The Effectiveness of School-wide Positive Behavior Interventions and Supports for Reducing Racially Inequitable Disciplinary Exclusions in Middle Schools

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Abstract

We merged data on the extent to which middle schools implemented school-wide positive behavior interventions and supports (SWPBIS) with data on disciplinary exclusions occurring in those schools across a period of 3 years. We conducted descriptive and multivariate analyses of variance to examine if (a) SWPBIS can be implemented with fidelity in middle school settings, (b) SWPBIS implementation is associated with reductions in disciplinary inequity, and (c) changes in disciplinary inequity vary with the proportion of students from low socio-economic and non-White backgrounds. Analysis of intervention fidelity data indicated that schools implemented the core features of SWPBIS based on training and support provided. Based on descriptive outcomes SWPBIS implementation was associated with (a) overall lower rates of ISS, the least severe form of disciplinary exclusion; (b) overall high rates of truancy, especially for AI/AN and Hispanic students; (c) some reductions in disciplinary exclusions for Hispanic and AI/AN students, but few for African-American students; and (4) few increases in the durations of disciplinary exclusions. School-level demographic factors did not appear to impact racial/ethnic inequity in schools implementing SWPBIS. Based on our findings we suggest a number of recommendations, including focused research on integrating behavioral science and critical race theory, training SWPBIS implementers in disaggregating discipline data by student race/ethnicity and interpreting data patterns, increasing meaningful integration of non-White parents into SWPBIS implementation practices, and holding implementers accountable for promoting culturally responsive systems and practices.

The Effectiveness of School-wide Positive Behavior Support on Reducing Disciplinary Exclusions of Students from Non-White Backgrounds in Middle Schools

Racially disproportionate discipline outcomes for students from non-White backgrounds have been consistently documented (Aud, Fox, & Kewal-Ramani, 2010; Townsend, 2000; Skiba et al., 2011). African-American students are commonly over-represented in office discipline referrals (Bradshaw, Mitchell, O'Brennan & Leaf, 2010; Kaufman et al., 2010; Skiba, et al., 2011; Skiba, Peterson, & Williams,1997; Vincent, Tobin, Swain-Bradway & May, 2011), and tend to receive more severe consequences for behavioral violations than their White peers (Glackman et al., 1978; Gregory, 1995; Shaw & Braden, 1990; Skiba, Michael, Nardo, & Peterson, 2002; Skiba & Peterson, 2000). These more severe consequences include removal from the classroom. Truancy, a form of self-exclusion from school, is particularly pronounced for American Indian students (Aud et al., 2012). In general, students from non-White backgrounds tend to be excluded for longer durations than their White peers (Vincent & Tobin, 2011). Although small gains in discipline outcomes for non-White students are being reported (Aud et al., 2012), Losen and Skiba (2010) state that suspension rates for K-12 students have "at least doubled since the early 1970's for all non-Whites" (p. 2), with the racial gap between Black and White suspension rates increasing from 3 percentage points in 1973 to 10 percentage points in 2000. At the same time, the overall enrollment of U.S. public schools is rapidly diversifying. Since 1990, the percentage of White students enrolled in public schools has decreased from 67% to 54% and the percent of Hispanic students has increased from 12% to 23% (Aud et al., 2012).

Research has shown that, overall, disciplinary exclusions tend to increase with increasing grade level. Based on discipline data from 29,613 middle school students, Raffaele-Mendez and Knoff (2003) found that at the middle school level, 20.69% of African-American students were

suspended at least once, compared to 12.8% of Hispanic-American students and 8.84% of White students. Of all students suspended in secondary schools (grade 6 through 12) in 2007, African-American students had the largest percentage (43%), followed by Hispanic-American students (22%) and White students (16%). Similarly, African-American students had the highest percentage of expulsions (13%), followed by Hispanic-American students (3%) and White students (1%) (Aud et al., 2010). Losen and Skiba (2010) examined data derived from a Civil Rights Data Collection survey conducted in 9,220 middle schools and found that 14.7% of all male and 7.5% of all female middle school students were suspended, while 28.3% of African-American male and 18% of African-American female middle school students were suspended. Latino students tend to be disproportionately over-represented at the middle school level (Skiba et al., 2011), and experience high drop-out rates (Aud et al., 2012). In 2010, approximately 16% of Hispanic students aged 16 to24 dropped out, compared to approximately 5% of their White peers.

While disciplinary exclusion from school has generally deleterious consequences for students' school success (Algozzine, Wang, & Violett, 2011; Losen & Skiba, 2010), it becomes most consequential during the middle school years when children transition into adolescence and when school attachment through positive relationships with peers and adults becomes an important foundation for future social and academic success (Fenzel, 2000; Hughes, Witherspoon, Rivas-Drake, & West-Bey, 2009; Losen & Skiba, 2010; Wimberly, 2002; Wimberly & Noeth, 2005). School attachment has been shown to decline in general between 6th and 8th grade, a decline that has been attributed to students' attitudes toward school becoming more negative (Simons-Morton et al., 1999) and a perceived low value of school (Roeser & Eccles, 1998). Among the primary factors associated with decreased school attachment is deviant

behavior (Maddox & Prinz, 2003; Oelsner, Lippold, & Greenberg, 2011), weak or negative student-teacher relationships (Blankemeyer, Flannery & Vazsonyi, 2002), and low academic performance (Oelsner et al., 2011).

The overall poor disciplinary outcomes for non-White students, especially at the middle school level; the challenges middle school students face in maintaining strong school attachments; and the shifts in the racial/ethnic composition of U.S. public schools towards increasing numbers of non-White students suggest that middle schools face tremendous challenges to create environments that (a) are perceived as welcoming by all students regardless of their racial/ethnic background, (b) effectively reduce over-representation of non-White students in disciplinary exclusions, and (c) keep all students, especially the growing population of non-White students, successfully engaged in academic instruction and learning. To achieve this tall order, many middle schools look towards behavioral supports intended to build positive student-teacher relationships, prevent disciplinary exclusions, and thus facilitate student academic engagement (Caldarella et al., 2011; Luiselli, Putnam & Sunderland, 2002; Taylor-Greene et al., 1997).

A Widely Used Approach to Behavioral Support in Schools and its Evidence-Base

One widely used approach to behavioral support delivery in school is school-wide positive behavior interventions and supports (SWPBIS; Sugai & Horner, 2002). SWPBIS is premised on the assumption that (a) defining 3-5 core behavioral expectations valued by all school constituencies, (b) proactively teaching and communicating what those behaviors look like in various school settings, (c) acknowledging and rewarding appropriate behavior, (d) establishing a consistent continuum of consequences for inappropriate behavior, and (e) continuous collection and analysis of data to assess students' responsiveness to existing support

strategies results in positive school environments where all students can succeed behaviorally and academically (Sprague & Horner, 2006; Sugai, Horner, & Gresham, 2002).

