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Exploring the Relation Between Office Discipline Referrals and Reinforcement Rates in Schoolwide Positive Behavior Support Programs

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EXPLORING THE RELATION BETWEEN OFFICE DISCIPLINE REFERRALS AND REINFORCEMENT RATES IN SCHOOLWIDE POSITIVE BEHAVIOR SUPPORT PROGRAMS

by

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ABSTRACT

Exploring the Relation Between Office Discipline Referrals and Reinforcement Rates in Schoolwide Positive Behavior Support Programs

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The implementation of schoolwide positive behavioral support (SWPBS) programs is becoming increasingly common in schools across the nation. Although a primary assumption of SWPBS is that schoolwide administration of positive supports to students who meet behavioral expectations will result in fewer behavior problems, surprisingly few studies have investigated the effects of various positive reinforcement rates (RR) on office discipline referral rates (ODR). This study investigated the relationship between RRs and ODRs among schools ($N = 44$) implementing SWPBS programs with high fidelity. Results revealed no significant differences in RRs or ODRs between Title I and non-Title I schools but did reveal a significant difference in the ratio of RRs to ODRs between the top and bottom ODR quartile schools. Overall, RRs were slightly associated with a decrease in ODRs. Results also suggested schools did not appropriately respond to schoolwide RR and ODR data. The present status of SWPBS

data collection and utilization procedures is presented and practical implications are discussed.

(80 pages)

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CHAPTER I

INTRODUCTION

School discipline problems and disruptive behavior are among the highest ranking problems identified by teachers and parents in the U.S. (Games & Menlove, 2003; Skiba & Sprague, 2008; Utley, Kozleski, Smith, & Draper, 2002). Schools have implemented a variety of techniques and interventions in attempts to address these concerns and to reduce problematic student behaviors. The literature now clearly indicates that traditional, negative consequences in response to student problem behavior are ineffective (Games & Menlove, 2003; Safran & Oswald, 2003; Skiba, 2002; Skiba & Peterson, 2000). Thus, educators have recently begun to shift from a reactive approach to managing problem behaviors to a more proactive model commonly known as positive behavior support (PBS). PBS is a preventative, data-driven model that provides a systematic approach to preventing the development of new behavioral problems, while providing the necessary level of support to manage existing behavioral concerns (Sugai et al., 2000). Basically, PBS programs include strategies to teach, reward, and support appropriate behaviors to help most students to behave and to promote a positive school climate.

Historically, PBS has been associated with support for individuals with developmental and other disabilities (Carr et al., 1999); however, within the last decade, PBS has emerged as a significant practice in public schools nationwide (Walker, Cheney, Stage, & Blum, 2005). Specifically, many schools have adopted a schoolwide positive behavior support (SWPBS) model to address schoolwide behaviors through all staff and student involvement, including administration, teachers, and students. Although PBS

programs are becoming increasingly popular in schools across the country, the PBS literature is still emerging, and the need to continue exploring the implementation, utilization of data, and effectiveness of PBS across a variety of settings is evident. For example, most of the literature examines PBS at the primary and secondary prevention levels, with much less exploration of the implementation and effectiveness at the tertiary level (Crimmins & Farrell, 2006). Additionally, the majority of studies examining the efficacy of primary prevention plans have been conducted at the elementary level (Hunter, Elias, & Norris, 2001; Lane & Menzies, 2003; Netzel & Eber, 2003; White, Marr, Ellis, Audette, & Algozzine, 2001). Furthermore, the majority of research on PBS uses office discipline referrals (ODRs), suspension rates, and behavioral checklists to evaluate the effectiveness of a program (e.g., Lane & Menzies, 2003; Scott, 2001; Sugai et al., 2000; White et al., 2001). More recently, data on academic performance has also been used to determine whether PBS is effective (e.g., Killian, Fish, & Maniago, 2006; Lane & Menzies, 2005; Lassen, Steele, & Sailor, 2006; Luiselli, Putman, Mandler, & Feinberg, 2005). However, outcome measures used in PBS prevention studies have been criticized for being too limited in breadth, relying too heavily upon ODR data, lacking adequate sensitivity, possessing questionable reliability and validity, and for not including measures of treatment integrity and social validity (Lane & Menzies, 2005; Lane, Robertson, & Graham-Bailey, 2006). In addition to these criticisms, the PBS literature currently lacks a "gold standard," which reflects a successful outcome that schools should strive to achieve.

Although the primary premise of PBS is that the provision of positive supports to all students who meet behavioral expectations will result in fewer behavior problems, surprisingly few studies have investigated the effects of various positive reinforcement rates given to students on ODR rates. Studies investigating the effects of PBS certainly have used various types of positive reinforcement strategies that can be monitored to estimate rates of positives given to students. For example, praise notes, good news referrals (e.g., Metzler, Biglan, Ruspy, & Sprague, 2001), "caught being good" cards, or lotto tickets paired with specific praise that are later entered into a lottery for a chance to earn a reward or privilege (e.g., Luiselli, Putnam, & Sunderland, 2002; Luiselli et al., 2005; Netzler & Eber, 2003) are common reinforcement strategies that could easily be monitored. A few recent studies that have investigated whether different groups of students receive equal amounts of reinforcement as well as whether different groups of students respond differently to reinforcement have revealed interesting results that suggest attention to rates of positive reinforcement is important (e.g., Lane, Kalberg, Bruhn, Mahoney, & Driscoll, 2008; Lane, Wehby, Robertson, & Rogers, 2007). However, implications of various amounts of positive reinforcement rates on ODR rates remain unknown. For example, the recommended rate of reinforcement per student for a given school population has yet to be determined. The ideal ratio of positive supports (i.e., reinforcers) to negative indicators (i.e., ODRs) that results in reduced or maintains low levels of ODRs is also currently unknown.

Clearly more research is needed to further explore the relation between rates of reinforcement systems and student behavior in schools implementing PBS programs.

Information on the impact of positive reinforcement rates on PBS program outcomes is necessary to help schools design and modify the reinforcement component of the schoolwide prevention intervention to ensure that the PBS program is maximally effective. Additionally, it is currently unknown whether different types of schools, such as elementary versus middle schools or schools receiving additional funding, such as Title I schools, differ in their rates of reinforcement or ODR outcomes. Thus, the purpose of this study was to examine reported positive reinforcement and ODR rates within public schools implementing SWPBS programs to identify trends and relationships between the two variables and to investigate whether these trends and relationships differ across various school types. Specifically, this study attempted to answer the following questions.

1. Are there significant differences in ODR or reinforcement rates between elementary schools and middles schools, between Title I and non-Title I schools or between proficient and nonproficient academically performing schools?
2. Among schools with high fidelity ratings of their SWPBS program, are there significant differences in reinforcement rates or positive-to-negative indicator ratios between schools identified as having met a preset criterion for more successful versus less successful SWPBS programs?
3. To what extent do monthly reinforcement rates predict monthly ODR rates?
4. To what extent do schools maintain or modify reinforcement rates based on ODR rates?

CHAPTER II

REVIEW OF LITERATURE

The purpose of this literature review is to summarize the rationale for PBS programs and previous research on the effectiveness of PBS program on schoolwide behavioral and academic performance. Thus, the first objective for this review is to first provide a summary of the need for schoolwide interventions and problems with traditional methods of managing student behavior. Second, a description of the PBS model as an alternative method will be presented followed by a review of research on the PBS program. The final purpose of this review is to summarize research on the outcome measures that are most frequently used to make decisions regarding the effectiveness of a PBS program.

Emotional and Behavioral Problems in School Setting

Schools are expected to serve a variety of children with a range of abilities and needs, including students with emotional and behavioral challenges. According to the Surgeon General Report on Mental Health (1999), one in five children have a diagnosable mental, emotional, or behavioral disorder, and up to 1 in 10 may suffer from a serious emotional disturbance. Additionally, during the 2005-2006 school year, 1% or about 477,000 students between the ages of 3 and 21 received federally supported services for emotional disturbances (U.S. Department of Education, 2006). Students whose social behaviors differ substantially from those with typical skill abilities may be at risk for academic and social difficulties (Lane & Menzies, 2003). For example, in the

school system, students with severe emotional or behavioral challenges are often evaluated and classified as having an emotional disturbance (ED), and these students are more likely to fail their courses, drop out of school at higher rates (55% fail to complete high school), are less engaged in postsecondary education, and have greater difficulties with social relationships and employment than other students (Bullis & Cheney, 1999; Malmgren, Edgar, & Neel, 1998; U.S. Department of Education, 2002). Students with ED are also more likely to engage in criminality, substance abuse, and deviant sexual behavior than their peers (Bullis & Cheney, 1999).

Students with ED are eligible for additional services provided through special education. In their position statement on students with emotional and behavioral disorders, the National Association of School Psychologists (NASP; 2005) defined ED as a disability characterized by behavioral or emotional responses in school so different from appropriate age, cultural, or ethnic norms that they adversely affect educational performance, including academic, social, vocational, and/or personal skills. Such a disability is more than a temporary, expected response to stressful events in the environment, is consistently exhibited in two different settings, and is unresponsive to direct intervention in general education. Additionally, NASP stated that ED can coexist with other disabilities and may include children with psychological disorders with sustained disturbances of conduct or adjustment such as schizophrenia, affective disorders, or anxiety disorders, when they adversely affect educational performance. Another way to describe students with ED is by using the empirically supported externalizing and internalizing dichotomy of behavioral and emotional disorders of

children and youth (Merrell & Walker, 2004). The externalizing-internalizing classification has been widely accepted as the new standard for broadband classification of children with behavioral and emotional problems (Achenbach, 1998; Cicchetti & Toth, 1991; Merrell, 2003). Externalizing refers to acting out problems that involve excess behavior that is problematic, such as antisocial and aggressive behaviors, conduct problems and delinquency, destructive and harmful behavior, and the hyperactive-impulsive manifestations of ADHD (Merrell & Walker, 2004). Internalizing refers to problems that result from "overcontrolled" or self-directive behavioral and emotional characteristics, and includes disorders such as depression, anxiety, social withdrawal, and somatic problems (Merrell & Walker, 2004). However, students with internalizing problems has been historically grossly overlooked and underserved in education and mental health systems (Dwyer, Nicholson, & Battistutta, 2006).

Without adequate support, children with or at-risk for emotional and behavioral problems often become frustrated and exhibit disruptive behaviors that interfere with classroom instruction. When students exhibit problem behaviors, problems often continue to occur at the same or more severe level throughout the school year, especially when no level of intervention or support are provided to these students (Gresham, Lane, & Lambros, 2000). Traditionally, schools have relied on reactive, primarily punitive methods in attempt to reduce disruptive behavior problems. Punitive strategies often were ineffective or resulted in negative side effects such as increased or more severe behaviors or a disliking and/or avoiding school (Mayer, 1995; Mayer & Butterworth, 1979; Mayer, Butterworth, Nafpaktitis, & Sulzer-Azaroff, 1983). Moreover, valuable academic time is

lost because managing problem behaviors can take up to 50% of teachers' and administrators' time (U.S. Department of Education, 2000) and students miss instructional time when removed from the classroom when their behavior is being managed (Reichle, 1990).

