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Program Evaluation of Universal Positive Behavioral Interventions and Supports in Kentucky

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PROGRAM EVALUATION OF UNIVERSAL POSITIVE BEHAVIORAL
INTERVENTIONS AND SUPPORTS IN KENTUCKY

A Dissertation
Presented to
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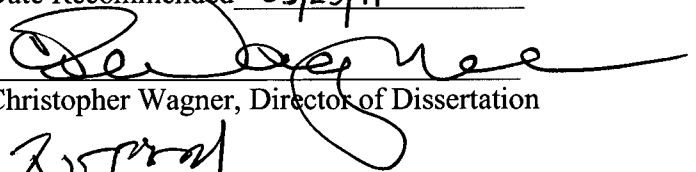
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Kelly S. Davis
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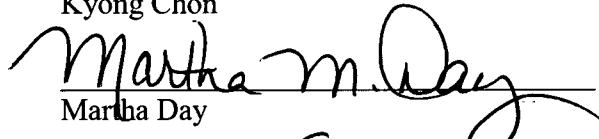
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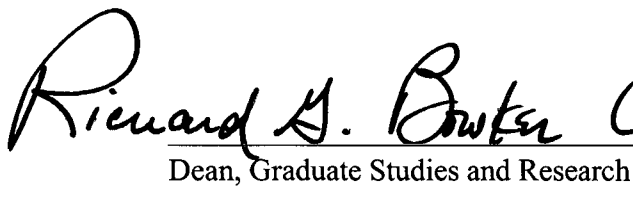
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To my husband, Todd, and daughters, Caroline and Allison, for their love and unwavering support over the last few years. I would not have finished without you. You three are amazing. You inspire me and challenge me, and I am honored to be your wife and mother. Thanks for all you have done for me.

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PROGRAM EVALUATION OF UNIVERSAL POSITIVE BEHAVIORAL

INTERVENTIONS AND SUPPORTS IN KENTUCKY

Kelly S. Davis   May 2011   191 Pages

Directed by: Christopher Wagner, Kyong Chon, Martha Day, and Mary Evans

Educational Leadership Doctoral Program   Western Kentucky University

The current study was undertaken to examine the impact of Positive Behavioral Interventions and Supports (PBIS) implementation on schools in Kentucky. Research questions evaluated (a) whether schools in Kentucky implemented PBIS with fidelity and (b) how PBIS implementation impacted student outcomes. Results of the study indicated that elementary, middle, and high schools implemented PBIS with fidelity. Associations were noted between PBIS implementation and decreases in office discipline referrals, out-of-school suspensions, dropout rate, and student retention rate. Results suggested that the PBIS model of training and technical assistance used in Kentucky demonstrates a reliable model for schools to follow to implement sustainable behavior change that likely will lead to improved student outcomes. Future research of PBIS in Kentucky would be beneficial. Analysis of statewide versus regional data would provide a more comprehensive picture of the strengths and limitations of Kentucky's PBIS model. The current study results suggest a need to examine both quantitative and qualitative data related to PBIS implementation. Evaluation of this nature would provide greater insight into barriers and successes of PBIS implementation which would promote more effective training and technical assistance.

Chapter 1: Introduction

In the mid 1990s, the Kentucky Department of Education developed the Behavior Task Force, consisting of educational administrators, teachers, support staff from state and local levels, personnel from collaborating agencies, and parent advocacy organizations. The task force determined that three areas should be addressed: (a) establish a cadre of behavior consultants to provide expert support for students with challenging behavior; (b) develop a web page focused on providing information and support; and (c) develop model programs in schools to address effective behavior management for all students in a schoolwide manner (Waford, 2010). The initial concept of developing model programs to promote schoolwide behavior practices has evolved from a ten school pilot program in 1997 to the statewide implementation of Positive Behavioral Interventions and Supports (PBIS) since 2004, with training and technical assistance provided by the Kentucky Center for Instructional Discipline (KYCID).

According to Waford (2010), ten schools initially participated in the Model Schools Project. These schools submitted an application and were selected to participate in a three-year grant process. Instructional materials from Sprick, Garrison, and Howard (2002) were used to guide the process. Each school had a behavior coach assigned to provide additional guidance and support. The behavior coaches became the primary trainers for the subsequent discipline project called Kentucky Instructional Discipline in Schools (KIDS). The KIDS project was an expansion of the initial effort to 50 schools and took place from 2000-2003. Both projects had behavior coaches and were led by trainers with periodic professional development opportunities over extended periods of

time. The goal was to provide support at three levels of intervention - primary, secondary, and tertiary.

At the schoolwide level, schools in the KIDS Project showed significant improvements in their approach to student behavior. According to Waford (2010), significant decreases in office referrals, suspension rates, and expulsion rates were common among schools, and teachers reported higher levels of confidence in addressing student behavior. Survey data collected from schools and the Kentucky Department of Education during the KIDS Project revealed concerns regarding collection and use of effective and meaningful data, sustainability of the process over time, cost of the methods of training, and rate of expansion into more schools (Waford). As a result, a third project was initiated to try a different approach considering some of the experiences of the previous efforts.

The Instructional Discipline Pilot Project (IDPP) began in 2003 with 31 schools. The main focus was not only to use information and materials from Sprick, Garrison, and Howard (1998) and Sprick et al. (2002) but to also incorporate more research and strategies from the National Technical Assistance Center on Positive Behavioral Interventions and Supports. Greater emphasis on data collection and analysis was a key aspect of the IDPP, as was keeping the reality of sustainability in mind, expanding beyond the primary intervention level, and increasing involvement of mental health agency partners. The IDPP was completed in 2004-05. As a result of successes identified in the IDPP, the KYCID was organized in 2004 to provide on-going training and technical assistance to schools in Kentucky implementing PBIS.

Since its inception in 2004, the KYCID has provided training in the PBIS model to over 350 schools. However, to date there has been no comprehensive evaluation of the efforts of the KYCID to establish PBIS in Kentucky schools. Statewide positive behavior supports have been evaluated in Florida (Childs, Kincaid, & George, 2010), Iowa (Mass-Galloway, Panyan, Smith, & Wessendorf, 2008), Maryland (Barrett, Bradshaw, & Lewis-Palmer, 2008), and New Hampshire (Muscott, Mann, & LeBrun, 2008), and results show enhanced student outcomes as a result of PBIS implementation. Because it is important to conduct evaluations of statewide efforts in order to ensure that states build scalable and sustainable systems of support (Horner, Sugai, & Lewis-Palmer, 2005), this study seeks to provide comprehensive information about the PBIS initiative in Kentucky. The study will provide information to stakeholders about the association between PBIS implementation and student outcome measures to allow informed decision-making about the potential use of PBIS in schools. Before evaluating the effects of PBIS in Kentucky, it is necessary to describe the need for and the elements of the model.

Positive Behavioral Interventions and Supports

Educators face numerous, and sometimes overwhelming, challenges in their efforts to teach students the skills and knowledge needed to graduate and be employable. In many schools, student misbehavior regularly interferes with teachers' time to provide instruction of core content in reading, math, science, writing, and other academic areas. In 2004, Public Agenda conducted a national survey of 725 middle and high school teachers. Ninety-seven percent of surveyed teachers indicated that schools need good discipline to excel but that student discipline problems, particularly disruptive behaviors, are so prevalent they are unable to teach at the level necessary to prepare students for

adult life. As a result, over one-third of the teachers surveyed reported that they had

considered quitting teaching due to the volume and intensity of student behavior

problems. These teacher perceptions were corroborated in the *Annual Report on School*

Safety (U.S. Department of Education and U.S. Department of Justice, 2000), which

found that disruptive behavior is much more widespread than carrying weapons and

physical fighting on school property.

   Although behavior incidents involving weapons and physical fighting have

sharply declined, disruptive behavior in the classroom has remained steady (U.S.

Department of Education and U.S. Department of Justice, 2000; Lewis & Sugai, 1999;

Safran & Oswald, 1993; Sugai & Horner, 2002). In fact, a little more than 60% of 12th

grade students and about 90% of 8th grade students polled in the annual report stated that

"their teachers interrupted class to deal with student misbehavior at least once during an

average week" (U.S. Department of Education and U.S. Department of Justice, p. 12).

Additionally, 43 out of every 1,000 students reported they were victims of non-violent

crimes while at school or going to or from school and that these incidents had a negative

impact on the school climate and culture. While schools have taken steps to prevent

violent crimes by installing metal detectors and cameras, hiring resource officers,

implementing zero tolerance policies, and suspending or expelling students for physically

aggressive or illegal behaviors, there has been limited focus on implementing schoolwide

practices to address students who are disruptive, disrespectful, or otherwise inappropriate

(Sugai & Horner, 2002). Instead, schools have historically relied on punishment as the

primary means of dealing with student misbehavior. Skiba and Peterson (2000)

recounted how school discipline procedures have generally grown more intolerant and

oriented towards punishment, despite research demonstrating the ineffectiveness of punitive approaches in behavior management.

As research continued to highlight the problems associated with an overreliance on punishment, models supporting positive discipline approaches began to be developed and applied in schools. In a shift away from punishment as the primary means to address student behavior issues, over 14,000 schools across the United States, including over 350 in Kentucky, have begun using a systems-based approach to address student discipline and school culture. This process, known as PBIS, is designed to enhance school culture and climate by changing the organizational structure of the school in order to promote prosocial student behavior and decrease reliance on punitive measures (Office of Special Education Programs [OSEP] Center on Positive Behavioral Interventions and Supports, 2005).

PBIS is a general term that refers to the application of systemic and individualized practices designed to increase appropriate student behaviors and prevent inappropriate student behaviors (Sugai & Horner, 2002). According to E. G. Carr et al. (2002), positive behavior is defined as behavior that increases the likelihood of "success and personal satisfaction" (p. 4) within school, home, and community. The PBIS movement began in the late 1980s and early 1990s as a modernized, multi-faceted method of developing effective systems to support prosocial student behavior (Colvin, Kame'enui, & Sugai, 1993; Lewis & Sugai, 1999; Walker et al., 1996).

The broad aim of PBIS is to improve student behavioral and academic outcomes by using data to make decisions about student behavior, developing practices that support positive student behavior, and developing systems that support staff behavior change

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(OSEP Center on PBIS, 2005). Gartin and Murdick (2001) summarized new language in the Individuals with Disabilities Education Act amended in 1997 which pertained to PBIS. The new language emphasized *functional behavioral assessment* and *positive behavioral interventions and supports* as methods all schools should use in designing and implementing discipline practices.

PBIS is not a curriculum, program, or intervention but rather is an approach used to improve the adoption, implementation, and sustainability of effective evidence-based practices that promote appropriate student behavior (OSEP Center on PBIS, 2005; Sugai & Horner, 2009). The theory and conceptual foundations of PBIS are rooted in applied behavior analysis (E. G. Carr et al., 2002). The link to applied behavior analysis highlights that:

> observable behavior is an important indicator of what individuals have learned and how they operate in their environment, behavior is learned and rule governed, environmental factors (antecedent and consequence events) are influential in determining whether a behavior is likely to occur, and new and alternative prosocial behaviors can be taught. (Sugai & Horner, 2009, pp. 309-310)

Schools implementing PBIS are concerned with gathering and analyzing both outcome data (e.g., office discipline referrals, in-school suspensions, out-of-school suspensions) and fidelity data via the use of multiple checklists and surveys. Research conducted on PBIS has demonstrated its effectiveness in improving school culture and climate and improving student behavior across all age levels including preschool (Stormont, Smith, & Lewis, 2007); elementary school (Horner et al., 2009; Sadler & Sugai, 2009); middle school (Metzler, Biglan, Rusby, & Sprague, 2001; Warren et al.,

2006) and high school (Bohanon et al., 2006; Flannery, Sugai, & Anderson, 2009). PBIS implementation has been demonstrated to lead to sustained changes in schools' discipline practices (Barrett et al., 2008) and to reductions in office discipline referrals (Luiselli, Putnam, Handler, & Feinberg, 2005; Mass-Galloway et al., 2008; Metzler et al.) and out-of-school suspensions (Mayer et al., 1993; Scott & Barrett, 2004).

Purpose of the Study

In order to ensure that training and technical assistance leads to desirable outcomes for schools, it was important to study the impact of PBIS implementation on schools in Kentucky. In addition to evaluating how PBIS implementation affects office discipline referral and out-of-school suspension rates, examination of the impact on student achievement and non-academic indicators such as dropout rate, graduation rate, and student retention rate was necessary as these factors all influence student success (Linney & Seidman, 1989). Of equal importance was to examine sustainability of the implementation process over time. Many studies offer evidence of immediate effects of program implementation, but some researchers have argued that the investment of time, energy, and resources to affect change is only noteworthy to the extent that newly established practices are sustained over time (Coburn, 2003). Therefore, it was important to examine whether schools in Kentucky sustain PBIS implementation over a period of time. In addition, Fixsen, Naoom, Blase, Friedman, and Wallace (2005) and Lane, Kalberg, Bruhn, Mahoney, and Driscoll (2008) have noted a lack of evidence surrounding evaluation of PBIS implementation fidelity. Because sustainability is directly impacted by fidelity of implementation, it was critical to evaluate the fidelity of PBIS implementation in schools in Kentucky.

The purpose of the study was two-fold. One purpose was to examine whether Kentucky schools that receive training in the PBIS model implement universal PBIS with fidelity over time. The second purpose was to evaluate how the implementation of PBIS impacts student outcome variables such as office discipline referrals, out-of-school suspensions, student retention rates, school dropout rates, graduation rates, and student achievement. Fidelity and outcome data were evaluated by school level (i.e., elementary, middle, high) to determine if there were differences across school levels.

Research Questions

This study was conducted with elementary and secondary schools in western Kentucky. Data from 56 schools over a three-year period were analyzed to evaluate fidelity and outcome data related to PBIS implementation. The following research questions were explored:

1. Are schools in western Kentucky implementing universal PBIS with fidelity over time and by school level?

2. How does universal PBIS implementation affect student outcome measures over time and by school level?

   a. Does PBIS implementation affect office discipline referrals?

   b. Does PBIS implementation affect out-of-school suspensions?

   c. Does PBIS implementation affect high school graduation rate?

   d. Does PBIS implementation affect the school dropout rate?

   e. Does PBIS implementation affect the student retention rate?

   f. Does PBIS implementation affect student achievement in reading?

   g. Does PBIS implementation affect student achievement in math?

Significance of the Study

To date, there has been no comprehensive evaluation of PBIS implementation in Kentucky elementary and secondary schools. This study is significant because it provides a longitudinal analysis of the impact of PBIS implementation on important outcomes such as office discipline referrals, out-of-school suspensions, dropout rates, retention rates, graduation rates, and student achievement. The study is significant because it provides information about fidelity of implementation and whether Kentucky's PBIS model is sustainable in schools. The study provides important information to elementary and secondary school personnel who may consider the implementation of PBIS in their schools. In addition, the study provides information to state-level stakeholders regarding the benefits of continuing or expanding Kentucky's statewide PBIS initiative.

Definitions of Key Terms

1. *Positive Behavioral Interventions and Supports (PBIS).* "Positive Behavioral Interventions and Supports is a systems approach for establishing the social culture and individualized behavior supports needed for a school to be a safe and effective learning environment for all students" (Sugai & Horner, 2009, p. 309).

2. *Kentucky Center for Instructional Discipline (KYCID).* The organization that provides training and support for PBIS implementation in Kentucky.

3. *Fidelity.* Adherence to the tenets of a model or program (Moncher & Prinz, 1991).

4. *Fidelity data.* Data collected and analyzed to determine if a model or program has adhered to the components of implementation.

5. *Fidelity of implementation.* Content and instructional strategies used in the way in which they were designed and intended to be used (National Center on Response to Intervention, 2010).

6. *Outcome data.* Data sources collected and analyzed to determine if behavior or academic outcomes have improved as a result of implementation of a program or model.

7. *Sustainability.* "Continued use of an intervention or program, with ongoing implementation fidelity to the core program principles, after supplemental resources used to support initial training and implementation are withdrawn" (Han & Weiss, 2005, p. 666).

8. *Applied Behavior Analysis.* "The process of applying sometimes tentative principles of behavior to the improvement of specific behaviors, and simultaneously evaluating whether or not any changes noted are indeed attributable to the process of application – and if so, to what parts of the process" (Baer, Wolf, & Risley, 1968, p. 91).

9. *Schoolwide Evaluation Tool (SET).* A research quality tool used to annually assess universal schoolwide positive behavior supports in order to measure the extent to which PBIS is being implemented (Sugai, Lewis-Palmer, Todd, & Horner, 2001).

10. *Benchmarks of Quality (BoQ).* A research quality tool, created as an alternative to the SET, and used to annually assess universal schoolwide positive behavior supports in order to measure the extent to which PBIS is being implemented (Kincaid, Childs, & George, 2005).

11. *Office discipline referral.* "An event in which (a) a student engaged in a behavior that violated a rule/social norm in the school, (b) a problem behavior was observed by a member of the school staff, and (c) the event resulted in a consequence delivered by administrative staff who produced a permanent (written) product defining the whole event" (Sugai, Sprague, Horner, & Walker, 2000, p. 96).

12. *Out-of-school suspension.* A mandatory leave from school assigned to a student as punishment for misbehavior that typically lasts between one to ten days.

13. *Graduation rate.* The percentage of students entering a high school in the ninth grade and graduating in four years. Graduation rate is computed for high schools only (Kentucky Department of Education, 2010).

14. *Dropout rate.* The percent of students that drop out of school. Dropout rate is collected for grades 7 through 12 in Kentucky. The dropout definition holds a school accountable for the entire school year and includes summer dropouts (Kentucky Department of Education, 2010).

15. *Retention rate.* The percent of students that are held back (retained) a grade level in the prior grade. Retention rate is collected for grades 4 through 12 in Kentucky (Kentucky Department of Education, 2010).

Conclusion

PBIS is growing at a rapid pace across the United States and in Kentucky, both in terms of numbers of schools implementing and quantity of research being conducted on the various elements and components of implementation. In the last few years, some PBIS organizations have undertaken statewide evaluations to determine the impact of

PBIS on important student outcomes that affect safety and school culture. Kentucky has been implementing positive behavior supports since 1997 and has had a statewide organization in place to provide training and technical assistance since 2004. Since that time, over 350 schools have received training and on-going support in PBIS implementation. This study was conducted to evaluate PBIS efforts in Kentucky to inform stakeholders about the effects on student outcome data as well as to help determine the benefits of supporting a statewide PBIS initiative. The following chapter provides an extensive review of the literature surrounding PBIS in order to provide critical information about the elements under investigation in this study.

Chapter 2: Review of the Literature

The focus of the study was to evaluate the fidelity and effectiveness of PBIS implementation in Kentucky schools. In order to accomplish the goals of the study, an extensive overview of PBIS theory and research was necessary. This chapter first provides an overview of the theoretical perspective from which PBIS was developed, namely applied behavior analysis. Eight PBIS components which have roots in applied behavior analysis were reviewed. This portion of the chapter concludes with an examination of the distinctions between PBIS and applied behavior analysis. Next, a review of the literature on PBIS is provided in order to expand understanding of the topic. Within the review, systems of implementation are first discussed, followed by defining characteristics of PBIS. After the review of the literature, an examination of PBIS research related to fidelity and outcome data variables being studied is provided. The topics include fidelity of implementation, office discipline referrals, out-of-school suspensions, graduation rate, student retention rate, student dropout rate, and student achievement.

Theoretical Perspective

Examination of the theoretical perspectives that have guided the development of PBIS is essential. The first section of the chapter focuses on the theoretical constructs of a successful model developed for the purpose of improving student behavior in schools. PBIS concepts and principles have been largely derived from the multi-faceted field of applied behavior analysis. The connection to applied behavior analysis occurred for several reasons. Early proponents of PBIS were very knowledgeable about applied behavior analysis and used this knowledge to conduct research on how to better support

people with developmental disabilities (Dunlap, 2006). The researchers were similarly skilled in using applied behavior analysis techniques to support management of student behavior in schools. In addition, other initial PBIS researchers were well versed in behavioral parent training and worked to support parents in dealing with challenging child behavior problems (Singer & Wang, 2009).

According to Singer and Wang (2009), PBIS was "originally a breakaway movement from the field of ABA based on moral revulsion at aversive treatments developed and promoted by prominent behavior analysts" (p. 18). One major difference between the two models was that PBIS advocates believed it was immoral to use aversive treatments on human subjects when positive alternatives were available (Singer, Gert, & Koegel, 1999). Aversive treatments included such punishments as use of a device that administered electric shocks and use of a helmet that delivered white noise and a spray of water in the face to people with developmental disabilities (Singer & Wang). Around the same time, advocates of PBIS were becoming part of a social movement aimed at normalizing people with developmental disabilities into home communities rather than keeping them isolated in institutions (Singer & Wang). Although this group of researchers had become disillusioned with certain aspects of applied behavior analysis, several principles served as core beliefs in designing a different way to examine behavior. These principles are reviewed in the following sections.

Applied behavior analysis.

In a seminal publication, Baer et al. (1968) outlined some of the first ideas about the application of behavior analysis to the study of behavior. The authors provided a framework for examining socially relevant behaviors in their naturally occurring settings

rather than studying human behavior in general in a "laboratory setting." Thus, they took

principles from other theories, such as reinforcement, and conducted studies in actual

settings, such as classrooms, to see how the theory as constructed through laboratory

experiments would translate into actual practice. With the creation of the *Journal of*

Applied Behavior Analysis, Baer et al. laid the foundation for the analysis of effective

behavior techniques as well as generalization to multiple settings. Their journal became

influential in the fields of psychology and education with an explosion of research

articles expounding innovative ideas to everyday behavior problems (Dunlap, 2006).

Since that time, the field of applied behavior analysis has rapidly expanded, specifically

in regard to behavioral practices and strategies in schools that support appropriate student

behavior.

Applied behavior analysis was established in the 1960s and was defined as "the

process of applying sometimes tentative principles of behavior to the improvement of

specific behaviors, and simultaneously evaluating whether or not any changes noted are

indeed attributable to the process of application – and if so, to what parts of the process"

(Baer et al., 1968, p. 91). According to E. G. Carr et al. (2002), the field of PBIS owes

much of its methodological foundation to applied behavior analysis (ABA). As Dunlap

(2006) states:

> The debt that PBS owes to ABA is most obvious at the procedural level of direct
>
> intervention practices, especially at the level of the individual. These practices
>
> are derived largely from principles of instrumental learning, such as positive
>
> reinforcement and stimulus control, and extend to the considerable assessment
>
> and intervention technology that developed over the early years of ABA. This

technology includes refined strategies of instruction, antecedent manipulations,

contingency management, and functional analysis and functional assessment. In

addition, intervention research and evaluation in PBS typically have adopted the

methods of direct observation and time series designs, which are emblematic of

ABA. (p. 58)

J. E. Carr and Sidener (2002) conducted an extensive review of the literature to

examine PBIS components that have derived from applied behavior analysis research and

found eight characteristics that were typically described. These include (a) a focus on

building effective environments; (b) use of multi-faceted interventions; (c) use of an

ecological, multi-tiered model; (d) adherence to a systems perspective to affect long-term

change; (e) ensuring meaningful outcomes for students; (f) use of positive intervention

strategies; (g) a focus on person-centered planning; and (h) use of functional assessment

to support effective behavior planning for individual students. Each of these components

will be reviewed in the following sections.

Building effective environments with multi-faceted interventions.

Within the context of PBIS implementation, a major goal is to design effective

environments that promote appropriate behavior (Sugai & Horner, 2002). The focus of

improving student behavior is to change the environment rather than change the person.

Because PBIS is a broad set of systemic and individualized strategies for achieving

important social and learning outcomes for students, it is considered to be a multi-faceted

intervention rather than a single procedure (E. G. Carr et al., 2002), and it is

conceptualized as having all the necessary elements required to promote meaningful

change in the school environment (J. E. Carr & Sidener, 2002).   Work by Bambara and

Knoster (as cited in E. G. Carr et al., 2002) confirmed the belief that behavior challenges (individual student or school-based) are dependent on multiple variables and require a multi-faceted set of strategies.

Ecological, multi-tiered model.

The need for multi-tiered levels of behavior intervention arose, in part, from increased attention regarding school violence after publication of a landmark national study of school violence, *Violent Schools-Safe Schools* (National Institute of Education, 1978). The study, mandated by Congress, was conducted by surveying over 4,000 elementary and secondary schools, completing site visits at over 600 schools, and performing case studies at 10 schools. Study results indicated that the annual cost of school crime was approximately $200 million. While security devices and security personnel were found to be useful in reducing school crime, the single most salient difference between safe schools and violent schools was the use of a fair and consistent discipline system by a strong, dedicated administrator. Subsequent studies explored the components of fair and consistent discipline systems and the use of multiple layers of intervention to address student behavior.

Morrison and Furlong (1994) advocated a need to reframe the issue of school violence. While many studies had previously addressed individual student characteristics leading to aggression and violence, Morrison and Furlong posited that, in addition to meeting the needs of individual students, the conceptualization of school violence must also address creating safe environments. The authors cautioned against addressing school violence as individual events in isolation from addressing school safety as a whole, stating that "there is a danger in taking a microscopic view of school violence and

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focusing on the events of violence rather than the complexities of the environments that influence and support these events, in particular the school" (Morrison & Furlong, p. 241). Costs of unsafe schools were found to include a poor learning environment for all students, reduced quality of life, potential modeling of delinquent or inappropriate behavior to other students, and the emotional stress of being in a chaotic and unpredictable environment on a daily basis.

Morrison and Furlong (1994) suggested that use of a multi-tiered system to build a positive school environment would counteract violent behavior. Their model contained four interrelated dimensions that contribute to safe school environments: (a) student and staff characteristics, (b) school physical environment, (c) school social environment, and (d) culture of the school. Their early work in conceptualizing a multi-pronged approach to addressing student behavior contributed to the multi-tiered interventions used in PBIS implementation.

The comprehensive, multi-tiered approach used in PBIS was outlined by Walker et al. (1996). The authors provided a thorough framework for preventing antisocial behavior in schools. They described a three-tiered model emphasizing behavior screening for all students, coordinated, multi-tiered prevention and intervention efforts, decreasing overreliance on suspension and expulsion as methods of dealing with student misbehavior, and use of a continuum of alternative school placements to address a continuum of student needs. According to Sugai (2007), the original multi-tiered logic model was developed in the 1950s as a response paradigm for the prevention of chronic illness. By the 1980s and 1990s, researchers were applying the levels of prevention to other disciplines such as public health and mental health. In the mid 1990s to early

2000s, use of the prevention logic model was being commonly used to depict the levels

of prevention and intervention related to PBIS. Walker et al. represented the three-tiered

model as a triangle (see Figure 1).
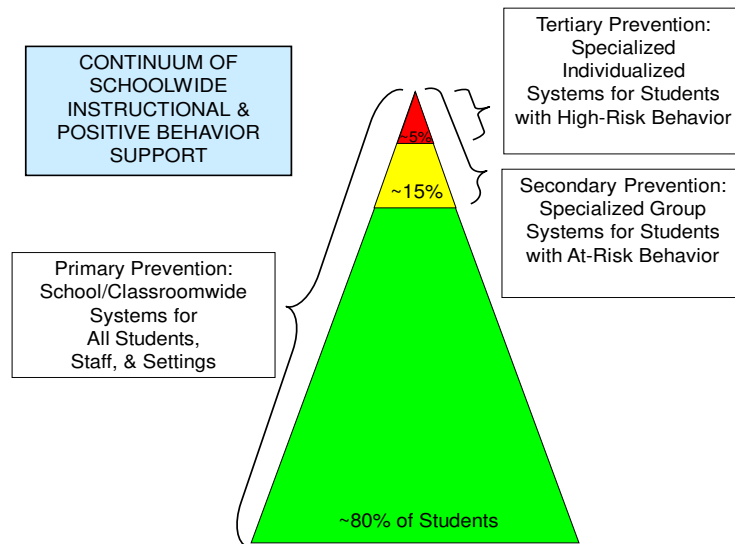
Figure 1. Three-tiered prevention model of PBIS.