The evidence-base for SWPBIS rests largely on demonstrations of reductions in office discipline referrals (ODR) across entire school populations (Bradshaw, Koth, Thornton, & Leaf, 2009; Bradshaw, Mitchell, & Leaf, 2010; Bradshaw, Reinke, Brown, Bevans, & Leaf, 2008). The extent to which SWPBIS implementation is associated with greater disciplinary equity across students from different racial/ethnic backgrounds remains unclear. Some studies have shown that disciplinary inequity persisted despite SWPBIS implementation (Kaufman et al., 2010; Vincent, Tobin, Hawken, & Frank, 2012), while others have shown that SWPBIS appears promising to reduce disciplinary inequity (Bradshaw, Mitchell, O'Brennan & Leaf, 2010; Vincent, Swain-Bradway, Tobin, & May, 2011).

Much of the evidence-base supporting SWPBIS is derived from implementations in elementary schools (Bradshaw, Koth, Thornton, & Leaf, 2009; Bradshaw, Mitchell, & Leaf, 2010; Bradshaw, Reinke, Brown, Bevans, & Leaf, 2008; Horner et al., 2009). A limited number of studies describe SWPBIS implementation efforts in middle schools. For example, Taylor-Greene et al. (1997) document overall reductions in ODR in a middle school of 530 students following SWPBIS implementation. Similarly, Luiselli and colleagues (2002) show overall reductions in disruptive behavior, vandalism, and substance abuse following behavioral support implementation modeled after SWPBIS in a middle school with an enrollment of approximately 640 students, 96.5% of whom were European-American and 7% of whom qualified for free or reduced-cost lunch. Caldarella and colleagues (2011) describe SWPBIS implementation in a middle school with 1063 students, 87.9% of whom were Caucasian, and 37.8% qualified for reduced-price lunch. Compared to students in a control school, middle school students exposed

to SWPBIS showed greater improvements in prosocial behavior and rated their school climate as better. Perceptions in school safety did not differ between schools. None of these studies, however, disaggregated student outcomes by student race/ethnicity.

Although SWPBIS implementation emphasizes contextual fit to local cultures (Sugai et al., 2010), current practice guidelines provide few specific recommendations for creating school cultures that equally acknowledge all students' racial/ethnic backgrounds, minimize potential bias in data collection protocols and procedures, and support all staff members in acquiring and strengthening cultural self-awareness and cultural knowledge (Vincent et al., 2011). Of particular concern is the limited practice of disaggregating discipline data by student race/ethnicity, a prerequisite to identifying potentially inequitable outcomes. For example, many schools that implement SWPBIS are trained to use the School-wide Information System (SWIS, May et al., 2005; see www.swis.org), a web-based discipline data collection and analysis tool developed in conjunction with SWPBIS and intended to allow meaningful data disaggregations to analyze discipline patterns. Although SWIS has the capacity to disaggregate discipline data by student race/ethnicity, the SWIS manual and training focus primarily on generating and interpreting ODR patterns across monthly averages, types of problem behaviors, locations, times of day, and individual students (Todd, Horner, Rossetto-Dickey, Sampson, & Cave, 2012). Disaggregations by student race/ethnicity do not seem to be sufficiently emphasized. As a result, few SWIS users make use of this SWIS function. Based on a review of SWIS data collected between 2005 and 2008, only 14% of SWIS users accessed the SWIS ethnicity report, a tool that would allow them to discern racial/ethnic inequality in discipline outcomes (Vincent, 2008).

Similarly, there is little emphasis on holding schools accountable for culturally responsive SWPBIS implementation. Much work has been done to develop evaluation tools

increasing accountability for culturally responsive systems and practices. For example, the Center on Education & Lifelong Learning/Equity Project at Indiana University developed the *Cultural Responsiveness Assessment* and the *5x5 School Walkthrough*. Both instruments merge cultural responsiveness awareness with core SWPBIS components. Unfortunately, these measures are currently not included in the on-line SWPBIS evaluation site (see https://www.pbisassessment.org/Evaluation/Surveys).

Purpose of the Current Study

The purpose of the current study was three-fold. First, we examined if SWPBIS can be implemented with fidelity in middle schools, given that middle schools differ from elementary schools in their organizational structure, and middle school students customarily exhibit higher levels of problem behaviors than elementary school students. Second, we examined if SWPBIS implementation in middle schools was associated with greater equity in disciplinary exclusions events as well as durations of exclusions across students from different racial/ethnic backgrounds. Finally, we examined if disciplinary equity varied across school demographic factors including percent of students on free and reduced-price lunch and minority enrollment in those schools that implemented SWPBIS. Based on the findings of our analyses, we propose policy recommendations for future SWPBIS implementation and research efforts.

Method

Data sources

We merged data from two sources: Data on SWPBIS implementation in middle schools came from a 5-year randomized wait-list controlled study to test the effect of SWPBIS implementation in middle schools on students' behavioral outcomes that was recently completed in Oregon and for which the second author was co-principal investigator. The study involved two

cohorts (each containing matched treatment and control schools), providing data for 4 years during the 5-year project duration from 2006-2007 to 2010-2011. SWPBIS implementation was measured with the Prevention Practices Assessment (PP-A; Institute on Violence and Destructive Behavior, 2008a), and the Prevention Practices Survey (PP-S, Institute on Violence and Destructive Behavior, 2008b; see Appendix for more information). While the study focused on measuring student behavioral outcomes, it did not measure disciplinary exclusions from the classroom, nor did it focus on disciplinary equity as an intervention target. It did, however, measure the extent to which middle schools implemented SWPBIS with fidelity.

Data on disciplinary exclusions by student race/ethnicity were provided to the second author by the Oregon Department of Education and are reported in the same manner across all schools. These data provided information on in-school-suspension (ISS), out-of-school suspension (OSS), expulsion (EXP), and truancy (TRU). ISS was defined as temporarily removing a student from the regular classroom while he or she remains under the supervision of school personnel; OSS was defined as temporarily removing a student from the regular school to another setting; EXP was defined as removing a student from the regular school for the remainder of the school year or longer; and TRU was defined as an event consisting of eight unexcused absences of one-half day or more in one month. ISS, OSS, and EXP were recorded as events as well as associated with durations measured in half day increments.

Student race was coded as White, African-American, Hispanic, Asian/Pacific Islander, and American Indian/Alaska Native (AI/AN). It is important to note that during the course of the 5-year study the procedure of coding student ethnicity as well as the number of racial/ethnic categories changed. In 2009-2010 schools began to phase in a new 2-step procedure mandated by the U.S. Department of Education. This meant that students first needed to report their ethnicity

as Hispanic or Non-Hispanic, and then their race as AI/AN, Asian, Black or African-American, Native Hawaiian/Pacific Islander, or White. Students who reported more than on racial background were categorized as Multiracial. Any student reporting Hispanic ethnicity was counted as Hispanic, regardless of his/her racial affiliation (National Forum on Education Statistics, 2008). Due to this change in race/ethnicity coding, some students' racial/ethnic code might have changed during the course of the study.

Sample

A total of 35 middle schools in Oregon participated in the recently completed study; schools ranged in size and locale from rural schools with 65 students to suburban/urban schools with over 1,100 students. Schools were randomly assigned to a treatment (full SWPBIS training schedule with on-going coaching) or control condition (one day annual workshop or consultation on SWPBIS) after first being matched using total enrollment. Table 1 provides an overview of the demographic characteristics of the sample.

Table 1: Number (percent) of students enrolled, students on free or reduced lunch (FRL), percent minority enrollment, school size, and school locale by condition during Year 1.