Certainly, the concern about the amount of teacher and school resources used to support these students is justified (Sugai & Horner, 2002). Due to these concerns, schools have begun to shift from a reactive approach to a more proactive model of managing behavior problems. This proactive model is commonly known as positive behavioral support (PBS) and provides a systematic approach to preventing the development of new behavioral problems, while providing the necessary level of support to manage existing behavioral concerns (Lane et al., 2007). This systematic approach is designed to reduce the need for reactive, punitive methods by better allocating school based resources that provide positive supports to a struggling student when problems first emerge.

Positive Behavior Support

PBS emerged in the mid-1980s as a positive, instructional approach that provided an alternative to punishment for behavior problems (Sugai, Horner et al., 2000). PBS was originally described as a "nonaversive" alternative to humiliating and stigmatizing negative consequences used in attempts to control behavior problems exhibited by individuals with severe disabilities (Horner et al., 1990). Behavioral approaches such as social skills trainings and positive reinforcement programs are common strategies used as

part of this model. Initial studies on the effects of PBS on student behavior change demonstrated the effectiveness of PBS for students with emotional and behavioral problems (e.g., Clark et al., 1995; Kern, Childs, Dunlap, Clarke, & Falk, 1994; Lane, Umbreit, & Beebe-Frankenberger, 1999). Over time, other studies showed that PBS could also effectively decrease disruptive behavior for individuals without disabilities (e.g., Lewis, Powers, Kelk, & Newcomer, 2002; Umbreit, Lane, & Dejud, 2004) when applied in general education settings (e.g., Radford & Ervin, 2002; Scott, 2001). As the effectiveness of PBS has become clearer, it is not surprising that it has become more integrated into various environments to support all student populations; the approach is increasingly being adopted, implemented, and integrated with a greater range of disciplines, including community mental health, school psychology, and general education (e.g., Clark & Hieneman, 1999; Horner, Sugai, & Horner, 2000; Scott & Eber, 2003).

PBS is a data-driven model typically comprised of primary, secondary, and tertiary levels of prevention (Sugai, Horner, et al., 2000). The primary, or universal level, includes schoolwide interventions applied to all students. This schoolwide level of intervention is sometimes referred to as tier I, schoolwide positive behavioral support (SWPBS), or schoolwide positive behavioral interventions and support (SWPBIS). The intent of this primary level of prevention is to prevent problems from occurring by teaching and acknowledging all students' appropriate behaviors instead of only reacting to misbehaving students. At the primary level, behavioral expectations are defined and taught, a reward system for appropriate behavior is implemented, a continuum of

consequences for problem behaviors is determined, and continuous data collection used for decision-making should occur. Examples of interventions at the primary level include programs such as schoolwide contingency programs, schoolwide bully prevention curricula, and schoolwide social and emotional learning programs. When the tier I program is effective, approximately 80% of students respond to this level of prevention (Sugai, Horner, et al., 2000).

The secondary, or tier 2, level includes more focused intervention programs for at-risk students and/or students not responding to the primary level of intervention. At the secondary level, schools should engage in progress monitoring for at-risk students and should have a system for increasing structure and predictability, increasing contingent adult feedback, and increasing home/school communication for students at this level. The secondary level consists of more intensive interventions and may include strategies such as training on social-emotional or anger management skills in small group settings. Researchers estimate that approximately 15% of the student body will require secondary interventions (Sugai, Horner, et al., 2000).

The tertiary, or tier 3, level is appropriate for students who do not respond to the primary and secondary efforts and/or students who exhibit severe behavioral problems in need of immediate intense attention. Logically, intervention data from a small percentage of students obtained during the first two levels suggest that behavior problems are not easily remediated. Thus, these are students who exhibit severe behavioral problems and who are in need of more intense attention. Tertiary support focuses on problem solving assessment strategies to develop interventions that meet individual needs. For example,

functional behavior assessments (FUBA) may be used to develop hypotheses for individual behavior intervention plans (BIP) and intensive curricular modifications. When the primary and secondary levels are effective, approximately 5% of the student body requires tertiary level interventions (Sugai, Horner et al., 2000).

Empirical Support for PBS

With the recent increase of interest in PBS models, studies supporting the effectiveness of PBS on student behavior change are also emerging in the literature. For example, Lewis, Sugai, and Colvin (1998) conducted one of the earliest studies using a multiple baseline design to investigate the effect of a schoolwide social skills program and schoolwide reinforcement system on overall problem behavior. The reinforcement program was a token system in which school staff administered tickets and verbal praise to students who were observed engaging in targeted behaviors related to school rules. Students then placed their signed chance tickets into classroom boxes for an opportunity to earn a monthly award. In addition, students who maintained a high rate of compliance with school rules, 80% or better, were designated as self-managers and were allowed to access building privileges (e.g., leave for lunch early, use the restroom unsupervised, run teacher errands). Direct observation and daily behavior counts were used to track the frequency of problem behavior at recess, in the cafeteria, and during hallway transitions. The percentage of nonoverlapping data points (PND) between baseline and experimental phases were used to determine effectiveness of the interventions. Results of this study indicated that the social skill instruction and direct intervention combination produced

modest reductions in the overall level of problem behavior observed across the three settings (PND: cafeteria = 56%, playground = 63%, transitions = 20%). Data also indicated that the observed changes in behavior were maintained up to 3 months (PND: cafeteria = 83%, transition = 100%, playground = 50%).

In addition to direct observation, the effectiveness of PBS programs has been measured by observing changes in in-school and out-of-school suspension rates. Scott (2001) examined the effects of a schoolwide PBS approach on suspensions in a high-risk inner-city elementary school. Schoolwide data on in-school and out-of-school suspensions were tracked to determine the effectiveness of this program for the total number of students, as well as for minority students. Results indicated that the schoolwide PBS approach was associated with a 61% decrease in hours spent in in-school suspension for both the school population as a whole and for minority students alone. Stated differently, students gained over 775 classroom hours during the intervention year. Additionally, results showed a 65% decrease in the number of days students were suspended as well as a 75% decrease for both the total number of students suspended and total number of minority students suspended.

A few studies have further evaluated the impact of a PBS program on both problem behaviors and academic performance (e.g., Killian et al., 2006; Lane & Menzies, 2005; Lassen et al., 2006; Luiselli et al., 2005). Luiselli et al. (2005), for example, conducted a 3-year longitudinal study examining the effects of a schoolwide PBS program on student discipline problems and academic performance. The schoolwide program consisted of preparing and implementing a schoolwide behavior support plan,

organizing staff responsible for various implementation functions, and regular didactic training, review, and feedback for teachers and administrators. Positive behavior expectations were taught to students, were posted around the school, and a schoolwide token reinforcement system was also implemented. ODRs, suspensions, and standardized test data were collected to determine the effectiveness of the program. ODR and suspension data were collected each month across three consecutive school years, while academic data was collected at the beginning of the first and second school years. Results of this study indicated that this whole-school intervention was associated with a continual decrease in discipline problems over the course of three years and student academic performance improved simultaneously with the intervention. Compared to pretreatment, the rate of ODRs decreased by 44% at posttreatment and decreased a total of 58% at follow-up. Suspension rates decreased by approximately 17% at posttreatment and 33% at follow-up compared to baseline. Overall academic performance improved during the intervention phase, as indicated by an average increase of 18 percentage points on the reading comprehension test and 25 percentage points on the mathematics tests.

A few studies have further compared different populations of students' responses to schoolwide PBS programs. Lane and Menzies (2005), for example, conducted a study that compared the effects of a schoolwide PBS program with elementary school students with academic (n = 26), behavioral (n = 29), and combined (n = 16) concerns relative to students with typical profiles (n = 15). Students were selected based on low academic performance on statewide standardized tests and district-level assessments, and on high behavior problems based on teacher report and school record data. The PBS model used

in this study consisted of two levels of intervention. Level one included a primary intervention plan containing literacy and behavioral components. Level two included more intensive, secondary interventions that focused on academic and social skills instruction for students who were nonresponsive to primary interventions after the first three months of the school year. Data were collected at the beginning of the school year before implementation of the PBS program, three months after the start of school to identify students requiring level two interventions, and again at the end of the school year.

Results of the Lane and Menzies (2005) study revealed differences among different types of students' academic and behavioral performance. Students in the academic concerns and behavioral concerns group made significantly more progress on the district level (*ES* = -0.91 and -3.18, respectively) and curriculum-based measures of reading (*ES* = -1.80 and -1.78, respectively) than did students in the typical performance group. Students in the combined concerns group had significantly higher mean differences in writing scores than either the academic concerns (*ES* = -2.08) or behavioral concerns (*ES* = -1.55) group. No significant changes on the state academic measure were found, indicating that this more global measure may have lacked the sensitivity to detect change. Results of the behavioral measures indicated that student risk scores were significantly lower (indicating improvement) for the combined concerns group than for the academic concerns (*ES* = 1.22), behavioral concerns (*ES* = 1.38), and typical performance (*ES* = 1.08) groups. Additionally, results indicated that students in both the combined concerns and the academic concerns group showed an increase in school

attendance. These results suggest that the literacy interventions may have provided the individualized focus to make school a less aversive place for students with academic concerns, thereby encouraging attendance. These results also suggest a need for increased levels of support for students in the behavioral concerns group. These outcomes are not surprising, however, as the schoolwide plan in this study placed greater emphasis on the literacy component than the behavioral component.

While empirical evidence for PBS exists, relatively few methodologically rigorous studies have investigated its effectiveness. Recently, two randomized controlled trials (RCTs) investigated the effectiveness of primary prevention SWPBS programs. Bradshaw, Mitchell, and Leaf (2010) used data from a 5-year longitudinal RCT to investigate the effectiveness of SWPBS in 37 public elementary schools. Schools were matched based on baseline demographic data, with 21 schools randomized to the treatment condition and 16 allocated to the control condition. Schools in the treatment group developed SWPBS teams, and these teams engaged in a 2-day SWPBS training coordinated by the state followed by annual 2-day booster training sessions. Treatment fidelity was assessed using the School-Wide Evaluation Tool (SET; Sugai, Lewis-Palmer, Todd, & Horner, 2001) and the Effective Behavior Support Survey (EBS; Sugai, Todd, & Horner, 2000). Student outcomes were monitored using the School-Wide Information System (SWIS; May et al., 2003), which is an internet-based data system used to collect and manage major and minor student discipline referral data by the school staff. In this study, both major (e.g., abusive language, fighting, and lying) and minor (e.g., physical contact, disruption, and property misuse) office referrals were examined as well as

school-level suspension rates, and school-level scores on the state's standardized academic achievement tests. Results revealed the schools trained in SWPBS implemented the model with high fidelity and experienced a reduction in ODRs (d = 0.12) and suspensions (d = 0.27). Further, fifth graders in SWPBS schools tended to show grater gains in standardized math scores compared to the gains of fifth graders in the comparison schools (d = 0.54), although these differences were not significant (p = 0.105).

Using this same sample, Bradshaw, Koth, Thornton, and Leaf (2009) investigated the impact of SWPBS on organizational effectiveness. Results revealed a significant effect of SWPBS on the schools' overall organizational health (d = 0.29), staff affiliation (d = 0.24), academic emphasis (d = 0.22), resource influence (d = 0.21), and collegial leadership (d = 0.20) over the 5-year trial. These results supported that changes in organizational health are relevant consequences of SWPBS and may be a contextual mediator of the effect of SWPBS on student performance.