Walker et al. (1996) and Sugai and Horner (2002) explained the need for a fully

integrated approach that provides behavior support at the universal level for typical

students who are not at-risk for behavior problems, the secondary level for students at-

risk to develop antisocial behavior patterns, and the tertiary level for students who show

evidence of life course, persistent antisocial behavior patterns. The three-tiered model

provides a continuum of supports for all students within a particular school (Sugai &

Horner, 2002).

Universal tier.

According to Sugai and Horner (2002), the universal tier is designed to provide

core teaching about important behaviors at a schoolwide level. As such, all students

receive instruction on schoolwide behaviors and procedures. Strategies at this tier are

considered proactive, with the major goal being to prevent problem behaviors before they occur. Teaching strategies are designed around the characteristics of the global school culture and are intended to positively influence the vast majority of students (Walker et al., 1996). If universal interventions are implemented with fidelity, a smaller number of students will be identified who have not responded to the strategies, and further interventions can be provided to them (Gresham, 2005). Six major features typify implementation at the universal level (Colvin et al., 1993; Lewis & Sugai, 1999):

1. The vast majority of staff agrees to implement PBIS.

2. The school staff, aided by students and community members, develops a set of three to five schoolwide expectations that embody support for critical behavior and academic outcomes. An example of a school's expectations is: Be Respectful, Be Responsible, Be a Team Player, Be Willing to Learn.

3. The schoolwide expectations are taught directly to students and are reviewed on a regular basis. Behavior is taught in context in order to enhance learning. For example, students go to the cafeteria while learning how to demonstrate schoolwide expectations in the cafeteria. Schools establish a schedule for initial teaching and re-teaching.

4. A schoolwide system of reinforcement and recognition is developed and implemented with consistency. Students receive acknowledgement (verbal, non-verbal, and tangible) for demonstrating key behavior expectations. They receive regular feedback about their performance in following the expectations.

5. A continuum of consequences is established to address rule violations and minor misbehavior. Students are taught what types of behaviors are considered to be rule violations and what types of consequences will be used to address misbehavior. Staff members must differentiate between minor and major violations in order to increase their consistency of response.

6. A data-based decision-making system is developed to collect pertinent behavior data, analyze the data for patterns, and use the data to strengthen and/or sustain PBIS implementation.

At the universal tier, behavior is taught, practiced, and monitored across all school settings. As a result, students are aware of the expectations during every aspect of their school day. Regular teaching and review provides a foundation for supporting appropriate behavior for the majority of students and preventing the emergence of behavior problems in at-risk students (Sugai & Horner, 2009). However, even with primary intervention in place, approximately 20% of students will need further support beyond that received at the universal level (Turnbull et al., 2002).

Secondary tier.

Secondary tier interventions are considered when data-based decision-making rules indicate that a student has not responded to the universal tier of intervention (Gresham, 2005). The student receives supplemental behavioral supports plus the continuation of universal supports in order to provide additional opportunities for behavioral success. Secondary tier supports are designed to address about 15% to 30% of the student population (Gottfredson, Gottfredson, & Skroban, 1996). Research-based strategies are used as secondary tier interventions and are designed to be more intensive

than universal interventions in terms of time, resources, and effort (Sugai & Horner, 2009).

Secondary tier interventions are an integrated component in the schoolwide PBIS process. Typically, five common implementation features are evident (Sugai & Horner, 2009). First, a specialized team guides the intervention process. The team ideally includes professionals with expertise in applying behavior theory into practice such as school psychologists, guidance counselors, or special education teachers. In addition, regular education teachers with good behavior management skills are often team members. The team uses data to identify students needing support and to determine if students are benefitting from interventions. Decision rules are created for each intervention to determine if students are successful or unsuccessful.

The second implementation feature is establishing a mechanism for screening and identifying students who have not responded to universal tier interventions. Third, interventions used at the secondary tier are directly linked to the universal schoolwide expectations so that more specific focus is provided to students regarding these essential behaviors (Sugai & Horner, 2009). A continuum of interventions is usually incorporated into the PBIS process in order to provide a range of less intensive to more intensive interventions. The fourth feature is developing a method of regular communication with students, staff, parents, and administration. The main goal of regular communication is to increase opportunities for the student to receive feedback about his behavior. The last typical implementation feature is use of a variety of positive strategies to reinforce desired student behavior (Sugai & Horner, 2009).

At this level students receive group or individualized interventions that support their specific behavior needs. A key feature of the secondary tier is that students are able to gain access to interventions quickly, typically within one week of identification (Hawken, 2009). Interventions at the secondary level focus on re-teaching needed expectations in a more systematic way. The goal at this tier is to reduce problem behavior and increase appropriate behavior (Turnbull et al., 2002).

Group interventions may include Check and Connect, Behavior Education Program, social/academic instructional groups, and mentoring. If group interventions are not successful, individual interventions may include the provision of group interventions with individualized features, an individualized behavior plan, or an individualized program such as First Step to Success (Hawken, 2009).

The most effective way to make decisions regarding a student's movement from the universal tier to the secondary tier is through team-based decisions (Scott, 2003). One aspect of the decision-making process is to track discipline data such as office discipline referrals. Office discipline referrals are analyzed in regards to the number of referrals, the specific behavior concerns, in what setting the behavior happened, when the behavior happened, and why the behavior happened. This type of information leads to an analysis of a specific pattern of behavior and thus to more effective interventions. A systematic method for flagging students simplifies the ability to identify students at risk (Crone, Horner, & Hawken, 2004).

In addition to reviewing office discipline referrals and using flagging criteria, teacher referrals are also reviewed by the problem-solving team (Scott, 2003). The referring teacher provides information about strategies used in the classroom and the

context in which the behavior is occurring so that appropriate interventions can be determined. This helps determine whether the problematic behavior can be handled within the classroom. Sometimes, additional interventions may be successful in reducing problem behavior, making movement to the secondary tier unnecessary. That is, the behavior may be problematic in the classroom but can be managed with additional strategies used by the classroom teacher. Team-based decision-making allows the team to gather relevant qualitative and quantitative data so effective behavioral interventions can be developed, either at the universal or secondary level (Scott, 2003).

Tertiary tier.

The most complex level of intervention is the tertiary level which is needed for approximately 5% of a school's population (OSEP Center on PBIS, 2005). This level of intervention is for students who display the most intense behavior problems and who require individual behavior supports and/or wraparound supports in order to modify undesirable behavior. If effective interventions are not provided, students with significant behavioral issues are more likely to demonstrate school failure or drop out of school (Rylance, 1997). In fact, Rylance (1997) found that nearly half of a sample of 664 high school students with severe emotional behavior problems dropped out of school.

Anderson and Scott (2009) provide a clear and concise description of the necessary elements of supporting students with behavioral challenges:

> The goals of intensive positive behavior support are to (a) provide support for students exhibiting behavior problems, (b) organize intervention development and implementation, (c) provide a system for useful yet efficient ongoing data collection to guide decision-making within schools, and (d) ensure school teams

have the resources and skills needed to implement intensive positive behavior

supports with fidelity and in a manner that can be sustained over time. (p.708)

Systems perspective.

There are numerous evidence-based practices that have been found to impact

behavior problems. However, the accurate and sustained use of effective practices is

often hindered by overuse of reactive consequences, competing educational initiatives,

and lack of long-term planning to sustain short-term effects (Sugai & Horner, 2006;

Walker et al., 1996). PBIS proponents espouse the continuous analysis and use of data,

systems, and practices in order to achieve outcomes of enhanced social competence and

academic achievement. This model is depicted in Figure 2.
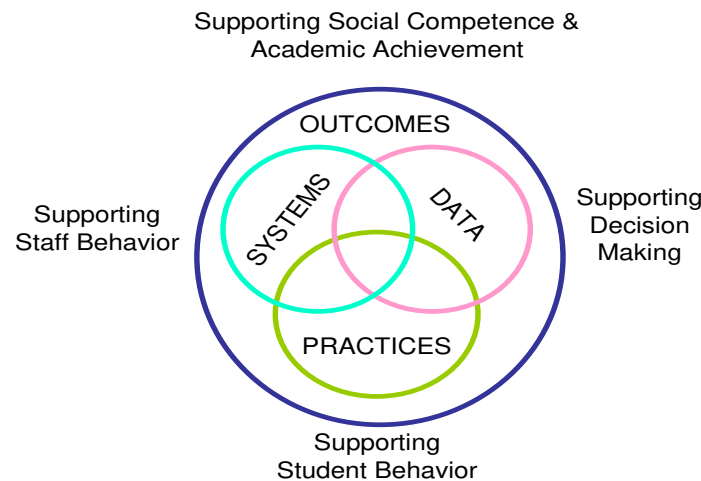
Figure 2. Interaction of the four main elements of PBIS.

The four elements (i.e., data, systems, practices, and outcomes) "interact with and

guide each other" (Sugai & Horner, 2006, p. 249). The emphasis on systems issues

separates the PBIS model from other behavioral interventions used in schools because it

provides specific focus to educators on components that will increase the likelihood of

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creating sustainable change (Sugai & Horner, 2002). Hallmarks of a systems perspective include the formal establishment of system supports in areas such as funding, personnel, political support, training, and coaching to ensure sustainable implementation of PBIS practices (J. E. Carr & Sidener, 2002; Sugai & Horner, 2002, 2006). E. G. Carr et al. (2002) identified focusing on correcting problem contexts rather than correcting problem behavior as a defining feature of PBIS. No matter how effective interventions have been demonstrated to be, they will likely fail in a disorganized and chaotic environment.

Mayer and Butterworth (1979) conducted one of the first successful studies of the use of systems-wide intervention to address violent student behavior. Using a prevention focus, they first identified practices that increased the likelihood of violent behavior. They then worked to change those practices by teaching adults in the school alternative, research-based methods of addressing student behavior, both in the classroom and schoolwide. Intervention strategies were employed that (a) provided differentiation of instruction based on student level of functioning, (b) increased positive interactions between teachers and students, (c) reduced the use of punishment, (d) enhanced teachers' skills in behavior management techniques, and (e) provided training in behavioral consultation to school psychologists and counselors. Core teams from each school in the study received training, and teams met regularly throughout the course of the study to create and refine teaching procedures and discuss data and progress. Results of the study indicated a reduction in the dollar costs of vandalism, a decrease in the number of inappropriate student behaviors, and a sustained increase in the number of positive interactions between teachers and students. The results of this study paved the way for further use of a systems-wide approach to address student behavior issues.

Improved social outcomes for students.

Research suggests that behavior interventions implemented schoolwide are related to improved social outcomes for students (Nelson, Colvin, & Smith, 1996; Nelson, Martella, & Galand, 1998; Nelson, Martella, & Marchand-Martella, 2002). In addition to finding reductions in office discipline referrals after implementation of schoolwide positive discipline programs, improvements were seen in specific social outcomes. For example, Nelson, Martella et al., (2002) reported that after implementation of schoolwide PBIS procedures and routines, the social competence of at-risk students improved, whereas the control students' social competence remained fairly stable. This result suggests that a schoolwide approach aimed at decreasing problem behaviors of students will also translate into a higher level of social competence. Likewise, Nelson et al. (1998) found that a schoolwide, systematic, specific response to disruptive behavior played a significant role in the overall reduction in office discipline referrals in an elementary school. In another study, researchers demonstrated a clear improvement in social interactions of students after implementation of PBIS procedures in an urban elementary school (Nelson et al., 1996).

Positive intervention strategies.

The use of reinforcement to shape behavior was first identified and studied by behavioral psychologist, B. F. Skinner. Core PBIS principles have developed based on the study of the use of positive and negative reinforcement to reduce inappropriate behavior and increase appropriate behavior. The principles of reinforcement were promoted by B. F. Skinner (1953, 1957) as part of his theory of human behavior. Skinner's theoretical development of radical behaviorism prompted a shift in thinking in

the field of psychology away from classical conditioning to considering the modification of voluntary behavior, formally called operant behavior. Skinner (1953) believed people choose to behave in certain ways based on interests, such as riding a bike, jogging, reading, or writing a book, and that classical conditioning failed to account for these types of behaviors. His observations led him to propose a theory about how these, and similar behaviors, called operants, occur. In addition to developing a new theory of behavior, Skinner (1953, 1957) was the first to coin the terms *functional relationship* and *functional analysis*. A functional relationship is defined as the connection between behavior and its cause, and functional analysis is the process of determining the cause of behavior. What Skinner described as *radical behaviorism* is known today as behaviorism, behavior learning theory, and/or operant conditioning.

Skinner's initial research and findings provided the impetus for a large body of research on reinforcement during the 1960s and 1970s. Even as early as the late 1960s, portions of Skinner's theory were being used more widely than any other approach to address behavior and learning difficulties (Baer et al., 1968). In fact, many of the principles established by Skinner are frequently used in schools and businesses today, such as modeling, shaping, and reinforcement. Understanding the uses and misuses of specific components of behaviorism, particularly reinforcement and punishment, are integral to the successful implementation of PBIS.

Reinforcement.

Reinforcement of desired student behavior is one key element of the PBIS process because it (a) increases the likelihood that desired behaviors will be repeated, (b) focuses greater attention on appropriate behaviors than on inappropriate behaviors, (c)

encourages a positive school climate, and (d) reduces the need to use punitive disciplinary measures (Kincaid, Childs, Blase, & Wallace, 2007). Skinner (1953) taught that positive reinforcement occurs when something needed or wanted by the learner is provided immediately following a desired behavior, and that negative reinforcement occurs when an undesirable behavioral consequence is withheld, with the effect of strengthening the likelihood of the behavior being repeated. Skinner (1963) did not specify causal origins of reinforcers but rather argued that reinforcers are defined by a change in response strength. He also stated that something that is a reinforcer to one person may not be to another. Accordingly, activities, foods, or items which are generally considered pleasant or enjoyable may not necessarily be reinforcing; they can only be considered reinforcing if the behavior that immediately precedes the potential reinforcer increases in similar future situations.

Skinner's early work in the area of reinforcement prompted an explosion of research in the 1960s and 1970s across many different organizations, including businesses and schools. Several early studies focused on the use of praise in schools to provide positive feedback and encourage the occurrence of target behaviors in students. When praise is delivered accurately and effectively, the target behavior is likely to be strengthened and occur again at a future time. Beginning with empirical studies by Zimmerman and Zimmerman (1962), Becker, Madsen, Arnold, and Thomas (1967), and Madsen, Becker, and Thomas (1968), the use of teacher praise has been associated with increases in children's correct responses, level of task engagement, and frequency of appropriate behavior. Mayer, Butterworth, Nafpaktitis, and Sulzer-Azaroff (1983) reported that when teachers used behavioral strategies designed to promote a positive

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school environment, rates of praise significantly increased and rates of off-task student behavior significantly decreased. Kazdin (1974) reported that assessing teacher behavior in the delivery of praise or other reinforcement strategies is essential. His research indicated benefits of teacher observation to determine (a) which teachers need support in correct delivery of reinforcement, (b) what teacher behaviors need support through training, and (c) if training has the desired effect on teacher behavior.

A functional analysis of verbal praise by Brophy (1981) yielded a comprehensive list of guidelines for effective praise in schools. For verbal praise to be effective, it must be contingent, or related, to the behavior being praised. Praise must be specific and particular to the accomplishment of the student and must be credible, providing information to the student about his competence or the value of his accomplishments. Effective praise rewards the attainment of specific performance criteria (which can include effort). Praise should orient students towards a greater appreciation of their own task-related behavior and thinking about problem-solving. Effective praise uses a student's past accomplishments as context for describing present accomplishments. For praise to be effective, it must be given when the student exhibits noteworthy effort or success at a difficult task. Tasks that are difficult for one student will not be difficult for another; as long as the accomplished task was difficult for the student receiving the praise, it will be meaningful. Lastly, praise attributed to effort and ability will more likely be repeated in the future.

In contrast, Brophy (1981) found that ineffective praise is delivered in a random or haphazard fashion and is usually restricted to global positive reactions that provide the student with no specific information (e.g., "Good job!"). Ineffective praise rewards mere

participation rather than focusing on performance processes or outcomes. Ineffective

praise orients students toward comparing themselves to others and uses the

accomplishments of others as the context for describing the student's accomplishments.

In addition, Brophy found that ineffective praise fosters the attitude that task effort is

spent for external reasons such as pleasing the teacher. Finally, when praise is delivered

ineffectively, it can focus the student's attention on the teacher as an external authority

figure who is being manipulative.

Reinforcement of instructional behaviors has also been evaluated. A meta-

analysis of 26 studies conducted between 1984 and 1995 on instructional reinforcement

offered insight into research related to non-instructional reinforcement (Cotton, 1999).

One finding from her meta-analysis was that when academic achievement is reinforced,

both achievement and behavior (i.e., on-task, non-disruptive behavior) improve.

However, although reinforcement of appropriate behavior improves behavior, there is no

impact on academic achievement.

The use of reinforcement strategies has seen its share of detractors. Several early

studies reported that when reinforcement strategies were introduced to teachers by

consultants such as school psychologists, teachers did not always follow through with the

reinforcement system suggested by the consultant (Kuypers, Becker, & O'Leary, 1968).

Hall (1971) reported that teachers tended to discontinue practices found to improve

student behavior when the experimental study ended. Likewise, it was found in another

study that teachers reverted back to usual practices over time rather than maintain

systematic procedures, regardless of their effectiveness in improving student behavior

(Kazdin, 1974).

Questions surrounding the effectiveness of reinforcement continued into the 1980s. For example, Stipek (1988) argued that (a) only observable behaviors can be rewarded and (b) teachers often pay attention to undesired behavior rather than ignore or punish it. Behavior modification stresses the importance of reinforcing only desired behavior, yet providing attention to undesirable behavior serves to reinforce its continuation. Additionally, Stipek noted evidence suggesting that the exclusive use of external reinforcers can reduce students' intrinsic motivation to learn and succeed by decreasing task interest, inhibiting performance, reducing creativity, and encouraging passivity. These studies highlight that while effective in many cases, reinforcement can be difficult to deliver successfully or can be used inappropriately.

Despite the wealth of research on reinforcement use in schools, there is very little research specifically examining the effectiveness of PBIS schoolwide reinforcement systems (M. P. George, White, & Schlaffer, 2007). However, in a study by Wheatley et al. (2009), behavior in an elementary school cafeteria was found to be significantly improved by (a) teaching desired behaviors, (b) giving students the opportunity to practice skills, and (c) rewarding students with praise notes when they demonstrated appropriate behavior. Metzler et al. (2001) reported that implementation of PBIS in middle schools led to increases in the proportion of students receiving praise or rewards for following schoolwide behavior expectations.

A dissertation completed by Sparks (2007) yielded interview data from four elementary schools regarding their schoolwide reinforcement systems. Clear differences were evident between the two *high implementer* schools and the two *low implementer* schools. High implementer schools reported using a variety of individual rewards,

including verbal praise, written recognition, and tangible items such as pencils and stickers. They also provided large group social reinforcements through school assemblies and special lunches with the principal as well as use of a lottery drawing for prizes. Additionally, high implementer schools included parents in their systems by sending home written recognition of student behavior. In contrast, low implementer schools used schoolwide reinforcement systems either inconsistently or not at all for periods of time over the course of the study.

Another study provided information about schoolwide reinforcement systems used in PBIS approaches in Florida (Kincaid et al., 2007). A comprehensive analysis of barriers and facilitators to PBIS implementation was completed in Florida as part of the Florida Positive Behavior Support Project. During a statewide forum involving 26 schools, participants were separated into small groups of either high implementer or low implementer schools based on previously obtained data. Using a modified nominal group process, participants were asked to identify barriers to PBIS implementation and facilitators to implementation; the responses were analyzed in multiple ways. The researchers reported that the absence of a schoolwide reinforcement system was a "highly important" barrier to successful PBIS implementation for low implementer schools while the presence of a schoolwide reinforcement system was a "highly important" facilitator to successful implementation.

Both studies were limited by small sample sizes. Additionally, there was no statistical measurement of the relationship between level of implementation (high versus low) and the schoolwide reinforcement system; therefore, no conclusions can be drawn. However, one recent study examining which features of a PBIS fidelity measure best

predicted implementation showed one of the largest effect sizes for the use of a
schoolwide system to acknowledge and reinforce desired behaviors (Doolittle, 2006).
Future research would be beneficial in substantiating the potential impact of a well
designed variable interval reinforcement system implemented within a school.

   Punishment.

   Negative reinforcement is very commonly confused with punishment. However,
whereas negative reinforcement increases the likelihood of behavior being exhibited,
punishment is intended to decrease the probability of a specific behavior being exhibited.
By definition, punishment is the "presentation of an aversive event or the removal of a
positive event following a response which decreases the frequency of that response"
(Kazdin, 1975, p. 33-34).

   Punishment is one of the more commonly used reinforcement theory strategies,
but some behaviorists believe it should be tried only if positive and negative
reinforcement cannot be used or have previously failed. One of the main drawbacks to
using punishment is that it serves to reduce an undesired behavior but fails to provide an
avenue for learning a more appropriate behavior. Skinner (1974) argued that (a)
punishment often serves only to suppress undesirable behaviors rather than reduce their
frequency, (b) people learn to avoid being punished, and (c) punishment can serve as a
model for aggressive behavior. As with reinforcement, what is punishment to one person
(e.g., being sent out of the classroom) may not be seen as punishment to another.
Consequently, using punishment effectively in an organization can be challenging,
especially when the organization creates policy outlining specific punishments for
specific offenses. For example, if a school has a policy that a student failing to complete

his homework will miss recess, but the student prefers staying inside and does not find losing recess to be punishing, then taking away recess will likely not decrease the student's instances of failing to complete his homework.

Skiba and Peterson (2000) discussed that school discipline procedures have generally grown more intolerant and oriented towards punishment, despite research demonstrating the ineffectiveness of punitive approaches in behavior management. Maag (2001) addressed why punishment is generally preferred over positive reinforcement, especially in schools. One reason positive reinforcement is disavowed is that people perceive it as threatening one's freedom to choose; that is, some people see positive reinforcement as being coercive. Another reason that positive reinforcement is seen as less desirable is because of the "well-ingrained historical and cultural ethos" (p. 176) surrounding the use of punishment. Thus, a *punishment paradigm* has evolved. Maag stated, "Besides having history on its side, a punishment mentality has been perpetuated for the simple reason that punishing students has traditionally been highly reinforcing to teachers" (p. 176).

Ironically, in many cases, the act of punishing students often ends up serving as negative reinforcement for teachers, and a vicious cycle is created. For example, some teachers attempt to punish disruptive students by sending them to the hall or office. Regardless of whether or not the student actually finds being removed from the classroom to be aversive, the teacher is reinforced because the disruption (i.e., the student) has been removed. This then increases the likelihood that the teacher will send the student out of the classroom the next time he is disruptive. This cycle was labeled the *negative reinforcement trap* by Patterson (cited in Maag, 2001, p. 176).

Person-centered planning.

Person-centered planning emerged as a philosophy within the field of developmental disabilities (Kincaid, 1996) and is used primarily in developing tertiary level interventions for students with the most challenging behavior problems. The philosophy advocates that the student always remains the core focus of behavior interventions. This marks a shift in thinking from program-centered planning in which students with behavioral challenges are provided with pre-existing services or strategies to person-centered planning in which interventions are planned around the strengths and needs of students with behavioral challenges (Eber et al., 2009).

The main objectives of person-centered planning are to create a vision for the future of the student, identify and use student strengths in intervention planning, identify and prioritize needs, and develop a detailed action plan (Eber, 2003). At its core, person-centered planning is used to focus on improving quality of life as defined by the student and family (Risley, 1996). If quality of life issues are addressed first, multiple behavior problems may be significantly decreased, or even eliminated, increasing the chances of successful behavior planning in addressing other maladaptive behaviors. Pertinent critical life domains (i.e., family, living situation, financial, educational/vocational, social/recreational, behavioral/emotional, psychological, health, legal, cultural, and safety) may be addressed throughout the intervention process (VanDenBerg & Grealish, 1998). Therefore, the family, as well as the student, is more likely to see positive outcomes of wraparound intervention (Eber et al., 2009). Anderson and Freeman (2000) consider person-centered planning to be one of the essential features of PBIS.

Functional assessment.

A function-based approach to behavior support for students is a critical aspect of PBIS. Understanding who, what, where, when, how often, and why in relation to student misbehavior is instrumental in providing direction for intervention at all three tiers of implementation (Newton, Horner, Algozzine, Todd, & Algozzine, 2009; Scott, Anderson, Mancil, & Alter, 2009). Horner (2000) and OSEP Center on PBIS (2005) advocate that PBIS intervention starts with a functional assessment involving the identification of undesired or inappropriate behaviors and the variables that maintain them. Five key steps guide the process of implementing function-based supports: (1) define the behavior of concern, (2) identify relationships between the problem behavior and the environment, (3) create a hypothesis regarding the function of the problem behavior, (4) verify the hypothesis, and (5) develop an intervention (Scott et al.).

In summary, key PBIS theoretical principles derived directly from the well-established research field of applied behavior analysis. However, proponents of PBIS broke away from strict adherence to applied behavior analysis theory due to concerns regarding treating people with dignity. Advocates of PBIS believed it was immoral to use aversive treatments (Singer & Wang, 2009), especially when positive behavior strategies were available, and they were proponents of a movement providing resources to allow people with developmental disabilities to live and work in communities rather than live in institutions.

In addition to philosophical disagreements with applied behavior analysis theory, advocates of PBIS also disagreed regarding the application of theory principles. PBIS proponents believed it was critical to apply behavior principles on a macro level (e.g.,

school) rather than focusing exclusively on individual student behavior (Singer & Wang, 2009). PBIS researchers realized that although it was generally easy to find treatment effects for individual student behaviors with university researchers conducting experiments in schools, undesired behaviors often recurred after treatment ended. Thus, PBIS researchers began (1) examining the contexts in which misbehaviors occurred and (2) evaluating methods for changing the contexts rather than individual behavior (Singer & Wang, 2009). This led to a significant growth in the research field of PBIS.

Review of the Literature on PBIS

The theory base from which PBIS evolved was explored in the previous sections. As PBIS has emerged as an alternative model to considering behavioral complexities of students, a growing body of research has developed. Research on PBIS has been conducted to evaluate its systems of implementation as well as its defining characteristics. Each of these topics will be reviewed in the following sections.

Systems of implementation in the PBIS model.

A major element of PBIS is use of a systems perspective when determining interventions (Lewis & Sugai, 1999; Sugai & Horner, 2009). This perspective gives priority to establishing expertise within the school and district about PBIS and student behavior, ensuring strong commitment and support from staff, gauging staff level of interest to ensure readiness to commit to PBIS implementation, high fidelity of implementation, and regular monitoring and evaluation of efforts (OSEP Center on PBIS, 2005). Prevention and teaching components are critical across all systems of implementation.

PBIS espouses an emphasis on prevention of problem behavior. Schools

implementing PBIS create a continuum of interventions and systems designed to prevent

(a) the occurrence of new behavior problems, (b) patterns of behavior response in adults

that trigger problem behaviors in students, and (c) an increase in the frequency, intensity,

and duration of existing behavior problems (Sugai & Horner, 2002, 2009). The

continuum of interventions and systems is typically arranged within the three-tiered

model of universal, secondary, and tertiary prevention.

With PBIS implementation, specific attention is given to providing direct

instruction regarding desired behavior. Direct instruction is typically provided in

different contexts, including all students, small groups of students, and individual

students. In order to provide consistency in teaching, lesson plans are created and used

during instruction (H. P. George, 2009). Staff members also receive direct instruction in

the PBIS model (Sugai & Horner, 2002, 2009). The application of PBIS focuses on (a)

schoolwide, (b) nonclassroom, (c) classroom, and (d) individual student systems (Lewis

& Sugai, 1999).