		Treatment (n = 18)	Control (17)
Total Enrollment		6492	7006
	White	4749 (73.15%)	4724 (67.43%)
	African-American	136 (2.09%)	163 (2.33%)
	Hispanic	1098 (16.91%)	1553 (22.17%)
	Asian t	256 (3.94%)	171 (2.44%)
	AI/AN	253 (3.90%)	395 (5.64%)
Free or Reduce Lunch	Mean (SD) Pct. Students on FRL	61.17 (18.06)	63.89 (17.96)
Percent Minority	Mean (SD) Pct. Minority enrollment	23.94 (17.42)	27.51 (23.95)
Size			
	Small (<250)	8 (44.4%)	4 (23.5%)
	Medium (251-500)	7 (38.9%)	7 (41.2%)
	Large (>500)	3 (16.7%)	6 (35.3%)
Locale			
	Rural	8 (44.4%)	8 (47.1%)
	Town	6 (33.3%)	7 (41.2%)
	Suburban/city	4 (22.2%)	2 (11.8%)

Analytical Procedures

To examine if SWPBIS can be implemented with fidelity in middle schools, we conducted a repeated measures ANOVA on PP-A total scores with condition (treatment, control) as the between subjects factor, and time (measurement occasions) as the within subjects factor. A statistically significant condition X time interaction would then indicate that SWPBIS implementation differed across conditions.

To examine equity in disciplinary exclusion frequency and duration in relation to SWPBIS, we analyzed the discipline data provided by the Oregon Department of Education for the schools who participated in the study. Because we wanted to capture all schools in the 2-cohort design, we included only years 2 to 4 in our analysis. Because our dataset contained only information about students involved in disciplinary exclusion events, we aggregated each disciplinary exclusion type (ISS, OSS, EXP, and TRU) by student race at the school level to arrive a total number of events. Based on the number of events, we calculated the rate of events per 100 students per day in each racial/ethnic group by dividing the number of events involving students from a given racial/ethnic category by the school's enrollment of the racial/ethnic category divided by 100, and then dividing by 170, the average number of school days in Oregon. Thus, we arrived at a rate that was comparable across groups with different enrollments, across schools with different racial/ethnic compositions, and across schools with different numbers of instructional days per school year. Some students in our dataset were involved in multiple events of the same type. For example, an African-American student might have been suspended in-school multiple times during one year. Because our focus was the rate of disciplinary events per racial/ethnic group, students involved in multiple discipline events were counted multiple times.

Because we were also interested in changes in the duration of disciplinary exclusions, we calculated the percent of days lost to disciplinary inclusion by aggregating for each racial/ethnic group the number of days associated with ISS, OSS, and EXP at the school level. We then calculated the total number of student days for each racial/ethnic group by multiplying the number of students enrolled by 170 days, the average length of the school year in Oregon. Finally, to arrive at the percent of days lost, we divided the number of days a given racial/ethnic group lost to disciplinary exclusions by the number of student days the group generated and multiplied by 100.

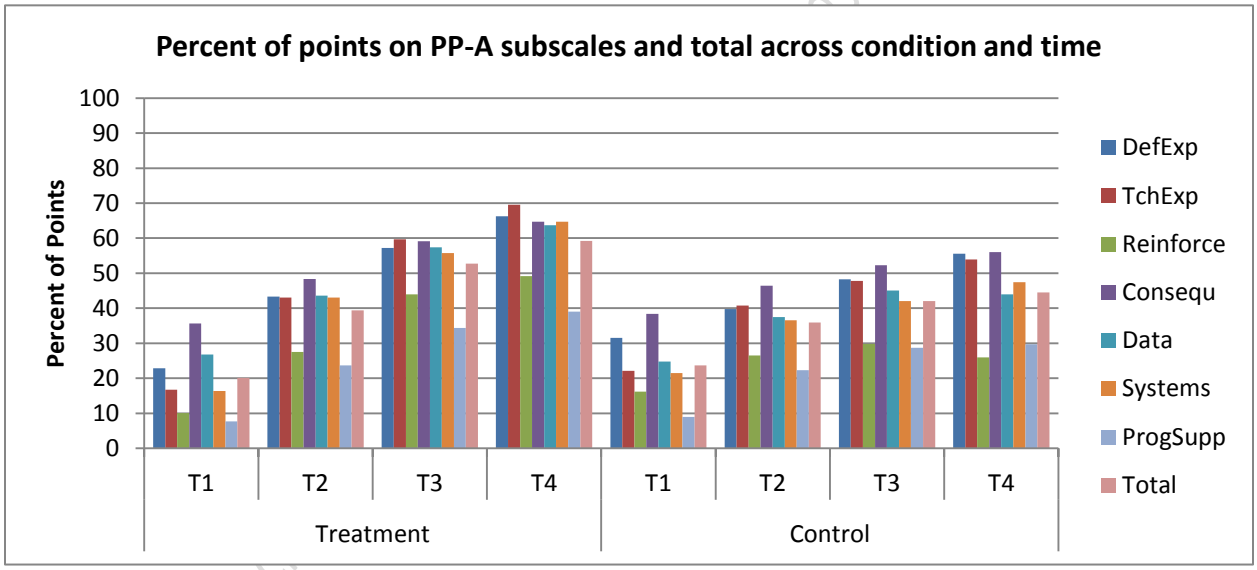
We conducted repeated measures MANOVA with condition (treatment, control) and race/ethnicity as the between subjects factors and time (measurements occasions) as the within subjects factor to examine differences in ISS rate, OSS rate, EXP rate, TRU rate, and Percent of Days Lost. A statistically significant condition x time x race/ethnicity interaction would indicate that trajectories in the dependent variables varied by students' racial/ethnic background and SWPBIS implementation status. Finally, to examine the relationship among SWPBIS implementation, disciplinary equity, and school demographic variables, we focused on data from treatment schools during the final year of the study only, because treatment schools had reached their highest SWPBIS implementation scores. We used a MANOVA to assess the relationship between percent of students on free and reduced lunch (FRL), minority density, and ethnicity on rates of ISS, OSS, EXP, and TRU, as well as Percent of Days Lost. Percent of students on FRL was coded as low (< 30%), medium (31-60%), and high (>60%). Minority density was based on the overall non-White school enrollment, and coded as low (less than 30%), medium (31-60%) and high (more than 60%). A statistically significant ethnicity X school demographics interaction would indicate that disciplinary equity varied with school demographics in treatment schools.

Results

Can SWPBIS be implemented with fidelity in middle school settings?

Figure 1 presents an overview of the percent of points schools earned on each PP-A subscale and the total scale across time and condition. On all subscales and the total scale, treatment schools made larger gains across the four years of the project than the control schools. It is important to note that the treatment schools had lower scores at T1 than the control schools at T1, yet by T3, they had higher scores on all subscales and the total scale than the control schools.

Figure 1



The results of the repeated measures ANOVA with the total PP-A scale are summarized in Table 2. The condition x time interaction was statistically significant for the total PP-A scale, $F(3, 84) = 4.731$, $p = .004$, meaning that the gains in PP-A total scale scores differed significantly by condition. Thus, the difference between SWPBIS implementation in treatment versus control schools was statistically significant. The time by condition effect was linear, $F(1, 28) = 9.183$, $p = .005$, $\eta = .247$. The simple contrast on the time by condition effect indicated that

T1 differed significantly from T4, F (1, 28) = 8.262, p =.008. The differences between T2 and T4, F (1, 28) = 1.523, p = .227 and the difference between T3 and T4, F (1, 28) = .001, p = .972 were non-significant.