A second RCT used a wait-list design to investigate the effectiveness of SWPBS among 61 elementary schools over the course of 3 years (Horner et al., 2009). Schools in the treatment condition received ongoing training and technical assistance that was provided by state personnel. Results revealed significant differences between the treatment and control condition on implementation of the SWPBS model as well as on school safety and academic performance. Training and technical assistance were functionally related to improved implementation of SWPBS (d = 1.78), and improved use of SWPBS was functionally related to improvements in the perception of school safety (d

= -0.86) and the number of students meeting or exceeding state reading assessment standards (d = 0.58). Following training and assistance in SWPBS, schools also reported lower rates of ODRs; however, this finding cannot be assumed to be the result of implementation of SWPBS because ODR data collected prior to the intervention did not meet Irvin, Tobin, Sprauge, Sugai, and Vincent's (2004) standards of ODR validity, which would have been necessary in order to experimentally examine the effects of SWPBS on ODR rates.

Outcome Measures of PBS

Currently, the majority of research on PBS uses ODRs, suspension rates, and behavioral checklists to evaluate the effectiveness of a program (e.g., Lane & Menzies, 2003; Scott, 2001; Sugai, Todd, et al., 2000; White et al., 2001). More recently, data on academic performance has also been used to determine whether PBS is effective (e.g., Killian et al., 2006; Lane & Menzies, 2005; Lassen et al., 2006; Luiselli et al., 2005). However, outcome measures used in PBS prevention studies have been criticized for the following: (a) being too narrow in scope, with heavy reliance on office referral data that may be more reflective of teacher behavior rather than student behavior; (b) lacking sufficient sensitivity to detect changes in student behavior that may be occurring; (c) failing to obtain or report accuracy of entry, reliability, and validity data, and (d) not including measures of treatment integrity and social validity (Lane & Menzies, 2005; Lane et al., 2006).

The U.S. Department of Education (2002) recommended the use of ODRs to

document a school's behavioral climate and to evaluate the effects of intervention programs; however, the reliability (Nelson, Benner, Reid, Epstein, & Currin, 2002; Nelson, Gonzales, Epstein, & Benner, 2003) and validity of ODRs (Irvin et al., 2004) has been questioned. For example, Lane and colleagues (2007) found that if ODR data is not collected systematically, it may be an unreliable measure of both a school's risk status as well as changes in students' behavior. Further, while Irvin and colleagues concluded there is a substantial basis for interpreting and using ODRs to assess schoolwide behavioral climate and the effectiveness of schoolwide behavioral interventions, they also purported a number of validation questions and concerns regarding ODR interpretations and uses. Some proposed questions currently unsubstantiated in the literature included what the ideal "behavioral climate" for different types of schools (e.g., elementary, middle, high) should be, how the behavioral support needs of a school or district should be determined, and the meaning of an increase in ODRs. For example, does a high frequency of ODRs indicate an increase in problems behavior, inaccurate use of the discipline system, or the need for more behavioral support, and how do cultural expectations of the schools, families, and community affect these considerations? In sum, the validity concerns of ODRs are largely related to schoolwide issues of their utility for informing decision making about concurrent and future schoolwide behavioral climates.

In contrast to these concerns, however, Irvin and colleagues (2006) found preliminary support for the validity of use and utility of ODR data for decision making about student behavior. Based on educators' self-report, Irvin and colleagues found that ODR data were accessed and reportedly used at least monthly for facilitating decision

making about student behavior in elementary and middle schools. Further, results supported the conclusion that schools regard SWIS ODR data and reports as increasing efficiency in the decision making process. However, middle schools reported SWIS ODR data and reports as less efficient, less effective, and more effortful than did elementary schools.

National ODR Data

Based on the Office of Special Education Programs Center on Positive Behavioral Interventions and Supports (OSEP Center on PBIS, 1999), a successful PBS program will result in a student body in which 80% of students will exhibit zero or one instance of major problem behaviors that will result in an ODR for the entire school year. However, a schoolwide "gold standard" that reflects a successful ODR rate that schools should strive to achieve does not currently exist. Although this standard is currently unknown, the School-Wide Information System (SWIS) can provide schools with preliminary comparison data to determine whether they have a higher or lower ODR rate than the national average of ODR rates among schools using the SWIS database.

SWIS is an internet based data system used to collect and manage major (e.g., abusive language, fighting, and lying) and minor (e.g., physical contact, disruption, and property misuse) student discipline referral data by the school staff. The SWIS website provides national data of the major referrals per 100 students per school day from 3,410 schools and 1,737,432 total students for the 2008-2009 school year (SWIS, 2009) and from 4,019 schools and 2,063,408 total students during the 2009-2010 (SWIS, 2010)

school year. The ODRs per 100 students per school day are calculated as a standardized metric to compare ODRs across various school sites with different numbers of students and school days. Thus, an average of 0.34 ODRs per 100 students per school day means that there is about 1 ODR per every 300 students. Mean ODRs per 100 students per school day during the 2008-2009 school year were as follows: 0.34 (*SD* = 0.49) for kindergarten to sixth grades, 0.85 (*SD* = 1.11) for sixth to ninth grades, 1.27 (*SD* = 2.39) for 9th to 12th grades, and 1.06 (*SD* = 2.60) for kindergarten to 8th grades (SWIS, 2009). The median ODRs per 100 students per school day reported by schools using the SWIS during the 2009-2010 school year were as follows: 0.22 for kindergarten to 6th grades, 0.50 for 6th to 9th grades, 0.68 for 9th to 12th grades, and 0.42 for kindergarten to 8th grades (SWIS, 2010).

Additionally, two prior large-scale, descriptive studies report the rate of ODRs for different school-grade levels based on student enrollment (Spaulding & Frank, 2009; Spaulding et al., 2008). The authors in these studies purported that the reported ODR rates can provide benchmark data against which school and district staff can compare their schools. They suggested that the reported ODR rates might be considered guidelines for a "normal" ODR rate, based on grade level served and student enrollment. Spaulding and colleagues reported schoolwide discipline referral patterns from 1,510 schools nationwide that used SWIS for one year. Results of this study reported that rates of average ODRs per 100 students per school day were 0.37 (*SD* = 0.45) for elementary schools, 1.05 (*SD* = 1.06) for middle schools, and 1.32 (*SD* = 1.45) for high schools. Another way to cite these results is that there was an average of approximately one ODR

per day for every 300 students in the elementary school sample, approximately three ODRs per day for every 300 students in the middle school sample, and an average of approximately four ODRs per day for every 300 students in the high school sample.

Spaulding and colleagues (2008) also reported subsequent administrative decisions following the occurrence of each ODR. Their findings revealed that educators' responses to ODRs were primarily punishing in nature. In elementary schools, administrators responded to ODRs in the following ways: conference with the student (14.3%), detention (13.3%), loss of privileges (13.1%), parent contact (12.1%), time spent in the office (10.8%), out-of-school suspension (10.5%), in-school suspension (10.2%), other (6.0%), unknown (5.2%), bus suspension (2.5%), one-on-one instruction (1.0%), restitution (0.5%), Saturday school (0.4%), and expulsion (0.1%). At the middle school and high school levels, the most common responses to ODRs were detention (26.2% and 28.4%, respectively), followed by in-school suspension (24.2%, 18.9%), and out-of-school suspension (17.5%, 14.1%).

In a second large scale report of 1,129 elementary, middle, and high schools that recorded ODRs over 3 years with SWIS, Spaulding and Frank (2009) reported comparable rates of ODRs in elementary schools (M = 0.36, SD = 0.42) but slightly lower rates of ODRs in middle (M = 0.86, SD = 0.71) and high school (M = 0.99, SD = 1.12). Alternatively stated, Spaulding and Frank found an average of approximately1 ODR per day for every 300 students in the elementary school sample, approximately 2.6 ODRs per day for every 300 students in the middle school sample, and an average of approximately three ODRs per day for every 300 students in the high school sample.

Because neither study reported nor included or excluded schools based on types of schoolwide positive or discipline programs that were put into place in each participating school, it is expected that a school with an effective PBS program would be at least at this reported "normed" ODR rate or lower.

Reinforcement

Although a central component of a SWPBS program is a reinforcement system in which students are rewarded for complying with behavioral expectations, minimal research has been conducted in this area. A review of the PBS literature revealed that the frequency or rate of reinforcement within PBS programs is seldom, if ever reported. Researchers conducting PBS studies have often described the use of various types of schoolwide reinforcement strategies such as praise notes, good news referrals (e.g., Metzler et al., 2001), "caught being good" cards, or lotto tickets to reinforce students for meeting behavioral expectations that are later entered into a lottery for a chance to earn a reward or privilege (e.g., Luiselli et al., 2002, 2005; Netzler & Eber, 2003). However, although these reinforcement strategies easily allow for schools or researchers to monitor the number of reinforcers administered to students each month, a review of the literature revealed that treatment integrity of the reinforcement system was often reported, but not one study was found that reported data regarding the administration of schoolwide reinforcement rates. Only two studies were found that reported the rate of reinforcement accessed by individual students within different groups (Lane et al., 2007, 2008). Measurements designed to evaluate the treatment integrity of PBS programs often assess

the reward component of the program using retrospective self-reports from students and teachers. For example, the SET assesses treatment integrity of the positive reinforcement component of a PBS program by assessing whether or not at least 50% of students asked reported that they received a reward for expected behaviors within the past two months and whether or not 90% of the staff reported they have delivered a reward to students for expected behavior over the past two months. The reliance on retrospective self-report could produce results with questionable validity. Further, the utility of this information is also questionable, as it provides schools with very little information about the reinforcement component of their program. Thus, the effect of various positive reinforcement rates on the rate of schoolwide discipline problems is currently unknown.

Results from the few studies that have examined reinforcement systems within a PBS system have revealed interesting results that suggest attention to rates of positive reinforcement. For example, Lane and colleagues (2007) examined the effect of a SWPBS program on grade point average (GPA), unexcused tardies, and suspensions with high school students with externalizing behavior problems (n = 25), internalizing behavior problems (n = 31), comorbid behavior problems (n = 25), typically developing students (n = 43), and students with high-incidence disabilities (n = 54). As part of the program in the participating high schools, students received reward tickets contingent upon the student demonstrating one of the expectations specified in either the discipline or social skills components of the schoolwide plan. These tickets were then entered into a schoolwide drawing for students to possibly win a larger reward. Each student's rate of access to reinforcement was determined by dividing the total number of tickets given to a

student by a teacher and then turned in to the lottery by the student divided by the number of instructional days. Results revealed that all four groups of students accessed equal rates of reinforcement, with means ranging from 0.032 (*SD* = 0.04) per day, or approximately one ticket per month (0.96), for students in the internalizing group to 0.058 (*SD* = 0.09) per day, or 1.74 tickets per month, for students in the high-incidence and typical groups. However, results showed that reinforcement impacted students in different groups in subtly different ways. Reward tickets were related to increases in GPA, decreases in tardies, and decreases in suspensions for students with internalizing behavior problems (*d* = 0.39, -0.60, & -0.27, respectively), externalizing behavior problems (*d* = 0.22, -0.17, & -0.04), and typically developing students (*d* = 0.03, -0.72, -0.21). However, results revealed that students with internalizing behavior problems were most responsive to the SWPBS program on all dependent measures while students in the comorbid concerns and high-incidence disabilities groups demonstrated a slight decrease in GPA and no change in suspensions or tardies.