Schoolwide systems.

Universal prevention of problem behavior is designed to be used schoolwide with

all students, in all settings, and by all staff (Lewis & Sugai, 1999). The intent of

schoolwide systems is to provide all students with the same level of behavior instruction,

supervision, and support. A school implementing PBIS develops, teaches, and reinforces

three to five positively stated schoolwide expectations across various settings of the

school. Overt teaching of school-based social skills and reinforcement systems that

encourage appropriate behavior are critical features of schoolwide systems (Colvin et al.,

1993; Lewis & Sugai, 1999). If implemented with fidelity, at least 80% of all students typically demonstrate the behaviors that have been taught (OSEP Center on PBIS, 2005). Teaching desired expectations and providing regular reinforcement reduces cases of new problem behaviors, thus preventing them from occurring.

Nonclassroom systems.

Nonclassroom systems refer to areas outside of the classroom where students congregate for specific purposes such as the cafeteria, playground, hallways, bus loading zones, restrooms, and assemblies (Lewis & Sugai, 1999). In the PBIS model, rules and procedures to govern behavior in these areas are explicitly taught since these areas tend to be less structured and contain a higher density of students. About 50% of behavior problems reported for administrative action originate from nonclassroom settings (Nelson et al., 1996). Lewis and Sugai (1999) suggested that nonclassroom area teaching and supervision practices be centered around (a) organizing features of the physical environment, (b) establishing predictable routines, (c) teaching behaviors appropriate to the specific setting, and (d) ensuring staff members use appropriate supervision techniques including movement, proximity, visual scanning, and high rates of positive interactions. Studies by Lewis, Colvin, and Sugai (2000), Lewis and Garrison-Harrell (1999), and Lewis, Sugai, and Colvin (1998) all showed that use of precorrection, active supervision, and high rates of positive reinforcement in nonclassroom areas resulted in a decrease in problem behaviors. In contrast, social skills instruction was found to have no effect on problem behaviors in nonclassroom areas.

Several studies have demonstrated the efficiency and effectiveness of using PBIS practices to promote appropriate student behavior in nonclassroom settings. Clear

improvements in social behavior were found in multiple studies (Lewis et al., 2000; Lewis, Powers, Kelk, & Newcomer, 2002; Nelson et al., 1996). In addition, a study by Colvin, Sugai, Good, and Lee (1997) found that the more frequently staff members noticed appropriate student behavior during transition times, the fewer instances of problem behavior occurred.

Classroom systems.

There is no doubt that teacher behavior has a direct impact on student performance in the classroom. According to Brophy (1986), research consistently demonstrates that both expectations from the teacher that students will reach mastery of learning objectives and effective classroom management practices are causally related to student achievement. Linney and Seidman (1989) reported a negative relationship between teacher criticism and student achievement. Within the PBIS paradigm, effective classroom systems to promote both appropriate behavior and high rates of learning are key to successful implementation.

Effective PBIS methods incorporate classroom behavior management strategies that are aligned with schoolwide expectations and rules (Lewis & Sugai, 1999). Each teacher determines what classroom rules and routines relate to the schoolwide expectations for behavior. For example, if a schoolwide expectation is Show Respect, a classroom rule that aligns with respect might be to keep hands, feet, and objects to self. Students are also taught routines regarding behaviors such as starting the school day, turning in work, transitioning from one activity to another, getting assistance, or completing assignments after an absence. Within a PBIS framework, classroom behaviors are taught daily during the first few weeks of school until a large majority of

students show mastery of the behaviors and routines, and then re-teaching occurs after breaks and holidays, or when data indicate re-teaching is warranted (Colvin & Lazar, 1997; Cotton, 1990). Instruction is coupled with direct practice so that teachers can correct behavioral mistakes and provide reinforcement for desired behaviors. In addition, evidence-based practices are used to manage student behavior.

A recent, extensive review of the literature on classroom management completed by Simonsen, Fairbanks, Briesch, Myers, and Sugai (2008) suggested five empirically-supported critical practices of effective classroom management: (a) maximizing structure, (b) posting, teaching, reviewing, monitoring, and reinforcing behavioral expectations, (c) actively engaging students in instruction, (d) using a continuum of strategies to respond to appropriate behavior, and (e) using a continuum of strategies to respond to inappropriate behavior.

Studies have been conducted to address the use of PBIS to impact classroom behavior. For example, Algozzine and Algozzine (2007) evaluated the impact of using PBIS principles on the instructional ecology of elementary classrooms. Two schools were selected for the study with similar demographics; the treatment school had implemented PBIS components with fidelity while the comparison school had implemented no PBIS components. Observers gathered data on the use of teaching monitoring, voice tone, and appropriate correction procedures in 12 classrooms in the PBIS school and 12 classrooms in the comparison school. Then, classroom instructional variables were assessed to gauge instructional methods, teaching styles, and classroom environments. The researchers found that total on-task behavior of students was

significantly higher and off-task behavior was significantly lower in PBIS classrooms than in comparison classrooms.

Individual student systems.

Lewis and Sugai (1999) stated that systems of support are needed for students who have not responded to universal tier interventions. They discussed the need for schools to develop a simple process for teachers to request assistance and to have a process in place to identify students needing secondary or tertiary level assistance. The authors recommended establishing a behavior support team that would respond promptly to requests for assistance. They emphasized the importance of having at least one person on the behavior support team with experience in conducting functional assessments of behavior.

In order to fully develop individual student systems, Lewis and Sugai (1999) further suggested that (a) local resources be used to conduct functional assessments, (b) family and community members be invited to participate in the behavior planning as appropriate and possible, and (c) schools provide formal training opportunities for families on behavior support and parenting strategies. Lastly, they emphasized a need to carefully monitor individual behavior plans and provide regular feedback to relevant stakeholders.

Medley, Little, and Akin-Little (2008) evaluated the adequacy of individual behavior support plans in PBIS schools in comparison to non-PBIS schools. Their research found that support plans developed in PBIS schools were more technically adequate than those developed in non-PBIS schools. However, plans developed in PBIS schools were nevertheless deemed as underdeveloped to fully meet the needs of students

requiring individual supports. This study highlighted the inherent challenges schools face in successfully providing adequate supports for the most behaviorally challenging students.

Defining characteristics of PBIS.

Sugai and Horner (2002, 2009) identified four key characteristics necessary for successful implementation of schoolwide PBIS: (1) creating a leadership team, (2) getting buy-in from staff, (3) using data to make decisions, and (4) providing staff training to promote implementation.

Leadership team.

Cohen (as cited in H. P. George, 2009) reported there are three critical variables that affect universal tier success: (a) administrator commitment, (b) staff buy-in, and (c) functioning of the leadership team. A leadership team that guides the teaching and implementation of PBIS is a critical feature of successful implementation (Sugai & Horner, 2002). A strong leadership team promotes initial staff buy-in and ongoing support for PBIS processes to flourish. The leadership team is responsible for evaluating school needs related to student behavior, developing an action plan, and supporting staff through training and monitoring.

Careful consideration should be used in selecting the leadership team. Ideally, the team should be representative of the staff with both certified and classified members, as well as the administrator and someone knowledgeable about applied behavior analysis (i.e., the PBIS coach). The leadership team must be aware in advance of the time commitment necessary to achieve desired results. Field research by Handler et al. (2007) suggested that 40-50 hours of planning and development time is needed by the leadership

team during the first year of PBIS implementation. In addition, Handler et al. identified

several essential activities of teams that impact the rate of implementation. These

included (a) a basic understanding of team functioning and dynamics; (b) consistency in

performing team duties such as having monthly meetings, following an agenda, and using

time wisely in team meetings; (c) on-going use of an action plan to develop, implement,

and monitor tasks and activities; and (d) consistent adherence to PBIS principles in

making decisions with data and developing key practices. Newton et al. (2009) stated

that leadership teams are more likely to be effective at making decisions with data if the

core social and academic outcomes are clearly articulated and measured. Since the

leadership team is the driving force of the implementation process, team members must

be highly knowledgeable of PBIS concepts and practices.

    The school principal plays a vital leadership role in establishing the culture of the

school and in shaping school discipline policy, both by effective administration and by

personal example. Principals of well-disciplined students are usually highly visible

models. They move about the school, greet students and teachers, and informally

monitor possible problem areas. Effective principals are liked and respected, rather than

feared, and communicate caring for students as well as a willingness to impose

punishment if necessary (National Association of Elementary School Principals, 1983).

    Administrators must be willing to implement necessary changes in order to make

PBIS effective. They must have knowledge of the PBIS system, treat PBIS as a priority,

and be willing to take part in all leadership and team meetings (Newton et al., 2009).

Administrators must be visible to students and staff throughout the implementation

process, including participating in the schoolwide reinforcement system and actively

monitoring implementation (Sugai, 2005). Schools that have shown the best results with PBIS implementation have had strong involvement from their administration (Handler et al., 2007).

Duckworth (1984) found that teachers' satisfaction with school discipline policy was related to their relationship with the principal. Good communication and shared values were important elements in the principal-teacher relationship. Ideally, a principal creates consensus among staff on rules and their enforcement. In practice, some principals create consensus by recruiting like-minded staff over the course of years (Duckworth), or by arranging transfers for teachers whose views are not aligned with the goals and plans for the school (National Association of Elementary School Principals, 1983).

In a study involving eight Charlotte, South Carolina middle schools, Gottfredson, Karweit, and Gottfredson (1989) concluded that stable and supportive administrative leadership was the overriding factor determining whether a discipline program was effective. Schools that successfully implemented a pilot program experienced distinct improvements in discipline. Handler et al. (2007) found that visibility was one of six key behaviors exhibited by principals in schools successfully implementing PBIS.

In addition to administrative leadership and guidance, coaching from a person skilled in behavior analysis is beneficial to the PBIS process. PBIS coaches' typical duties include serving as the liaison to the district team, developing deep knowledge about schoolwide PBIS, and ensuring critical elements are addressed so that fidelity of implementation is maintained (H. P. George, 2009). Adelman and Taylor (2003) found that coaching is especially crucial during start-up of new initiatives to support staff

motivation, teaming, and skill acquisition. According to Fixsen et al. (2005), the most

effective coaches ensure high quality implementation and provide high rates of positive

feedback to staff. Scott and Martinek (2006) found that in-person verbal prompts from a

PBIS coach improved data collection efforts in PBIS schools.

Staff buy-in.

One of the first tasks of a newly formed PBIS leadership team is to begin the

process of gaining staff buy-in for PBIS implementation. Sugai and Horner (2002)

recommended that 80% of school staff support implementation efforts at the outset.

Handler et al. (2007) found that schools with less than 80% initial staff buy-in can still be

successful as long as they plan steps to increase buy-in over time, for example educating

staff about PBIS principles and getting regular staff input and feedback. Critical aspects

of staff support include communicating about the short-term and long-term components

of implementation, getting input and feedback from staff, sharing data pertaining to

implementation, and ensuring the availability of adequate resources such as materials,

training, time, and money are available.

Using data to make decisions.

The leadership team must commit to regular collection, review, and analysis of

behavior data in order to identify how implementation has been successful and how it

might need to be improved (Safran & Oswald, 2003; Sugai & Horner, 2002). All schools

are encouraged to regularly examine outcome data such as office discipline referrals and

any disciplinary actions such as in-school-suspensions, out-of-school suspensions,

detentions, time-outs, or expulsions (Simonsen & Sugai, 2007). Additionally, leadership

teams examine fidelity data to determine if PBIS has been implemented the way it is

supposed to be implemented. Checklists and surveys provide useful information about strengths and limitations to PBIS implementation (Lewis & Sugai, 1999; Sugai & Horner, 2002). Teams use the analyzed data sources to create long-term and short-term goals for improvement and sustainability. Sugai and Horner (2002) suggested that the PBIS action plan contain specific descriptions of tasks to be completed, as well as staff and administrative responsibilities, timeline for completion, resources needed, and how each task will be monitored.

Newton et al. (2009) developed a team-initiated problem-solving (TIPS) model as a means for PBIS teams to systematically use data for problem-solving. They based the TIPS model on other problem-solving models but provided emphasis on data collection and use at every step of the problem-solving process. The TIPS model encourages teams to (1) review status and identify problems, (2) develop and refine hypotheses, (3) discuss and select solutions, (4) develop and implement an action plan, and (5) evaluate and revise the action plan. The authors' goal in developing the TIPS model was to provide PBIS leadership teams with a consistent method of conducting a team meeting with data-based decision-making, goal setting, and action planning actively used to support PBIS implementation and sustainability.

Newton et al. (2009) contended that schools require direct teaching and coaching in order to successfully use TIPS, or other problem-solving methods, during PBIS team meetings. Thus, Todd et al. (2011) completed a study to determine the impact of direct training and coaching on school teams' use of the TIPS model. In a multiple baseline design with four elementary school PBIS teams, direct training and coaching during two PBIS team meetings was provided by the researchers. The authors evaluated how well

teams followed basic meeting protocols (e.g., use of an agenda, stable team members, team roles assigned and used, and taking minutes), and examined use of problem-solving practices for creating interventions. Direct observation data revealed that three of the four teams showed improved use of basic meeting protocols and problem-solving practices following TIPS training.

Research suggests schools are increasing their use of local data to guide decision-making about PBIS implementation (Sugai, 2007). Sugai stated that there are several reasons for the increase: (a) schools are learning that student outcomes are improved when they increase their use of data-based decision-making; (b) more schools are using decision-making practices that decrease the effort and complexity of data management; and (c) schools are discovering that when they actively use data to make decisions, intervention features are more contextually relevant, and they are more likely to find improvements in student behavior and teacher effectiveness.

Staff training to promote implementation.

Schools must ensure that all staff have a common vision and use common language regarding PBIS in order to develop a common experience (Sugai & Horner, 2002). Specifically, staff members must be knowledgeable about PBIS procedures, and adequate supports must be made available to support staff efforts. Adequate supports include providing teacher training, communicating regularly with staff, getting input from staff about what works and does not work, and recognizing and reinforcing staff members for their efforts. In developing a common vision, common language, and common experience, three critical components must be addressed: (a) developing a clear statement of purpose to describe the goals and objectives of PBIS plans; (b) defining a small

number of clearly defined behavioral expectations; and (c) creating procedures to teach

and encourage the defined behavioral expectations (Gottfredson, 1987; Gottfredson et al.,

1996; Mayer et al., 1983; Sugai & Horner, 2002). Staff training in PBIS implementation

goes beyond traditional in-service training and ensures both the teaching of specific skills

to fluency and applying skills across multiple settings (Sugai & Horner, 2006).

To sum, there is ample research showing that PBIS is a multi-faceted model being

widely used to address the contexts in which student misbehavior occurs. The key

elements and characteristics of a successful implementation model have been articulated

by multiple researchers for a number of years. In addition to understanding the

theoretical perspective of PBIS, it is also important to understand the literature addressing

its use and effectiveness. The following sections provide evidence from the literature

regarding the fidelity of implementation and the impact on various student outcome data.

Fidelity of Implementation

Fidelity is defined as "adherence to both the proper execution of the specific

practices and the effective coordination of all the practices as they are intended to be

combined" (Center on Innovation & Improvement, 2010, p. 1). Moncher and Prinz

(1991) defined fidelity as adherence to the tenets of a model or program. A model, like

PBIS, that has been shown to be effective in some schools can be ineffective in other

schools if fidelity to the model is not maintained. Thus, interest in fidelity of

implementation has increased in recent years. Fidelity of implementation is defined by

the National Center on Response to Intervention (2010) as the delivery of content and

instructional strategies in the way in which they were designed and intended to be

delivered. Plans for monitoring fidelity of implementation should begin prior to program

inception (Center on Innovation & Improvement, 2010).

In conducting an extensive review of the literature, Lane et al. (2008) reported

that direct observation techniques are noticeably absent from evaluation of fidelity of

PBIS primary tier interventions although frequently used in assessment of secondary and

tertiary tier interventions. According to Gresham, Gansle, and Noell (1993), a lack of

data regarding fidelity of implementation threatens a study's internal and external

validity. Treatment integrity of PBIS implementation in elementary schools was

evaluated by Lane et al. Fidelity of implementation was found to vary across rater and

method of measurement, suggesting that schools should (a) carefully consider the type of

measurement that will be used to evaluate fidelity and (b) use multiple methods for

fidelity assessment. In a qualitative interview study, Bambara, Nonnemacher, and Kern

(2009) identified five essential practices for sustaining PBIS implementation: (a)

establishing a school culture in which all staff members have a common understanding

and belief in PBIS; (b) strong administrative support; (c) attention to how time for PBIS

activities is allocated, structured, and used by team members; (d) adequate and on-going

staff training and technical assistance; and (e) active family and student involvement.

Warren et al. (2006) found that despite initial decreases in ODRs, time outs, and

suspensions after a year of PBIS implementation at an urban middle school, fidelity was

compromised in Year 2 when a breakdown in teaching behavior expectations and

providing regular reinforcement of appropriate behavior occurred. This breakdown

resulted in an increase in inappropriate student behavior. Thus, it appeared that a lack of

adherence to PBIS implementation strategies had a negative impact on student behavior.

Schools implementing PBIS are typically encouraged to collect multiple sources

of data to provide information about the fidelity of implementation (Childs et al., 2010;

Lane et al., 2008). Measures of fidelity allow the school team to examine whether they

are addressing all the critical components of PBIS as well as analyze strengths and areas

of weakness. Typical measures used by schools to evaluate fidelity of implementation

include the Team Implementation Checklist, PBIS Self-Assessment Survey, Schoolwide

Evaluation Tool, and Benchmarks of Quality. Each of these measures is reviewed in the

following sections.

Team Implementation Checklist.

School teams are encouraged to examine their own practices by quarterly

completion of the Team Implementation Checklist (TIC; see Appendix A). The TIC

serves as a guide in appraising the status of PBIS start-up, team functioning, development

of key components, and evaluation (Sugai, Todd, & Horner, 2001). Items are rated

collectively by the team as achieved, in progress, or not started. The TIC takes about 10-

15 minutes to complete.

Although it is widely used by PBIS schools, little research has been conducted on

the reliability and validity of the TIC. In the 2008 review of Maryland's statewide PBIS

initiative, Barrett et al. reported data showing the TIC to have high internal consistency

(Cronbach's α = .93, n = 1,633 forms completed). No other studies outlining the

psychometric properties of the TIC were discovered in the literature review.

A major benefit of the TIC is that it provides a quick and concise measure of

PBIS team functioning. If used regularly, the instrument allows teams to monitor their

progress to ensure they are maintaining a consistent level of implementation. There are

at least two major disadvantages of the TIC. One is a lack of research on its

psychometric properties. The second disadvantage is that given the self-reporting nature

of the checklist, team members may have difficulty rating themselves objectively

(Bradshaw, Debnam, Koth, & Leaf, 2009).

PBIS Self-assessment Survey.

The PBIS Self-assessment Survey (SAS; Lewis & Sugai, 1999; Sugai, Todd, &

Horner, 2000) is used prior to implementation of PBIS by schools to obtain a baseline of

implementation across (a) schoolwide, (b) nonclassroom, (c) classroom, and (d)

individual student systems (see Appendix B). The survey is then taken annually by staff

to evaluate strengths and weaknesses, assess changes over time, and build an action plan

for future implementation (Sugai, Todd, et al., 2000). The purpose of the SAS is to

measure the extent to which PBIS is being implemented (Lewis & Sugai, 1999; Sugai,

Todd, et al., 2000).

The survey includes 46 items across four subscales: Schoolwide Systems,

Nonclassroom Systems, Classroom Systems, and Individual Student Systems. The SAS

generally takes about 20-30 minutes to complete. For each question, participants are

instructed to indicate the current status of implementation (i.e., in place, partially in place,

or not in place) and the priority for improvement (i.e., high, medium, or low) for each

item. Participants are instructed to leave items blank if they do not have direct

knowledge of the content evaluated in the question (Lewis & Sugai, 1999; Sugai, Todd,

et al., 2000).

Two previous studies have evaluated the psychometric properties of the SAS. In

2005, Hagan-Burke et al. examined the internal consistency of the Schoolwide Systems

subscale of the survey and found it to have high internal consistency ($\alpha = .88$). All

subscale items correlated positively with one another. This study was conducted using

1,219 surveys from 37 schools in Alabama. In a second study completed in 2006, Safran

evaluated the internal consistency of the SAS from a total of 80 surveys completed by a

variety of staff members at two elementary schools and one middle school. His results

yielded moderate to high total scale reliability ($\alpha = .85$). As expected, subscale reliability

coefficients were lower than the total scale (Schoolwide, $\alpha = .75$; Nonclassroom, $\alpha = .60$;

Classroom, $\alpha = .74$; Individual Student, $\alpha = .66$).

Since research is sparse on the psychometric properties of the SAS, further

analysis was conducted for inclusion in this dissertation study by the author. An analysis

was completed using survey information from 472 school participants from 12 schools

completing the SAS in the spring of 2010. There were responses from seven elementary

schools, three middle schools, and two high schools. The participants included general

education teachers, special education teachers, administrators, guidance counselors,

educational assistants, school psychologists, and parents. Sixty-two percent of the

respondents were general education teachers. Schools completed the surveys between

March 1 and April 30. Some schools asked their staff members to complete the survey

on the same day and at the same time while other schools provided a window of time

(e.g., two weeks) for completion. Each participant completed the survey independently

via the web. Participants were asked to complete their ratings based on their own

individual experiences in the school and to answer only questions that were relevant to

the work they perform in the building.

Data were coded into Excel and then transferred into SPSS for analysis. For the purpose of this study, only current status of implementation was analyzed. Participant responses were coded in the following manner: Not in Place = 0; Partially in Place = 1; In Place = 2. To assess the reliability of the PBIS Self-assessment Survey, Cronbach's alpha was computed for the total scale as well as the four subscales. The validity of the PBIS Self-assessment Survey was evaluated by completing a confirmatory factor analysis. Factor loadings for each of the four subscales were examined, as well as the total variance explained.

Using Cronbach's alpha, measures of internal consistency were computed for the four subscales and the total scale. Total scale reliability for current status of implementation was high ($\alpha = .95$). Subscale coefficient alpha levels also indicated high consistency ($\alpha = .87$ for Schoolwide Systems, $\alpha = .81$ for Nonclassroom Systems, $\alpha = .84$ for Classroom Systems, and $\alpha = .88$ for Individual Student Systems). Coefficients of this magnitude indicate that subscale items are closely related to one another. All subscale items correlated positively with one another.

The total scale and subscale reliability coefficients were somewhat higher than those found by Safran (2006). However, the internal consistency of the Schoolwide Systems subscale ($\alpha = .87$) was comparable to that found by Hagan-Burke et al. (2005; $\alpha = .88$). Both of these studies had larger sample sizes and thus, greater variability of the group.

Validity of the SAS was assessed by conducting a factor analysis. The purpose of the analysis was to evaluate whether the 46 SAS items were constructed for the four described dimensions: Schoolwide Systems, Nonclassroom Systems, Classroom Systems,

and Individual Student Systems. The dimensionality of the 46 survey items was analyzed using confirmatory factor analysis. The four-factor solution was rotated by using a Varimax rotation to yield interpretable factors. The four factors cumulatively accounted for 45% of the variance. Inspection of the items for each factor confirmed that the first group of items assessed Individual Student Systems, the third group of items assessed Nonclassroom Systems, and the fourth group of items assessed Schoolwide Systems. Inspection of items from the other factor failed to confirm that it measures Classroom Systems. Thus, this factor was identified as Unknown Factor One.

Seven of the eight items on the Individual Student Systems subscale showed strong correlations between factor and variables. Likewise, ten of the 18 items on the Schoolwide Systems subscale and six of the nine items on the Nonclassroom Systems subscale showed strong correlations between factor and variables. In contrast, the other factor, identified as Unknown Factor One, contained factor loadings from all four subscales and only four of 11 items from the Classroom Systems subscale. Although the factor analysis showed that the items in this factor were not specifically related to classroom systems, a common theme was found; nine of the 11 items pertained to management of student behavior (for example, dealing with problem behavior, transitions, supervision, teaching, and reinforcing behavior).

The SAS is a survey instrument widely used by schools implementing PBIS to garner information regarding fidelity of implementation across the four identified subscales. However, more research on the SAS is needed to determine its psychometric properties. While the SAS appears to have strong internal consistency, construct validity is questionable in regards to the Classroom Systems subscale. Further, no studies have

been conducted to evaluate properties such as test-retest reliability, content validity, or criterion validity.

Schoolwide Evaluation Tool.

In addition to quarterly examination of team functioning, PBIS school teams annually evaluate their overall universal implementation by using either the Schoolwide Evaluation Tool (SET; Sugai, Lewis-Palmer et al., 2001) or the Benchmarks of Quality (BoQ; Kincaid et al., 2005). The SET (see Appendix C) and BoQ (see Appendix D) are both research-validated measures that assess the development and implementation of PBIS across several critical elements (Bradshaw et al., 2009). The SET or BoQ is used annually to evaluate strengths and identify areas of need, and results are intended to be used for action planning.

There are seven critical implementation elements evaluated via the SET (Sugai, Lewis-Palmer et al., 2001). The instrument yields subscale scores for the seven elements as well as a total score. Scores range from 0% to 100%. Higher scores indicate higher fidelity of universal PBIS implementation. Studies by Doolittle (2006) and Horner et al. (2004) suggested that a school receiving an 80% or higher on the total score as well as an 80% or higher on the subscale measuring the teaching of behavior expectations demonstrates high levels of universal PBIS implementation fidelity. Horner et al. found the SET assessment to have strong psychometric properties including internal consistency ($\alpha = .96$), test-retest reliability for all seven critical elements ($r = .89$ to 1.00), and construct validity ($r = .75$).   In a follow-up study of the psychometric properties of the SET, Vincent, Spaulding, and Tobin (2010) corroborated results of Horner et al., finding internal consistency of the SET to be acceptable across elementary ($\alpha = .85$), middle ($\alpha =$

.85), and high schools (α = .90). Further analysis of confidence interval ranges conducted by Vincent et al. indicated that the subscales measuring management and expectations taught appear to be less well defined than the other five subscales.

In 2006, Doolittle used the SET to evaluate whether schools implemented PBIS with fidelity. Her evaluation found that 75% of schools met the SET's implementation criterion within two years and 65% of the schools meeting the initial target sustained the criterion mark for at least two years. Likewise, analysis completed by Barrett et al. (2008) revealed that more than 60% of trained PBIS schools (n = 21 elementary schools) in Maryland reached 80% fidelity within a year of implementation and all but one reached the fidelity target within two years.

The SET requires an outside examiner with extensive training to spend two to three hours at a school completing the evaluation (Horner et al., 2004). Therefore, it can be costly in terms of personnel, training, and time to districts or state initiatives to use the SET as the primary method of PBIS Tier 1 evaluation (Bradshaw et al., 2009). Additionally, evaluation of its psychometric properties by Vincent et al. (2010) indicated that the SET is a more useful indicator of universal PBIS implementation during initial implementation stages but may not adequately measure sustained implementation over time. The authors postulated that SET items adequately discriminate between non-implementing and implementing schools but may inadequately discriminate small differences in implementation that occur over time with enhanced knowledge and improved practices.

Benchmarks of Quality.

Because of the time and resources needed to evaluate a school's PBIS implementation with the SET, an alternate measure was developed to assess universal implementation. The Benchmarks of Quality (BoQ) was developed by Florida PBIS at the University of South Florida (Kincaid et al., 2005) and is used in some states instead of the SET as the annual assessment of PBIS universal level functioning. The BoQ was developed to gauge strengths and limitations of PBIS implementation. The measure is designed for PBIS leadership teams to use as a self-assessment rather than having to rely on an outside evaluator to assess implementation (Cohen, Kincaid, & Childs, 2007). Survey items are based on the critical elements of PBIS that are outlined by Lewis and Sugai (1999). The instrument includes 53 items across ten critical elements (Kincaid et al., 2005).

