment and control schools, and the slopes of GPA trends were similar, resulting in a non-significant interaction.

Discussion

The results of this study suggest a connection between SWPBS implementation and improvement in school climate and reductions in student misbehavior in the middle school setting. Most of the categories of the ISQ and all the factors of the PBS-SQ showed statistically significant improvements relative to the control school. Results from the student behavioral data also indicated that the treatment middle school showed statistically significant decreases in student

tardiness, unexcused absences, and ODRs when compared to the control school. For approximately half the dependent measures, the treatment school actually was in worse shape than the control school during the first year, but ended the last year in better shape, suggesting a meaningful treatment effect.

The practical significance of these findings should also be considered. Effect sizes for the changes in school climate tended to be moderate to high, with the largest effect of SWPBS belonging to students' ability to learn and use appropriate social behavior. The interaction effects on the PBS-SQ also revealed meaningful improvements in teachers' perceptions of the ability of the school to communicate and cooperate with key stakeholders (e.g., parents, students, community members) and assist students in the learning process. The statistically significant interaction effects on the ISQ also revealed that the treatment school improved on ratings of teacher excellence, school leadership, instructional quality, and resource management; the control school tended to stay the same or worsen in these categories. The practical significance of this finding suggests that SWPBS may improve areas of school climate, which have been found to have a positive impact on overall school quality and student success (Taylor et al., 2006).

Although the Cohen's *d* effect sizes for student outcomes were considered small, the practical

Table 4
Linear Trend Results, Effect Sizes, and Interaction Effects for the PBS-SQ Factors

ISQ Categories	Year 1 M (SD)	Year 2 M (SD)	Year 3 M (SD)	Year 4 M (SD)	Linear Trend (F)	Cohen's d	Interaction Effect (F)
Parent Support							
Treatment	3.24 (0.60)	3.30 (0.56)	3.44 (0.63)	3.51 (0.65)	4.07*	0.43	0.37
Control	3.87 (0.58)	3.86 (0.51)	3.95 (0.42)	3.95 (0.48)	0.77	0.15	
Teacher Excellence							
Treatment	4.31 (0.53)	4.31 (0.43)	4.48 (0.46)	4.52 (0.38)	4.71*	0.46	2.75*
Control	4.55 (0.39)	4.59 (0.37)	4.61 (0.36)	4.43 (0.36)	1.53	-0.3	
Student Commitment							
Treatment	3.18 (0.63)	3.27 (0.57)	3.51 (0.58)	3.62 (0.55)	11.56**	0.74	1.29
Control	3.87 (0.41)	3.94 (0.63)	4.06 (0.35)	3.99 (0.52)	1.72	0.26	
School Leadership							
Treatment	4.04 (0.70)	3.99 (0.83)	4.31 (0.62)	4.69 (0.41)	19.69***	1.13	6.19***
Control	4.31 (0.55)	4.49 (0.55)	4.56 (0.44)	4.36 (0.61)	0.30	0.09	
Instructional Quality							
Treatment	3.70 (0.76)	3.84 (0.58)	4.01 (0.56)	4.12 (0.55)	8.81**	0.63	3.13*
Control	4.19 (0.71)	4.21 (0.63)	4.14 (0.49)	4.04 (0.50)	1.43	-0.24	
Resource Management							
Treatment	3.32 (0.71)	3.45 (0.62)	3.74 (0.64)	3.79 (0.59)	11.67*	0.72	3.09*
Control	4.16 (0.52)	4.12 (0.49)	4.12 (0.64)	4.09 (0.56)	0.23	-0.13	
School Safety							
Treatment	3.86 (0.81)	3.73 (0.71)	3.78 (0.76)	3.97 (0.64)	0.44	0.15	2.11
Control	4.40 (0.40)	4.53 (0.50)	4.49 (0.40)	4.29 (0.52)	1.06	-0.24	

Note. Treatment (*n* = 149), Control (*n* = 166). *p < .05. **p < .01. ***p < .001.

significance can be quite meaningful. Each ODR requires a considerable amount of classroom and administrative time. In fact, researchers have reported that each ODR uses 20 to 45 minutes of instructional time (Lassen et al., 2006). Using the more conservative time of 20 minutes per ODR, estimates comparing the first year to the last year of SWPBS revealed that the treatment school saved 222 student and administrator hours due to the reduced number of ODRs. Additionally, the treatment school saved an estimated 643 student days in the classroom due to the reduced number of absences and 213 hours of class time due to reduced tardiness (assuming students were late an average of five minutes per tardy).