Lane and colleagues (2008) also conducted a study with students (*N* = 860) attending two separate elementary schools to investigate the effect of SWPBS programs on students' risk status for internalizing or externalizing behavior problems as well as to investigate whether different groups of students accessed reinforcement at different rates and whether there were differences between teacher completed integrity scales and direct observations of integrity. Both schools implemented a PBS program by teaching expected behaviors and subsequently reinforcing these behaviors through the use of reward tickets awarded by school staff members. Results showed that students at high or low risk for

behavioral problems received unequal access to reinforcement, with high-risk students receiving significantly fewer tickets (*M* [*SD]*: school 1 = 0.45 [0.53]; school 2 = 0.87 [0.24]) than students at low risk (*m* [SD]: school 1 = 0.66 [0.46]; school 2 = 1.29 [0.49]). Results also revealed that students with internalizing behavior problems were more responsive to the SWPBS program than students with externalizing behavior problems in one elementary school, as indicated by a 69% decrease in the percentage of the student body identified as at-risk for internalizing behavior problems at time 2 compared to no change in those identified at-risk for externalizing behavior problems. However, this difference was not found in the second elementary school (internalizing: 17% increase; externalizing: 0.3% decrease). Interestingly, in this study, the school with differences in responsiveness between internalizing and externalizing groups awarded all students significantly less reward tickets ($M = 0.63$, SD = 0.47) than the second school ($M = 1.19$; SD = 0.46), indicating that varied amounts of schoolwide reinforcement has different impacts on students. Thus, these results strongly suggest the idea that there may be a certain level of positive supports needed to achieve effectiveness across different subgroups.

Currently, preliminary research suggests that different groups of students, including those with various types of behavioral problems, may access schoolwide reinforcement at different rates. Further, these differences in reinforcement rates may influence program outcomes. Still unknown are the implications of various amounts of individual or schoolwide positive reinforcement rates on ODR rates. Similar to the gold standard in ODRs, the recommended rate of reinforcement per student has yet to be

determined.

Summary and Study Purpose

Although PBS is becoming increasingly popular in school systems nationwide, relatively few methodologically rigorous studies have looked at PBS empirically. The need to continue exploring the effectiveness of PBS across a variety of settings is evident. To date, the majority of PBS research has focused on the primary and secondary prevention levels, with much less exploration of the implementation and effectiveness at the tertiary level (Crimmins & Farrell, 2006). Additionally, the majority of studies examining the effectiveness of primary prevention plans have been conducted with elementary students (Hunter et al., 2001; Lane & Menzies, 2003; Netzel & Eber, 2003; White et al., 2001).

Since a primary component of PBS is the implementation of a schoolwide positive reinforcement system, it seems pertinent that this program component be investigated further. The development of empirically supported standards outlining recommended rates of reinforcement to achieve low rates of ODRs would benefit schools in a number of ways. Knowledge about the relationship between reinforcement rates and ODRs would allow schools to better design reinforcement programs that are more likely to lead to successful implementation and outcome of their PBS program, help schools identify areas needing improvement, and may help schools better understand any positive or negative behavioral changes seen among the school. Since PBS itself is a data-driven model, the recommended implementation procedures and outcome goals should also be

based on empirical evidence. Currently, the research supports that PBS has a positive impact on behavioral outcomes such as suspensions and ODRs; however, specific information regarding the frequency of reinforcement required to achieve positive outcomes is unknown. Further, the frequency to which schools are responding to reinforcement and ODR data to inform schoolwide program decisions is also unclear. Additionally, it is currently unknown whether different types of schools, such as elementary versus middle schools or schools receiving additional funding, such as Title I schools, differ in their rates of reinforcement or ODR outcomes. Thus, the purpose of this study was to explore some of these issues by examining reported positive reinforcement rates and ODR rates within public schools implementing SWPBS programs to attempt to identify trends and relationships between the two variables and to investigate whether these trends and relationships differ across various school types.

CHAPTER III

METHODOLOGY

Statewide PBS Training Program Overview

This evaluation project was conducted in collaboration with the personnel of a Statewide PBS Training Initiative Program. This training program was developed to support schools throughout the state to implement a PBS program. To get this support, schools and districts completed an application to participate in the program and signed an agreement to commit to participate in three years of training. In addition, a signed contract was required by school administrators. This contract stated the major activities of a PBS program that the school personnel agreed to implement. Activities included establishing a Student Intervention Assistance Team that focuses on problem solving for struggling students, identifying a team participant to act as a school-based coach, participating in up to five days of training activities, and developing and implementing a school PBS action plan. Finally, teams were required to evaluate the PBS program using screening and progress monitoring methods and submit this data on a monthly basis to the state trainers.

As part of the PBS program, most participating schools developed and administered a schoolwide program called the *Principal's 200 Club* (Bowen, Jenson, & Clark, 2004). This program involves a token economy behavior modification process in which conditioned reinforcers (e.g., tokens, ticket, or points) are used systematically to strengthen desired behaviors. The *Principal's 200 Club* program involves the school staff

giving out a certain number of tickets each week to students who are following expected rules. A student turns the ticket into the office, where a large poster containing a matrix of 200 squares with numbers on the side, similar to a BINGO card, is displayed. The student exchanges the ticket for a chip with numbers on it, which is selected from a jar in the office. The student then writes his/her name in the square on the matrix that corresponds to the selected numbered chip. When ten consecutive squares are filled, students whose names are in the ten squares earn a mystery reward. To assess number of reinforcers administered to students, most schools tallied the number of tickets given to students by staff for rule compliance per month. Schools were not required to use this specific program but were asked to use some sort of schoolwide reinforcement system that could be tallied and reported to the state.

To ensure that schools were entering and using meaningful data to monitor program effectiveness, first year training immediately emphasized the development of ODR and reinforcement rate (RR) data that could be frequently and systematically recorded, tallied, and reviewed at least monthly in order to make decisions regarding program effectiveness. Training included didactic workshop formats with teams and coaches throughout a school year, development of yearly action plans, and state trainers delivered several follow-up trainings at each school site to develop, implement, and manage a progress monitoring ODR system as well as to provide assistance with entering data information. Schools were also trained to administer the School-Wide Evaluation Tool, described below, at the end of a school year to evaluate the schoolwide program implementation.

Instruments

School-Wide Evaluation Tool

The School-Wide Evaluation Tool (SET; Sugai et al., 2001) is a 28-item measure that assesses the degree in which a school implements the key features of a PBS program (e.g., defined school-wide behavioral expectations, taught expectations to student, provided rewards for following the expectations, implemented a continuum of consequences for problem behavior, monitored problem behavior patterns for ongoing decision making, provided staff training, involved an administrator, and were supported by district). Information required to complete the SET is collected through direct observation; interviews with administrators, teachers, staff, and students; and through reviewing school documents such as written school policies, training curricula, and meeting notes. The SET has been used to assess intervention integrity (Scott & Barrett, 2004), to evaluate programs (Horner et al., 2004), and as a formative evaluation to assess program needs (Freeman, Smith, & Tiegi-Benet, 2003). The SET possesses key psychometric properties, including high internal consistency (total score Cronbach's α = 0.96), high test-retest reliability (97.3%), high interobserver agreement (99% for direct observations), and adequate convergent validity (Pearson $r = 0.75$, $p < .01$ with the Effective Behavior Support Self-Assessment Survey; Horner et al., 2004). Since student behavior change is unlikely before schoolwide expectations are taught, Horner and colleagues recommended a teaching expectation target of at least 80% on the SET. Authors also recommend an overall target of at least 80% on the SET, as preliminary research suggests that stable change is unlikely without adequate implementation of all

areas assessed by the SET (Horner et al., 2004).

Statewide PBS Program Evaluation Database System

Participating schools reported monthly data to the state by completing and submitting an online data summary form to the state (see Appendix). Schools reported the frequency of both negative indicators (i.e., ODRs, absences, suspensions) and positive indicators (i.e., individual schoolwide positives, group schoolwide positives, and adult schoolwide positives) occurring each month for the entire school. Finally, school also reported annual SET scores.

Procedures

Data Collection

This study utilized an archival data collection method. After obtaining written permission from the state program director to use data from the PBS program evaluation database and approval for procedures from a University based Institutional Review Board, the author was e-mailed a de-identified dataset that was exported directly from the PBS program evaluation database into an Excel file. Thus, the data provided through *Statewide PBS Program Evaluation Database System* during the 2007-2008 and/or 2008-2009 academic school years were used in this study to select participating schools and answer the aforementioned research questions.

Selection of Participating Schools

Participants included elementary and middle public schools that participated in

the statewide PBS training and reported data that was entered in the Statewide PBS Program Evaluation Database System during the 2007-2008 and 2008-2009 school years. The original dataset contained data from 85 schools located within 17 separate school districts across the state. To ensure schools implemented SWPBS programs with fidelity and in order to better interpret trends, schools were only included in this study if (a) the school possessed an overall SET score of 80% or higher as well as a score of 80% or higher on the *Expectations Taught* criterion (criterion B), and (b) the school possessed monthly ODR and RR data for the months of September through May. The inclusion criteria of overall and criterion B SET scores of 80% or higher were selected using the recommendations provided by the measure's authors (Horner et al., 2004), as these cutoffs are considered to be the minimum required scores in order to see behavior change and draw conclusions about the SWPBS program. Fourteen schools were excluded because they did not report SET data and 12 schools were excluded because their overall SET score was below 80% and/or their SET score on criterion B was below 80%. Some schools possessed data for both the 2007-2008 and the 2008-2009 school years. Thus, after removing schools with no or low SET data, a total of 71 cases from 58 separate schools remained. Twenty-seven cases from 24 separate schools were excluded because they were missing one or more data points between the months of September and May. Thus, 44 cases from 34 separate schools located within 11 different school districts met the final inclusion criteria for this study. Ten schools that met the inclusion criteria possessed data for both the 2007-2008 and 2008-2009 school years. A flowchart depicting the inclusion/exclusion process is provided in Figure 1. The mean scores for the

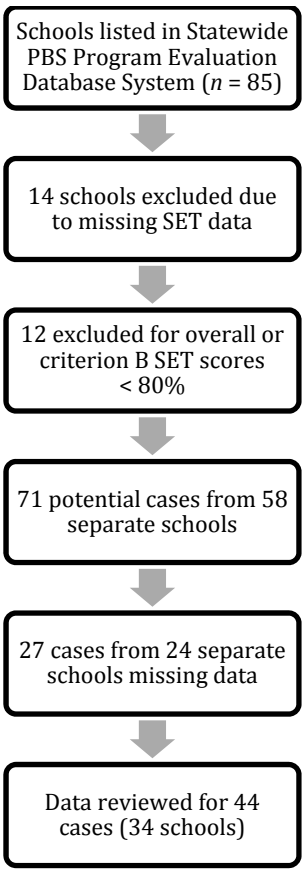

Figure 1. Flowchart depicting inclusion/exclusion of schools.

included schools were 92.7% (*SD* = 7.2) and 92.1% (*SD* = 4.7) on the Criterion B SET and overall SET, respectively.