Table 2: Repeated Measures Analysis of Variance Summary Table for PP-A Total Scale (n = 15 control, n = 15 treatment)

Source	***SS***	***df***	***MS***	***F***	***p***	***η***
Between subjects (Condition)						
Total PP-A	849.896	1	849.896	3.922	.058	.123
Error	6067.491	28	216.696			
Within Subjects (Time)	14516.219	3	4838.740	64.806	<.0005	.698
Condition X Time	1059.761	3	353.254	4.731	.004	.145
Error	6271.874	84	74.665			

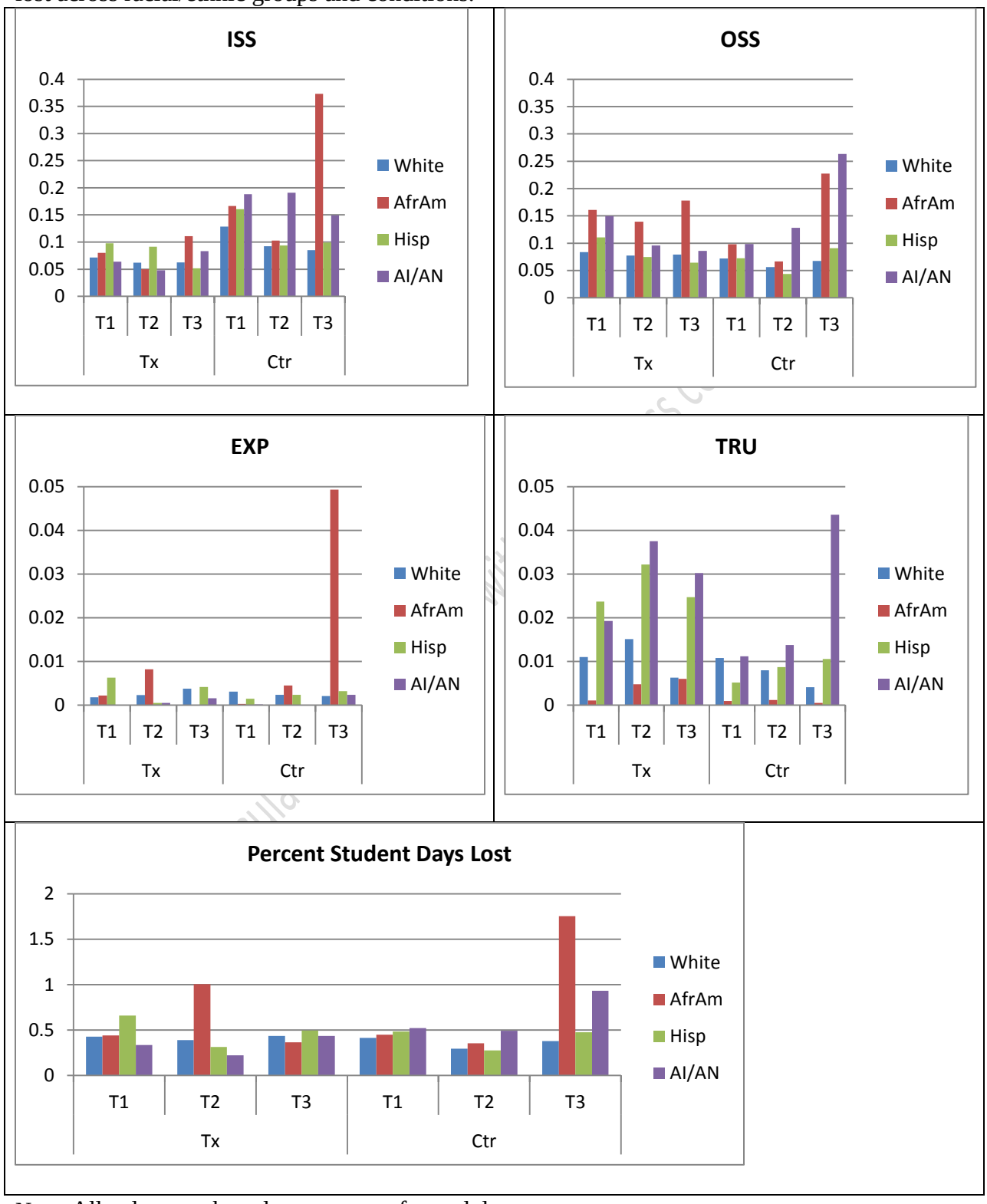
Is SWPBIS implementation in middle schools associated with greater equity in disciplinary exclusion events across students from White and non-White backgrounds?

We examined descriptive data first. Figure 2 provides an overview of disciplinary exclusion rates by racial/ethnic group. We focused on African-American, Hispanic, and AI/AN students, because they traditionally experience the poorest discipline outcomes, and we included White students as the comparison group. Panels 1 to 4 show the mean rates for ISS, OSS, EXP, and TRU for each racial group across conditions; it is important to note that EXP and TRU, because they were rarer events, are graphed on a more fine-grained y-axis than ISS and OSS. Panel 5 shows mean Percent of Days Lost across racial/ethnic groups and condition. It appears that all students in the treatment condition had lower ISS rates than students in the control condition. In the treatment condition, White students' ISS rates declined steadily across the years, while ISS rates for the other student groups fluctuated. In the control condition, White

students' ISS rates were lower than those of all other students' across all years. OSS rates in the treatment condition declined for all non-White student groups except for African-American students. White student's OSS rates held fairly steady. In the control groups OSS rates tended to increase for non-White students while they held somewhat steady for White students. EXP rates were overall lowest for AI/AN students in the treatment group, although they increased during the course of the study. In the control group, EXP rates increased for all groups except White students. TRU rates were overall lowest for African-American students across both conditions, but African-American students in the treatment condition had higher TRU rates than in the control condition. TRU rates were highest for Hispanic and AI/AN students; they fluctuated for those groups in the treatment condition, while they increased in the control condition. TRU rates for White students decreased in both conditions. Percent of student days lost did not differ substantially for White students across conditions. In the treatment condition, percent of student days lost appeared to show an increasing trend for AI/AN students, a decreasing trend for Hispanic students, and substantial fluctuation for African-American students. In the control group, percent of days lost increased for AI/AN and African-American students, but held steady for Hispanic students.

Taken together, SWPBIS implementation in middle schools seems associated with (a) overall lower rates of ISS, the least severe form of disciplinary exclusion; (b) overall high rates of truancy, especially for AI/AN and Hispanic students; (c) some reductions in disciplinary exclusions for Hispanic and AI/AN students, but few for African-American students; and (4) few increases in the durations of disciplinary exclusions.

Figure 2: Mean rates per 100 students per day of EXP, ISS, OSS, and TRU for students from White, African-American, Hispanic, and AI/AN backgrounds, and mean percent of days lost across racial/ethnic groups and conditions.



Note: All values are based on non-transformed data.