Another interesting finding was the association between SWPBS and school leadership. When the researchers compared the first- to fourth-year scores on the ISQ, the largest effect size was for the school leadership category, indicating that teachers at the treatment school reported practically significant and meaningful changes in their perceptions of leadership over the four years of SWPBS implementation. It is

Table 5
Linear Trend Results, Effects Sizes, and Interaction Effects for GPA, ODRs, Tardiness, and Unexcused Absences

School Record	Year 1	Year 2	Year 3	Year 4	Linear Trend *(F)*	Cohen's *d*	Interaction Effect *(F)*
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*			
GPA							
Treatment	3.09 (0.79)	3.10 (0.81)	3.15 (0.82)	3.20 (0.76)	11.81**	0.14	0.03
Control	3.20 (0.78)	3.20 (0.77)	3.25 (0.78)	3.31 (0.73)	15.10***	0.14	
ODRs							
Treatment	0.79 (2.20)	1.19 (3.15)	0.93 (2.70)	0.52 (1.61)	11.27**	-0.14	14.01***
Control	0.42 (1.58)	0.32 (1.15)	0.21 (0.94)	0.20 (0.93)	30.87***	-0.17	
Tardiness							
Treatment	4.40 (7.38)	7.66 (13.55)	3.60 (10.07)	2.33 (5.37)	78.16***	-0.32	77.51***
Control	1.08 (3.15)	0.79 (2.47)	0.49 (2.13)	0.86 (2.19)	17.92***	-0.08	
Absences							
Treatment	10.35 (33.52)	6.86 (19.62)	8.72 (28.34)	6.74 (31.47)	5.85*	-0.11	12.04***
Control	10.52 (20.04)	13.11 (25.06)	14.08 (25.58)	15.47 (27.26)	30.25***	0.21	

Note. Treatment (*n* = 4826). Control (*n* = 5940). *p < .05. **p < .01. ***p < .001.

possible that the intervention created opportunities for principals and other school leaders to demonstrate their leadership skills through organizing and participating in the SWPBS team, creating positive behavioral goals and expectations, making data-based decisions, encouraging collaboration among community and staff, providing training and reinforcement opportunities, and helping staff members develop new skills and competencies. Similar functions have also been associated with successful principal leadership and school effectiveness (Deal & Peterson, 2009; Leithwood & Jantzi, 2006). The specifics of how SWPBS may create opportunities for leadership development and which leadership qualities may facilitate better SWPBS implementation are questions that warrant further investigation.

While SWPBS did appear to have significant and practical effects on student behavior and school climate, there were no statistically significant effects on GPA in comparison to the control school. This finding is consistent with previous research, which found only slight improvements in academic performance as a result of SWPBS (Muscott et al., 2008), and is not surprising considering the focus of the intervention. The SWPBS intervention in the present study was focused toward social skills

education and behavioral improvement, with little direct attention to academic learning.

These findings also have important implications for school effectiveness. Similar to previous findings (Medley et al., 2008; Muscott et al., 2008; Warren et al., 2006), this study demonstrated positive impacts of SWPBS on ODRs, tardiness, and absences, which would seem to be associated with effective schools. Rather than simply examining ODRs and other student outcomes, the present study demonstrated the impact of SWPBS on measures of school climate. A healthy school climate has been shown to be critical to school effectiveness (Muijs et al., 2004) and successful school reform (Sterbinsky et al., 2006). This study also added the distinctive element of school-wide screening to SWPBS, allowing for students identified as at risk to be referred for more targeted interventions. Since a small percentage of students typically account for a majority of the behavioral problems in a school (Gresham, 2004), the entire school may benefit when at-risk students receive the help and support they need. This study also provided additional support for the use of SWPBS in a middle school setting. Given the longitudinal design, the impact of SWPBS may be gradual rather than immediate.

The magnitude of implementing a comprehensive intervention like SWPBS should be considered. As SWPBS does require a fair amount of time and resources, a cost-benefit analysis (although not conducted as part of this study) could be used when deciding whether or not to implement SWPBS in a particular school. Although the researchers believe all middle schools have the capability to implement such a program, some may lack the leadership, resources, and motivation to effectively undertake something of this scope. This study was facilitated by a grant which allowed a full-time staff person to be hired to aid in school-wide implementation and funded staff training and program evaluation. Such additional human and financial resources may be needed to effectively implement SWPBS, though this likely depends on the resources of the particular school/district and the extensiveness of SWPBS implementation. Middle schools with the motivation to implement SWPBS are advised to work closely with their local school districts and state departments of education, as monies may be available through special education, Safe and Drug-Free Schools, and Title I funding.

The limitations of this study should also be considered when interpreting the results. Because of the intensity and extensiveness of implementing SWPBS, this study considered only one middle school, using a convenience sample. Additionally, the two schools were not randomly assigned. Though the comparison school was selected based on similar demographics, the treatment school had indicators of being at greater risk during pretest (e.g., lower ratings of school climate, higher levels of ODRs), and the two schools differed in other important ways that may have influenced the results. Future research could consider implementing similar SWPBS interventions in several randomly selected schools with more diverse samples. Another possible limitation is the differences between the treatment and control school demographics at the first year of the intervention. Ideally, the control school and treatment school would have been more similar in their student demographics. Finally, this study did not have consistent measures of treatment fidelity (e.g., direct observations, surveys, interviews), making it difficult to assess the degree of implementation of the SWPBS intervention across the four years of the study. Future research in this area would benefit from including such measures in the study design.

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