School demographic information was collected by accessing public information available through the Utah State Office of Education (USOE) website (2009). Descriptive statistics collected from the websites included the school type (e.g., elementary, middle, or high school), Title I status, locales of school (e.g., rural, urban, etc.), student-to-teacher ratio, SES indicated by free or reduced lunch data, gender population, ethnicity population, and percentage of students receiving special education or English language

learner (ELL) services. Annual school assessment outcome reports were also reviewed per school through the SOE website to determine proficient and nonproficient academically performing schools. Each school, by state law, was required to have at least 95% students participating in schoolwide assessments and report percentage of students scoring at or above a proficiency level on a direct writing assessment (DWA), criterion-referenced test (CRT), and/or an alternate assessment. In addition, the state required schools to report their overall progress. The overall progress of a school and/or a subgroup is a longitudinal measure defined as low, medium, or high by comparing the achievement levels of the same student from one year to the next (USOE, 2009). The state considers a school to be performing as expected if *either* at least 80% of the students' assessment scores fell within the proficiency range or the school received progress scores of at least 190 in the whole school and subgroup populations. Given this criterion, if the state considered a school to be performing as expected, then the school was considered to be a proficiently performing school in this dataset.

The collected demographic data showed that the mean school population of included schools is 688 (SD = 224.5) students with a mean student and teacher ratio of 21.5 (SD = 2.6). Additional descriptive information for the 44 included schools is shown in Table 1. Demographic make-up of schools in this sample is shown in Table 2.

Outcome Indices

Outcome indices used in this study were derived from data provided from the State Program Evaluation Database for each participating school, including frequencies

Table 1

Descriptive Statistics of Overall Sample

School type	%	*n*
Level		
Elementary	91	40
Middle	9	4
Title I status		
Title I	41	18
Non-Title I	59	26
Locale		
Large suburb	59	26
Distant town	11	5
Midsize city	9	4
Remote town	9	4
Small suburb	7	3
Small city	5	2
Proficient state performance		
Proficient	86	38
Nonproficient	14	6

of ODRs and individual schoolwide positives. Definitions of each index used in this study follow.

ODR Rates

ODR frequency data collected from the database were converted to an ODR rate of average ODRs per100 students per day for each month using the following formula: (total monthly ODRs/enrollment) x 100/number of school days that month. This conversion of the data allows for comparison across schools with differences in student enrollment and/or the number of school days per month (Ervin, Schaughency, Goodman, McGlinchey, & Matthews, 2006; Spaulding et al., 2008). Prior studies have indicated that

Table 2

Demographic Make-up of Include Schools

Characteristic	%
Race	
White	73
Hispanic/Latino	17
American Indian	2
Asian	2
Black	2
Pacific Islander	2
Undeclared	1
English Language Learners	
Non-ELL	86
ELL	14
Free/reduced lunch	
No program	62
Program	38
Special Education status	
No disability	88
Disability	12
Gender	
Male	52
Female	48

ODRs are sensitive to change in program evaluation and have strong predictive validity for student adjustment (Irvin et al., 2004).

Reinforcement Rates

In order to compare rates equivalently across schools, reinforcement frequency data collected from the database were converted to average reinforcement rates (RRs) per 100 students per day for each month. The reported individual rewards were totals of the number of submitted 200 club tickets, good praise notes, or good news referrals students

received for meeting the expectations. The RRs of average reinforcers per 100 students per day for each month were calculated using the following formula: (total monthly RRs/enrollment) x 100/number of school days that month.

Positive-to-Negative Indicator Ratios

After ODR rates and RRs had been calculated, monthly positive-to-negative indicator (P-N) ratios for each school were calculated by dividing calculated RR rates by calculated ODR rates. Twenty-five of the 396 total ODR data points were values of 0. In order to calculate a P-N ratio for these months, the ODR values were temporarily changed to one. The ODR per day per 100 students was calculated, and this non-zero number was used to calculate the P-N ratio. The ODR scores were then changed back to their zero values. The P-N ratio provides a ratio of the positive indicators to negative indicators per day per 100 students for each month for each school.

CHAPTER IV

RESULTS

A descriptive research design, incorporating quantitative methods, was used in the current study. The monthly ODR, RR, and P-N ratio data were reported for 9 months (September through May) for each of the 44 schools, resulting in a total of 396 data points for each outcome variable. The overall average monthly ODRs, RRs, and P-N ratios per day per 100 students were 0.15 (*SD* = 0.18), 6.57 (*SD* = 9.89), and 203.75 (*SD* = 547.23), respectively. The average monthly ODR, RR, and P-N Ratio was also calculated for each school. Table 3 presents the overall average monthly mean, standard deviation, and range of ODRs, RRs, and P-N ratios per 100 students per day for the overall sample as well as for the following types of schools: Title I and non-Title I schools, elementary and middle schools, and schools who met academic proficiency versus those who did not. Tables 4- 6 present the means and standard deviations of ODRs, RRs, and positive-to-negative indicator ratios per 100 students for the overall sample as well as for the following types of schools: Title I and non-Title I schools, elementary and middle schools, and schools who met academic proficiency versus those who did not. Figures 2-4 depict the average ODRs, RRs, and P-N ratios per 100 students per day for each month, respectively.

The first question of interest was whether there were significant differences in ODR, RR, or P-N ratios between elementary and middle schools, between Title I and non-Title I schools, or between proficient and nonproficient academically performing schools. Unfortunately, since there were only four middle schools and six schools who

Table 3

Descriptive Statistics for Yearly Average of Monthly ODR, RR, and P-N Ratios per 100 Students per Day for Total Schools, Title I and Non-Title I Schools, Elementary and Middle Schools, Proficient and Nonproficient Academic Performing Schools

	ODR			RR			P-N ratio		
Type of school	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
All schools (*N* = 44)	0.15	0.16	0.004-0.88	6.57	9.03	0.41-40.61	203.75	450.84	1.04-2375.93
Title I (*n* = 18)	0.19	0.20	0.004-0.88	6.73	10.88	0.78-40.61	94.14	151.95	1.04-6.38.78
Non-Title I (*n* = 26)	0.12	0.12	0.01-0.55	6.47	7.74	0.41-27.91	279.63	565.03	2.10-2375.93
Elementary (*n* = 40)	0.15	0.16	0.004-0.88	7.08	9.33	0.41-41.61	222.06	469.36	1.04-2375.93
Middle (*n* = 4)	0.11	0.06	0.06-0.16	1.51	0.48	0.95-2.09	20.62	15.89	6.32-39.89
Proficient academic performance (*n* = 38)	0.14	0.12	0.01-0.55	6.97	9.63	0.41-41.61	211.68	476.99	2.10-2375.93
Nonproficient academic performance (*n* = 6)	0.22	0.33	0.004-0.88	4.07	2.68	0.78-8.33	153.49	246.58	1.04-638.78

did not meet academic proficiency, valid comparisons could not be made between elementary schools and middles schools or between proficient and nonproficient academically performing schools.

To determine whether there were significant differences in any of the outcome variables between Title I and non-Title I schools, the data were first analyzed to

Table 4

Mean and Standard Deviations for Average Monthly ODR per 100 Students Per Day for Total Schools, Title I and Non-Title I Schools, Elementary and Middle Schools, Proficient and Nonproficient Academic Performing Schools

	September		October		November		December		January		February		March		April		May	
Type of school	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
All schools ($N = 44$)	0.137	0.152	0.145	0.196	0.144	0.156	0.180	0.257	0.128	0.190	0.175	0.187	0.141	0.136	0.131	0.135	0.140	0.123
Title I ($n = 18$)	0.181	0.202	0.198	0.268	0.170	0.183	0.224	0.317	0.180	0.262	0.205	0.230	0.184	0.159	0.178	0.159	0.167	0.142
Non-Title I ($n = 26$)	0.106	0.983	0.108	0.116	0.125	0.134	0.151	0.208	0.092	0.111	0.154	0.157	0.111	0.112	0.098	0.106	0.122	0.107
Elementary ($n = 40$)	0.14	0.16	0.15	0.20	0.14	0.16	0.18	0.27	0.13	0.20	0.18	0.20	0.15	0.14	0.13	0.14	0.14	0.13
Middle ($n = 4$)	0.11	0.06	0.09	0.07	0.14	0.10	0.15	0.08	0.08	0.03	0.11	0.04	0.09	0.04	0.10	0.09	0.14	0.11
Proficient academic performance ($n = 38$)	0.12	0.11	0.13	0.12	0.14	0.13	0.16	0.21	0.11	0.11	0.16	0.14	0.14	0.12	0.12	0.12	0.13	0.11
Nonproficient academic performance ($n = 6$)	0.22	0.32	0.27	0.46	0.17	0.28	0.27	0.48	0.26	0.44	0.25	0.38	0.16	0.23	0.17	0.20	0.19	0.18

Table 5

Mean and Standard Deviations for Monthly RR per 100 Students per Day for Total Schools, Title I and non-Title I Schools, Elementary and Middle Schools, Proficient and Nonproficient Academic Performing Schools

	September		October		November		December		January		February		March		April		May	
Type of school	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
All schools (*N* = 44)	5.57	9.03	6.07	9,07	9.94	8.23	7.33	10.52	7.03	12.06	6.64	8.07	6.64	9.69	7.44	11.16	6.48	11.10
Title I (*n* = 18)	6.04	10.43	6.99	11.26	5.84	8.40	7.24	12.23	6.63	11.02	5.45	6.20	6.59	10.84	8.21	15.03	7.54	15.24
Non-Title I (*n* = 26)	5.25	8.13	5.43	7.37	6.01	8.28	7.40	9.41	7.31	12.93	7.46	9.18	6.67	9.03	6.91	7.74	5.75	7.25
Elementary (*n* = 40)	6.00	9.37	6.53	9.39	6.41	8.50	7.91	10.87	7.64	12.50	7.13	8.31	7.12	10.04	8.01	11.57	6.97	11.53
Middle (*n* = 4)	1.35	1.22	1.42	0.92	1.28	0.70	1.61	1.21	0.98	0.42	1.70	0.71	1.82	0.71	1.81	0.80	1.64	1.12
Proficient academic performance (*n* = 38)	5.99	9.65	6.35	9.65	6.09	8.73	7.88	11.21	7.51	12.87	6.99	8.59	7.02	10.35	7.83	11.86	7.06	11.84
Nonproficient academic performance (*n* = 6)	2.95	1.74	4.32	3.82	4.99	4.09	3.89	2.32	4.05	3.49	4.43	2.75	4.23	2.41	5.01	4.82	2.79	1.76

Table 6

Mean and Standard Deviations for Average Monthly P-N Ratios per 100 Students per Day for Total Schools, Title I and Non-Title I Schools, Elementary and Middle Schools, Proficient and Nonproficient Academic Performing Schools

	September		October		November		December		January		February		March		April		May	
Type of school	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
All schools ($N = 44$)	157.79	361.38	274.06	693.95	227.07	630.81	206.73	503.71	192.66	395.85	167.01	497.58	241.19	747.99	244.14	606.35	135.08	370.24
Title I ($n = 18$)	69.03	97.04	122.71	232.51	96.76	176.28	138.78	199.33	101.35	161.73	82.37	193.22	88.24	194.02	75.02	113.98	72.97	128.10
Non-Title I ($n = 26$)	198.93	459.39	378.84	873.86	317.29	801.62	253.77	635.42	255.86	491.50	225.60	625.89	347.08	953.01	361.23	767.26	178.09	468.95
Elementary ($n = 40$)	158.98	376.85	298.29	724.07	248.38	658.48	225.94	524.94	210.60	411.26	181.98	520.04	262.78	782.04	264.77	632.83	146.83	186.71
Middle ($n = 4$)	13.86	10.73	31.80	29.42	13.97	14.40	14.67	17.36	13.24	6.54	17.28	9.85	25.28	19.66	37.89	34.76	17.59	20.39
Proficient academic performance ($n = 38$)	153.17	386.56	287.81	735.39	229.84	671.35	216.37	533.48	191.85	412.97	166.72	522.31	249.43	797.07	268.38	648.95	141.56	392.54
Nonproficient academic performance ($n = 6$)	99.07	119.62	186.97	359.23	209.55	293.92	145.66	266.09	197.74	292.50	168.84	332.37	188.97	326.34	90.60	112.67	94.04	190.43