The outcomes of the repeated measures MANOVA are summarized in Table 3. Of particular interest was the condition x time x ethnicity interaction. This interaction was statistically significant for ISS, F (8, 330) = 2.339, p = .028, for OSS, F (8, 330) = 2.599, p = .011, for EXP, F (8, 330) = 2.753, p = .009, and for TRU, F (8, 330) = 2.854, p = .006. It was non-significant for Percent of Days Out, F (8, 330) = 1.015, p = 424. The statistically significant interactions indicate that changes in all types of disciplinary exclusions showed different patterns across conditions depending on students' racial/ethnic backgrounds. Effect sizes for the interaction terms were extremely small ranging from η = .059 to η = .065.

Table 3: Repeated Measures Analysis of Variance Summary Table for ISS, OSS, EXP, TRU, and Percent Days Lost (n = 17 control, n = 18 treatment)

Source	***SS***	***df***	***MS***	***F***	***p***	***η***
Between subjects						
Condition						
ISS	.080	1	.080	.612	.435	.004
OSS	.388	1	.388	3.461	.065	.021
EXP	.446	1	.446	3.640	.058	.022
TRU	.558	1	.558	4.523	.035	.027
PctDaysLost	.002	1	.002	.018	.893	.000
Ethnicity						
ISS	1.847	4	.462	3.547	.008	.079
OSS	2.350	4	.588	5.245	.001	.113
EXP	2.137	4	.534	4.358	.002	.096
TRU	1.830	4	.458	3.708	.006	.082
PctDaysLost	1.005	4	.251	2.165	.075	.050
Condition * Ethnicity						
ISS	.765	4	.191	1.470	.214	.034
OSS	.752	4	.188	1.678	.158	.039
EXP	.699	4	.175	1.425	.228	.033
TRU	.727	4	.182	1.472	.213	.034
PctDaysLost	.796	4	.199	1.715	.149	.040
Error						
ISS	21.482	165	.130			
OSS	18.484	165	.112			
EXP	20.230	165	.123			
TRU	20.361	165	.123			
PctDaysLost	19.141	165	.116			
Within Subjects*						
Time						
ISS	.012	2	.006	.185	.817	.001

OSS	.055	2	.028	.806	.438	.005
EXP	.075	2	.037	1.260	.282	.008
TRU	.087	2	.044	1.496	.227	.009
PctDaysOut	.601	2	.300	5.756	.004	.034
Time*Condition						
ISS	.039	2	.020	.593	.543	.004
OSS	.146	2	.079	2.117	.127	.013
EXP	.038	2	.019	.636	.509	.004
TRU	.037	2	.019	.640	.510	.004
PctDaysLost	.184	2	.093	1.784	.170	.011
Time*Ethnicity						
ISS	.200	8	.025	.757	.633	.018
OSS	.289	8	.036	1.049	.398	.025
EXP	.238	8	.030	1.003	.429	.024
TRU	.249	8	.031	1.065	.387	.025
PctDaysLost	1.272	8	.159	3.048	.003	.069
Time*Condition*Ethnicity						
ISS	.591	8	.074	2.239	.028	.059
OSS	.715	8	.089	2.599	.011	.059
EXP	.652	8	.082	2.753	.009	.063
TRU	.667	8	.083	2.854	.006	.065
PctDaysLost	.424	8	.053	1.015	.424	.024
Error						
ISS	10.878	330	.033			
OSS	11.344	330	.034			
EXP	9.769	330	.030			
TRU	9.637	330	.029			
PctDaysLost	17.213	330	.052			

*Because our data violated the assumption of sphericity, Greenhouse-Geisser p-values are reported.

How does the relationship between SWPBIS implementation and disciplinary equity vary across school demographic factors?

Results from the multivariate analysis of variance testing the relationship between condition, school level demographic factors (percent of students on free and reduced lunch, percent minority enrollment), ethnicity, and disciplinary exclusions were largely non-significant. Of particular interest to us were the interactions between ethnicity and percent of students on FRL as well as percent minority enrollment. All interaction terms including ethnicity were statistically non-significant for ISS, OSS, EXP, TRU, and Percent of Days Lost. Thus, during the year the treatment schools reached their highest SWPBIS implementation scores, the effect of

ethnicity did not depend on percent of students on FRL and minority enrollment. The effect of ethnicity on ISS, OSS, EXP, and TRU rates as well as percent of days lost to disciplinary expulsions was also statistically non-significant. The effect of percent of students on FRL was statistically significant for EXP rates, F (2, 65) = 4.352, p = .017, and for TRU rates, F (2, 65) = 3.735, p = .029. Lower EXP rates occurred in schools with higher than 60% of students on FRL, and lower TRU rates occurred in schools with higher than 60% of students on FRL.

Limitations

A number of considerations limit the interpretability of our study's outcomes. First, it is important to consider that the 5-year randomized waitlist controlled study was not specifically designed to reduce disciplinary inequity through SWPBIS implementation. Rather, we examined outcome variables that were originally not part of the analysis plan in relation to SWPBIS implementation data derived from the study. However, this approach allowed us to examine if SWPBIS implementation "as usual" had an effect on racial/ethnic inequity in discipline.

Second, the relatively low differences in implementation fidelity of SWPBIS in the treatment and control conditions makes conclusions about differences in disciplinary outcomes between treatment and control schools somewhat tenuous. Based on research in elementary schools, 80% of the total score on the PP-A is considered the implementation criterion. However, the statistically significant difference between the implementation trajectories of treatment and control schools provides a certain level of confidence in our conclusions. SWPBIS implementation in middle schools is emerging, and little is known about implementation criteria in middle school settings.

Third, the discipline data we used to assess disciplinary inequities were not normally distributed and attempts at data transformations resulted only in approximations of normality.

Thus, our data set did not always meet all assumptions of the statistical tests; statistical outcomes, therefore, need to be interpreted with caution. Also, the representativeness of the mean rates for ISS, OSS, EXP, TRU and Percent of Days Lost was limited by relatively high standard deviations, suggesting that rates varied highly across schools. As such, the outcomes of our statistical tests are difficult to interpret.

Finally, a relatively small sample size resulted in low statistical power. Replications with larger sample sizes are necessary to confirm our outcomes. Nonetheless, our study provided important insights and additions to existing research; it also clearly indicated that much more research is needed to examine the effectiveness of SWPBIS on disciplinary equity.

Discussion and Recommendations

Although our analyses revealed somewhat erratic and difficult to interpret patterns, outcomes seem consistent with existing research: The effectiveness of SWPBIS for reducing racial/ethnic inequities in discipline outcomes appears unsystematic (Kaufman et al., 2010; Vincent et al., 2011). Our study has a number of messages to add to existing research. Because racial inequities in disciplinary exclusions are particularly consequential at the middle school level when young adolescents begin to form their cultural identities and school attachment predictive of future academic success (Fenzel, 2000; Hughes, Witherspoon, Rivas-Drake, & West-Bey, 2009; Losen & Skiba, 2010; Wimberly, 2002; Wimberly & Noeth, 2005), positive school environments to facilitate those developmental processes appear critical. Our data have shown that SWPBIS implementation in middle schools is possible. Schools in the treatment group had larger gains on all PP-A subscales across the four years than schools in the control group. It seems interesting that during the initial 2 years of the study, both treatment and control schools put much emphasis on consequences, i.e. punishment for inappropriate behavior. As

training in SWPBIS continued, treatment schools shifted emphasis from punitive consequences to teaching behavioral expectations, while the control schools continued emphasizing punitive consequences. This change from reactive punishment to proactive support reflects the essence of SWPBIS.