The BoQ assessment consists of having team members complete individual rating forms and the PBIS coach complete a more detailed rating form. A scoring rubric is provided to aid in clarity and consistency in scoring items. The results of all ratings are tabulated and discussed, and a final score for each item is determined. Schools with a total score of 70 or higher are considered to implement universal PBIS with high fidelity while schools with a total score of less than 70 are considered to implement with low fidelity (Childs et al., 2010).

The BoQ was piloted in 105 elementary, middle, and high schools in Maryland and Florida. Of the 105 schools, PBIS implementation in 47 of the schools was also evaluated with the SET. All schools were implementing PBIS and were trained how to use the BoQ instrument. Cohen et al. (2007) found the BoQ to have strong psychometric

properties including internal consistency (α = .96), test-retest reliability (.94), and interrater reliability (.87). The BoQ scores also moderately correlated with SET scores (r = .51).

The authors suggested that the BoQ scores are possibly a better measure of fidelity and integrity than the SET because 13 schools that reached the 80% percent mark on the SET did not reach it on the BoQ. The researchers concluded the reason was likely because the BoQ measures aspects of implementation that the SET does not measure (Cohen et al., 2007). When examining data of 24 of the Florida schools that also had baseline data, the authors found that after two years of implementation, schools with higher BoQ scores showed greater decreases in office discipline referrals than schools with lower BoQ scores. Although this finding has not been investigated in other states with other PBIS initiatives, the study suggested that the BoQ is a good measure of fidelity and implementation of universal PBIS components (Cohen et al., 2007).

According to Cohen et al. (2007), use of the BoQ instead of the SET has several advantages. First, it is easy to administer and requires less training to use than the SET. Second, administration time for the BoQ is significantly less than the SET (i.e., approximately 90 minutes for the BoQ compared to 3 hours for the SET). Third, an external evaluator is not needed to conduct the BoQ as it is for the SET. This more efficient use of local resources may increase the likelihood of schools choosing to complete the annual assessment.

Research Examining Office Discipline Referrals

Measurement of student behavior is essential in the context of PBIS implementation. One of the most common methods of measuring student behavior is the

analysis of office discipline referrals (ODRs). An ODR is defined by Sugai, Sprague et al. (2000) as the following:

> an event in which (a) a student engaged in a behavior that violated a rule/social norm in the school, (b) a problem behavior was observed by a member of the school staff, and (c) the event resulted in a consequence delivered by administrative staff who produced a permanent (written) product defining the whole event. (p. 96)

Well-designed ODR forms track specific types of information with pre-established categories to heighten consistency of reporting and enhance interpretation of trends (Wright & Dusek, 1998). For example, an ideal ODR form typically gathers information about the referred student, referring staff member, location, date, and time of the incident, problem behavior exhibited, possible motivation for the behavior, and consequence or action taken. Most middle and high schools track major incidents only (i.e., those requiring administrative involvement) while many elementary schools also count minor incidents (i.e., those handled by the classroom teacher but documented for tracking purposes; Spaulding et al., 2010).

The use of ODRs as a schoolwide behavioral outcome measure is standard practice in schools implementing PBIS. PBIS leadership teams use ODR data to examine schoolwide behavioral patterns by examining how many misbehaviors are reported, what behaviors are happening, when and where they occur, and who is getting referrals. This type of examination leads to efficient problem-solving of schoolwide issues and increases the likelihood that selected strategies and practices will be more effective in improving school climate (Newton et al., 2009; Spaulding et al., 2010). Use of ODRs as outcome

measures of behavior interventions is warranted because they are an efficient source of information for documenting whether the implementation of PBIS results in systems change; however, a major disadvantage is the varying ways in which schools define behaviors and apply referral procedures (Sugai, Sprague et al., 2000). In addition, there is some evidence that ODRs may be a less than useful indicator of identifying students who need secondary or tertiary tier interventions.

Nelson, Benner, Reid, Epstein, and Currin (2002) evaluated the convergent validity of ODRs with a standardized teacher checklist used to screen potential secondary or tertiary level students. They found that ODRs failed to identify relatively large numbers of students in need of more individualized behavior supports. This lack of convergent validity is likely because (a) ODRs may underestimate the actual prevalence of problem behavior (Irvin, Tobin, Sprague, Sugai, and Vincent, 2004; Simonsen & Sugai, 2007) and (b) behaviors potentially requiring secondary tier attention (such as social skill deficits, withdrawal behavior, or chronic but mild misbehaviors) may not be written up as a referral (Simonsen & Sugai, 2007).

Despite the limitation of using ODRs as a reliable indicator of students needing secondary and tertiary interventions, several recent studies have evaluated the validity of ODRs for schoolwide decision-making in schools implementing PBIS. The studies have provided support for the use of ODRs as a general indictor of schoolwide levels of problem behavior (Irvin et al., 2004; Irvin et al., 2006; Spaulding et al., 2010). Irvin et al. (2004) applied Messick's unified approach to construct validity in examining the literature on ODRs. Their meta-analysis revealed that predictive and concurrent correlational relationships exist between ODRs and (a) student behaviors such as

aggression, drug use, defiance, behavior disorders, and juvenile delinquency; (b) student attitudes towards rules and commitment to education; and (c) school and classroom issues such as orderliness, victimization, safety, and crime.

In addition, there are numerous studies demonstrating that implementation of PBIS results in reductions of office discipline referrals. In a statewide study in Iowa by Mass-Galloway et al. (2008), two of three training cohorts demonstrated substantial decreases in office discipline referrals. A study by Metzler et al. (2001) investigated the effects of implementing PBIS at three junior high schools in Oregon (grades six, seven, and eight) with similar populations over a three-year period. Each year there was a different group of students in each grade, but the goal of the study was to evaluate the social context of each school and not the students in each grade. Students were taught schoolwide expectations/rules and appropriate social behavior. Staff members increased positive reinforcement for appropriate behavior, implemented consequences for rule violations, and continuously monitored behavior data. Study results indicated a 41% drop in office referrals from the year prior to implementation to the second year after implementation. Additionally, students who had ten or more referrals showed a significant drop in office referrals over the three year period (Metzler et al.).

Other researchers have also found reductions in office discipline referrals as a result of implementing PBIS (Bohanon et al., 2006; Nelson, Martella et al., 2002; Turnbull et al., 2002; Warren et al., 2006). For example, in a two-year study of a high poverty, urban elementary school, Luiselli et al. (2005) indicated that office discipline referrals decreased 44% after one year of PBIS implementation and decreased another 26% after two years of implementation. Bradshaw, Mitchell, and Leaf (2010) reported

that both the percentage of elementary school students receiving major or minor referrals

and the number of referral events per student decreased significantly over the five years

of their study. In an evaluation of a district model of effective behavior and instructional

support over ten years, Sadler and Sugai (2009) found that the district's ODR rates were

maintained at significantly lower rates than the reported national rate of schools using the

Schoolwide Information System (SWIS). PBIS implementation in an urban middle

school was found to result in significant reductions in ODRs over three years of

implementation (Lassen, Steele, & Sailor, 2006). Although these studies had some

limitations, the results provide a foundation for the use of PBIS in schools in decreasing

office discipline referrals.

Research Examining Out-of-School Suspensions

In addition to measuring student behavior by analyzing office discipline referrals,

many PBIS schools also track out-of-school suspensions. Examining student suspension

trends is critical for any school, especially in light of recently adopted state and district

standards designed to reduce misbehavior. Many states have adopted *zero-tolerance*

policies in an attempt to curb inappropriate behavior. Zero tolerance has become a

popular method of dealing with problem behavior as policies dictate the automatic

suspension or expulsion of students for certain offenses (Skiba & Peterson, 1999).

Suspending students under the umbrella of zero tolerance impacts student achievement

due to time spent outside of the learning environment, and it seemingly has little to no

impact on the behavior for which the student is punished (Skiba & Peterson, 2000). Out-

of-school suspension has been used as a primary means of addressing inappropriate

student behavior for many years, and research in this area has shown that suspensions are

not always administered equitably or for appropriate reasons (Skiba & Sprague, 2008).

Additionally, researchers have reported that schools with higher suspension rates

typically have lower academic quality and provide less attention to school climate issues

(American Psychological Association Zero Tolerance Task Force, 2008; Christle,

Jolivette, & Nelson, 2005).

In one of the earliest investigations of school disciplinary practices, the Children's

Defense Fund (1975) found that suspension rates for nonwhite and male students were

two to three times higher than those for white and female students, often for comparable

offenses. Skiba and Peterson (2000) noted a similar pattern almost 30 years later; further,

disproportionality in suspension rates for African-American students was present in

nearly every state (Skiba & Peterson, 1999). Suspended students frequently had learning

disabilities or other learning problems and usually came from single-parent households

(Children's Defense Fund, 1975). Additionally, the majority of suspensions were for

behaviors such as tardiness, smoking, truancy, and disrespect rather than for more serious

offenses such as fighting, drugs or alcohol, or sexual harassment. The research of Skiba

and Peterson (1999, 2000) showed this trend unchanged in current times.

The Children's Defense Fund (2009) reported that in Kentucky there were 13.3

out-of-school suspensions per 100 African-American students as compared to 5.8 out-of-

school suspensions per 100 White students. The greater the frequency of suspension use,

the greater the level of overrepresentation among African-American students was shown

to be. During the 2008-2009 school year in Kentucky, there were 67, 665 out-of-school

suspension events for offenses such as disturbing class, fighting, defiance of authority,

threat/intimidation, and profanity/vulgarity (D. C. May & Chen, 2010). Trend data show

there was a 15.1% reduction in out-of-school suspensions between 2004-05 and 2008-09. While this reduction is encouraging, it nevertheless represents a significant loss of instructional time during the course of a school year. In fact, suspension policies have been shown to have a negative impact on student grades, attitude towards school, and potential for dropping out (Nichols, Ludwin, & Iadicola, 1999).

Studies investigating the impact of PBIS implementation on student outcomes have shown implementation to result in a reduction of out-of-school suspensions (Luiselli et al., 2005; Nelson, Martella et al., 2002; Turnbull et al., 2002; Warren et al., 2006). In a study conducted by Mayer et al., (1993), the use of systems-wide intervention strategies in a high school setting was found to have an impact on out-of-school suspensions, with a decrease of 35.5% in the experimental schools. Scott and Barrett (2004) found a 58% reduction in out-of-school suspensions during the first year of PBIS implementation in a Maryland elementary school and an additional 31% reduction during the second year of implementation. Out-of-school suspensions were significantly reduced over three years of PBIS implementation in an urban middle school (Lassen et al., 2006). Bradshaw et al. (2010) reported that the percentage of students suspended from school significantly decreased over time in schools implementing PBIS compared to a control group of schools. As with the research on ODRs, there is clear evidence of an association between PBIS implementation and reductions in out-of-school suspensions.

Research Examining School Retention, Dropout and Graduation Rates

Far greater academic and social demands are placed on students as they transition from middle school to high school. High schools are departmentalized by subject area, and the explicit focus is on academic content. At the same time, students are expected to

be independent and self-reliant, and individualized attention from adults is decreased (Sugai, 2005). Unfortunately, many high school teachers do not consider social and emotional development as a key responsibility. Additionally, rule violations are typically addressed through a continuum of exclusionary consequences such as detention, suspension, and expulsion (Sugai, 2005; Sugai & Horner, 2002). For some students, the social and academic demands of high school create enough conflict or disinterest that they choose to drop out of school.

The graduation rate for students in the United States is estimated to be between 69% and 74% with Kentucky's rate slightly above the national average at 72% to 76% (Alliance for Excellent Education, 2010). Although the *No Child Left Behind Act* was designed, in part, to address leaving school prior to graduation, the dropout rate has remained relatively stable since its enactment (Bradshaw, O'Brennan, & McNeely, 2008). Although a variety of reasons has been proposed to explain why some students fail to graduate from high school, many researchers have indicated lack of academic achievement (Balfanz, Herzog, & Mac Iver, 2007; Tobin & Sugai, 1999) and chronic behavior problems (Balfanz et al., 2007; Scott & Barrett, 2004; Sweeten, 2006; Tobin & Sugai, 1999) to be among the most prevalent. Problem behaviors leading to exclusionary consequences such as suspension and expulsion not only result in time away from instruction (Scott & Barrett, 2004; Tobin & Sugai, 1999) but may also reinforce antisocial behaviors in students, ultimately leading to more behavior problems (Gottfredson, 1987; Mayer, 1995; Sugai & Horner, 2002). In fact, 82% of the adult prison population is composed of high school dropouts (Coalition for Juvenile Justice, 2001).

Jerald (2006) found that students with both academic and behavioral challenges are more likely to drop out of school than students with problems in either one of those areas. Using a national longitudinal sample of youth and controlling for selection bias, Sweeten (2006) reported that even one appearance in court during high school for delinquent behavior increased the likelihood of dropping out of school by a factor of three. This effect was more pronounced for youths with less previous involvement in delinquent behavior. Research by Ekstrom, Goertz, Pollack, and Rock (1986) found that getting suspended from school was moderately correlated with higher dropout rates. These studies provide ample evidence of links between behavior problems and increased risk for dropping out.

Recent data from the Children's Defense Fund (2004) showed that about 11% of all students nationwide were retained for at least one grade. A study by Allensworth and Easton (as cited in Swain-Bradway, 2009) suggested that early academic success in high school is highly predictive of graduation. The researchers found that 81% of freshmen who earned enough credits in the first year to be promoted to 10th grade - and who failed no more than one core subject during the 9th grade year - graduated within four years. In comparison, only 22% of the freshmen who failed to meet these two criteria graduated on time. Other researchers have determined that students who fail to graduate can be predictably identified as early as sixth grade. Balfanz et al. (2007) conducted a longitudinal study of nearly 13,000 sixth grade students in Philadelphia over an eight-year period. The purpose of the study was to identify routinely collected data indicators that flag sixth graders who are likely to fail to graduate on time or within one year of their expected graduation. To be identified as an early warning flag, the variable had to have

high predictive power and have a high yield. Five flags, all having to occur during sixth

grade (i.e., the first year of middle school in this study's sample), were identified: (a)

attending school 80% of the time or less; (b) failing math; (c) failing English; (d)

receiving an out-of-school suspension; and (e) receiving a final grade of unsatisfactory in

conduct.

While much of the research associated with school failure has focused on risk

factors, some researchers have argued that a core competencies framework can be used to

encourage school success (Bradshaw et al., 2008). The authors posited that competencies

such as a positive sense of self, self-control, decision-making skills, a moral system of

belief, and prosocial connectedness can serve as a theoretical framework to promote

school success. The researchers highlighted several programs and policies that have been

implemented to promote success in school; some of these include Big Brothers/Big

Sisters and other mentoring programs, Check and Connect (Evelo, Sinclair, Hurley,

Christenson, & Thurlow, 1996), Behavior Education Program (Crone et al., 2004),

Parent-Child Home Program (Levenstein, Levenstein, Shiminski, & Stolzberg, 1998),

Promoting Alternative Thinking Strategies (Greenberg, Kusché, & Mihalic, 1998), and

Second Step (Grossman & Neckerman, 1997). Mayer et al. (1983) found that clarifying a

school's discipline policy, explicitly teaching desirable behavior to students, reducing the

use of punishment, training staff to increase emotional connectedness to students, and

differentiating instruction resulted in improvements in the school dropout rate for at-risk

students. Use of these positive behavior approaches made an impact, as dropout rates for

at-risk students decreased from what was typical for that area (50-80%) to the district

average of 33%.

While numerous programs exist that target students identified at-risk for dropping out or failing to graduate, there is little systematic research on schoolwide interventions that promote keeping students in school (Bradshaw et al., 2008). In a notable exception, PBIS implementation in a New Hampshire high school was associated with a decrease in the dropout rate from 17% to 3% over a five-year period (Cheney, Malloy, & Hagner, 1998).

Martin, Tobin, and Sugai (2002) reviewed schoolwide programs and strategies that have been used to promote school success and prevent students from leaving early. Some of these approaches included using student advisory programs, getting students involved in extracurricular activities, and expanding school-to-work programs. In addition, a meta-analysis of the literature on dropout prevention revealed five elements of successful dropout prevention programs: (a) school organizational features and administrative support, (b) positive school climate, (c) service delivery and instruction that are student-centered, (d) instructional content and curriculum that combines quality instruction with experiential learning, and (e) positive staff and teacher culture (Woods, 1995). Based on a review of the literature, the author outlined multiple recommendations to keep students in school. One of the recommendations has a direct link to the implementation of PBIS. Woods (1995) stated:

> Make a positive school climate and positive relationships high priorities in the school and in the classroom. Students need to feel attached to school as a supportive community that recognizes their individuality and that cares about and promotes their success. (p. 11)

Research Examining Student Achievement

Most school administrators deciding to invest time and effort in a comprehensive systems-change model such as PBIS want to know if implementation will have an impact on student achievement. This question is not easily answered given the multitude of factors that directly impact achievement (Horner et al., 2009). For example, Christle et al., (2005) found that poverty accounted for 33% of the variance in standardized test scores in a large sample of elementary schools in Kentucky. Nevertheless, many educators researching the effectiveness of PBIS implementation have examined the impact of implementation on student achievement. Horner et al. examined the academic achievement of third graders in a randomized, wait-list controlled study and found that the reading scores of the treatment group were significantly higher than those in the control group after one year of PBIS implementation.

Nelson, Martella et al. (2002) reported that implementation of PBIS in seven elementary schools in a district showed strong positive effects on reading achievement as compared to the remaining 28 elementary schools in the district serving as the control group. In a ten-year study on effective behavior and academic supports conducted in a midsized Oregon school district, Sadler and Sugai (2009) found a relationship between behavior and academic performance. Specifically, they determined that students with zero to one ODRs were more likely to meet state reading standards and earn higher scores on reading assessments than their peers. In other studies, at-risk students participating in PBIS programs designed to provide behavior and academic supports for small groups showed improved grades as a result of intervention (Gottfredson et al., 1996; Swain-Bradway, 2009).

While the studies of a few researchers have found some links between PBIS implementation and student achievement, others have been less conclusive in their findings. In a study of PBIS implementation in an urban middle school, Lassen et al. (2006) found that academic performance in reading and math was predicted by the number of ODRs and suspensions received by students. Students with fewer ODRs and suspensions had higher scores on reading and math achievement tests. However, the researchers noted that effect sizes were small, accounting for only 1% to 2% of the total variance. In a five-year longitudinal randomized controlled effectiveness trial of PBIS, Bradshaw et al. (2010) reported no significant differences in math or reading achievement scores of third- and fifth-graders between the control group and the experimental group. Although improvement in test scores tended to be greater for schools implementing PBIS, the results were not significant.

In an evaluation of PBIS in New Hampshire, a majority of schools reported to implement PBIS with fidelity were found to experience gains in math achievement (Muscott et al., 2008); however, the study did not indicate whether non-PBIS schools showed similar gains during the same time period. Additionally, less than half of the schools achieving fidelity showed associated gains in reading. Similarly, Luiselli et al. (2005) reported gains in reading comprehension and math scores in an elementary implementing PBIS. However, study limitations precluded drawing conclusions about the relationship to PBIS implementation because achievement scores were not compared to either a control school or to other elementary schools in the state.

Because academic achievement is affected by more salient factors than behavior (Algozzine & Algozzine, 2009; Horner et al., 2009), it is not surprising that research

studying the relationship between achievement and PBIS implementation has produced inconsistent findings. Those who believe that increasing instructional minutes in the classroom will result in academic gains assume that every student is receiving quality instruction (Algozzine & Algozzine, 2009). The authors further state that if quality instruction "has not been verified, researchers will continue to have a difficult time finding a causal relationship between decreased ODRs and increased academic gains" (p. 526). As research by Morrissey (2009) suggests, it is likely that specific focus must be given to changing variables that more directly affect student learning (i.e., improving teacher behaviors that have been found to positively impact student learning and ensuring quality instruction is occurring) in order to see differences in achievement. Research by Horner, Sugai, and Vincent (2005) supports the integration of schoolwide behavior and academic supports in order to see benefits to both behavior and academic performance.

Conclusion

Numerous studies suggest promising results of using the PBIS model to improve school climate and reduce student misbehavior. However, the majority of studies have been nonrandomized samples of one or two schools or large groups of schools (Bradshaw et al., 2010). One notable exception is the Horner et al. (2009) randomized, wait-list controlled effectiveness research study that examined the functional relationship between the delivery of PBIS implementation procedures by regular school personnel, rather than outside consultants, and the fidelity of PBIS practices used in elementary schools. Results of the study indicated that regular school personnel provided the training and assistance necessary to implement PBIS practices with fidelity. In another randomized controlled effectiveness trial completed by Bradshaw et al. (2010), schools that received

training implemented PBIS with high fidelity and sustained high fidelity implementation for the length of the trial.

Beyond studies of small samples of schools, there have been few studies conducted on the impact of statewide PBIS initiatives on key student outcomes. Recently, however, a handful of states have published results of statewide PBIS studies. A study by Mass-Galloway et al. (2008) evaluated Iowa's PBIS initiative over a three-year period. Schools participating in this study were trained using identical PBIS models and also had access to PBIS coaches that aided in the implementation of the program. The study looked at three factors: (a) implementing PBIS with fidelity, (b) the use of PBIS to effectively change patterns of problem behavior, and (c) the impact of PBIS in affecting a school's ability to implement more intense behavior supports.

The researchers examined data from 39 schools in Iowa across four cohorts (Mass-Galloway et al., 2008). Cohort 1 began PBIS training and implementation in the fall of 2002 with eight schools. These schools were considered demonstration sites throughout the three years of research. In the fall of 2003 seven other sites were trained and began implementation (Cohort 2), and in the fall of 2004, 24 sites were added (Cohort 3). PBIS evaluation measures such as the SET and TIC as well as ODRs were used to measure fidelity and outcomes.

The SET data showed that when schools implemented PBIS with fidelity and integrity (80% or higher), positive outcomes were more likely. Furthermore, the study showed that when given the needed tools, schools were able to reliably implement key PBIS features (Mass-Galloway et al., 2008). In Cohorts 1 and 3, 75% of the schools demonstrated a 42% decrease in office discipline referrals, although office discipline

referrals increased in Cohort 2. The study did not provide enough data for researchers to identify whether schools with PBIS were better able to address individuals with specific behavior problems.

The statewide PBIS initiative in New Hampshire was evaluated in 2007 (Muscott et al., 2008). Their focus was to assess the effect of Tier 1 PBIS procedures on discipline and academic outcomes in 28 schools after one year of implementation. Fidelity measures examined included a team checklist, the SAS, and the SET while outcome measures examined were ODRs, out-of-school suspensions, in-school suspensions, and reading and math scores. After one year of implementation, 88% of schools were found to implement with fidelity (80% or higher on the SET). Schools showed decreases in ODRs (28%), out-of-school suspensions (19%), and in-school suspensions (31%). Lastly, implementation of PBIS was found to be associated with gains in math for the majority of schools in the sample; however, gains in reading were evident in less than half the schools achieving PBIS fidelity.

The third statewide evaluation of PBIS found in the literature occurred in Maryland and was conducted by Barrett et al. (2008). This extensive evaluation analyzed the impact of PBIS implementation in over 400 schools. Fidelity measures included in the study were the TIC, the SET, a checklist for PBIS coaches, and an inventory measuring the phases of PBIS implementation. Outcomes measures examined were ODRs, suspension rates, and a staff survey. Needs assessment were also conducted to gather information about training and support needs. Schools studied in the Maryland PBIS evaluation were found to implement PBIS with high fidelity and to have lower office discipline referral rates and suspension rates.

Most recently, Florida's PBIS initiative was evaluated by Childs et al. (2010). A number of research questions were developed and some of the evaluation process is still on-going. Childs et al. used a number of the inquiries in the pivotal evaluation template developed by Horner, Sugai, and Lewis-Palmer (2005) to guide their evaluation. Fidelity was evaluated using the BoQ, an implementation survey, and a team process evaluation. Outcome measures included ODRs, out-of-school suspensions, in-school suspensions, and reading scores. Over 300 schools in Florida were included in the study sample. Some of the key research questions by Childs et al. included the following:

1. Are schools trained in Universal PBIS implementing with fidelity? Across years? Across school levels?

2. Do PBIS teams that work well together implement with greater fidelity?

3. Do schools implementing PBIS decrease ODRs, days of in-school suspension, and days of out-of-school suspension?

4. Do schools implementing PBIS realize an increase in student achievement?

5. Do schools implementing with high fidelity have greater outcomes than do implementers with low fidelity?

6. Do teams that work well together have greater outcomes than those that do not work as well together?

7. Why do schools discontinue implementation of PBIS?

8. Are consumers of PBIS satisfied with the training, technical assistance, products, and support received? (p. 201)

There were several key findings in the Florida study (Childs et al., 2010). In regards to fidelity of implementation, over half of all active PBIS schools scored a 70 or

76

higher on the BoQ, indicating high fidelity of implementation. Further, fidelity of implementation was found to increase across years of implementation. Schools moved from an average BoQ score of 66 during the first administration of the instrument to an average score of 75 in the second and third years. There was a difference in fidelity noted across school level. Alternative schools demonstrated the highest BoQ scores, followed by elementary, middle, and high schools. In evaluating the impact of team functioning on fidelity, the researchers found that both high and low implementing schools scored relatively high on team functioning. Thus, they concluded that the measure of team functioning did not effectively differentiate between high and low performing schools.

In regards to impact on student behavior and achievement, Childs et al. (2010) reported overall percentage decreases in ODRs and in-school suspensions and a slight overall percentage increase in out-of-school suspensions. The overall percentage decrease in ODRs was found to be statistically significant. Analyzing Florida Comprehensive Assessment Test reading scores from 2004 to 2007, the authors indicated that PBIS schools had a higher percentage of students reaching performance on grade level when compared to the statewide average. Schools implementing PBIS with high fidelity showed substantially different effects on all four outcome measures. Similar to the findings on team functioning in relation to fidelity, the evaluation revealed that there was no difference on outcome data based on team functioning.

The main issues surrounding a school's decision to discontinue participation in Florida's PBIS initiative were (a) high rate of administrative and staff turnover, (b) lack of time, and (c) lack of commitment (Childs et al., 2010). Consumer satisfaction was

rated as high, with 82% of respondents reporting that support from Florida PBIS was helpful or somewhat helpful, staff members were professional and respectful, and resources and materials were useful.

The statewide studies of PBIS implementation outlined here provide a useful framework for creating an evaluation plan of Kentucky's PBIS initiative. The Florida evaluation plan is especially relevant as it provides in-depth information regarding implementation fidelity, impact on student behavior and academics, and training and technical assistance issues. Statewide program evaluations have (a) provided critical information about what is working and not working at the statewide level in regards to training and technical assistance, (b) demonstrated that PBIS implementation has a significant impact on student behavior outcomes, and (c) allowed state organizations to begin answering crucial questions about the value of funding large scale PBIS initiatives (Childs et al., 2010). Completion of a program evaluation in Kentucky will provide valuable information for state, district, and school level stakeholders in the Commonwealth as well as for the national PBIS movement. To that end, the current study investigated the following research questions:

1. Are schools in western Kentucky implementing universal PBIS with fidelity over time and across school level?

2. How does universal PBIS implementation affect student outcome measures over time and across school level?

   a. Does PBIS implementation affect office discipline referrals

   b. Does PBIS implementation affect out-of-school suspensions?

   c. Does PBIS implementation affect high school graduation rate?

d. Does PBIS implementation affect the school dropout rate?

e. Does PBIS implementation affect the student retention rate?

f. Does PBIS implementation affect student achievement in reading?

g. Does PBIS implementation affect student achievement in math?