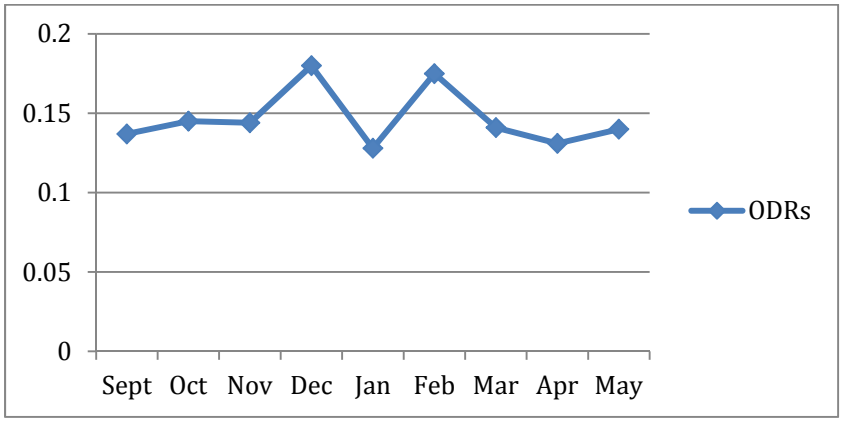

Figure 2. Average office discipline referrals per 100 students per day for each month.

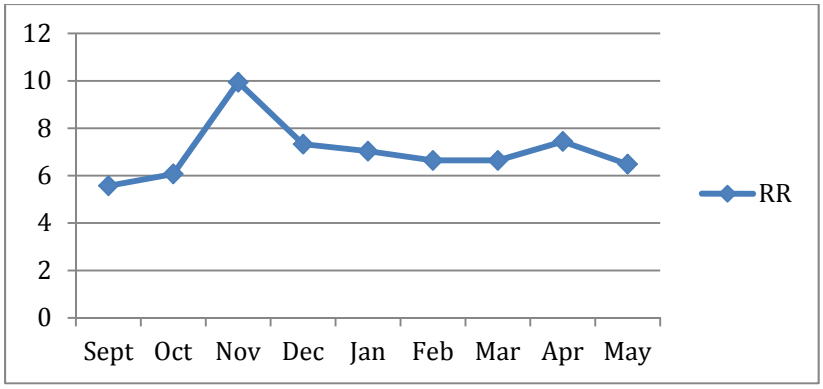

Figure 3. Average reinforcement rates per 100 students per day for each month.

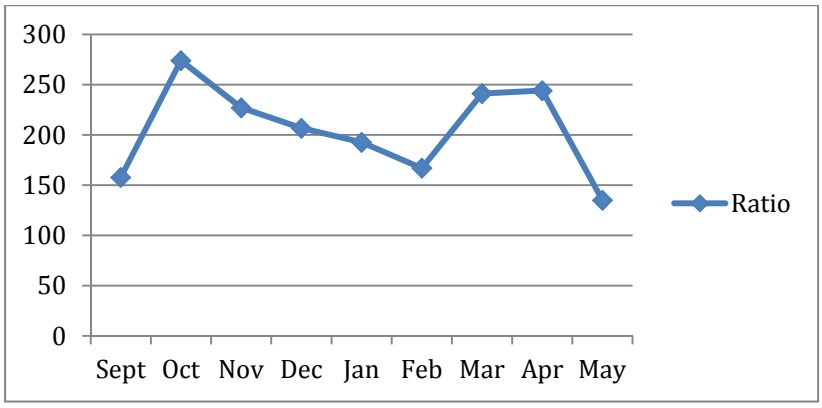

Figure 4. Average positive to negative ratios per 100 students per day for each month.

determine whether the RR and ODR data per month represented a normal distribution. Normal distributions produce a skewness and kurtosis statistic of about zero, with small variations occurring by chance alone. Values of 2 standard errors of skewness (*ses*) or 2 standard errors of kurtosis (*sek*) are most likely skewed or differ from mesokurtic to a significant degree. For this sample, *ses* was 0.357, which would indicate that skew statistic values that fall outside of a range between - 0.714 and + 0.714 violate the assumption of normality. The *sek* for this sample is 0.702 which would indicate that kurtosis statistic values that fall within the range between -1.404 and + 1.404 violate the assumption of normality (Tabachnick, & Fidell, 1996). All ODR, RR, and P-N ratio skew and kurtosis values fell outside of these ranges for each month (skew range, 1.57 to 4.05; kurtosis range, 2.49 to 20.13); thus, a natural log transformation was conducted to help normalize the data. Given that some schools reported a zero value of ODRs in a given month, and a value of zero cannot be converted into a natural log transformation, a value of three was added to each ODR, RR, and P-N ratio score prior to converting these values to their natural log (Osborne, 2002). Using this transformed data, a repeated measures multivariate analysis of variance (RM-MANOVA) was performed with alpha set at .05 for the independent variable Title I verses non-Title I schools on the three dependent variables ODR, RR, and P-N ratio. A severely significant Box's *M* test for all outcome variables ($p < 0.001$) and significant Mauchly's *W* ($p < 0.001$) indicated the assumptions of homogeneity of covariance matrices and sphericity were violated; thus a valid RM-MANOVA could not be conducted. Therefore, a multi-group MANOVA was conducted with Title I status as the independent variable and the log transformed average monthly

ODR, RR, and P-N ratio as the dependent variables. Results revealed a significant Box's *M* (p = 0.008), and thus results were evaluated using a Pillai's Trace statistic. Results of the MANOVA revealed there were no significant multivariate differences between Title I and non-Title I schools (*Multivariate F* [3, 40] = 0.68, p = 0.57; Pillai's Trace = 0.048; partial η^2 = 0.048). Results were also nonsignificant at the univariate level for average monthly ODRs (F = 2.11, p = 0.15; sum of squares = 0.005; partial η^2 = 0.048), average monthly RRs (F = 0.028, p = 0.87; sum of squares = 0.012; partial η^2 = 0.001), and average monthly P-N ratios (F = 0.73, p = 0.40; sum of squares = 1.77; partial η^2 = 0.017).

The second research question of interest was whether there were significant differences in RRs or P-N ratios between schools identified as having met a preset criterion for successful versus less successful SWPBS programs. To answer this question, schools were first broken into quartiles using the average monthly ODR rate per 100 students per day. The top quartile, which consisted of the 11 schools with the lowest average monthly ODR rates for the school year, was compared against the bottom quartile, which consisted of the 11 schools with the highest average monthly ODR rates for the school year. The mean, standard deviation, and range of ODRs, RRs and P-N ratios for each quartile are presented in Table 7. The groups were compared on log transformed monthly RRs and log transformed monthly P-N ratios using a Repeated Measures MANOVA to determine whether there were differences over time between the two groups. Results revealed a significant Box's *M* statistic for the log transformed monthly RR data (p = 0.018) and log transformed P-N ratio data (p = 0.002) and a

Table 7

Mean, Standard Deviation, and Range for ODRs, RRs, and P-N Ratios by ODR Quartiles

	ODR			RR			P-N ratio		
Quartile	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Top quartile (*n* = 11)	0.03	0.03	0.00-0.12	9.22	8.91	0.45-39.92	652.87	953.78	3.94-4085.91
Second quartile (*n* = 11)	0.08	0.04	0.00-0.19	3.32	2.51	0.05-14.09	70.46	92.32	0.64-466.00
Third quartile (*n* = 11)	0.14	0.06	0.00-0.30	5.06	9.41	0.13-63.61	45.63	89.34	1.31-585.18
Bottom quartile (*n* = 11)	0.35	0.24	0.09-1.26	9.88	14.54	0.16-60.24	54.03	99.89	0.74-502.00

significant Mauchly's W ($p < 0.05$), and therefore results were evaluated using the Pillai's Trace statistic. Results of the RM-MANOVA revealed a significant main effect between the top and bottom quartiles, $F(2, 19) = 84.06$, $p < 0.001$; Pillai's Trace = 0.898; partial $\eta^2 = 0.0898$. There was not a significant main effect for time, $F(16, 320) = 1.32$, $p = 0.19$; Pillai's Trace = 0.124; partial $\eta^2 = 0.062$ or for the time by quartile interaction, $F(16, 320) = 0.66$, $p = 0.83$; Pillai's Trace = 0.064; partial $\eta^2 = 0.032$. Because results revealed multivariate significance, results were investigated at the univariate level. Pairwise comparisons revealed a significant difference between the top and bottom quartile for P-N ratio (mean difference = 2.58, $p < 0.001$; partial $\eta^2 = 0.54$) but not between RRs (mean difference = 0.197, $p = 0.53$; partial $\eta^2 = 0.02$). The average RR and P-N ratio each month by top and bottom ODR quartiles are depicted in Figures 5 and 6.

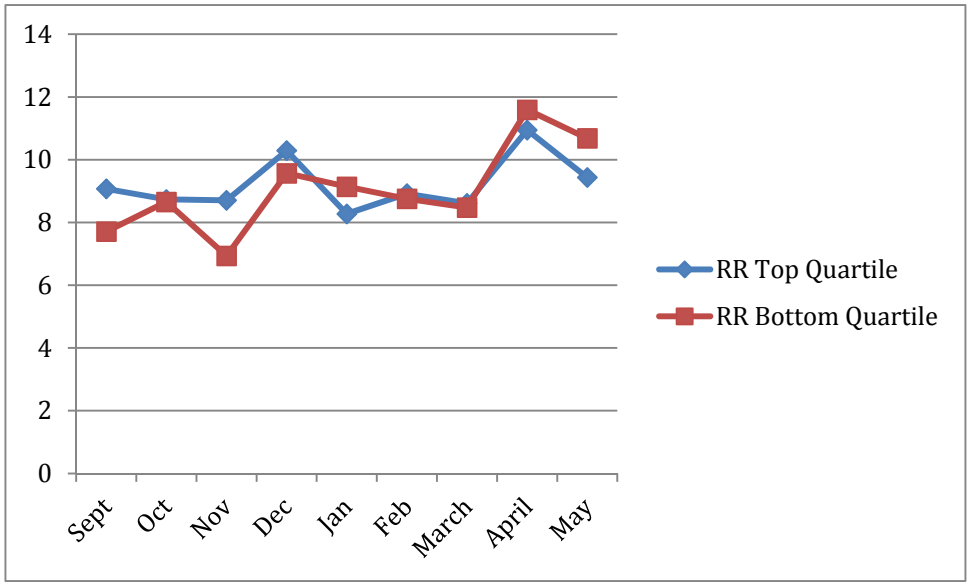

Figure 5. Average reinforcement rates each month by top and bottom ODR quartile.