The results of our descriptive and inferential analyses of disciplinary exclusion rates for students from different racial/ethnic backgrounds showed that reductions in disciplinary exclusions did not only differ across conditions, as one would expect, but also across ethnic groups. Thus, ethnicity appears to remain a predictor of disciplinary exclusion despite SWPBIS implementation efforts, i.e. disciplinary inequities remain. While no clear patterns emerged, African-American and AI/AN students tended to benefit less from SWPBIS implementation than their peers.

Given the persistence of racially inequitable discipline outcomes despite SWPBIS implementation in middle schools, it might be useful to apply the systems approach embraced by SWPBIS to encourage greater cultural awareness and self-reflection. Because the majority of teachers in the U.S. public schools are White (Aud et al., 2010; Coopersmith, 2009), many non-White students are taught by White teachers in schools led by White administrators. This cultural discontinuity between students and school personnel who put in place the systems to support students might impact the extent to which school-wide systems match student needs. Bradshaw et al. (2010) found that teacher perceptions of student behavior, teacher tolerance of student misbehavior, and teacher ethnicity did not account for over-representation of African-American students in disciplinary referrals. However, based on interviews with teachers, Skiba et al. (2006) documented that, when asked about the performance of students from non-White backgrounds, many teachers provided evasive responses. An explicit and systemic emphasis on cultural self-

awareness might contribute to decreases in disciplinary inequity.

Within the SWPBIS conceptual framework, teachers are encouraged to rely on evidence-based practices to provide social and academic instruction to students. Little emphasis is put on examining the cultural relevance of a practice before adopting it, or on ensuring that instructional practices explicitly validate all students' cultural backgrounds (Delpit, 1992). The emphasis on culturally relevant instruction has been particularly emphasized by the Native American community in order to improve discipline as well as academic outcomes for AI/AN students (Chavers, 2000).

Frequent and regular use of data for decision-making is one of the hallmarks of SWPBIS implementation. However, rarely is the cultural validity of discipline data questioned (Quintana et al., 2006). To decrease racial/ethnic inequities in discipline, it appears imperative that data collection systems, including operational definitions of behavioral violations are closely examined for potential cultural biases. Evidence that many non-White students receive more severe consequences for similar behaviors compared to White students (Skiba et al., 2011) supports the need to examine data on which important decisions are based for their cultural validity. Equally important might be collecting data on the extent to which school-wide systems and practices are culturally responsive.

Finally, SWPBIS implementation is intended to be driven by social and academic student outcomes. Given that social and academic outcomes for non-White students lag far behind those for their White peers (Aud et al., 2010, 2012), it appears necessary to reassess the mechanisms for including all members of a school community in the process of defining what desirable outcomes are and how they can be achieved. Although SWPBIS represents an evidence-based framework for creating positive school environments where students can succeed socially

(Bradshaw, Koth, et al., 2009; Bradshaw, Mitchell, & Leaf, 2009; Bradshaw et al., 2008), integrating recommendations from the literature on creating culturally responsive school environments might increase its effectiveness in reducing disciplinary inequities.

Based on the outcomes of our study, their consistency with existing research, and our conceptual work on expanding the SWPBIS framework to promote attention to cultural responsiveness (Vincent et al., 2011), we would like to suggest the following policy recommendations:

- *Conduct focused research on integrating behavioral science with critical race theory.* The literature clearly suggests that behavior is culturally conditioned (Delpit, 1992; Gay, 2002; Ladson-Billing, 1995). Greater emphasis on conceptualizing and empirically testing the relationships between cultural differences among student groups as well as students and teachers and behavioral support practices would allow conclusions about how components of SWPBIS need to be adapted to facilitate disciplinary equity.
- *Provide focused training of SWPBIS implementers in disaggregating student discipline data by race/ethnicity and interpreting resulting patterns*. Disaggregations of discipline data by student/race ethnicity is a necessary prerequisite to identifying potential inequity patterns and working towards solutions. Although tools to perform these disaggregations exist, they might not be sufficiently used.
- *Hold SWPBIS implementers accountable for promoting culturally responsive systems and practices*. Self-assessments and direct observation measures used to document implementation fidelity should contain items querying the extent to

which key practices of SWPBIS are implemented in a culturally responsive manner. If implementation fidelity were based on culturally responsive implementation, school personnel and coaches guiding implementation efforts might be encouraged to work towards building culturally responsive systems and practices.

- *Provide proactive outreach to non-White parents and community members*. Meaningful relationships with parents are essential to positive student outcomes. Establishing positive relationships with parents whose children might feel unfairly disciplined might be difficult, but could help to initiate critical dialogue from which teachers, students, and parents might benefit.
- *Give greater attention to qualitative data regarding cultural inequity*. Much of the data driving SWPBIS research and implementation are derived from quantitative measures. Perceptions of cultural discontinuities or potential disciplinary unfairness are often better captured with qualitative measures. Qualitative data might enrich our understanding of the subtle disconnects that might result in inequitable student outcomes.

References

Algozzine, B., Wang, C., & Violette, A.S. (2011). Reexamining the relationship between academic achievement and social behavior. *Journal of Positive Behavior Interventions 13*, 3-16.

Aud, S., Fox, M.A. & KewalRamani, A. (July 2010). *Status and trends in the education of racial and ethnic groups*. (NCES 2010-015). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Aud, S., Hussar, W., Johnson, F., Kena, G., Roth, E., Manning, E., Wang, X., and Zhang, J. (2012). *The Condition of Education 2012* (NCES 2012-045). U.S. Department of Education, National Center for Education Statistics. Washington, DC. Available at http://nces.ed.gov/pubsearch.

Blankemeyer, M., Flannery, D. J., & Vazsonyi, A. T. (2002). The role of aggression and social competence in children's perceptions of the child-teacher relationship. *Psychology in the Schools, 39,* 293-304.

Bradshaw, C.P., Koth, C.W., Thornton, L.A. & Leaf, P.J. (2009). Altering school climate through school-wide positive behavior interventions and supports: Findings from a group randomized effectiveness trial. *Prevention Science, 10,* 100-115.

Bradshaw, C.P., Mitchell, M.M., & Leaf, P.J. (2010). Examining the effects of schoolwide positive behavioral interventions and supports on student outcomes. *Journal of Positive Behavior Interventions 12,* 133-148.

Bradshaw, C.P., Mitchell, M.M., O'Brennan, L.M., & Leaf, P.J. (2010). Multilevel exploration of factors contributing to the overrepresentation of black students in office discipline referrals. *Journal of Educational Psychology, 102*(2), 508-520.

Bradshaw, C., Reinke, W., Brown, L., Bevans, K., & Leaf, P. (2008). Implementation of school-wide positive behavioral interventions and supports (PBIS) in elementary schools: Observations from a randomized trial. *Education and Treatment of Children, 31*(1), 1-26.