Chapter 3: Method

The study addressed the impact of PBIS implementation on schools in western Kentucky. Specifically, the following issues were addressed: (a) schools' implementation of the PBIS model with fidelity by year of implementation and by school level and (b) the impact of implementation on student outcomes. This chapter outlines the research methods used to investigate PBIS implementation in Kentucky.

Participants

The study was conducted with 56 schools in western Kentucky that had received training from the KYCID and had been implementing PBIS for at least three school years. The schools were located in 22 districts, which varied with regard to size. The sample of schools was diverse and representative of schools across other parts of western Kentucky. Fifty percent of the participating schools were rural, 37.5% were town, and 12.5% were city or suburban. All 56 schools received Title 1 support. Table 1 depicts demographic variables by school level. Average elementary and middle schools sizes were comparable with high schools being slightly larger. One high school was much larger than all other schools with a student population of 1,960. The free and reduced lunch rate was comparable across all three school levels but with more variance at the elementary level than at the middle and high school levels. The percentage of students identified as Caucasian was roughly equivalent for elementary, middle, and high schools with elementary schools having the most variance.

Table 1

School Demographic Information

Demographic Variable	Elementary (*n* = 29)		Middle (*n* = 17)		High (*n* = 10)	
	M	*SD*	*M*	*SD*	*M*	*SD*
School Size	497.41	147.08	528.59	186.77	727.90	477.40
Free/Reduced Lunch Rate (%)	55.76	15.11	56.47	11.10	53.40	9.36
Caucasian Students (%)	78.93	19.61	83.94	14.86	80.80	16.96

Informed consent to participate in the study was obtained from each school principal and district superintendent (see Appendices E and F). There was a 100% participation rate. In order to be considered for the study, schools had to have (a) received training in universal tier PBIS supports, (b) been implementing PBIS for at least three years, and (c) collected data regarding fidelity of implementation for the three years of implementation. Therefore, although the KYCID has provided training to over 350 schools since 2005, only 56 schools met the criteria for inclusion. Approval for the study was granted by the Institutional Review Board of Western Kentucky University (see Appendix G).

Measures

Fidelity of implementation.

Fidelity of PBIS implementation was evaluated through examination of both the Schoolwide Evaluation Tool (SET) and Benchmarks of Quality (BoQ) instruments. Both the SET and BoQ are research-validated measures that assess the development and implementation of PBIS across several critical elements (Bradshaw et al., 2009). The

SET and BoQ have been found to measure similar constructs and to be moderately correlated ($r = .51$; Cohen et al., 2007). The SET or BoQ is used annually to evaluate strengths and identify areas of need, and results are intended for use in action planning.

In the early years of Kentucky's PBIS initiative, the SET was used for annual assessment of universal PBIS implementation. However, it became overly time consuming and costly to administer the SET as the number of schools being trained increased. When the BoQ was published, the KYCID decided to use it in order to ensure that all schools would have annual evaluation of universal implementation with a psychometrically sound instrument. In the current study, SET results were used to assess fidelity of implementation for the baseline year and after one year of implementation, and the BoQ results were used to measure fidelity for the second and third years.

Schoolwide Evaluation Tool.

The SET is a research-validated measure that assesses the development and implementation of PBIS across several critical elements (Bradshaw et al., 2009). The SET is used annually to evaluate strengths and identify areas of need, and results are used for action planning. There are seven critical implementation elements evaluated with the SET (Sugai, Lewis-Palmer et al., 2001). The instrument yields subscale scores for the seven elements as well as a total score. Scores range from 0% to 100%. Higher scores indicate higher fidelity of universal PBIS implementation. Studies by Doolittle (2006) and Horner et al. (2004) suggested that a school receiving an 80% or higher on the total score as well as an 80% or higher on the subscale measuring the teaching of behavior expectations demonstrates high levels of universal PBIS implementation fidelity. Horner et al. (2004) found the SET assessment to have strong psychometric properties including

internal consistency (α = .96), test-retest reliability for all seven critical elements (r = .89 – 1.00), and construct validity (r = .75).

Benchmarks of Quality.

The Benchmarks of Quality (BoQ) was developed by Florida PBIS at the University of South Florida (Kincaid et al., 2005) and is used for annual assessment of PBIS universal level functioning. Survey items are based on the critical elements of PBIS that are outlined by Lewis and Sugai (1999). The instrument includes 53 items across ten critical elements (Kincaid et al., 2005). Schools with a total score of 70 or higher are considered to implement Tier 1 PBIS with high fidelity while schools with a total score of less than 70 are considered to implement with low fidelity (Childs et al., 2010). Cohen et al. (2007) found the BoQ to have strong psychometric properties including internal consistency (α = .96), test-retest reliability (r = .94), and interrater reliability (α = .87).

Student outcome data.

The second research question evaluated the impact of PBIS implementation on the student outcome variables of ODRs, out-of-school suspensions, graduation rate, retention rate, dropout rate, reading achievement, and math achievement. ODR rates were computed by dividing the total number of referrals per school per year by the total enrollment per school per year divided by 100 to get a referral rate per 100 students. Baseline ODR data was not collected for two reasons: (1) many schools in the study did not keep records of behavior discipline events before beginning PBIS implementation, and (2) the validity of ODR data when collected without a systematic process has been questioned by some researchers (Irvin et al., 2004). Four of the 56 schools in the sample

were excluded from ODR analysis because of incomplete ODR data across the three years studied.

Out-of-school suspension rates were computed in the same manner as ODRs. Suspensions were computed by dividing the total number of suspensions per school per year by the total enrollment per school per year divided by 100 to get a suspension rate per 100 students. This computation allowed for comparison by schools across time without regard to population increases or decreases.

Graduation, dropout, and retention rates were reported as percentages as calculated by schools and reported annually to the Kentucky Department of Education. One high school was omitted from the sample of 56 for the analysis of graduation, dropout, and retention rates because they reported errors in their data.

Reading and math achievement was measured by examining the percentage of students in each school earning a rating of proficient or distinguished on the Kentucky Core Contents Test for reading and math for each year of the study.

Research Design

The study involved use of a causal-comparative research design. The purpose of causal-comparative research is to determine the cause of differences between groups (Johnson & Christensen, 2000). In causal-comparative research, the independent variable has already occurred and random assignment to groups is not possible. Because it is not truly experimental in design, determination of cause is less robust than in experimental studies. In the current study, since experimental manipulation of variables was impossible because treatment (i.e., PBIS implementation) had already occurred, causal-comparative research was the most appropriate design.

Johnson and Christensen (2000) state that the term causal-comparative design is outdated and should be replaced with nonexperimental research. According to the authors, nonexperimental research can be classified into one of three designs based on the primary research objective: descriptive, predictive, or explanatory. They also suggest that nonexperimental research can be classified according to time dimension: cross-sectional, longitudinal, or retrospective. Using their terminology, the current study would be classified as explanatory and longitudinal nonexperimental research. Explanatory research helps explain how a model operates by identifying factors that produce change in it. Longitudinal data are collected at multiple points in time and comparisons are made across time (Johnson & Christensen).

To make the strongest case possible of causality, researchers should consider the three necessary conditions for cause and effect (Johnson & Christensen, 2000). First, the variables being studied must be related. Second, proper time order is a requirement; that is, if changes in variable 1 cause changes in variable 2, variable 1 must happen before variable 2. Third, any observed relationship must not be due to a confounding variable.

Procedures

Schools participating in Kentucky's PBIS project allowed baseline data to be collected prior to beginning training with KYCID. Baseline information about current level of universal PBIS implementation was collected from administration of the SET. In addition, ODR and suspension data were provided, and graduation, dropout, and retention rates (as appropriate to school level) were accessed from the website of the Kentucky Department of Education. The percentage of students achieving either proficient or distinguished status in reading and math was also collected for analysis. The goal in

Kentucky is for 100% of students to score at the proficient to distinguished level by 2014; therefore, the examination of these scores in the current study yielded information about the growth of reading and math scores in PBIS schools. This information was accessed from the website of the Kentucky Department of Education. At the end of the first year of implementation, these data points were collected again. At the end of the second and third years of implementation, all outcome data measures were collected along with data from administration of the BoQ which was used in place of the SET.

Data Analysis

The study was conducted with elementary and secondary schools in western Kentucky. Data from 56 schools over a three-year period were analyzed to determine if schools implemented with fidelity over time. In addition, fidelity was analyzed to determine if there were differences in implementation based on school level. The analysis also provided information about how PBIS implementation affected key student outcome data. The rationale for the study was framed within the following research questions:

1. Are schools in western Kentucky implementing universal PBIS with fidelity over time and across school level?

2. How does universal PBIS implementation affect student outcome measures over time and across school level?

   a. Does PBIS implementation affect office discipline referrals?

   b. Does PBIS implementation affect out-of-school suspensions?

   c. Does PBIS implementation affect high school graduation rate?

   d. Does PBIS implementation affect the school dropout rate?

e. Does PBIS implementation affect the student retention rate?

f. Does PBIS implementation affect student achievement in reading?

g. Does PBIS implementation affect student achievement in math?

Upon collection and entry of all data into an Excel spreadsheet, data were exported into SPSS v. 18 for analysis. The first research question was designed to determine if schools in western Kentucky implemented universal PBIS with fidelity over time and across school level. For this question, the independent variables were years of implementation and school level (categorical), and the dependent variable was level of implementation fidelity (continuous).

A split plot analysis of variance (ANOVA; Shavelson, 1996) was used to answer the first research question. The purpose of a split plot ANOVA is to determine whether "the observed difference between means may be due to chance or to systematic differences among the population means" (Shavelson, 1996, p. 485). There are several design requirements inherent to the split plot ANOVA (Shavelson, 1996). Each requirement and its relationship to research question one is explained:

1. There are two types of independent variables, between-subjects and within-subjects and each variable can have multiple levels. In this study, the between-subjects variable is school level with three levels (elementary, middle, and high). Years of implementation is a within-subjects variable with four levels (i.e., Baseline, Year 1, Year 2, and Year 3).

2. The between-subjects variable is either manipulated by the researcher or measured by the researcher. The between-subjects variable, school level, is

measured. That is, subjects are sampled from their respective populations (i.e., elementary, middle, or high).

3. For the within-subjects variable, if repeated measures are taken, each block contains one subject. For the repeated measures case, the order of the treatment conditions should be randomized except in cases where treatment precludes randomized order. In the current study, evaluation occasion (i.e., Baseline, Year 1, Year 2, Year 3) precludes randomization of presentation order.

The purpose of the second research question was to evaluate how universal PBIS implementation affected student outcome measures by year of implementation and across school level. To answer each subpart, the independent variables were years of implementation and school level (categorical), and the dependent variable was the student outcome variable (continuous). As with question one, a split plot ANOVA (Shavelson, 1996) was used to answer the question. Thus, seven separate repeated measures ANOVAs were conducted. Design requirements were similar to those in question one. Because repeated measures of all dependent variables were pre-post in nature, randomization of presentation order was precluded.

Chapter 4: Results

The current study sought to determine the impact of PBIS implementation in Kentucky schools. The first research question, are schools in western Kentucky implementing universal PBIS with fidelity over time and across school level, was examined through repeated measures ANOVA. The second question evaluated how universal PBIS implementation affected student outcome measures of (a) office discipline referrals, (b) out-of-school suspensions, (c) graduation rate, (d) dropout rate, (e) retention rate, (f) reading achievement, and (g) math achievement over time and across school. Each question and subpart is addressed in a separate section. Each section is organized by an analysis of descriptive statistics, ANOVA results, and then post hoc analyses.

Analysis of Fidelity of Implementation for Year of Implementation and School Level

Descriptive statistics of the fidelity measures are summarized for year of implementation and school level in Table 2. Examination of the mean scores by implementation year indicates that the total mean scores of fidelity for all three groups increased from Baseline to Year 3 with a slight dip in Year 2. The dip in the total means seems to be associated with the change of the fidelity measures from SET at Baseline and Year 1 to BoQ at Year 2 and Year 3. A score of 80 on the SET is comparable to a score of 70 on the BoQ. Even though the total mean was slightly lower at Year 2 than at Year 1, it was nevertheless above the fidelity threshold of 70 for the BoQ. Review of the standard deviation (*SD*) of fidelity scores suggests that schools showed a wider range of baseline scores; however, the *SD*s decreased considerably by the third year of implementation. The decrease in *SD*s suggests that more schools at Year 3 obtained fidelity scores closer to the mean (*M* = 82.66). The mean fidelity scores are generally

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greater at the elementary school level than those at the other levels. This pattern

exhibited consistently over the three years of PBIS implementation including baseline

year.

Table 2

Descriptive Statistics of Fidelity Measures for Year of Implementation and School Level

Year	School Level	*M*	*SD*	*N*
Baseline	Elementary	62.66	16.26	29
	Middle	42.41	20.15	17
	High	43.10	22.03	10
	Total	53.02	20.83	56
1	Elementary	86.52	8.84	29
	Middle	63.00	14.23	17
	High	68.80	13.62	10
	Total	76.21	15.78	56
2	Elementary	77.28	11.60	29
	Middle	74.00	13.28	17
	High	68.70	12.26	10
	Total	74.75	12.43	56
3	Elementary	84.21	9.76	29
	Middle	81.41	9.51	17
	High	80.30	14.57	10
	Total	82.66	10.60	56

A repeated measures ANOVA was conducted to examine fidelity of PBIS implementation for year of implementation and school level and to evaluate interaction effects between year of implementation and school level. The independent variables were years of implementation and school level, and the dependent variable was fidelity of PBIS implementation as measured by the total score received on the SET at Baseline and Year 1 and the BoQ at Year 2 and Year 3. Prior to conducting the repeated measures ANOVA, the assumption of sphericity was checked through Mauchly's Test. The test revealed that the assumption of sphericity is violated ($\chi^2 = 26.08$, $p < .05$). Therefore, degrees of freedom were corrected using Huynh-Feldt estimates in the following univariate analyses of within- and between-subject effects.

Table 3 presents the results of repeated measures ANOVA on fidelity of implementation. The significant within-subjects effect for years of implementation ($F = 64.53$, $p < .05$) suggests that scores on the fidelity measures changed over time. There is also a significant interaction effect by time and school level ($F = 5.01$, $p < .05$). This result indicates that the changes over time are different by school level. Analysis of between-subjects effects, depicted in Table 3, reveals that the means of the three school levels are significantly different from one another ($F = 13.56$, $p < .05$). Based on the effect size measures, the time factor is found to contribute the most to the variations of the fidelity measure scores ($\eta^2 = .55$).

Table 3

ANOVA Results of Fidelity Measures for Year of Implementation and School Level

Effect	Factor	SS	df	MS	F	η^2
Within	Year (Y)	27250.28	2.41	11320.88	64.53[*]	0.55
	Year by School Level (Y x S)	4227.95	4.81	878.23	5.01[*]	0.16
Between	School Level (S)	8670.23	2.00	4335.12	13.56[*]	0.34

Note. [*]$p < .05$.

Post hoc analysis was conducted for the significant differences in the fidelity measures scores for year of implementation using the Bonferroni adjustment. The post hoc comparison results summarized in Table 4 indicate that the Baseline and Year 1 scores, Baseline and Year 2 scores, Baseline and Year 3 scores, Year 1 and Year 3 scores, and Year 2 and Year 3 scores are significantly different from one another. This suggests that the noted gains in fidelity scores are significant across time. Scores between Year 1 and 2 are not significant.

Table 4

Post Hoc Comparisons of Fidelity Measures for Year of Implementation

Year (I)	Year (J)	Mean Difference (I-J)	*SE*
Baseline	1	-23.38[*]	2.62
	2	-23.94[*]	3.19
	3	-32.58[*]	2.73
1	Baseline	23.38[*]	2.62
	2	-.55	2.16
	3	-9.20[*]	1.98
2	Baseline	23.94[*]	3.19
	1	.55	2.16
	3	-8.65[*]	1.79
3	Baseline	32.58[*]	2.73
	1	9.20[*]	1.98
	2	8.65[*]	1.79

Note. [*]$p < .05$.

Table 5 displays the results of the post hoc analysis for the significant differences in fidelity scores among different school levels. The results indicate there are no differences in the pattern of implementation across time between middle and high schools; however, elementary schools show a significantly different pattern of implementation than both middle and high schools.

Table 5

Post Hoc Comparisons of Fidelity Measures for School Level

School Level (I)	School Level (J)	Mean Difference (I-J)	SE
Elementary	Middle	12.46[*]	2.73
	High	12.44[*]	3.28
Middle	Elementary	-12.46[*]	2.73
	High	-.02	3.56
High	Elementary	-12.44[*]	3.28
	Middle	.02	3.56

Note. [*]*p* < .05.

As shown in Figure 3, further examination of the patterns of implementation over time reveal that all three types of schools showed an increasing trend from Baseline to Year 3 of implementation. Elementary, middle, and high schools had mean baseline SET scores below the 80% fidelity threshold, with elementary schools showing higher scores than middle and high schools. The mean score of elementary schools remained higher than middle and high schools after one year of implementation but all three school levels had similar mean scores at the end of years 2 and 3.
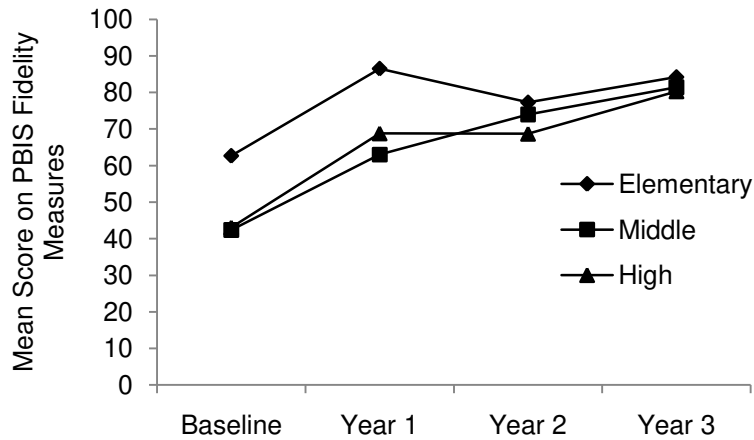
Figure 3. Mean differences of fidelity measures for year of implementation and school level.

In summary, results of the analysis on fidelity of implementation indicate that schools in western Kentucky are implementing universal PBIS with fidelity over years of implementation and by school level. Mean scores on fidelity measures for elementary, middle, and high schools trended upward from Baseline to Year 3 of PBIS implementation.

Analysis of Office Discipline Referral Rates for Year of Implementation and School Level

Descriptive statistics of the office discipline referral rates are summarized for year of implementation and school level in Table 6. Examination of the mean scores by implementation year indicates that the total mean scores of office discipline referral rates for all three groups decreased from Year 1 to Year 3. Elementary and middle school mean scores decreased from Year 1 to Year 3 while high school mean scores decreased from Year 1 to Year 2 and then increased in Year 3. Review of the *SD*s of office discipline referral rates suggests that office referral rates among middle and high schools

varied greatly. The *SD*s for middle schools in Year 1 and for high schools in Year 3 were particularly large. The mean office referral rates were lower at the elementary school level than those at the other levels. This pattern exhibited consistently over the three years of PBIS implementation.

Table 6

Descriptive Statistics of Office Discipline Referral Rates for Year of Implementation and School Level

Year	School Level	*M*	*SD*	*N*
1	Elementary	56.77	34.32	29
	Middle	231.55	166.23	15
	High	156.00	77.61	8
	Total	122.46	123.24	52
2	Elementary	46.55	27.18	29
	Middle	149.70	97.06	15
	High	147.41	72.42	8
	Total	91.82	79.67	52
3	Elementary	37.81	24.03	29
	Middle	132.32	87.51	15
	High	163.69	102.87	8
	Total	84.44	82.27	52

A repeated measures ANOVA was conducted to examine office referral rates for year of implementation and school level and to evaluate interaction effects between year of implementation and school level. The independent variables were years of

implementation and school level, and the dependent variable was office referral rates

calculated as a number of referrals per year per 100 students.

Table 7 presents the results of repeated measures ANOVA on office discipline

referral rates. The significant within-subjects effect for referral rates ($F = 11.48$, $p < .05$)

suggests that office discipline referral rates changed over years of implementation. There

is also a significant interaction effect by time and school level ($F = 8.37$, $p < .05$). This

result indicates that the changes over time are different by school level. Analysis of

between-subjects effects, depicted in Table 7, reveals that the means of the three school

levels are significantly different from one another ($F = 18.92$, $p < .05$). Based on the

effect size measures, the school level factor is found to contribute the most to the

variations of the office discipline referral rates ($\eta^2 = .44$).

Table 7

ANOVA Results of Office Discipline Referrals Rates for Year of Implementation and

School Level

Effect	Factor	*SS*	*df*	*MS*	*F*	η^2
Within	Year (Y)	33080.37	1.44	23024.49	11.48[*]	0.19
	Year by School Level (Y x S)	48255.86	2.87	16793.44	8.37[*]	0.26
Between	School Level (S)	546481.42	2.00	273240.71	18.92[*]	0.44

Note. [*]$p < .05$.

Post hoc analysis was conducted for the significant differences in the office

referral rates for year of implementation. The post hoc comparison results summarized in

Table 8 indicate that the Year 1 and Year 2 scores and Year 1 and Year 3 scores are

significantly different from one another. This suggests that the decreases in office

referral rates are significant across those time periods. Scores between Year 2 and Year 3

are not significant.

Table 8

Post Hoc Comparisons of Office Referral Rates for Year of Implementation

Year (I)	Year (J)	Mean Difference (I-J)	*SE*
1	2	33.56[*]	8.43
	3	36.84[*]	10.79
2	1	-33.56[*]	8.43
	3	3.28	5.46
3	1	-36.84[*]	10.79
	2	-3.28	5.46

Note. [*]$p < .05$.

Table 9 displays the results of the post hoc analysis for the significant differences

in office discipline referral rates among different school levels. The results indicate that

there are no differences in the pattern of office referral rates across time between middle

and high schools; however, elementary schools show a significantly different pattern of

implementation than both middle and high schools.

Table 9

Post Hoc Comparisons of Office Referral Rates for School Level

School Level (I)	School Level (J)	Mean Difference (I-J)	*SE*
Elementary	Middle	-124.15[*]	22.07
	High	-108.66[*]	27.71
Middle	Elementary	-124.15[*]	22.07
	High	15.49	30.37
High	Elementary	108.66[*]	27.71
	Middle	-15.49	30.37

Note. [*]$p < .05$.

As shown in Figure 4, further examination of the patterns of office discipline referral rates over time reveal that middle schools show a significant decreasing trend, especially from Year 1 to Year 2. Elementary schools show a slight decreasing trend each year. High schools show a slight decrease from Year 1 to Year 2 and then an increase in Year 3.
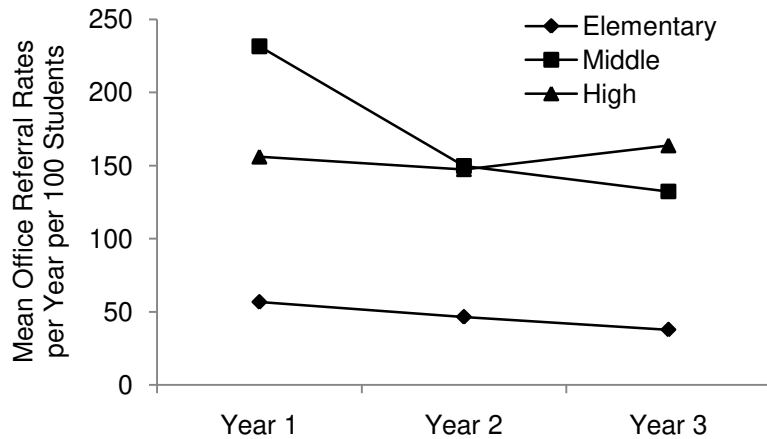
Figure 4. Mean differences of office discipline referral rates for year of implementation and school level.

In summary, results of the analysis on office referral rates indicate that schools in western Kentucky who are implementing PBIS showed significant decreases in office discipline referrals over time. There were differences in the decrease of office referrals by school level and by year of implementation.

Analysis of Out-of-School Suspension Rates for Year of Implementation and School Level

Descriptive statistics of the out-of-school suspension rates are summarized for year of implementation and school level in Table 10. Examination of the mean scores by implementation year indicates that the total mean scores of out-of-school suspensions for

all three groups decreased from Baseline to Year 3. Overall mean scores were highest for middle schools at baseline, followed by high schools and elementary schools. There was very little difference in the mean suspensions scores of elementary schools from Baseline to Year 3 while middle and high schools had more pronounced decreases. The *SD*s of suspension scores were extremely large for middle schools at Baseline and Year 1. Examination of individual school data revealed that two middle schools had suspension rates at Baseline and Year 1 that were markedly higher than the other middle schools which contributed to the large *SD*s.

Table 10

Descriptive Statistics of Out-of-School Suspension Rates for Year of Implementation and School Level

Year	School Level	*M*	*SD*	*N*
Baseline	Elementary	3.75	5.70	29
	Middle	27.91	27.82	17
	High	18.44	9.17	10
	Total	13.71	19.34	56
1	Elementary	3.21	5.71	29
	Middle	25.74	34.77	17
	High	14.65	9.12	10
	Total	12.09	21.96	56
2	Elementary	3.25	5.41	29
	Middle	14.30	12.36	17
	High	15.31	11.63	10
	Total	8.76	10.71	56
3	Elementary	2.70	5.49	29
	Middle	13.49	10.87	17
	High	14.22	8.25	10
	Total	8.03	9.59	56

A repeated measures ANOVA was conducted to examine out-of-school suspension rates for year of implementation and school level and to evaluate interaction effects between year of implementation and school level. The independent variables

were years of implementation and school level, and the dependent variable was out-of-school suspensions calculated as a number of suspensions per year per 100 students.

Table 11 presents the results of repeated measures ANOVA on out-of-school suspensions. The significant within-subjects effect for years of implementation ($F = 6.82$, $p < .05$) suggests that out-of-school suspension rates changed over time. There is also a significant interaction effect by time and school level ($F = 4.61$, $p < .05$). This result indicates that the changes over time are different by school level. Analysis of between-subjects effects, depicted in Table 11, reveals that the means of the three school levels are significantly different from one another ($F = 11.22$, $p < .05$). Based on the effect size measures, the school level factor is found to contribute the most to the variations of the office discipline referral rates ($\eta^2 = .30$).

Table 11

ANOVA Results of Out-of-School Suspension Rates for Year of Implementation and School Level

Effect	Factor	*SS*	*df*	*MS*	*F*	η^2
Within	Year (Y)	1321.08	1.45	910.17	6.82[*]	0.11
	Year by School Level (Y x S)	1787.83	2.90	615.87	4.61[*]	0.15
Between	School Level (S)	13804.06	2.00	6902.03	11.22[*]	0.30

Note. [*]$p < .05$.

Post hoc analysis was conducted for the significant differences in the out-of-school suspension rates for years of implementation. The post hoc comparison results summarized in Table 12 indicate that there are significant differences in out-of-school suspension means between Baseline and Year 2 and Baseline and Year 3. No significant

differences are evident between Baseline and Year 1, Year 1 and Year 2, Year 1 and Year 3, or Year 2 and Year 3.

Table 12

Post Hoc Comparisons of Out-of-School Suspension Rates for Year of Implementation

Year (I)	Year (J)	Mean Difference (I-J)	SE
Baseline	1	2.16	1.00
	2	5.74[*]	1.61
	3	6.56[*]	1.77
1	Baseline	-2.16	1.00
	2	3.58	2.07
	3	4.40	2.25
2	Baseline	-5.74[*]	1.61
	1	-3.58	2.07
	3	0.82	0.77
3	Baseline	-6.56[*]	1.77
	1	-4.40	2.25
	2	-0.82	0.77

Note. [*]$p < .05$.