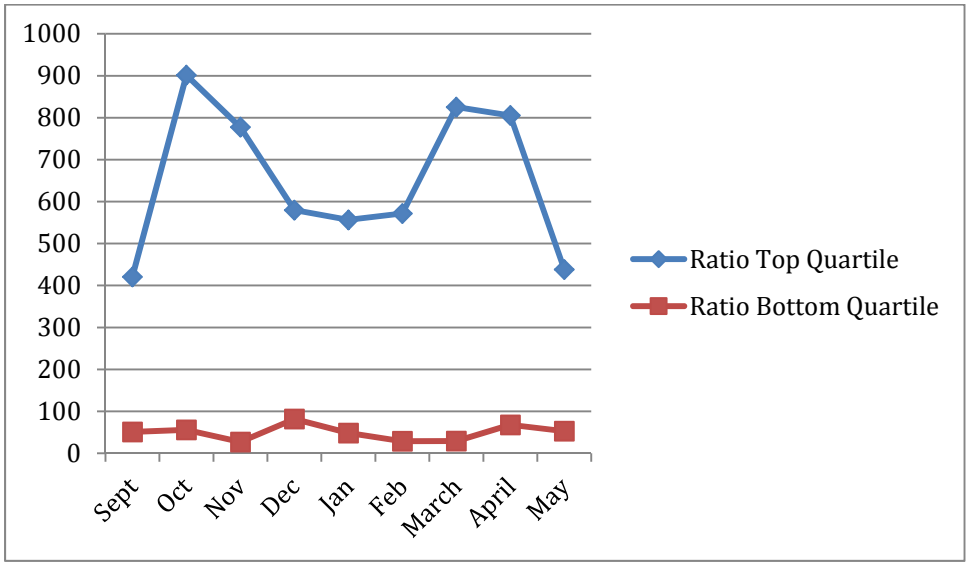

Figure 6. Average positive to negative ratio each month by top and bottom ODR quartile.

The third research question asked the extent to which monthly RRs predict monthly ODRs. To answer this question, a linear regression was conducted. Given the extreme variability in RRs and ODRs, the data was transformed into z-scores to easily identify and remove outliers. Any score above or below 1.96 standard deviations from the mean was considered an outlier and was not included in the regression analysis. Of the 398 cases, 48 contained outlier data and were subsequently excluded from the regression analysis. After removing outliers a linear regression was conducted between the log transformed RR and ODR values. Results revealed a weak, but significant negative correlation between RRs and ODRs (Pearson's $r = -0.143$, $p = 0.004$). RRs significantly predicted ODRs and explained 2.1% of the variance in ODRs (ß = -0.143, $p = 0.007$; $R^2 = .021$). This result suggests that an increase in RRs was weakly associated with a decrease in ODRs. Results from the linear regression are presented in Table 8. A scatterplot of RRs on ODRs is presented in Figure 7.

The final question of interest was related to the extent in which schools appear to be using RR and ODR data to guide SWPBS practices. Specifically, the extent in which schools maintained or modified RRs based on ODRs was investigated. To explore this

Table 8

Linear Regression of RRs as a Predictor of ODRs

	Unstandardized coefficients		Standardized coefficients		
Variable	B	Std. Error	Beta	*t*	Sig.
Constant	1.153	.007		169.137	.000
Log RR	-.010	.004	-.143	-2.695	.007

Note. Dependent variable log transformed ODRs.

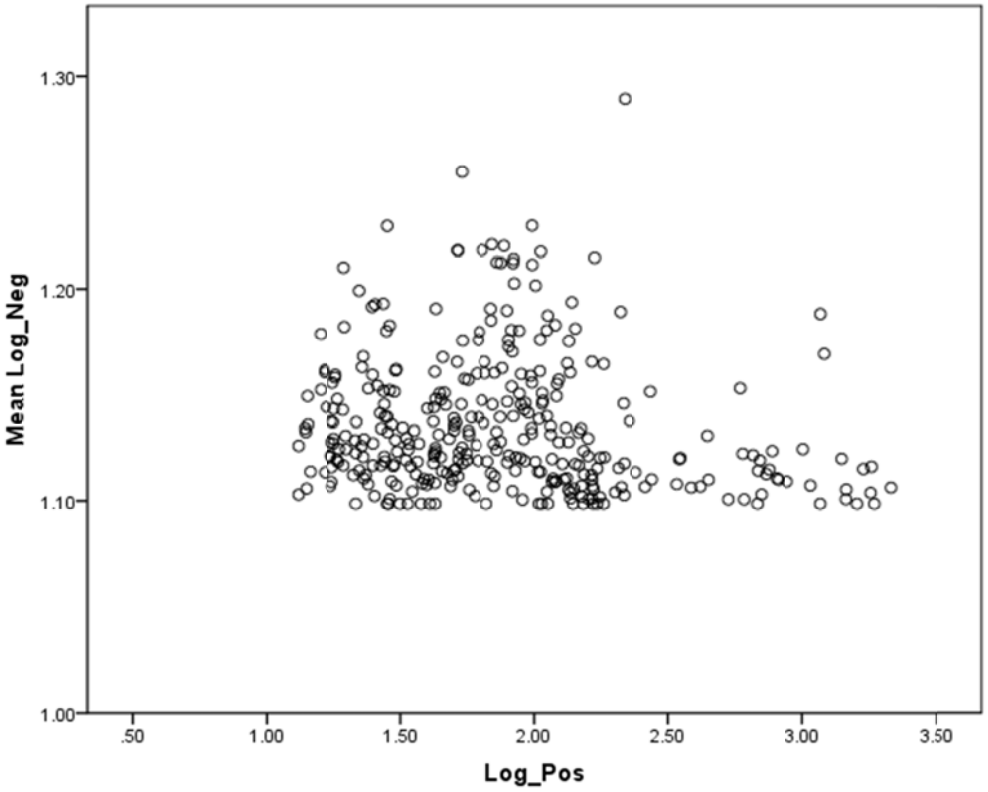

Figure 7. Scatterplot of RRs on ODRs.

issue, two percentages were examined: (a) the percentage of time monthly RRs were maintained or decreased following the maintenance or decrease of ODRs during the previous school month, and (b) the percentage of time monthly RRs increased or stayed the same following a monthly increase in ODRs. To examine this, the dataset was first coded to indicate if there was an increase or a decrease in ODRs between the months of September and October, between October and November, and so forth. Of 308 monthly intervals that were in the data sample, there were 150 times that ODRs increased, 148 times that ODRs decreased, and 10 times that ODRs remained the same. Second, the data was coded to indicate if there was an increase or decrease in RRs between the months of

October and November, between November and December, and so forth. Of the 308 monthly intervals that were in the data sample, there were 157, 151, and 0 times that RR increased, decreased, or stayed the same, respectively.

To examine schoolwide positive response to poor behavior outcomes, the frequency of increases in subsequent RRs following a monthly increase in ODRs was determined. Results revealed the frequency of RR increases following ODR increases was 76 out of 151 comparisons. This indicates that the reinforcement rates increased 50% of the time following an increase in ODRs in the previous month.

The amount of time schools maintained or decreased their reinforcement rates following a decrease in ODRs was also explored. Results revealed that the frequency of RR decreases or no change in RRs following a decrease of ODRs was 77 out of 158 comparisons. Thus, schools maintained or decreased their reinforcement rates 48.7% of the time following a decrease in ODRs in the previous month.

CHAPTER V

DISCUSSION

SWPBS programs are designed to provide a systematic, evidence-based practice for monitoring and preventing student discipline problems (Sugai, Horner, et al., 2000). Within the past decade, an increasing focus has been placed on PBS and as a result, SWPBS programs have continually emerged among schools across the nation (Walker et al., 2005). A growing body of evidence supports that PBS is associated with improvements in students' behavior as measured by office discipline referral, suspensions, and expulsions data (e.g., McCurdy, Manella, & Eldridge, 2003; Nelson, Martella, & Galand, 1998; Scott & Barrett, 2004; Todd, Haugen, Anderson, & Spriggs, 2002), school climate (Netzel & Eber, 2003), academic performance (Ervin et al., 2006), and instructional time (Horner, Sugai, Todd, & Lewis-Palmer, 2005). However, although PBS programs are designed to provide positive consequences contingent on rule compliance, few studies have investigated this program component and the potential use for program decision-making (e.g., Lane et al., 2007, 2008).

Given that schools are attempting to identify effective positive reinforcement systems to increase appropriate behaviors that replace undesirable behaviors typically resulting in ODRs, it is important that the effect of assumed reinforcers within SWPBS programs are further investigated. Results from this study replicated and extended the literature by examining patterns of RRs and ODRs within schools implementing SWPBS programs with high fidelity. Similar to the Spaulding and colleagues (2008) study, this study investigated the average number of ODRs per day per 100 students for both

elementary and middle schools. The averages of ODRs per day per 100 students from this study, however, were substantially lower than the national SWIS averages as well as the averages found by Spaulding and colleagues, particularly for middle schools. The lower averages found in this study may be related to a number of factors. First of all, the discipline programs within the schools included in Spaulding and colleagues' study and the national SWIS (2009, 2010) averages are unknown. While many schools that implement SWPBS programs utilize SWIS to track their data, it is possible that schools that do not implement PBS also use this program. Further, the fidelity of the SWPBS programs within schools using SWIS is also unknown. The lower averages found in this study could be representative of lower ODR rates among schools implementing SWPBS with high fidelity. Additionally, since the schools in this sample had been implementing SWPBS programs for a year or longer, it is possible that maximal treatment effects had already been achieved. In other words, the ODR rates found in this study may be representative of a basal level ODR rates seen among schools whose SWPBS program reached maximal effectiveness. If this is the case, then the results from this study may be able to provide preliminary goal rates for schools with developing SWPBS programs. It is also possible, however, that the sample from this study is somehow unique from the larger, national population.

Similar to Lane et al. (2007, 2008), this study investigated the rate of reinforcement administered in SWPBS programs. Lane and colleagues (2007) found that at the high school level, the average RR per student per day ranged between 0.032 and 0.058. In other words, on average, high school students received between 0.7 and 1.3

tickets over 22 school days (approximately 1 month). These numbers are much smaller than those found by Lane and colleagues (2008), who found that at the elementary level the average RR per student per day was .63 at one school and 1.19 at another school. Stated differently, Lane and colleagues (2008) found that on average, students at one elementary school received roughly 14 tickets (13.86) per month and about 26 tickets (26.18) per month at a second elementary school. Results from the present study revealed that elementary students received, on average, about 1.6 reinforcers each month. At the middle school level, students received an average of 0.33 reinforcers each month, or about one reinforcer every 3 months. In other words, the RRs of the elementary schools included in this study were much lower than the RRs of Lane and colleagues (2008) study. Unfortunately, ODRs were not reported in Lane and colleagues' study, so it is unknown whether the increased reinforcement rate was related to reduced rates of schoolwide behavior problems. Interestingly, although the RRs in the present study were lower than those found in previous research, the ODR rates in the study were also lower than those found in previous research. This finding further supports the notion that there may be a minimum rate of reinforcement needed to produce change and that reinforcement above a certain rate is no longer beneficial in creating meaningful change. Additionally, if the present sample is representative of SWPBS programs that have reached maximal effectiveness, the lower RRs found in this study may indicate that lower rates of reinforcement can successfully maintain low rates of ODRs. If this is the case, these results suggest that fading of reinforcers over time can result in continued low-levels of ODRs.