Caldarella, P., Shatzer, R.H., Gray, K.M., Young, K.R., & Young, E.L. (2011). The effects of school-wide positive behavior support on middle school climate and student outcomes. *Research in Middle Level Education Online, 35*(4), 1-14.

Chavers, D. (2000). Indian teachers and school improvement. *Journal of American Indian Education, 39*(2), 1-18.

Coopersmith, J. (2009). *Characteristics of public, private, and Bureau of Indian Education elementary and secondary school teachers in the United States: Results from the 2007-08 Schools and Staffing Survey*. (NCES 2009-324). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education, Washington, DC.

Delpit, L.D. (1992). Education in a multicultural society: Our future's greatest challenge. *Journal of Negro Education, 61*(3), 237-249.

Fenzel, L.M., (2000). Prospective study of changes in global self-worth and strain during the transition to middle school. *Journal of Early Adolescence, 20*, 93-116.

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 4*(2), 106-116.

Glackman, T., Martin, R., Hyman, I., McDowell, E., Berv, V., & Spino, P. (1978). Corporal punishment, school suspension, and the civil rights of students: An analysis of Office for Civil Rights school surveys. *Inequality in Education, 23*, 61-65.

Gregory, J.F. (1995). The crime of punishment. Racial and gender disparities in the use of corporal punishment in the U.S. Public Schools. *Journal of Negro Education, 64*, 454-

462.

Gresham, F.M. (2004) Current Status and Future Directions of School-Based Behavioral Interventions. *School Psychology Review* 33, 326-343.

Horner, R.H., Sugai, G., Smolkowski, K., Eber, L., Nakasato, J., Todd, A., & Esperanza, J. (2009). A randomized, waitlist-controlled effectiveness trial assessing school-wide positive behavior support in elementary schools. *Journal of Positive Behavior Interventions 11*, 133-144.

Horner, R.H., Todd, A.W., Lewis-Palmer, T., Irvin, L.K., Sugai, G., & Boland, J.B. (2004). The school-wide evaluation tool (SET): A research instrument for assessing school-wide positive behavior support. *Journal of Positive Behavior Interventions, 6*(1), 3-12.

Howell, D. (2002). *Statistical methods for psychology*. (5th ed.) Pacific Grove, CA: Duxbury.

Hughes, D., Witherspoon, D., Rivas-Drake, D., & West-Bey, N. (2009). Received ethnic-racial socialization messages and youths' academic and behavioral outcomes: Examining the mediating role of ethnic identity and self-esteem. *Cultural Diversity and Ethnic Minority Psychology, 15*(2), 112-124.

Institute on Violence and Destructive Behavior (2008a). *Prevention Practices Assessment*. University of Oregon, Eugene: Author.

Institute on Violence and Destructive Behavior (2008b). *Prevention Practices Survey*. University of Oregon, Eugene: Author.

Irvin, L. K., Tobin, T. J., Sprague, J. R., Sugai, G., & Vincent, C. G. (2004). Validity of office discipline referral measures as indices of school-wide behavioral status and effects of school-wide behavioral interventions *Journal of Positive Behavior Interventions, 6*, 131-147.

Kaufman, J. S., Jaser, S. S., Vaughan, E. L., Reynolds, J. S., Di Donato, J., Bernard, S. N., & Hernandez-Brereton, M. (2010). Patterns in office discipline referral data by grade, race/ethnicity, and gender. *Journal of Positive Behavior Interventions, 12*, 44-54.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32, 465-491.

Losen, D.J. & Skiba, R.J. (2010). *Suspended education: Urban middle schools in crisis.* Indiana University: Center for Evaluation and Education Policy.

Luiselli, J.K., Putnam, R.F., & Sunderland, M. (2002). Longitudinal evaluation of behavior support interventions in a public middle school. *Journal of Positive Behavior Interventions, 4*, 184-190.

Maddox, S.J., & Prinz, R.J. (2003). School bonding in children and adolescents: Conceptualization, assessment, and associated variables. *Clinical Child & Family Psychology Review, 6*, 31-49.

May, S., Ard, W. III., Todd, A.W., Horner, R.H., Glasgow, A., Sugai, G., & Sprague, J.R. (2005). *School Wide Information System.* Educational and Community Supports, University of Oregon, Eugene, Oregon.

National Forum on Education Statistics, Race/Ethnicity Data Implementation Task Force. (2008). *Managing an identity crisis: Forum guide to implementing new federal race and ethnicity categories* (NFES 2008-802). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Nelson, J.R., Gonzales, J.E., Epstein, M.H., & Benner, G.J. (2003). Administrative discipline contacts: A review of the literature. *Behavioral Disorders, 8*, 27-37.

Oelsner, J., Lippold, M., & Greenberg, M. (2011). Factors influencing the development of school

bonding among middle school students. Journal of Early Adolescence, 31(3), 463-487.

Office for Civil Rights (2012). *The transformed civil rights data collection*. United States Department of Education, Washington, DC.

Quintana, S.M., Aboud, F.E., Chao, R.K., Contreras-Grau, J., Cross, W.E., Hudley, C. . . . Vietze, D. L. (2006). Race, ethnicity, and culture in child development: Contemporary research and future directions. *Child Development, 77*, 1129-1141.

Vietze, D. L. (2006). Race, ethnicity, and culture in child development: Contemporary research and future directions. *Child Development, 77*, 1129-1141.

Raffaele Mendez, L. M., & Knoff, H. M. (2003). Who gets suspended from school and why: A demographic analysis of schools and disciplinary infractions in a large school district. *Education and Treatment of Children, 26*, 30-51.

Roeser, R. W., & Eccles, J. S. *(*1998*)* Adolescents' perceptions of middle school: Relation to longitudinal changes in academic and psychological adjustment. *Journal of Research on Adolescence, 8,* 123–158.

Shaw, S.R. & Braden, J.P. (1990). Race and gender bias in the administration of corporal punishment. *School Psychology Review, 19*, 378-383.

Simons-Morton, B.G., Crump, A.D., Haynie, D.L., & Saylor, K.E. (1999). Student-school bonding and adolescent problem behavior. *Health Education Research 14*(1), 99-107.

Skiba, R. J., Michael, R. S., Nardo, A. C., & Peterson, R. (2002). The color of discipline: Sources of racial and gender disproportionality in school punishment. *Urban Review, 34*, 317-342.

Skiba, R. J., Horner, R. H., Chung, C., Rausch, M. K., May, S., & Tobin, T. (2011). Race is not neutral: A national investigation of African American and Latino disproportionality in

school discipline. *School Psychology Review, 40*, 85-107.

Skiba, R.J. & Peterson, R.L. (2000). School discipline at a crossroads: From zero tolerance to early response. *Exceptional Children, 66*(3), 335-347.

Skiba, R. J., Peterson, R. L., &Williams, T. (1997). Office referrals and suspension: Disciplinary intervention in middle schools. *Education and Treatment of Children, 20*(3), 295–316.

Skiba, R.J., Simmons, A., Ritter, S., Kohler, K., Henderson, M., & Wu, T. (2006). The context of minority disproportionality: Practitioner perspectives on special education referral. *Teachers College Record, 108* (7), 1424-1459.