Table 13 displays the results of the post hoc analysis for the significant differences in out-of-school suspension rates among different school levels. The results indicate there are no differences in out-of-school suspensions over time between middle and high schools; however, elementary schools show a significantly different pattern of out-of-school suspensions than both middle and high schools.

Table 13

Post Hoc Comparisons of Out-of-School Suspension Rates for School Level

School Level (I)	School Level (J)	Mean Difference (I-J)	*SE*
Elementary	Middle	-17.13[*]	3.79
	High	-12.43[*]	4.55
Middle	Elementary	17.13[*]	3.79
	High	4.71	4.94
High	Elementary	12.43[*]	4.55
	Middle	-4.71	4.94

Note. [*]*p* < .05.

As shown in Figure 5, further examination of the patterns of out-of-school suspension rates over time reveal that all three types of schools show a decreasing trend in suspensions from Baseline to Year 3 of PBIS implementation. While elementary schools show a slight downward trend, both middle and high schools show more pronounced reductions in out-of-school suspensions. Because elementary suspension rates were generally low at baseline and remained low across the years of the study, there was a significant difference in their pattern of suspensions as compared to middle and high schools. Middle schools, particularly, showed a marked decline in suspensions, decreasing from a mean of 27.91 suspensions per 100 students at baseline to a mean of 13.49 at Year 3.
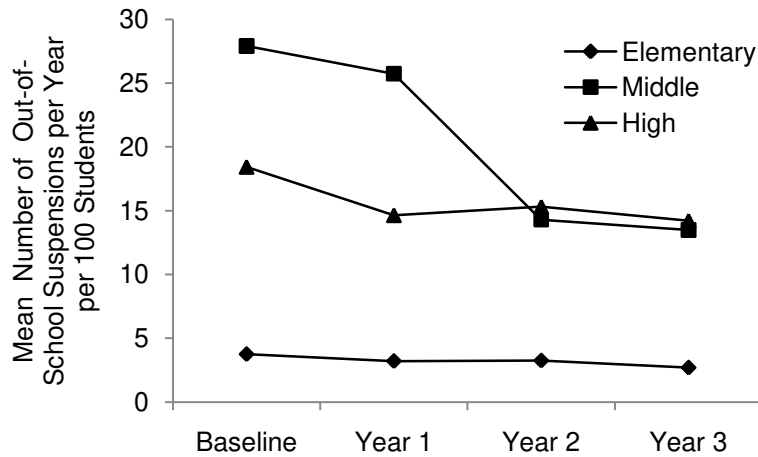
Figure 5. Mean differences of out-of-school suspension rates for year of implementation

and school level.

In summary, results of the analysis on out-of-school suspension rates indicate that

schools in western Kentucky implementing PBIS showed significant decreases in out-of-

school suspensions for year of implementation. Further, there were differences in the

decrease of suspensions by school level.

Analysis of Graduation Rates for Year of Implementation

Descriptive statistics of graduation rates are summarized for year of

implementation in Table 14. Only high school data was examined for this analysis since

only high schools track graduation rates. Examination of the high school data indicates

that the mean graduation rate was virtually unchanged from Baseline to Year 3. The

mean graduation rate was highest at baseline followed by Year 3, Year 2 and Year 1.

The *SD*s of graduation rates ranged from 3.30 to 5.22, suggesting that graduation rates

varied moderately across the sample of nine schools.

Table 14

Descriptive Statistics of High School Graduation Rates for Year of Implementation

Year	*M* (%)	*SD*	*N*
Baseline	87.14	5.22	9
1	84.91	3.30	9
2	85.64	4.35	9
3	86.36	4.74	9

A repeated measures ANOVA was conducted to examine graduation rates for year of implementation. The independent variable was years of implementation, and the dependent variable was graduation rate reported as a percentage of students who were first counted as freshman and graduated in four years. The analysis indicated that there was no significant within-subjects effect for graduation rate. As shown in Figure 6, the graduation rate for the high schools under study is relatively stable across the years of evaluation.
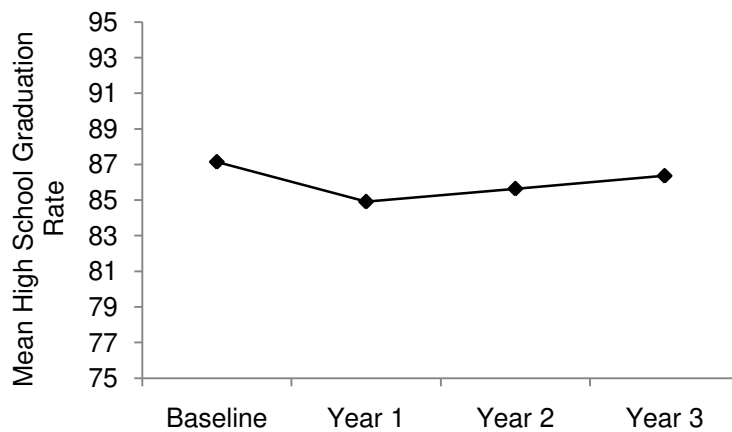
Figure 6. Mean differences of high school graduation rates for year of implementation.

In summary, results of the analysis on graduation rates with high school data did not show significant changes over time in graduation rates in western Kentucky high schools implementing PBIS although there is a slight decrease between the baseline and first year of implementation.

Analysis of Dropout Rate for Year of Implementation

Descriptive statistics of dropout rates are summarized for year of implementation in Table 15. Although dropout rates are tracked in Kentucky by both middle and high schools, a preliminary examination of individual dropout data revealed that middle schools participating in the study had no dropouts during the years under investigation in the study. Therefore, only high school dropout data was analyzed. Examination of the high school data indicates that the mean dropout rate decreased from Baseline to Year 3 with equivalent rates at years 2 and 3. The *SD*s of dropout rates ranged from 0.58 to 1.32. The *SD*s increased from Baseline to Year 3, suggesting that the graduation rates were more varied at Year 3 than at baseline.

Table 15

Descriptive Statistics of High School Dropout Rates for Year of Implementation

Year	*M* (%)	SD	N
Baseline	3.23	0.58	9
1	2.75	1.10	9
2	1.98	1.01	9
3	1.94	1.32	9

A repeated measures ANOVA was conducted to examine dropout rates for year of implementation. The independent variable was years of implementation, and the

dependent variable was dropout rate reported as a percentage of students who dropped out of high school. The significant within-subjects effect for years of implementation (F = 4.16, $p < .05$) suggests that dropout rates changed over time.

Post hoc analysis was conducted for the significant differences in the dropout rates for years of implementation. The post hoc comparison results summarized in Table 16 indicate that there are significant differences in dropout rate means between Baseline and Year 2. No significant differences are evident between Baseline and Year 1, Baseline and Year 3, Year 1 and Year 2, Year 1 and Year 3, or Year 2 and Year 3.

Table 16

Post Hoc Comparisons of High School Dropout Rates for Year of Implementation

Year (I)	Year (J)	Mean Difference (I-J)	SE
Baseline	1	0.48	.43
	2	1.25*	.28
	3	1.28	.52
1	Baseline	-0.48	.43
	2	0.77	.48
	3	0.81	.42
2	Baseline	-1.25*	.28
	1	-0.77	.48
	3	0.04	.44
3	Baseline	-1.28	.52
	1	-0.81	.42
	2	-0.04	.44

Note. *$p < .05$.

As shown in Figure 7, the high school dropout rate trends downward from Baseline to Year 3 of PBIS implementation. The most significant decrease in the dropout

rate is between Baseline and Year 2 of implementation. Dropout rate appears to level off
at Year 3.
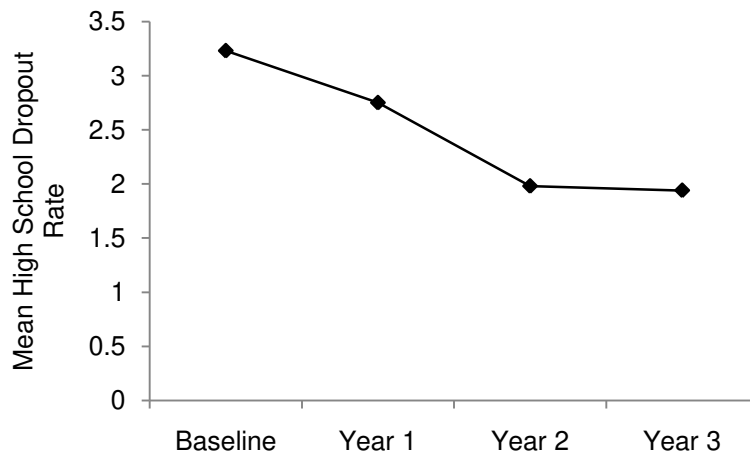
Figure 7. Mean differences of high school dropout rates for year of implementation.

In summary, results of the analysis on dropout rates indicate that high schools in
western Kentucky implementing PBIS show significant decreases in dropout rates over
years of implementation with a significant decrease noted from Baseline to Year 2.

Analysis of Retention Rate for Year of Implementation and School Level

Descriptive statistics of the student retention rates are summarized for year of
implementation and school level in Table 17. Examination of the mean scores by
implementation year indicates that the total mean scores of retentions for all three groups
decreased from Baseline to Year 3. Overall retention rates decreased from Baseline to
Year 2 with a slight increase at Year 3. Mean scores by school level were highest for
high schools, followed by middle schools and elementary schools. There was very little
difference in the mean retention scores of elementary and middle schools from Baseline
to Year 3 while high schools showed a more pronounced decrease. The *SD*s of retention
scores were smallest for elementary schools, indicating that retention rates clustered

around the mean. *SD*s for high schools were smaller at Year 2 and Year 3 than at

Baseline and Year1 suggesting that retention rates were closer to the mean as retentions

decreased.

Table 17

Descriptive Statistics of Retention Rates for Year of Implementation and School Level

Year	School Level	*M*	*SD*	*N*
Baseline	Elementary	0.18	0.33	29
	Middle	0.94	1.56	17
	High	5.09	2.91	9
	Total	1.22	2.27	55
1	Elementary	0.20	0.38	29
	Middle	0.67	0.69	17
	High	5.07	2.96	9
	Total	1.14	2.15	55
2	Elementary	0.09	0.24	29
	Middle	0.53	0.84	17
	High	2.44	2.34	9
	Total	0.61	1.33	55
3	Elementary	0.12	0.27	29
	Middle	0.53	0.44	17
	High	3.64	2.47	9
	Total	0.82	1.62	55

A repeated measures ANOVA was conducted to examine retention rates for year of implementation and school level and to evaluate interaction effects between year of implementation and school level. The independent variables were years of implementation and school level, and the dependent variable was student retentions as calculated as a number of students retained a grade during the year.

Table 18 presents the results of repeated measures ANOVA on retention rates. The significant within-subjects effect for years of implementation ($F = 16.74$, $p < .05$) suggests that retention rates changed over time. There is also a significant interaction effect by time and school level ($F = 8.54$, $p < .05$). This result indicates that the changes over time are different by school level. Analysis of between-subjects effects, depicted in Table 18, reveals that the means of the three school levels are significantly different from one another ($F = 54.81$, $p < .05$). Based on the effect size measures, the school level factor is found to contribute the most to the variations of the retention scores ($\eta^2 = .68$).

Table 18

ANOVA Results of Retention Rates for Year of Implementation and School Level

Effect	Factor	SS	df	MS	F	η^2
Within	Year (Y)	32.23	2.68	12.02	16.74[*]	0.24
	Year by School Level (Y x S)	32.88	5.36	6.13	8.54[*]	0.25
Between	School Level (S)	427.65	2.00	213.82	54.81[*]	0.68

Note. [*]$p < .05$.

Post hoc analysis was conducted for the significant differences in retention rates for years of implementation. The post hoc comparison results summarized in Table 19 indicate that there are significant differences in retention means between Baseline and

Year 2, Baseline and Year 3, Year 1 and Year 2, Year 1 and Year 3, and Year 2 and Year

3. No significant differences are evident between Baseline and Year 1.

Table 19

Post Hoc Comparisons of Retention Rates for Year of Implementation

Year (I)	Year (J)	Mean Difference (I-J)	*SE*
Baseline	1	0.09	.20
	2	1.05[*]	.19
	3	0.64[*]	.18
1	Baseline	-0.09	.20
	2	0.96[*]	.15
	3	0.56[*]	.18
2	Baseline	-1.05[*]	.19
	1	-0.96[*]	.15
	3	-0.41[*]	.11
3	Baseline	-0.64[*]	.18
	1	-0.56[*]	.18
	2	0.41[*]	.11

Note. [*]$p < .05$.

Table 20 displays the results of the post hoc analysis for the significant

differences in retention rates among different school levels. The results indicate there are

significant differences in the retention rates over time between elementary and high and

middle and high schools; however, elementary and middle schools show no significantly

different retention rates.

Table 20

Post Hoc Comparisons of Retention Rates for School Level

School Level (I)	School Level (J)	Mean Difference (I-J)	SE
Elementary	Middle	-0.52	.30
	High	-3.91[*]	.38
Middle	Elementary	0.52	.30
	High	-3.39[*]	.41
High	Elementary	3.91[*]	.38
	Middle	3.39[*]	.41

Note. [*]*p* < .05.

As shown in Figure 8, further examination of the patterns of retention rates over time reveal that all three types of schools show a decreasing trend from Baseline to Year 3 of PBIS implementation. Retention rates of elementary and middle schools are lower than high school rates at baseline and remain low across the years of the study. High schools, on the other hand, show a steep downward trend with a slight increase from Year 2 to Year 3. Because elementary and middle school retention rates are generally low at baseline and remain low across the years of the study, there is a significant difference in their patterns as compared to high schools.
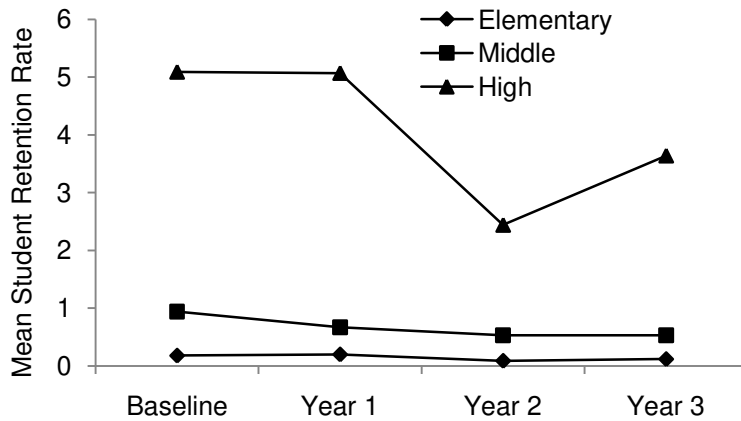
Figure 8. Mean differences of retention rates for year of implementation and school level.

In summary, results of the analysis of student retention rates indicate that schools in western Kentucky implementing PBIS showed significant decreases in retentions for year of implementation. This effect is due to the significant decrease in retention rates at the high school level.

Analysis of Reading Achievement for Year of Implementation and School Level

Descriptive statistics of the reading achievement scores are summarized for year of implementation and school level in Table 21. Examination of the mean scores by implementation year indicates that the total mean scores of reading achievement for all three groups increased from Baseline to Year 3. The mean reading achievement scores were generally higher at the elementary school level, followed by middle school and then high school. This pattern exhibited consistently over the three years of PBIS implementation including baseline. Review of the *SD*s data suggest reading achievement scores got closer to the mean from Baseline to Year 3 of implementation.

Table 21

Descriptive Statistics of Percentage of Students Scoring at Distinguished or Proficient in

Reading for Year of Implementation and School Level

Year	School Level	M	SD	N
Baseline	Elementary	72.02	10.00	29
	Middle	63.50	8.33	17
	High	44.96	12.51	10
	Total	64.60	14.01	56
1	Elementary	72.83	10.43	29
	Middle	66.51	8.45	17
	High	53.88	9.83	10
	Total	67.53	11.88	56
2	Elementary	73.63	8.07	29
	Middle	66.30	7.91	17
	High	58.47	5.46	10
	Total	68.70	9.48	56
3	Elementary	73.51	9.88	29
	Middle	69.87	6.93	17
	High	60.92	8.70	10
	Total	70.16	9.87	56

A repeated measures ANOVA was conducted to examine reading achievement for

year of implementation and school level and to evaluate interaction effects between year

of implementation and school level. The independent variables were years of

implementation and school level, and the dependent variable was reading achievement

scores as measured by the percentage of students earning a rating of proficient or

distinguished on the Kentucky Core Content Test.

Table 22 presents the results of repeated measures ANOVA on reading

achievement. The significant within-subjects effect for reading achievement ($F = 13.02$,

$p < .05$) suggests that reading achievement scores changed over time. There is also a

significant interaction effect by time and school level ($F = 3.85$, $p < .05$). This result

indicates that the changes over time are different by school level. Analysis of between-

subjects effects, depicted in Table 22, reveals that the means of the three school levels are

significantly different from one another ($F = 24.36$, $p < .05$). Based on the effect size

measures, the school level factor is found to contribute the most to the variations of the

reading achievement scores ($\eta^2 = .48$).

Table 22

ANOVA Results of Percentage of Students Scoring at Distinguished or Proficient in

Reading for Year of Implementation and School level

Effect	Factor	SS	df	MS	F	η^2
Within	Year (Y)	1597.19	2.75	581.92	13.02[*]	0.20
	Year by School Level (Y x S)	944.79	5.49	172.11	3.85[*]	0.13
Between	School Level (S)	10256.45	2.00	5128.23	24.36[*]	0.48

Note. [*]$p < .05$.

Post hoc analysis was conducted for the significant differences in reading

achievement scores for year of implementation. The post hoc comparison results

summarized in Table 23 indicate that the Baseline and Year 1 scores, Baseline and Year 2

scores, and Baseline and Year 3 scores are significantly different from one another. This

suggests lower reading scores at baseline and mean scores that are relatively similar at

years 1, 2, and 3. There are no significant differences between Year 1 and Year 2 scores,

Year 1 and Year 3 scores, or Year 2 and Year 3scores.

Table 23

Post Hoc Comparisons of Percentage of Students Scoring at Distinguished or Proficient

in Reading for Year of Implementation

Year (I)	Year (J)	Mean Difference (I-J)	SE
Baseline	1	-4.25[*]	1.49
	2	-5.97[*]	1.36
	3	-7.94[*]	1.48
1	Baseline	4.25[*]	1.49
	2	-1.73	1.21
	3	-3.69	1.43
2	Baseline	5.97[*]	1.36
	1	1.73	1.21
	3	-1.97	0.87
3	Baseline	7.94[*]	1.48
	1	3.69	1.43
	2	1.97	0.87

Note. [*]$p < .05$.

Table 24 displays the results of the post hoc analysis for the significant

differences in reading achievement scores among different school levels. The results

indicate there are significant differences between elementary and middle, elementary and

high, and middle and high schools' reading achievement growth patterns.

Table 24

Post Hoc Comparisons of Percentage of Students Scoring at Distinguished or Proficient

in Reading for School Level

School Level (I)	School Level (J)	Mean Difference (I-J)	*SE*
Elementary	Middle	6.45[*]	2.22
	High	18.44[*]	2.66
Middle	Elementary	-6.45[*]	2.22
	High	11.99[*]	2.89
High	Elementary	-18.44[*]	2.66
	Middle	-11.99[*]	2.89

Note. [*]$p < .05$.

As shown in Figure 9, further examination of the patterns of reading achievement scores over time reveal that all three types of schools showed an increasing trend from Baseline to Year 3 of implementation. Each school level showed mean scores at baseline that were different from one another, with elementary schools having the highest average score, followed by middle and high schools. This trend is evident across all three years of implementation. Elementary and middle schools showed slight upward trends in reading achievement scores over the three years of the study; high schools showed a more pronounced growth pattern.

Figure 9. Mean differences of percentage of students scoring at distinguished or proficient in reading for year of implementation and school level.

In summary, results of the analysis on reading achievement indicate that schools in western Kentucky implementing PBIS show significant increases in reading achievement for year of implementation. Further, there are significant differences in the reading achievement scores by school level.

Analysis of Math Achievement for Year of Implementation and School Level

Descriptive statistics of the math achievement scores are summarized for year of implementation and school level in Table 25. Examination of the mean scores by implementation year indicated that the total mean scores of math achievement for all three groups increased from Baseline to Year 3; however, the increase in scores was due to progressive increases in elementary and middle school scores. High school math scores were relatively flat from Baseline through Year 3. The mean math achievement scores were generally higher at the elementary school level, followed by middle school and then high school. This pattern exhibited consistently over the three years of PBIS implementation. Review of the *SD*s data suggest that deviations from the mean were

fairly uniform by school level. The *SD*s indicate that schools at all levels exhibited a

wide range of achievement scores.

Table 25

Descriptive Statistics of Percentage of Students Scoring at Distinguished or Proficient in

Math for Year of Implementation and School Level

Year	School Level	*M*	*SD*	*N*
Baseline	Elementary	51.99	12.91	29
	Middle	41.70	13.06	17
	High	37.01	7.79	10
	Total	46.19	13.56	56
1	Elementary	62.06	9.97	29
	Middle	50.28	13.15	17
	High	35.22	9.94	10
	Total	53.69	14.82	56
2	Elementary	67.18	9.19	29
	Middle	56.51	10.20	17
	High	37.09	9.84	10
	Total	58.57	14.61	56
3	Elementary	71.54	9.16	29
	Middle	62.00	9.97	17
	High	37.53	7.87	10
	Total	62.57	15.44	56

A repeated measures ANOVA was conducted to examine math achievement for year of implementation and school level and to evaluate interaction effects between year of implementation and school level. The independent variables were years of implementation and school level, and the dependent variable was math achievement scores as measured by the percentage of students earning a rating of proficient or distinguished on the Kentucky Core Content Test.

Table 26 presents the results of repeated measures ANOVA on math achievement. The significant within-subjects effect for math achievement ($F = 30.66$, $p < .05$) suggests that math achievement scores changed over time. There is also a significant interaction effect by time and school level ($F = 5.57$, $p < .05$). This result indicates that the changes over time are different by school level. Analysis of between-subjects effects, depicted in Table 26, reveals that the means of the three school levels are significantly different from one another ($F = 36.56$, $p < .05$). Based on the effect size measures, the school level factor is found to contribute the most to the variations of math achievement scores ($\eta^2 = .58$).

Table 26

ANOVA Results of Percentage of Students Scoring at Distinguished or Proficient in Math for Year of Implementation and School Level

Effect	Factor	SS	df	MS	F	η^2
Within	Year (Y)	4722.96	2.41	1959.86	30.66[*]	0.37
	Year by School Level (Y x S)	1714.56	4.82	355.74	5.57[*]	0.17
Between	School Level (S)	21538.76	2.00	10769.38	36.56[*]	0.58

Note. [*]$p < .05$.

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Post hoc analysis was conducted for the significant differences in math achievement for years of implementation. The post hoc comparison results summarized in Table 27 indicate that the Baseline and Year 1 scores, Baseline and Year 2 scores, Baseline and Year 3 scores, Year 1 and Year 2 scores, Year 1 and Year 3 scores, and Year 2 and Year 3 scores are all significantly different from one another. This indicates that significant growth in math achievement was seen across all years of implementation.

Table 27

Post Hoc Comparisons of Percentage of Students Scoring at Distinguished or Proficient in Math for Year of Implementation

Year (I)	Year (J)	Mean Difference (I-J)	SE
Baseline	1	-5.62[*]	1.69
	2	-10.03[*]	1.63
	3	-13.46[*]	1.87
1	Baseline	5.62[*]	1.69
	2	-4.41[*]	1.21
	3	-7.84[*]	1.40
2	Baseline	10.03[*]	1.63
	1	4.41[*]	1.21
	3	-3.43[*]	0.92
3	Baseline	13.46[*]	1.87
	1	7.84[*]	1.40
	2	3.43[*]	0.92

Note. [*]$p < .05$.

Table 28 displays the results of the post hoc analysis for the significant differences in math achievement scores among different school levels. The results indicate there are significant differences between elementary and middle, elementary and high, and middle and high schools' math achievement growth patterns.

Table 28

Post hoc Comparisons of Percentage of Students Scoring at Distinguished or Proficient in Math by School Level

School Level (I)	School Level (J)	Mean Difference (I-J)	*SE*
Elementary	Middle	10.57[*]	2.62
	High	26.48[*]	3.15
Middle	Elementary	-10.57[*]	2.62
	High	15.91[*]	3.42
High	Elementary	-26.48[*]	3.15
	Middle	-15.91[*]	3.42

Note. [*]$p < .05$.

As shown in Figure 10, further examination of the patterns of math achievement scores over time reveals that elementary and middle schools show an increasing trend from Baseline to Year 3 of implementation while the growth pattern of high schools is relatively flat. Each school level showed mean scores at baseline that were different from one another, with elementary having the highest mean score, followed by middle and high schools. Although middle and high school means are similar at baseline, middle school scores increase each year of implementation while high school scores remain at about the same level.
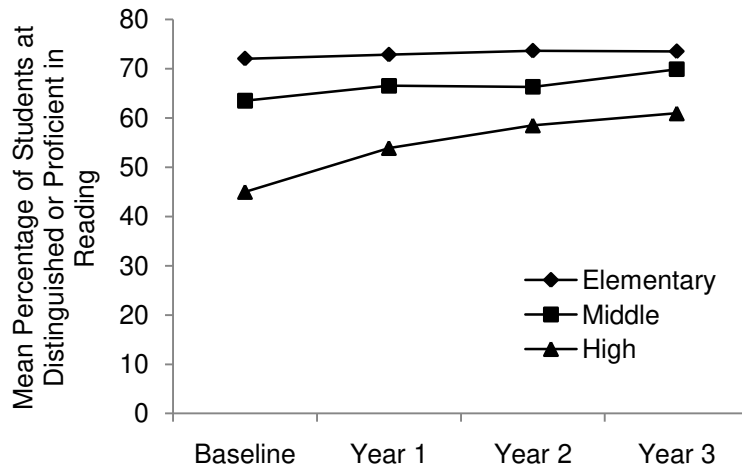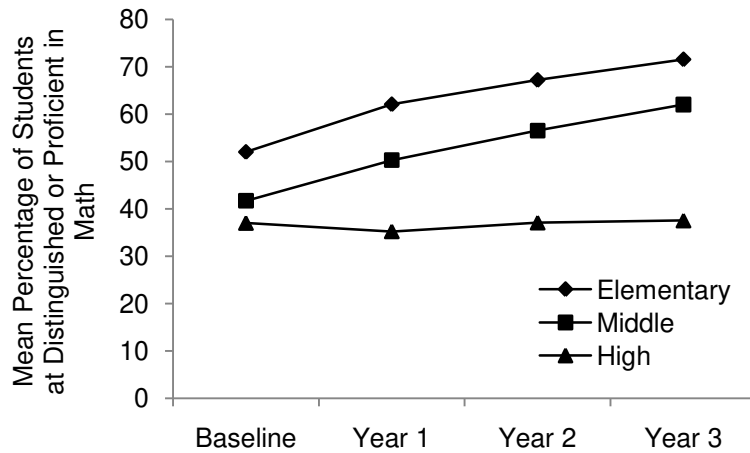
Figure 10. Mean differences of percentage of students scoring at distinguished or proficient in math for year of implementation and school level.

In summary, results of the analysis on math achievement indicate that schools in western Kentucky implementing PBIS showed significant increases in math achievement over time. There were differences in the increase of math achievement by school level with elementary and middle schools showing increases over time while high schools remained flat.