In the present study, between group comparisons were also made between Title I and non-Title I schools. Findings revealed there were no differences in the number of reported ODRs and RRs between Title I and non-Title I schools. In other words, Title I and non-Title I schools are experiencing equal rates of discipline problems and reinforcement administered each month. Although the sample size was not large enough to run analyses between schools that did and did not meet academic proficiency, results revealed a general trend for schools meeting academic proficiency to have higher RRs and lower ODRs compared to schools that did not meet academic proficiency. These findings add to the existing body of literature, as differences between Title I and non-Title I schools and academically proficient versus nonproficient have not been previously investigated.

Additionally, between group comparisons were made between schools with high versus low monthly ODR rates. Interestingly, schools with fewer overall ODRs did not report significantly higher rates of reinforcement administered each month compared to schools with more overall ODRs. However, schools with lower overall ODR rates reported a higher ratio of positive to negatives (RRs to ODRs) each month compared to schools with less successful SWPBS programs. These results suggest that the ratio of positives to negatives rather than RRs alone may be important in order to implement a successful SWPBS program. In other words, results from this sample suggest that the higher the ratio, the better ODR results. What is currently unknown is the maximum level of RR needed to get an acceptable ODR and the degree that the level of RRs can be faded, be varied, or should be consistently maintained over time.

Results from this study also revealed that RRs only predicted a small amount of the variance in ODRs. This finding was unexpected and is not consistent with previous findings regarding the relationship between reinforcement and problematic behavior (e.g., Carter, 2010; Fisher et al., 1992). This result could be related to a number of factors. It is possible that RRs are not actually functioning as reinforcers for many students and therefore have little impact on ODRs. If students do not perceive the schoolwide rewards as reinforcing or if they do not believe they will actually earn the reward for engaging in expected behaviors, then students will not be motivated to change their behavior to attempt to earn the rewards. Alternatively, it is also possible that the students who are receiving the majority of ODRs each month are not accessing the reinforcers. This explanation is consistent with previous findings of Lane and colleagues (2008), who found that different groups of students did not access reinforcement at equal rates. Finally, given that the SWPBS program were in place for more than a year in some of the schools in this sample, a large percentage of students may have never had an ODR and thus would not influence a decrease in ODR. If this were the case, then a smaller relationship on ODRs is to be expected over time.

Findings from this study also suggest schools do not seem to be using ODR data to guide decision making regarding the reinforcement component of their SWPBS programs. This finding is similar to the findings of Spaulding and colleagues (2008), who found schools reported a number of punishing consequences in response to ODRs but did not mention how, if at all, ODRs advised the implementation of the reinforcement systems within their programs.

In the present study, if schools were using ODR and RR data to guide their SWPBS program, the school should demonstrate an increase in RRs the month following an increase in ODRs. However, this is only happening 50% of the time. It is possible schools do not know how to use the data they are collecting to guide program decisions. This suggests that schools may need greater assistance from coaches and/or leadership teams to understand and utilize schoolwide data. Future research investigating reasons schools are not using monthly data to guide program decisions should be conducted. Exploration into this area will provide coaches and leadership/statewide teams with essential information they can subsequently utilize to help schools become more successful and efficient in their implementation of SWPBS programs.

Limitations and Future Directions

There are a number of limitations to this study that need to be addressed. First, the relatively small sample size of this study limited the analyses that could be conducted and also limits the generalization of the results. Because of the limited number of middle schools and schools not meeting academic proficiency, differences between elementary and middle schools and differences between academically proficient versus nonproficient schools could not be investigated. Thus, it is unknown whether the results of this study can be generalized to middle schools and schools not meeting academic proficiency. Further, the majority of the sample were Caucasian (73%), non-ELL (86%), and did not have a disability (88%); thus, it is unknown whether these results apply to schools with more diverse student populations or to schools outside of the state where this study was

conducted. Investigation of RRs and ODRs using data from other states and from schools with diverse populations needs to be conducted to determine whether the results from this study generalize to schools nationwide. Similarly, future studies should utilize a larger sample in order to make comparisons between different variables (e.g., elementary versus middle school, etc.).

Second, the statewide dataset used in this study contained more missing data and greater variability than anticipated. Thus, certain analyses were impossible to conduct and valid between school comparisons were difficult to make. First, the variability of ODR, RR, and P-N ratio data reported by schools was extremely high. This variability can be understood in a number of ways. The extreme variability in ODRs and RRs suggest there are between school differences in how educators are administering and/or recording schoolwide data. This may suggest that schools engage in different data collection practices. For example, some schools may require individual teachers to collect classwide ODR and RR data and report this to an administrator who subsequently calculates schoolwide data each month. Alternatively, some schools may require all ODR and RR paperwork to be submitted to the office each day and rely on one administrator to total and report this data at the end of each month. It is possible the variability in RRs may be related to differences in types of RR recorded (e.g., tickets turned in, winners of monthly drawings, etc.). The variation in RRs across schools may also reflect inconsistencies in teacher distribution of schoolwide reinforcers or may reflect inconsistencies in student submission of reinforcers to be counted. Variance in ODR rates across schools may be explained by variation in teacher tolerance each month,

fluctuations in more intensive reinforcement systems taking place at the tier 2 level, or recording problems similar to those described above. Such variability in the data makes it difficult to analyze differences across schools. Further, many schools continue to record data inconsistently, indicated by the exclusion of 51 of the 85 schools (60%) in the original dataset. Finally, the validity of the included data is unknown.

A third limitation of this study was that the number of children who received ODRs and reinforcement each month was not reported. It is possible that a small number of students exhibiting problem behavior could have accounted for a high number of ODRs each month. Without knowing the number of students who received ODRs each month, it is difficult to make assumptions about SWPBS programs, as it is expected that approximately 20% of students will require additional support at the tier 2 and tier 3 level. Further, without knowing which students received reinforcement, it is impossible to discern whether students at the tier 2 and tier 3 level access equal rates of schoolwide reinforcement as those at the tier 1 level. In order to better evaluate their SWPBS programs, schools should also collect data on the number of different students who received ODRs and reinforcement each month. In response to this problem, the Statewide Training Initiative Program modified the form being used during the 2010-2011 school year to include a place to indicate the number of students who received ODRs each month. Future research should investigate whether students who receive multiple ODRs each month access schoolwide reinforcement at the same rate as those who did not receive ODRs in a given month.

A fourth limitation was that schools that reported zero ODRs in a given month

were given an ODR value of one in order to calculate the P-N ratio for these months. As a result, these ratios may be a slight underestimation of actual the P-N ratio for these months. Additionally, as previously mentioned, the validity of the included schoolwide data is unknown and the variability of the dataset was extreme, making comparisons across schools difficult. Future studies should investigate the validity of data being reported by schools implementing PBS programs.

Finally, because of the variability in the dataset, preliminary recommendations regarding the ideal rate of reinforcement and ODRs per day per 100 students could not be made. Such standards and recommendations will help schools better evaluate the success of their SWPBS program; thus, research into this area should be continued.

Practical Implications

Much of the evidence for PBS has been primarily derived from single-subject designs (Kutash, Duchnowski, & Lynn, 2006). At the individual school level, PBS has been shown to be effective in reducing behavior problems as measured by ODRs, suspensions, and expulsions and to increase school climate and academic functioning (Horner et al., 2005). This study adds to the existing body of literature by demonstrating that while within school comparisons of PBS programs is positive, between school comparisons are difficult because of the variability in data between schools. One explanation for the variability between schools is that schools are using different methods to collect data and are therefore reporting violations differently. This explanation is consistent with previous findings that the validity of ODR data is questionable without

adequate training (Irvin et al., 2004). Thus, the results of this study support that additional training in how to systematically record ODRs may be needed.

Monitoring both RR and ODR is feasible and potentially can provide useful data based decision-making. Although results suggested that RR did not vary based on ODR data, results still indicated a weak reduction in ODR with RR when evaluating change in ODR for the entire school population. Schools may need additional training in how to collect accurate ODR and RR data so valid comparisons can be made across schools as well as over time within schools. Further, as previously mentioned, results of this study also suggest that schools may need additional training in how to analyze and use RR data to guide program decisions. Additionally, in order to better evaluate the implementation and success of SWPBS programs, schools should report the number of ODRs and reinforcers given each month, as well as the number of different students who received each.

Finally, schools may be able to increase the effectiveness of SWPBS programs for different groups of students by analyzing data to determine whether all students are accessing the SWPBS reinforcers. Lane and colleagues (2007, 2008) has provided preliminary evidence that students with internalizing behavior problems respond more positively to reinforcement than students with externalizing problems, comorbid problems, and high incidence disabilities. This finding may also suggest that students who are non-responders at the tier I prevention level may become responders if presented with increased access to reinforcement. Thus, another way to ensure at-risk students are accessing schoolwide reinforcers may be to identify and target those who would most

likely benefit from SWPBS. Perhaps better planning may reduce the need for more intensive tier 2 and tier 3 interventions, and thus save valuable time and personnel resources.

Summary

In conclusion, this study adds to the existing body of literature by providing further information about the present status of SWPBS data collection and utilization procedures. Overall, the results from this study provide further support that reinforcers are an important outcome measure that should be considered when assessing the effectiveness of a SWPBS program. While this study was primarily exploratory in nature, a number of relevant findings emerged. First, when PBS programs with high fidelity are in place, Title-I and non-Title I schools were both able to obtain similar low levels of ODRs, at least in this sample. Second, the negative correlation between RRs and ODRs suggests that higher levels of RR are related to lower ODRs. Thus, frequent monitoring of RR data can be used for effective decision-making about needed modifications within an existing PBS program. Finally, findings of this study can serve as a guide for researchers regarding areas requiring additional exploration, including investigation into the manipulation of amounts and schedules of reinforcement to improve data based decision-making to increase the effectiveness of SWPBS programs for all types of students.

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APPENDIX

Statewide PBS Program Evaluation Database System

To record your Data Summary, complete the information below and then click the **"Submit"** button at the bottom of the form. Fields with *** are required** to have an entry.

ABC-UBI Data Summary Submission		
Team Name* Select One		**Month*** Select One
Data Source	**#**	**Notes**
ODR/Major	*	
Minor	*	
Tardy	*	
Absence	*	
In-School Suspension	*	
Out-of-School Suspension	*	
Individual School Wide Positive	*	
Group School Wide Positive	*	
Adult School Wide Positive	*	
Additional Behavior Data		

Data entry instructions:
Leave fields BLANK if no data was collected.
Enter 0 (the numeral zero) if data is being collected and the incident number equals zero.
Data in both the # (number) and % (percentage) fields must entered as whole numbers (percentages rounded, no decimals)

Data Source	#	Notes
Other Class Time Out (think time, etc.)		
Behavior Education Program (BEP)		
Leveled Recess/Structured Recess		
Lunch Detention		
Links (Mental Health) Referrals		
Other *(type in descriptor below)*		

Supplemental/Intensive Academic Interventions

Data entry instructions:
Leave fields BLANK if no data was collected.
Enter 0 (the numeral zero) if data is being collected and the number or percentage equals zero.
Data in both the # (number) and % (percentage) fields must entered as whole numbers (percentages rounded, no decimals)

Grade	Math			Reading		
	#	%	Notes	#	%	Notes
K						
1						
2						
3						
4						
5						
6						
7						
8						
9						

Other Miscellaneous Notes

To erase all the information on this form, click "Reset".
*To submit, click the "Submit" button **ONCE and WAIT** for the information to be processed. Once the data has been submitted successfully you will be forwarded to a new web page where you can view and print the submitted data.*