Spaulding, S. A., Irvin, L. K., Horner, R. H., May, S. L., Emeldi, M., Tobin, T. J., & Sugai, G. (2010). Schoolwide social-behavioral climate, student problem behavior, and related administrative decisions: Empirical patterns from 1,510 schools nationwide. *Journal of Positive Behavior Interventions, 12* , 69-85. doi:10.1177/1098300709332345

Sprague, J., & Golly, A. (2005). *Best behavior: Building positive behavior support in schools*. Boston, MA: Sopris West.

Sprague, J.R. & Horner, R.H. (2006). Schoolwide positive behavioral supports. in S.R. Jimerson & M.J. Furlong (Eds). *The handbook of school violence and school safety*. (pp. 413-427). Mahwah, NJ: Erlbaum.

Sugai, G., & Horner, R.H. (2002). The evolution of discipline practices: School-wide positive behavior supports. *Child & Family Behavior Therapy 24*(1/2), 23-50.

Sugai, G., Horner, R.H., Algozzine, R., Barrett, S., Lewis, T., Anderson, C. . . . Simonsen, B. (2010). *School-wide positive behavior support: Implementers' blueprint and self-assessment.* Eugene, OR: University of Oregon. Available at www.pbis.org.

Sugai, G., Horner, R.H., & Gresham, F. (2002). Behaviorally effective school environments. In

M.R. Shinn, G. Stoner, & H.M. Walker (Eds.). *Interventions for academic and behavior problems: Preventive and remedial approaches.* (pp. 315-350). National Association for School Psychologists. Silver Spring, MD.

Sugai, G. & Simonsen, B. (2012). Positive behavior interventions and supports: History, defining features, and misconceptions. Available at http://pbis.org/school/pbis_revisited.aspx.

Tabachnick, B. & Fidell, L. (2001). *Using multivariate statistics*. (4th ed.) New York: Harper Collins.

Taylor-Greene, S., Brown, D., Nelson, L., Longton, J., Gassman, Cohen, J., Swartz, J., Horner, R. H., Sugai, G., & Hall, S. (1997). School-wide behavioral support: Starting the year off right. *Journal of Behavioral Education, 7,* 99-112.

Todd , A.W., Horner, R.H., Rossetto-Dickey, C., Sampson, N.K., & Cave, M. (2012). *SWIS User's Manual 2012. Version 4.4*. Educational and Community Supports, University of Oregon, Eugene, OR.

Townsend, B.J. (2000). The disproportionate discipline of African-American learners: Reducing school suspension and expulsions. *Exceptional Children, 66,* 381-391.

Vincent, C.G. (2008). *Do schools using SWIS take advantage of the "school ethnicity report"?* Evaluation Brief. Retrieved from http://pbis.org/evaluation/evaluation_briefs/default.aspx

Vincent, C.G., Randall, C., Cartledge, G., Tobin, T.J., & Swain-Bradway, J. (2011). Towards a conceptual integration of cultural responsiveness and school-wide positive behavior support. *Journal of Positive Behavior Interventions, 13*, 219-229.

Vincent, C.G., Spaulding, S.A., & Tobin, T.J. (2009). A re-examination of the psychometric properties of the School-wide Evaluation Tool (SET). *Journal of Positive Behavior Interventions, 12*, 161-179. Vincent, C.G., Spaulding, S.A., & Tobin, T.J. (2009). A re-

examination of the psychometric properties of the School-wide Evaluation Tool (SET). *Journal of Positive Behavior Interventions, 12*, 161-179.

Vincent, C. G., & Tobin, T. J. (2011). An examination of the relationship between implementation of school-wide positive behavior support (SWPBS) and exclusion of students from various ethnic backgrounds with and without disabilities. *Journal of Emotional and Behavioral Disorders, 19*, 217-232.

Vincent, C.G., Tobin, T.J. Hawken, L., & Frank, J. (2012). Disciplinary referrals and access to secondary interventions: Patterns across students across African-American, Hispanic-American, and White backgrounds. *Education and Treatment of Children, 35*, 431-458.

Vincent, C.G., Tobin, T.J., Swain-Bradway, J., & May, S. (2011). Disciplinary referrals for culturally and linguistically diverse students with and without disabilities: Patterns resulting from school-wide positive behavior support. *Exceptionality, 19*, 175-190.

Wimberly, G.L. (2002). *School relationships foster success for African-American students*. Iowa City, IA: ACT.

Wimberly, G.L. & Noeth, R.J. (2005). *College readiness begins in middle school*. Iowa City, IA: ACT.

Appendix: Technical Notes

Description of SWPBIS Implementation Fidelity Measures Used in the Study

The PP-S is a self-assessment completed by school staff. The PP-A is completed by a trained external data collector, and therefore provides a more objective assessment of implementation fidelity. Our analysis focused on PP-A data only, which were available from 30 schools in our sample. The PP-A represents an adaptation of the School-wide Evaluation Tool

(SET; Horner et al., 2004; Vincent, Spaulding & Tobin, 2009). It consists of 62 items and assesses SWPBIS implementation through 7 core domains: (a) defining behavioral rules and expectations (6 items), (b) teaching behavioral rules and expectations (7 items), (c) reinforcement and acknowledgement (9 items), (d) responding to problem behavior (11 items), (e) data-based monitoring and decision-making (10 items), (f) program implementation systems (11 items), and (g) program support systems (8 items). Each item is scored on a 5-point scale: non-existent, minimally, partially, mostly, and completely. The percent of possible points is calculated for each subscale and for the total scale. Based on research conducted with elementary schools, a school obtaining 80% of possible points is considered to be implementing SWPBIS to fidelity (Horner et al., 2009), although this criterion has not been rigorously validated. The trained data collector reviews permanent products, conducts interviews with the administrator and a sample of students, and surveys a sample of staff members. Therefore, it represents a maximally objective assessment of the extent to which the core domains of SWPBIS implementation are in place. Across the duration of the study, PP-A data were collected at baseline prior to SWPBIS training and in each subsequent year for a total of 4 measurement occasions. The 5 schools that did not complete the PP-A had PP-S data to document their implementation status.

Preparation of SWPBIS fidelity data for Analysis

Prior to analysis, we tested the PP-A data for normality of distributions; The Kolmogorov-Smirnov test of normality was non-significant for the total scale at all time points, suggesting that our data met the assumption of normality. Mauchley's test of sphericity was also non-significant ($p = .631$) suggesting that the assumption of sphericity was met. The assumption of independence was met. Repeated measures ANOVA tends to be robust against violations of

homogeneity of variance (Howell, 2002).

Preparation of Discipline Data for Analysis

We again examined our data for normality prior to analysis. Because all dependent variables were highly positively skewed we performed data transformations including square root, log-10, and inverse. Because inverse transformation resulted in the maximal normalization based on visual inspection of the normal and detrended Q-Q plots, we used inverse transformed data for the analysis. However, it is important to consider that the Kolmogorov-Smirnov test of normality remained significant, and therefore outcomes of our analyses will have to be interpreted with caution. Similarly, Box's M remained significant, indicating that data violated the assumption of homogeneity of co-variance; however, MANOVA tends to be robust against this violations (Tabachnick & Fidell, 2001). Mauchley's test of sphericity was also significant ($p < .0005$) suggesting that the assumption of sphericity was not met. The assumption of independence was met. Because data violated several of the assumptions of the test, results need to be interpreted with caution.