Conclusion

Eight repeated measures ANOVAs were conducted to analyze fidelity of PBIS implementation and the impact of PBIS implementation on various student outcome measures. The first research question asked whether schools in Kentucky were implementing PBIS with fidelity. The analysis indicated that scores on fidelity measures significantly increased over time. Elementary, middle, and high schools all showed increases in fidelity scores from Baseline to Year 3. Elementary schools reached fidelity more quickly than middle schools, and middle schools reached fidelity more quickly than

high schools. In summary, PBIS implementation was found to be reliable in terms of fidelity.

The second research question evaluated the impact of PBIS implementation on student outcome measures. Results of analyses indicated significant decreases in ODRs, out-of-school suspensions, dropout rate, and retention rate by year of implementation. Significant increases were evident in reading and math achievement scores. Graduation rates did not show significant increases across years of implementation, and, in fact, showed a slight decline. The results of the evaluation will be discussed in greater detail in the next chapter.

Chapter 5: Discussion

Discussion of Findings

The evaluation of PBIS implementation in Kentucky schools indicated some

significant findings in regards to fidelity of implementation and student outcome data.

Discussion of each analysis is presented in the following sections.

Fidelity of implementation.

Results indicated that scores on fidelity measures significantly increased over

time. Specifically, significant differences were found between Baseline and Year 1,

Baseline and Year 2, Baseline and Year 3, Year 1 and Year 3, and Year 2 and Year 3.

The increases between baseline and each year of implementation suggest that significant

differences occurred before versus after implementation. In addition, the results are

indicative of sustained implementation over time.

Differences in implementation were apparent by school level. Elementary,

middle, and high schools all showed increases in fidelity scores from Baseline to Year 3.

While schools at all levels showed similar levels of fidelity by Year 3 of implementation,

elementary schools achieved fidelity more quickly than middle and high schools. Middle

and high schools showed a similar pattern of implementation across the years. In

comparing the mean scores of middle and high schools to elementary schools, middle and

high schools exhibited a slower pattern of growth in fidelity of implementation, with

middle schools on average achieving fidelity after two years of PBIS implementation and

high schools on average achieving fidelity after three years of implementation.

Examination of individual school data indicated that 76% of elementary schools

achieved fidelity on the SET after one year of implementation and maintained fidelity, as

measured by a threshold score of 70 on the BoQ, in the two subsequent years. Eighty-three percent of elementary schools achieved fidelity at Year 2 and 93% achieved fidelity at Year 3. Only 6% of middle schools achieved fidelity on the SET after one year of PBIS implementation. By the end of two years, 71% had reached fidelity, and 82% had reached fidelity at the end of Year 3. The high school pattern showed 20% of schools at fidelity at the end of Year 1, 40% at the end of Year 2, and 70% at the end of Year 3.

Office discipline referral rates.

Evaluation results showed a significant decrease in ODRs across three years of PBIS implementation. The overall reduction for all schools between years 1 and 3 was 31%. This finding was due to decreases in elementary and middle school referral rates. High school office referral means declined between Year 1($x = 156.00$) and Year 2 ($x = 147.41$) but then rose above the Year 1 mean in Year 3 ($x = 163.69$). As previously noted, the *SD* for high school ODRs at Year 3 was very large. With a small high school sample size ($n = 10$), one outlier was able to affect the mean of the group. Nevertheless, office referral rates were not impacted at the high school level to the degree seen in elementary and middle schools.

The Office of Special Education Programs Technical Assistance Center of PBIS provides evaluation summaries of ODR rates yearly on the Schoolwide Information System (SWIS; S. May et al., 2003) website (www.swis.org). National ODR means are calculated and reported by grade ranges so that schools can compare their ODR rates to other schools across the country. Reported figures are mean ODRs per 100 students per day. The last year national means were reported by SWIS was 2008-09. The mean was .34 for K-6 grade schools, .85 for 6-8 grade schools, and 1.27 for 9-12 grade schools.

The 29 elementary schools evaluated in this study had a mean ODR rate per 100 students per day of .32 after Year 1 of implementation, .26 after Year 2 of implementation, and .21 after Year 3 of implementation. The mean ODR rate per 100 students per day in middle school was 1.31 after one year of implementation, .85 after two years of implementation, and .75 after three years of implementation. High schools had a mean ODR rate per 100 students per day of .88 after Year 1 of implementation, .85 after Year 2 of implementation, and .92 after Year 3 of implementation. Taken together, these findings suggest that the Kentucky schools investigated in this study experienced lower than typical rates of ODRs across all grade levels.

Out-of-school suspension rates.

Analysis of out-of-school suspension data showed that suspensions decreased significantly over years of implementation. Specifically, significant reductions were noted between Baseline and Year 2 and Baseline and Year 3. This suggests that significant differences in suspensions occurred before versus after implementation. When combined with the information regarding fidelity of implementation, the data suggest that as fidelity of implementation increased across years, out-of-school suspensions decreased.

Additionally, significant differences were found in the pattern of suspension rates by school level. Elementary schools had a low mean suspension rate at baseline and showed a slight decline across years of implementation. High schools also displayed a somewhat slight decline in suspension rates. In contrast, middle schools had the highest mean suspension rate at baseline and showed a significant reduction over time. While

their suspension rate was 34% higher than the high school rate at baseline, the middle school rate was 5% lower than the high school rate at Year 3.

When comparing the percent decrease in out-of-school suspensions for PBIS schools versus state rates, the figures are remarkable. Schools implementing PBIS showed an average reduction in out-of-school suspensions of 41% across three years of PBIS implementation. In contrast, the average reduction across the state for the same three years was 15%. Clearly, schools implementing PBIS have had a markedly greater reduction in out-of-school suspensions than has been seen statewide.

Graduation rate.

Results of the analysis on high school graduation rate revealed that there were no significant differences across years of PBIS implementation. In fact, the graduation rate was highest at baseline, declined at Year 1, and then slightly increased at Year 2 and Year 3. The graduation rate of the nine high schools under investigation was found to be slightly higher than the state graduation rate across the years of the study. The mean graduation rate was 87.14 at baseline, 84.91 at Year 1, 85.64 at Year 2, and 86.36 at Year 3. In comparison, the state graduation rate was 83.24 in 2006, 83.76 in 2007, 84.52 in 2008, and 83.91 in 2009. The small sample of high schools ($n = 9$) may have affected the analysis on graduation rates.

Dropout rate.

The examination of the high school dropout rate in the study revealed a significant reduction in dropout rate over years of PBIS implementation. The dropout rate declined slightly between Baseline and Year 1 followed by a larger decrease at Year 2 and a leveling off at Year 3. The decrease between Baseline and Year 3 was

significant. The significant results for dropout rate were somewhat surprising given the finding of no significance for the graduation rate. However, the graduation and dropout rates are computed differently, and this may have accounted for the disparate findings. To illustrate, during the time period of the study, graduation rate was computed by determining the percentage of students who started high school in a given year as freshmen and graduated in four years. Thus, graduation rate tracks a group of students across a four-year span. In contrast, dropout rate was computed by dividing the total number of students in a school by the total number of students who drop out during the year.

A comparison of the percent decrease in dropout rate for PBIS schools versus state rates showed interesting findings. During the time period of the study, the state dropout rate decreased by 17%. During the same time period, the dropout rate for PBIS schools decreased by 40%. Because of the small sample size ($n = 9$), results must be interpreted with caution.

Retention rate.

Analysis of retention rate data indicated that student retentions decreased significantly over years of PBIS implementation. There was a significant decrease between Baseline and Year 2, Baseline and Year 3, Year 1 and Year 2, and Year 1 and Year 3, but not between Baseline and Year 1. Further, the overall mean significantly increased from Year 2 to Year 3. Both elementary and high school retention rates rose between Year 2 and Year 3 which caused the increase in the overall mean.

Review of the retention data by school level revealed a similar pattern for elementary and middle schools. Elementary and middle schools began with low retention

rates that slightly declined from Baseline to Year 3. The elementary and middle school patterns were not significantly different from one another. However, both the elementary and middle school patterns were significantly different from the high school pattern. The mean high school retention rates at Baseline and Year 1 were significantly higher than the middle and elementary school means. The high school rate significantly decreased at Year 2 and spiked upward significantly at Year 3.

When comparing the percent decrease in retention rate for PBIS schools versus the state rate, the findings were similar to what had been noted for out-of-school suspensions and dropout rates. For the time period of the study, PBIS schools displayed a 33% reduction in retention rate as compared to a statewide reduction of 16%.

Reading achievement.

Results of the evaluation indicated that reading achievement mean scores increased significantly from baseline to each year of implementation. The increase showed significant differences by year and by school level. High schools displayed the most pronounced growth from Baseline to Year 3 (26%) while elementary and middle schools had slighter gains (2% and 9%, respectively). Elementary schools outperformed middle schools, while middle schools outperformed high schools.

Even though the results were significant, they must be interpreted in light of data on reading achievement growth statewide. An examination of statewide averages of elementary, middle, and high school students earning a proficient or distinguished in reading achievement reveals a similar growth pattern to the one shown by schools implementing PBIS. For example, the growth in reading achievement scores in elementary schools between 2006 and 2009 statewide was 5%, and the growth in reading

achievement scores in elementary PBIS schools during the same time period was 6%.

Growth patterns proved similar for all school levels across the time periods examined;

thus, interpretation cannot be made stating that PBIS schools showed a difference in

reading achievement as compared to other schools in the state.

Math achievement.

Results of the study on math achievement indicated mean scores increased

significantly over the years of implementation. The increase showed significant

differences by year and by school level. The differences in the overall means for each

year were all significantly different from one another. Elementary and middle school

shared similar growth patterns, while the mean scores of high schools remained flat. As

with reading achievement, elementary schools outperformed middle schools, while

middle schools outperformed high schools.

Even though the results were significant, they must be interpreted in light of data

on math achievement growth statewide. As with reading achievement, an examination of

statewide averages of elementary, middle, and high school students earning a proficient

or distinguished in math revealed a similar growth pattern to the one shown by schools

implementing PBIS. For example, the growth in math achievement scores in middle

schools between 2006 and 2009 statewide was 44%, while the growth in math

achievement scores in middle school PBIS schools during the same time period measured

45%. All school levels across the time periods examined showed similar growth patterns;

thus, interpretation cannot be made stating that PBIS schools showed a difference in math

achievement compared to other schools in the state.

Taken as a whole, overall findings of this evaluation support the theoretical framework proposed by PBIS proponents. The implementation of PBIS principles with fidelity is associated with positive student outcomes. The current study results indicated associations between PBIS implementation fidelity and decreases in ODRs, out-of-school suspensions, dropout rate, and retention rate. The PBIS model of training and technical assistance used in Kentucky demonstrates a reliable model for schools to follow to implement sustainable behavior change that likely will lead to improved student outcomes.

Implications

The evaluation results have several implications for PBIS training and technical assistance in Kentucky. First, the results build on previous evidence that school-based practitioners can reduce problem behaviors in schools using a team approach that focuses on systems change and data-based decision-making. PBIS training in Kentucky is delivered to school teams who are responsible for training and supporting their staff members in implementing, monitoring, evaluating, and sustaining the model. The study results suggest that the current model is effective as a means of ensuring successful and sustainable implementation of PBIS.

A second implication is that the KYCID has a critical role in PBIS implementation in Kentucky in ensuring the delivery of consistent training modules across the state and the provision of on-going technical assistance, booster trainings, and specific support for PBIS coaches. The study results suggest that the training modules used by the KYCID have led to implementation fidelity. The KYCID must ensure that training be continued in order to produce positive outcomes for schools involved in

training. Additionally, Kentucky's previous attempts at schoolwide positive behavior

supports were hindered when on-going technical assistance was not continued for schools

initially participating in the three grants. Therefore, it is critical for the KYCID to be able

to continue to provide on-going technical assistance to schools to ensure sustainability

over time.

A third implication of these results is that the collection of data at the state level is

critical to provide a comprehensive picture of the strengths and weaknesses of

Kentucky's PBIS delivery model. While the current results are encouraging, they apply

to schools in the western and south central parts of the state. Consistent collection of

fidelity and outcome data is needed across the entire state to better understand the

strengths and limitations of Kentucky's PBIS model.

A fourth implication is to increase understanding of how to successfully expand

the PBIS model to more Kentucky schools. The KYCID has trained over 350 schools

with a staff of seven. As more schools and districts commit to implement the PBIS

model, the KYCID must prepare to provide meaningful training and technical assistance

to a larger number of schools. To that end, the work of Coburn (2003) on *scaling up* may

be useful to consider. She contends that expanding an initiative (i.e., scaling up) requires

not only increasing the number of schools or districts involved but should also translate

into significant change in schools, sustainability over time, and autonomy at the school

and district levels in regards to ensuring enduring changes in practices and systems.

Coburn created a model of reform strategy that encompasses the variables of depth (i.e.,

the nature and quality of change), sustainability (i.e., meaning over time), spread (i.e.,

expanding norms, beliefs, and principles – not just increasing numbers), and shift (i.e.,

away from an external reform to an internal reform). At the state level, it will be important to consider the dynamics of scaling up as the KYCID expands and trains more schools and districts.

Likewise, implications exist for ensuring that the KYCID adequately discriminates between schools and districts that sustain a high level of implementation fidelity from those who do not. Han and Weiss (2005) identified several factors that may support or hinder program implementation efforts. These include (a) school- and teacher-specific factors such as administrative support, teacher self-efficacy, professional burnout, and teacher buy-in and (b) program-specific factors including teacher training and performance feedback. While PBIS information in Kentucky related to start-up, training, and on-going technical assistance and support already includes specific information on administrative support, teacher buy-in, and teacher training, the KYCID might benefit from exploring the research literature on teacher self-efficacy, burnout, and performance feedback more thoroughly and incorporating relevant information into the state PBIS training model.

Acknowledgement of Limitations

The design of the study sets limits to the scope of the research, and all studies possess some limitations. The present study had several limitations. Only data from schools in western Kentucky were included in the study; therefore, results cannot be universally applied. In addition, only data from schools implementing PBIS in Kentucky for at least three years were included in the study in order to examine long-term impacts which limited the number of schools included. Within the group of schools across

Kentucky implementing PBIS for at least three years, data were not available for some schools thus limiting the total number of schools included in the sample.

In regards to data analysis, the variability in data sets was noted in the results section, and statistical corrections were made prior to conducting repeated measures ANOVAs. However, due to the violation of the assumption of sphericity, caution must be used in interpreting results. As the number of schools in Kentucky's PBIS network expands, and more school data are available for analysis, research should yield more confident findings. Despite the statistical limitations, these preliminary results are encouraging.

Previous research suggested that school demographic factors are associated with varying levels of student behavior problems (Birnbaum et al., 2003). Demographic variables such as school size, type of school (i.e., urban, suburban, or rural), percentage of minority students, and socioeconomic level of students were not factored into the analysis to determine if any of these variables was predictive of differences in implementation across schools. The scope of the study limited analysis of this nature but future study would benefit from inclusion of demographic variables. A related limitation is that outcome results were not disaggregated by percentage of special education students or percentage of minority students because accurate data were not available. Because of the inherent interest in ensuring equitable treatment of all students, including information regarding special education and minority students would have strengthened the study.

The study was potentially limited by the fact that two different KYCID staff members provided training and technical assistance to schools in the study. Although

pre-established training modules were used to provide training, variations in training style, overall level of knowledge of PBIS principles, and adherence to training modules may have impacted the quality of training provided.

Randomized controlled trial research is typically used when a researcher wants to provide evidence of a cause and effect relationship (Hawkins & Matthews, 1999). Thus, the lack of control schools in the current study is a definite limitation in drawing firm conclusions regarding the use of PBIS as a means to decrease inappropriate student behavior and provide social supports to keep students engaged in schools. However, research of this nature requires that the main features of the intervention be so exact as to be able to be replicated in multiple schools (Hawkins & Matthews, 1999). Given the nature of the PBIS process, where schools are encouraged to implement research-based concepts while keeping the developmental and behavioral needs of their student population in mind, it is unlikely that the implementation process is ever exactly the same from school to school. While future research using a random control experimental design would undoubtedly have its benefits, less rigorous evaluation of procedures and programs, such as that conducted in the current study, certainly add value to the literature base on PBIS.

Because this was applied field research, all practices and programs used were not under the control of the KYCID trainers. For example, some schools used various social skills or behavior programs in addition to the strategies and practices implemented that are related to PBIS. Further, some schools showed better adherence to program implementation guidelines than others. Even though all schools received the same training modules from PBIS trainers, differences existed in the manifestation of

implementation in schools, from the way lesson plans were delivered to the way ODRs were recorded and analyzed. All of these factors must be considered as limitations. Additionally, evaluation of reading and math achievement compared different groups of students from Baseline to Year 3 rather than tracking the performance of the same group of students across three years. Tracking the same students would have allowed for a more thorough examination of the impact of PBIS implementation on reading and math achievement.

Recommendations for Future Research

The results of the study point to several recommendations for future research. First, more research is warranted to examine PBIS implementation across the whole state, evaluating multiple measures of fidelity and further exploring the impact of PBIS implementation on academic achievement and graduation rate. Future research would be beneficial to determine if associations between PBIS implementation and student outcomes found in this study were replicated.

With so many competing initiatives schools are mandated to implement, the adoption of PBIS must be made compelling for schools to devote the time and resources to implementing with fidelity over time. Therefore, it is imperative to continue to refine PBIS training and technical assistance to provide schools with meaningful supports to improve both student behavior and achievement. To that end, a literature review of 20 studies synthesized by the Office of the Superintendent of Public Instruction (2007) in the state of Washington, as well as subsequent investigation by Algozzine and Algozzine (2009), identified nine characteristics of high-performing schools and schools implementing PBIS:

- clear and shared focus;

- high standards and expectations for all students;

- effective school leadership;

- high levels of collaboration and communication;

- curriculum, instruction, and assessments aligned with state standards;

- frequent monitoring of learning and teaching;

- focused professional development;

- a supportive learning environment; and

- high levels of family and community involvement.

A more focused training approach, highlighting these characteristics and the relationship between student behavior and academic achievement, would provide schools with a clearer vision on achieving both behavior and academic goals.

Despite having provided training to over 350 schools in Kentucky, some schools chose to stop implementing PBIS. Qualitative research would aid the KYCID in identifying barriers to continuing particiation in the Kentucky PBIS network. If factors that prompted schools to drop out of the network were identified, prevention efforts could be instituted to better support other schools. In addition, the KYCID staff would benefit from incorporating information from qualitative assessments compiled by the grant evaluator. For example, approximately two-thirds of PBIS coaches who were surveyed in November, 2010 (Mueller & Garrett, 2010) reported that their PBIS teams use results from the TIC, SAS, and the BoQ for PBIS planning, implementation, and evaluation. Comments from PBIS coaches affirmed that they find the instruments to be useful in

supporting fidelity of implementation and sustainability over time. For example, one respondent stated that the instruments "allow us to know where we are and how we are going to get where we are going." The survey also yielded interesting comments about the negative aspects of collecting fidelity information. Several respondents stated that it is sometimes challenging to find extra time to administer, tally, and review the checklists and surveys. Several PBIS coaches also reported that some of the items on the SAS are confusing for their staff members to understand. Information such as this can aid the KYCID staff members in improving training quality and technical assistance provided to PBIS coaches and schools.

Data results on ODRs and out-of-school suspensions were not as consistent or significant at the high school level as they were at the middle school level. This could be partly due to the small number of high schools evaluated, but the KYCID should carefully evaluate its training model and provision of technical assistance to high schools to ensure their needs are adequately met. Upon seeing similar findings for high schools during the statewide evaluation of Florida's PBIS efforts, the Florida PBIS project began offering alternative strategies to support high schools. The KYCID staff members should track the evaluation of the alternate strategies for high schools and determine if Kentucky high schools would benefit from additional training and resources.

Conclusion

The PBIS model provides a theoretical framework for schools to apply systemic and individualized practices designed to increase appropriate student behaviors and prevent inappropriate student behaviors (Sugai & Horner, 2002). The broad aim of PBIS is to improve student behavioral and academic outcomes by using data to make decisions

about student behavior, developing practices that support student behavior, and developing systems that support staff behavior change (Sugai & Horner, 2002). The PBIS movement began in the late 1980s and early 1990s as a modernized, multi-faceted method of developing effective systems to support prosocial student behavior (Colvin et al, 1993; Lewis & Sugai, 1999; Walker et al., 1996). The Kentucky Center for Instructional Discipline has provided training and technical assistance in PBIS implementation to schools across the state since 2005. This study was designed as a comprehensive assessment of PBIS implementation in Kentucky, specifically the examination of fidelity of implementation and student outcome variables.

Acknowledging study limitations, overall findings of this evaluation are promising and support that implementation of PBIS principles with fidelity is associated with positive student outcomes. The current study results found associations between PBIS implementation fidelity and decreases in ODRs, out-of-school suspensions, dropout rate, and retention rate. Thus, the PBIS model of training and technical assistance used in Kentucky demonstrates a reliable model for schools to follow to implement sustainable behavior change that likely will lead to improved student outcomes.

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Appendix A: Team Implementation Checklist

Positive Behavior Support Team Implementation Checklist

School_____   Date of Report _____

District_____   County _____   State _____

INSTRUCTIONS: The PBIS team should complete both checklists monthly to monitor activities for implementation of PBIS in the school. Completed forms can be faxed (_____) or emailed (_____) by the first of each month to_____ .

PBIS Team Members_____

_____

_____

Person(s) Completing Report _____

Checklist #1: Start-Up Activity					
Complete & submit **Monthly**.		Status: <u>A</u>chieved, <u>I</u>n Progress, <u>N</u>ot Started			
	Date: (MM/DD/YY)				
Establish Commitment 1. Administrator's support & active involvement.	Status:				
2. Faculty/Staff support (One of top 3 goals, 80% of faculty document support, 3 year timeline).	Status:				
Establish & Maintain Team 3. Team established (representative).	Status:				
4. Team has regular meeting schedule, effective operating procedures.	Status:				
5. Audit is completed for efficient integration of team with other teams/initiatives addressing behavior support.	Status:				
Self-Assessment 6. Team/faculty completes the Team Checklist or Benchmarks of Quality self-assessment	Status:				
7. Team summarizes existing school discipline data.	Status:				

Team Implementation Checklist, v. 3.0, August, 2009
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8. Team uses self-assessment information to build implementation action plan.	Status:				
Establish School-wide Expectations: Prevention Systems 9. 3-5 school-wide behavior expectations are defined.	Status:				
10. School-wide teaching matrix developed.	Status:				
11. Teaching plans for school-wide expectations are developed.	Status:				
12. School-wide behavioral expectations taught directly & formally.	Status:				
13. System in place to acknowledge/reward school-wide expectations.	Status:				
14. Clearly defined & consistent consequences and procedures for undesirable behaviors are developed.	Status:				
Classroom Behavior Support Systems 15. Team has completed a school-wide classroom systems summary	Status:				
16. Action plan in place to address any classroom systems identified as a high priority for change.	Status:				
17. Data system in place to monitor office discipline referral rates that come from classrooms.	Status:				

Establish Information System 18. Discipline data are gathered, summarized, & reported at least quarterly to whole faculty.	Status:				
19. Discipline data are available to the Team at least monthly in a form and depth needed for problem solving.	Status:				
Build Capacity for Function-based Support 20. Personnel with behavioral expertise are identified & involved.	Status:				
21. Three members of the school are able to conduct simple functional behavioral assessments.	Status:				
22. Intensive, individual student support team structure in place to use function-based supports	Status:				

Additional Observations/Comments/Questions:

On-Going Activities

1. PBIS Team has met at least monthly.	Status:				
2. PBIS Team has given status report to faculty at least monthly.	Status:				
3. Activities for PBIS Action Plan implemented.	Status:				
4. Accuracy of implementation of PBIS Action Plan assessed.	Status:				
5. Effectiveness of implementation of PBIS Action Plan assessed.	Status:				
6. PBIS data analyzed.	Status:				

Appendix B: PBIS Self-Assessment Survey

SCHOOL-WIDE SYSTEMS

Current Status			Feature	Priority for Improvement		
In Place	Partial in Place	Not in Place	**School-wide** is defined as involving all students, all staff, & all settings.	High	Med	Low
			1. A small number (e.g. 3-5) of positively & clearly stated student expectations or rules are defined.			
			2. Expected student behaviors are taught directly.			
			3. Expected student behaviors are rewarded regularly.			
			4. Problem behaviors (failure to meet expected student behaviors) are defined clearly.			
			5. Consequences for problem behaviors are defined clearly.			
			6. Distinctions between office v. classroom managed problem behaviors are clear.			
			7. Options exist to allow classroom instruction to continue when problem behavior occurs.			
			8. Procedures are in place to address emergency/dangerous situations.			
			9. A team exists for behavior support planning & problem solving.			
			10. School administrator is an active participant on the behavior support team.			
			11. Data on problem behavior patterns are collected and summarized within an on-going system.			
			12. Patterns of student problem behavior are reported to teams and faculty for active decision-making on a regular basis (e.g. monthly).			
			13. School has formal strategies for informing families about expected student behaviors at school.			
			14. Booster training activities for students are developed, modified, & conducted based on school data.			
			15. School-wide behavior support team has a budget for (a) teaching students, (b) on-going rewards, and (c) annual staff planning.			
			16. All staff are involved directly and/or indirectly in school-wide interventions.			
			17. The school team has access to on-going training and support from district personnel.			
			18. The school is required by the district to report on the social climate, discipline level or student behavior at least annually.			

Name of School _____   Date _____

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NONCLASSROOM SETTING SYSTEMS

Current Status			Feature	Priority for Improvement		
In Place	Partial in Place	Not in Place	**Non-classroom settings** are defined as particular times or places where supervision is emphasized (e.g., hallways, cafeteria, playground, bus).	High	Med	Low
			1. School-wide expected student behaviors apply to non-classroom settings.			
			2. School-wide expected student behaviors are taught in non-classroom settings.			
			3. Supervisors actively supervise (move, scan, & interact) students in non-classroom settings.			
			4. Rewards exist for meeting expected student behaviors in non-classroom settings.			
			5. Physical/architectural features are modified to limit (a) unsupervised settings, (b) unclear traffic patterns, and (c) inappropriate access to & exit from school grounds.			
			6. Scheduling of student movement ensures appropriate numbers of students in non-classroom spaces.			
			7. Staff receives regular opportunities for developing and improving active supervision skills.			
			8. Status of student behavior and management practices are evaluated quarterly from data.			
			9. All staff are involved directly or indirectly in management of non-classroom settings.			

Name of School _____   Date _____

CLASSROOM SYSTEMS

Current Status			Feature	Priority for Improvement		
In Place	Partial in Place	Not in Place	**Classroom settings** are defined as instructional settings in which teacher(s) supervise & teach groups of students.	High	Med	Low
			1. Expected student behavior & routines in classrooms are stated positively & defined clearly.			
			2. Problem behaviors are defined clearly.			
			3. Expected student behavior & routines in classrooms are taught directly.			
			4. Expected student behaviors are acknowledged regularly (positively reinforced) (>4 positives to 1 negative).			
			5. Problem behaviors receive consistent consequences.			
			6. Procedures for expected & problem behaviors are consistent with school-wide procedures.			
			7. Classroom-based options exist to allow classroom instruction to continue when problem behavior occurs.			
			8. Instruction & curriculum materials are matched to student ability (math, reading, language).			
			9. Students experience high rates of academic success ($\geq$ 75% correct).			
			10. Teachers have regular opportunities for access to assistance & recommendations (observation, instruction, & coaching).			
			11. Transitions between instructional & non-instructional activities are efficient & orderly.			

Name of School _____   Date _____

INDIVIDUAL STUDENT SYSTEMS

Current Status			Feature	Priority for Improvement		
In Place	Partial in Place	Not in Place	**Individual student systems** are defined as specific supports for students who engage in chronic problem behaviors (1%-7% of enrollment)	High	Med	Low
			1. Assessments are conducted regularly to identify students with chronic problem behaviors.			
			2. A simple process exists for teachers to request assistance.			
			3. A behavior support team responds promptly (within 2 working days) to students who present chronic problem behaviors.			
			4. Behavioral support team includes an individual skilled at conducting functional behavioral assessment.			
			5. Local resources are used to conduct functional assessment-based behavior support planning (~10 hrs/week/student).			
			6. Significant family &/or community members are involved when appropriate & possible.			
			7. School includes formal opportunities for families to receive training on behavioral support/positive parenting strategies.			
			8. Behavior is monitored & feedback provided regularly to the behavior support team & relevant staff.			

Name of School _____   Date _____

Appendix C: Schoolwide Evaluation Tool

SCHOOLWIDE EVALUATION TOOL
(SET)

☐ Baseline Assessment
☐ Follow-Up Assessment

Date: _____

School: _____

District: _____

Data Collectors: _____
_____

Schoolwide Evaluation Tool version 2.0, November 2001
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Schoolwide Evaluation Tool (SET)

PURPOSE

The Schoolwide Evaluation Tool (SET) is designed to assess and evaluate the critical features of schoolwide effective behavior support across each academic school year. The SET results are used to:

- assess features that are in place,
- determine annual goals for schoolwide effective behavior support,
- evaluate ongoing efforts toward schoolwide behavior support,
- design and revise procedures as needed, and
- compare efforts toward schoolwide effective behavior support from year to year

COMPONENTS

Information necessary for this assessment tool is gathered through multiple sources:

- Administrator Interview
- Staff/Team Interviews
- Student Interviews
- Observations
- Document Review

IMPLEMENTATION

There are multiple steps for gathering necessary information.

Pre-Visit Activities
Step1: Make Initial Contact [see Section A: Implementation Guide]
Step 2:   Confirm Date to Conduct the SET Assessment

On-Site Activities
Step 3:   Conduct the SET Assessment [see Section B: Instrumentation]

Follow-Up Activities
Step 4:   Summarize and Report Results [see Section C: Scoring Guide]

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SCHOOLWIDE EVALUATION TOOL
IMPLEMENTATION GUIDE
PRE-VISIT ACTIVITIES

Step 1: Make Initial Contact

A. Identify school contact person & provide him/her with the "Overview of the SET" page (see next page)

B. Contact Name: _____ Role: _____
   Phone: _____
   Email: _____

C. Ask when they may be able to have the products gathered for the Document Review Process [Hint: If possible, ask to receive these materials in advance to facilitate the review process] Approximate Date: _____

D. Products to Collect
   _____ Discipline Handbook (*Guidelines for Success, Schoolwide Expectations, Foundations Team Notebook, or Discipline Section of Staff Manual*)
   _____ School Improvement Plan Goals (*Consolidated School Improvement Plan*)
   _____ Annual Action Plan for meeting schoolwide behavior support goals
   _____ Social skills instructional materials/implementation timeline (*Lesson plans for teaching schoolwide behavioral expectations, Guidelines for Success*)
   _____ Behavioral incident summaries or reports (e.g., office discipline referrals, suspensions, expulsions)
   _____ Office Discipline Referral Form(s)
   _____ Crisis Management Plan
   _____ Other related information

Step 2: Confirm Date to Conduct the SET Assessment

A. Confirm date with the school contact to conduct the administrator interview, take a tour of the school while conducting student and staff interviews, and to review products
   Date: _____ Time: _____ am/pm

On-Site Activities

Step 3: Conduct the SET Assessment

A. Conduct Administrator Interview

B. Tour school to conduct observations of posted school rules and to interview randomly selected students (minimum of 10) and staff (minimum of 10)

C. Complete Document Review

D. In conjunction with your data collection partner, complete SET scoring using a consensus process

E. Follow up with school contact and/or administrator before leaving the school; point out 2 or 3 strengths; inform them that their IDPP trainer will provide complete results at a later date

Follow-Up Activities

Step 4: Summarize and Report the Results

A. Provide the school's IDPP trainer with the completed SET & Forward copy to KDE

B. IDPP trainer graphs results using Excel spreadsheet

C. IDPP trainer meets with school team to review results   Date: _____ Time: _____ am/pm

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Schoolwide Evaluation Tool (SET)

Overview

Purpose

The Schoolwide Evaluation Tool (SET) is designed to assess and evaluate the critical features of schoolwide effective behavior support across each academic school year. The SET results are used to:

- □ assess features that are in place,
- □ determine annual goals for schoolwide effective behavior support,
- □ evaluate ongoing efforts toward schoolwide effective behavior support,
- □ design and revise procedures as needed, and
- □ compare efforts toward schoolwide effective behavior support from year to year.

Information necessary for this assessment tool is gathered through multiple sources, including review of permanent products, observations, and staff (minimum of 10) and student (minimum of 10 interviews). There are multiple steps for gathering all necessary information. The first step is to identify someone at the school as the contact person. This person will be asked to collect each of the available products listed below and to identify a time for the SET data collectors to preview the products and set up observations and interview opportunities. Once the process for collecting the necessary data is established, reviewing the data and scoring the SET averages 2 – 3 hours.

Products to Collect

_____ Discipline Handbook (*Guidelines for Success, Schoolwide Expectations, Foundations Team Notebook, or Discipline Section of Staff Manual*)
_____ School Improvement Plan Goals (*Consolidated School Improvement Plan*)
_____ Annual Action Plan for meeting schoolwide effective behavior support goals
_____ Social skills instructional materials/implementation timeline (*Lesson plans for teaching schoolwide behavioral expectations, Guidelines for Success*)
_____ Behavioral incident summaries or reports (e.g., office discipline referrals, suspensions, expulsions)
_____ Office Discipline Referral Form(s)
_____ Crisis Management Plan
_____ Other related information

Using SET Results

The results of the SET will provide schools with a measure of the proportion of features that are (1) not targeted or started; (2) in the planning phase; and (3) in the implementation/maintenance phases of development toward a systems approach to schoolwide effective behavior support. The SET is designed to provide trend lines of improvement and sustainability over time.

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Administrator Interview

Let's talk about your discipline system

1. Do you collect <u>and</u> summarize office discipline referral information?   ☐ Yes ☐ No (skip to Question 5)
2. What is your process for collecting & summarizing office discipline referral information? (E2)   (a) What data are collected?   (b) Who collects and enters the data?
3. What do you do with the office discipline referral information? (E2)   (a) Who looks at the data?   (b) How often do you share it with other staff?   (c) With whom do you share it?
4. What type of problems do you <u>expect</u> teachers/staff to refer to the office rather than handling in the classroom/specific setting? (D2)
5. What is the procedure for handling extreme crises/emergencies in the building (e.g., stranger with a gun, serious fight)? (D4)

Let's talk about your school rules (*Guidelines for Success, Schoolwide Behavioral Expectations*)

6. Do you have school rules (*Guidelines for Success, Schoolwide Behavioral Expectations*)?

   ☐ Yes   ☐ No (skip to Question 10)

7. How many are there?

8. What are the rules (*expectations, guidelines*)? (B5)

9. What are they called? (B2, B4)

10. Do you acknowledge students for doing well socially in ways that you do academically?

    ☐ Yes   ☐ No (skip to Question 12)

11. What are the social acknowledgements/activities/routines called (e.g., student of the month, reward assemblies, positive referrals, letter home, stickers, tickets)? (C2, C3)

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Let's talk about your schoolwide team

12. Do you have a team that addresses schoolwide discipline?

☐   Yes   ☐ No (skip to Question 19)

13. How often does the team meet? (F6)

14. Has the team taught/reviewed the schoolwide program to staff this year? (B3)

☐   Yes   ☐ No

15. Is your schoolwide team representative of your school staff? (F3)

☐   Yes   ☐ No

16. Are you or *another administrator* on the team? (F5)

☐   Yes   ☐ No

17. Do you *or another administrator* attend team meetings consistently? (F5)

☐   Yes   ☐ No

18. *Who is the team leader? (F4) (record name/title)*

19. Does the team provide faculty/staff updates on activities and data summaries? (E3)

☐   Yes   ☐ No

    If yes, how often?

20. Do you have an out-of-school (external) liaison in the state or district to support you in your development of schoolwide effective behavior support systems? (G2)

☐ Yes   ☐ No

    If yes, who is it?

21. What are your school improvement (*Consolidated School Improvement Plan*) goals? (F1)

22. Does your school budget contain an allocated amount of money for building and maintaining schoolwide effective behavior support? (G1)

☐ Yes   ☐ No

If yes, where does the money come from?

What are you most proud of in your school?

Staff/Team Member Interview Form (Minimum of 10)

	What are the school rules? Record # known [without assistance] (B5)	Have you taught the rules at least once this year? (B2)	Have you given any ___ since ___ (last 2 months) (C3)	**STAFF QUESTIONS** What type of student problems do/would you refer to the office? (D2)	What is the procedure for dealing with a stranger/fight? (D4)	Is there a team in your school to address SW effective behavior support systems?	Are you on the team? If yes, ask ☞	**TEAM MEMBER QUESTIONS** Does your team use discipline data to make decisions? (E4)	Has your team taught/reviewed SW program with staff this year? (B3)	Who is the team leader/facilitator? (F4)
1		Y N	Y N			Y N	Y N	Y N	Y N	
2		Y N	Y N			Y N	Y N	Y N	Y N	
3		Y N	Y N			Y N	Y N	Y N	Y N	
4		Y N	Y N			Y N	Y N	Y N	Y N	
5		Y N	Y N			Y N	Y N	Y N	Y N	
6		Y N	Y N			Y N	Y N	Y N	Y N	
7		Y N	Y N			Y N	Y N	Y N	Y N	
8		Y N	Y N			Y N	Y N	Y N	Y N	
9		Y N	Y N			Y N	Y N	Y N	Y N	
10		Y N	Y N			Y N	Y N	Y N	Y N	
Total										

List School Rules Here:

Student Interview Form (Minimum of 10)

	What are the school rules? Record # of rules known [without assistance] (B4)	Have you received a _____ since _____? [last 2 months] (C2)		List School Rules Here:
1		Y	N	
2		Y	N	
3		Y	N	
4		Y	N	
5		Y	N	
6		Y	N	
7		Y	N	
8		Y	N	
9		Y	N	
10		Y	N	
11		Y	N	
12		Y	N	
13		Y	N	
14		Y	N	
15		Y	N	
Total				

Observation Form

LOCATION	Are rules and expectations posted?		Is the documented crisis plan posted?	
Front Hall	Y	N	Y	N
Hall 1	Y	N		NA
Hall 2	Y	N		NA
Hall 3	Y	N		NA
Classroom 1	Y	N	Y	N
Classroom 2	Y	N	Y	N
Classroom 3	Y	N	Y	N
Cafeteria	Y	N	Y	N
Library	Y	N	Y	N
Other setting (gym, lab)	Y	N	Y	N
Total				

Schoolwide Evaluation Tool (SET)
Scoring Guide

Feature	Evaluation Question	Data Source(s) [Circle sources used] P=Product; I=Interview; O=Observation	Scoring Guide	Score (Range 0 – 2)
A. Behavioral Expectations Defined	1. Is there documentation that staff has agreed to 5 or fewer positively stated school rules/behavioral expectations?	**P** Discipline Handbook Instructional Materials Other _____	0 = No 1 = Too Many/Negatively Focused 2 = Yes	
	2. Are the agreed upon rules and expectations posted in 8 of 10 locations?	**O** Wall Posters Observation Other _____	0 = 0 – 4 1 = 5 – 7 2 = 8 - 10	
				/4
B. Behavioral Expectations Taught	1. Is there a documented system for teaching behavioral expectations to students on *at least* an annual basis?	**P** Lesson Plan Books Instructional Materials Other _____	0 = No 1 = States teaching will occur 2 = Yes	
	2. Do 90% of the staff asked state that teaching of behavioral expectations to students has occurred *at least once* this year?	**I** Interviews Other _____	0 = 0 – 50% 1 = 51 – 89% 2 = 90 – 100%	
	3. Do 90% of team members asked state that the schoolwide program has been taught/reviewed with staff on *at least* an annual basis?	**I** Interviews Other _____	0 = 0 – 50% 1 = 51 – 89% 2 = 90 – 100%	
	4. Can at least 70% of students asked state 67% of the school rules?	**I** Interviews Other _____	0 = 0 – 50% 1 = 51 – 69% 2 = 70 – 100%	
	5. Can 90% or more of the staff asked list 67% of the school rules?	**I** Interviews Other _____	0 = 0 – 50% 1 = 51 – 89% 2 = 90 – 100%	
				/10

Feature	Evaluation Question	Data Source(s) [Circle sources used] P=Product; I=Interview; O=Observation	Scoring Guide	Score (Range 0 – 2)
C. Ongoing System for Rewarding Behavioral Expectations	1. Is there a documented system for rewarding student behavior?	Interviews **I** Lesson Plan Books **P** Instructional Materials Other	0 = No 1 = States to acknowledge, but not how 2 = Yes	
	2. Do 50% or more of students asked indicate they have received a reward (other than verbal praise) for expected behaviors over the past 2 months?	Interviews **I** Other _____	0 = 0 – 25% 1 = 26 – 49% 2 = 50 – 100%	
	3. Do 90% of staff asked indicated they have delivered a reward (other than verbal praise) to students for expected behavior over the past 2 months?	Interviews **I** Other _____	0 = 0 – 50% 1 = 51 – 89% 2 = 90 – 100%	
				/6
D. System for Responding to Behavioral Violations	1. Is there a documented system for dealing with and reporting specific behavioral violations?	Discipline Handbook **P** Instructional Materials Other _____	0 = No 1 = States to document, but not how 2 = Yes	
	2. Do 90% of staff asked agree with administration on what problems are office-managed and what problems are classroom-managed?	Interviews **I** Other _____	0 = 0 – 50% 1 = 51 – 89% 2 = 90 – 100%	
	3. Is the documented crisis plan for responding to extremely dangerous situations posted in at least 6 of 7 locations?	Walls **O** Other _____	0 = 0 – 3 locations 1 = 4 – 5 locations 2 = 6 – 7 locations	
	4. Do 90% of staff asked agree with administration on the procedure for handling extreme emergencies (e.g., stranger in the building with a gun)?	Interviews **I** Other _____	0 = 0 – 50% 1 = 51 – 89% 2 = 90 – 100%	
				/8

Feature	Evaluation Question	Data Source(s) [Circle sources used] P=Product; I=Interview; O=Observation		Scoring Guide	Score (Range 0 – 2)
E. Monitoring & Decision-Making	1. Does the discipline referral form list the following? [circle items present on referral form] (a) student/grade (b) date (c) time (d) referring staff (e) problem behavior (f) location (g) persons involved (h) probable motivation (i) administrative decision	Referral Form	P	0 = 0 – 3 items 1 = 4 – 6 items 2 = 7 – 9 items	
	2. Can the administrator clearly define a system for collecting and summarizing discipline referrals (computer software, data entry time)?	Interview Other_____	I	0 = No 1 = Referrals are collected 2 = Yes	
	3. Does the administrator report that the team provides discipline data summary reports to the staff at least 3 times/year?	Interview Other_____	I	0 = No 1 = 1-2 times/year 2 = 3 or more times/year	
	4. Do 90% of team members asked report that discipline data are used for making decisions in designing, implementing, and revising schoolwide effective behavior support efforts?	Interviews Other_____	I	0 = 0 – 50% 1 = 51– 89% 2 = 90 – 100%	
					/8

Feature	Evaluation Question	Data Source(s) [Circle sources used] P=Product; I=Interview; O=Observation		Scoring Guide	Score (Range 0 – 2)
F. Management	1. Does the school improvement plan (*Consolidated School Improvement Plan*) list improving behavior support systems as one of the top 3 goals?	CSIP **P** Interview **I** Other _____		0 = No 1 = 4th goal or higher 2 = Yes	
	2. Do 90% of staff asked report that there is a schoolwide team established to address effective behavior support systems?	Interviews **I** Other _____		0 = 0 – 50% 1 = 51– 89% 2 = 90 – 100%	
	3. Does the administrator report that team membership includes representation of all staff?	Interview/ **I** Other _____		0 = No 2 = Yes	
	4. Can 90% of team members asked identify the team leader?	Interviews **I** Other _____		0 = 0 – 50% 1 = 51– 89% 2 = 90 – 100%	
	5. Is the administrator an active member of the schoolwide effective behavior support team?	Interview **I** Other _____		0 = No 1 = Yes, but not consistently 2 = Yes	
	6. Does the administrator report that team meetings occur at least monthly?	Interview **I** Other _____		0 = No team meetings 1 = Less often than monthly 2 = At least monthly	
	7. Does the administrator report that the team reports progress to the staff at least 4 times/year?	Interview **I** Other _____		0 = No 1 = Less than 4 times/year 2 = Yes	
	8. Does the team have an action plan for meeting specific *schoolwide effective behavior support goals that is less than one year old?*	Annual Plan **P** Calendar Other _____		0 = No 2 = Yes	
					/16

Feature	Evaluation Question	Data Source(s) [Circle sources used] P=Product; I=Interview; O=Observation	Scoring Guide	Score (Range 0 – 2)
G. District-Level Support	1. Does the school budget contain an allocated amount of money for building and maintaining schoolwide effective behavior support?	Interview I Other ____	0 = No 2 = Yes	
	2. Can the administrator identify an out-of-school (*external*) liaison in the district or state to support schoolwide behavior support systems development?	Interview I Other ____	0 = No 2 = Yes	
				/4

SET Summary Scores

Section	Score	Percent
A	/4 * 100	
B	/10 * 100	
C	/6 * 100	
D	/8 * 100	
E	/8 * 100	
F	/16 * 100	
G	/4 * 100	
	(Total/7)	

GOAL =   80 % Features Implemented
            _____
            80 % Score for Section B

STATUS = _____ %Total Features Implemented
            _____
            % Score for Section B

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kycid   *End-of-Year Report Item 1*   *Page 1*

School-wide Benchmarks of Quality: SCORING FORM

School Name: _____ District: _____

Coach's Name: _____ Date: _____

STEP 1: Coach uses the Scoring Guide to determine appropriate point value. Circle ONLY ONE response.

STEP 2: Indicate your team's most frequent response. Write the response in column 2.
(in place ++, needs improvement +, or not in place -). If there is a tie, report the higher score.

STEP 3: Place a check next to any item where there is a discrepancy between your rating and the team's rating.
Document the discrepancies on page 3.

Critical Elements	STEP 1					STEP 2 ++, +, or _	STEP 3 ✓
PBIS Team	1. Team has broad representation			1	0		
	2. Team has administrative support	3	2	1	0		
	3. Team has regular meetings (at least monthly)		2	1	0		
	4. Team has established a clear purpose or vision			1	0		
Faculty Commitment	5. Faculty are aware of behavior problems across campus (regular data sharing)		2	1	0		
	6. Faculty involved in establishing and reviewing goals		2	1	0		
	7. Faculty feedback obtained throughout year		2	1	0		
Effective Procedures for Dealing with Discipline	8. Discipline process described in narrative format or depicted in graphic format		2	1	0		
	9. Process includes documentation procedures			1	0		
	10. Discipline referral form includes information useful in decision making		2	1	0		
	11. Behaviors defined	3	2	1	0		
	12. Major/minor behaviors are clearly identified/understood		2	1	0		
	13. Suggested array of appropriate responses to minor (non office-managed) problem behaviors			1	0		
	14. Suggested array of appropriate responses to major (office-managed) problem behaviors			1	0		
Data Entry & Analysis Plan Established	15. Data system to collect and analyze ODR data	3	2	1	0		
	16. Additional data collected (attendance, grades, faculty attendance, surveys)			1	0		
	17. Data entered weekly (minimum)			1	0		
	18. Data analyzed monthly (minimum)		2	1	0		
	19. Data shared with team and faculty monthly (minimum)		2	1	0		
Expectations & Rules Developed	20. 3-5 positively stated school-wide expectations posted around school	3	2	1	0		
	21. Expectations apply to both students and staff	3	2	1	0		
	22. Rules/procedures developed for specific settings (where problems are prevalent)		2	1	0		
	23. Rules/procedures are linked to expectations			1	0		
	24. Staff feedback/involvement in expectations and rules/procedures development		2	1	0		

Adapted from the Florida Benchmarks of Quality Scoring Guide, part of Florida's PBS Project at USF

Critical Elements	STEP 1	3	2	1	0	STEP 2 ++, +, or _	STEP 3 ✓
Reward/ Recognition Program Established	25. A system of rewards has elements that are implemented consistently across campus	3	2	1			
	26. A variety of methods are used to reward students		2	1	0		
	27. Rewards are linked to expectations	3	2	1	0		
	28. Rewards are varied to maintain student interest		2	1	0		
	29. System includes opportunities for naturally occurring reinforcement			1	0		
	30. Ratios of reinforcement to corrections are high	3	2	1	0		
	31. Students are involved in identifying/developing incentives			1	0		
	32. The system includes incentives for staff/faculty		2	1	0		
Lesson Plans for Teaching Expectations/ Rules	33. A behavioral curriculum includes concept and skill level instruction		2	1	0		
	34. Lessons include examples and non-examples			1	0		
	35. Lessons use a variety of teaching strategies		2	1	0		
	36. Lessons are embedded into subject area curriculum		2	1	0		
	37. Faculty/staff and students are involved in development & delivery of lesson plans			1	0		
	38. Strategies to reinforce the lessons with families/community are developed and implemented			1	0		
Implemen- tation Plan	39. Develop, schedule and deliver plans to teach staff the discipline and data system		2	1	0		
	40. Develop, schedule and deliver plans to teach staff the lesson plans for teaching students		2	1	0		
	41. Develop, schedule and deliver plans for teaching students expectations/rules and procedures/rewards	3	2	1	0		
	42. Booster sessions for students and staff are planned, scheduled, and delivered		2	1	0		
	43. Schedule for rewards/incentives for the year is planned			1	0		
	44. Plans for orienting incoming staff and students are developed and implemented		2	1	0		
	45. Plans for involving families/community are developed and implemented			1	0		
Crisis Plan	46. Faculty/staff are taught how to respond to crisis situations			1	0		
	47. Responding to crisis situations is rehearsed			1	0		
	48. Procedures for crisis situations are readily accessible			1	0		
Evaluation	49. Students and staff are surveyed about PBIS		2	1	0		
	50. Students and staff can identify expectations and rules/procedures		2	1	0		
	51. Staff use discipline system/documentation appropriately	3	2	1	0		
	52. Staff use reward system appropriately	3	2	1	0		
	53. Outcomes (behavior problems, attendance, etc.) are documented and used to evaluate PBIS Action Plan	3	2	1	0		

TOTAL _____

Adapted from the Florida Benchmarks of Quality Scoring Guide, part of Florida's PBS Project at USF

Benchmarks of Quality TEAM SUMMARY

School_____ **Date**_____ **Total Benchmarks Score**_____

Areas of Discrepancy

Item #	Team Response	Coach's Score	Scoring Guide Description

*If a team discussion of an area of discrepancy reveals information that was previously unknown to the coach and would justify a different score on any item (based upon the Scoring Guide), adjust the benchmark item(s) and total scores.

Areas of Strength

Critical Element	Description of Areas of Strength

Areas in Need of Development

Critical Element	Description of Areas in Need of Development

Adapted from the Florida Benchmarks of Quality Scoring Guide, part of Florida's PBS Project at USF

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The following letter of cooperation was sent to 22 superintendents in order to request permission to contact schools in their district to participate in the study. Letters were mailed on October 21, 2010.

Dear Dr./Mr./Ms. (Superintendent Last Name):

The Kentucky Center for Instructional Discipline (KYCID) has enjoyed a professional partnership with schools in _____ County for many years. During that time, there has not been a comprehensive evaluation of the impact of PBIS on student outcomes. As part of a research project to fulfill requirements for my doctoral dissertation from Western Kentucky University, I plan to evaluate the relationship between PBIS implementation and office discipline referral, out-of-school suspension, attendance, retention, and drop-out rates. The project will provide much needed evaluation evidence of the effect of PBIS implementation in our region and might possibly be used to provide support for continued funding.

I would like to include the KYCID schools in your district with 4 or more years of data in the evaluation. Schools participating in the study, along with their districts, will remain anonymous and their identity will be held confidential.

Specifically, I would like to examine these data sources from your schools: Self-Assessment Survey results and office discipline referrals. Out-of-school suspensions, attendance, retention, and drop-out data will be gathered from public sources. Evaluation results will be shared with each cooperating school and district. With your permission, I will seek written cooperation from each school principal in your district with at least 4 years of data. Please indicate your preference, sign below, and return the completed form to me in the self-addressed, stamped envelope by November 5.

Thank you in advance for your support. I am excited to conduct a study that will be worthwhile to Kentucky's PBIS initiative. If you have any questions or concerns, please do not hesitate to contact me at 270-779-9470 or my dissertation chair, Dr. Chris Wagner, at 270-791-3088.

Sincerely,

Kelly Davis
Kentucky Center for Instructional Discipline
West Region Area Coordinator

_____ I agree to allow school data described above to be used in the study.

_____ I do not wish to allow school data described above to be used in the study.

_____
Signature

Appendix F: Letter to Principals

The following letter of cooperation was sent to 56 principals in order to request permission to use their school's data in the study. Letters were mailed upon receiving permission from district superintendents to contact principals.

Dear Dr./Mr./Ms. (Principal Last Name):

The Kentucky Center for Instructional Discipline (KYCID) has enjoyed a professional partnership with your school for several years in working to implement Positive Behavioral Interventions and Supports (PBIS). To date, there has not been a comprehensive evaluation of the impact of PBIS on student outcomes in Kentucky. As part of a research project to fulfill requirements for my doctoral dissertation from Western Kentucky University, I plan to evaluate the relationship between PBIS implementation and office discipline referral, out-of-school suspension, attendance, retention, graduation, and drop-out rates. The project will provide much needed evaluation evidence of the effect of PBIS implementation in our region and might possibly be used to provide support for continued funding.

I would like to include your school's data in the evaluation. Schools participating in the study, along with their districts, will remain anonymous and their identity will be held confidential.

Specifically, I would like to examine these data sources from your school: Self-Assessment Survey results and office discipline referrals. These two sources of information are on file in my office from the time period of collaboration between KYCID and _____. Out-of-school suspensions, attendance, retention, graduation, and drop-out data will be gathered from public sources. Evaluation results will be shared with each cooperating school and district. Please indicate your preference, sign below, and return the completed form to me in the self-addressed, stamped envelope by _____. A copy of the approval letter signed by your superintendent is included for your review.

Thank you in advance for your support. I am excited to conduct a study that will be worthwhile to Kentucky's PBIS initiative. If you have any questions or concerns, please contact me at 270-779-9470 or my dissertation chair, Dr. Chris Wagner, at 270-791-3088.

Sincerely,

Kelly Davis
KYCID West Region Area Coordinator

_____ I agree to allow school data described above to be used in the study.

_____ I do not wish to allow school data described above to be used in the study.

_____
Signature

Appendix G: Institutional Review Board Approval

WKU.

A LEADING AMERICAN UNIVERSITY WITH INTERNATIONAL REACH

HUMAN SUBJECTS REVIEW BOARD

In future correspondence, please refer to HS11-126, January 11, 2011

Kelly Davis
c/o Dr. Wagner
Educational Leadership
WKU

Kelly Davis:

Your research project, *Program Evaluation of Universal Positive Behavioral Interventions and Supports in Kentucky*, was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is not required; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

This project is therefore approved at the Exempt from Full Board Review Level.

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office. A Continuing Review protocol will be sent to you in the future to determine the status of the project. Also, please use the stamped approval forms to assure participants of compliance with The Office of Human Research Protections regulations.

Sincerely,

Paul J. Mooney, M.S.T.M.
Compliance Coordinator
Office of Research
Western Kentucky University

cc: HS file number Davis HS11-126