2004-05 to 2007-08

WAKE COUNTY
PUBLIC SCHOOL SYSTEM

A STATUS REPORT OF POSITIVE BEHAVIOR INTERVENTION AND SUPPORT IN THE WAKE COUNTY PUBLIC SCHOOL SYSTEM

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ABSTRACT

Positive Behavior Intervention and Support (PBIS) is a national initative to reform the learning environments of schools by establishing expectations, reducing behavioral problems, and supporting academic performance. Unlike other state evaluations, this report uses cluster analysis to identify a group of schools to serve as a comparison group. This report presents mixed results on the effectiveness of PBIS in the Wake County Public School System (WCPSS). Elementary schools achieved the highest levels of implementation in 2007-08, followed by middle schools, whereas high schools had not fully implemented PBIS. School-level analysis of outcomes offers little evidence of the success of Cohort 1 PBIS schools in producing consistent positive changes in climate, behavioral, and academic outcomes. Moreover, general trends were similar for PBIS and comparison schools, with differences most often favoring comparison schools. Participants of interviews and focus groups describe the positive impact of PBIS on promoting consistent behavior expectations and reducing tardy rates.

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A STATUS REPORT OF POSITIVE BEHAVIOR INTERVENTION AND SUPPORT IN THE WAKE COUNTY PUBLIC SCHOOL SYSTEM

SUMMARY

BACKGROUND

What need is Positive Behavior Intervention and Support designed to meet?

Positive Behavior Intervention and Support (PBIS) is both a philosophical framework and a collection of professional practices designed to increase school safety, create a more positive school climate, enhance students' social-behavioral skills, and establish an effective learning environment. It is available to schools that need assistance in developing strategies to effectively handle challenging and disruptive student behavior. Thus, schools may initiate the PBIS initiative to help improve their behavioral support systems. Within the Wake County Public School System (WCPSS), some new schools have adopted PBIS as a way to proactively set a positive climate.

What strategies does PBIS employ?

There are three main categories of PBIS activities:

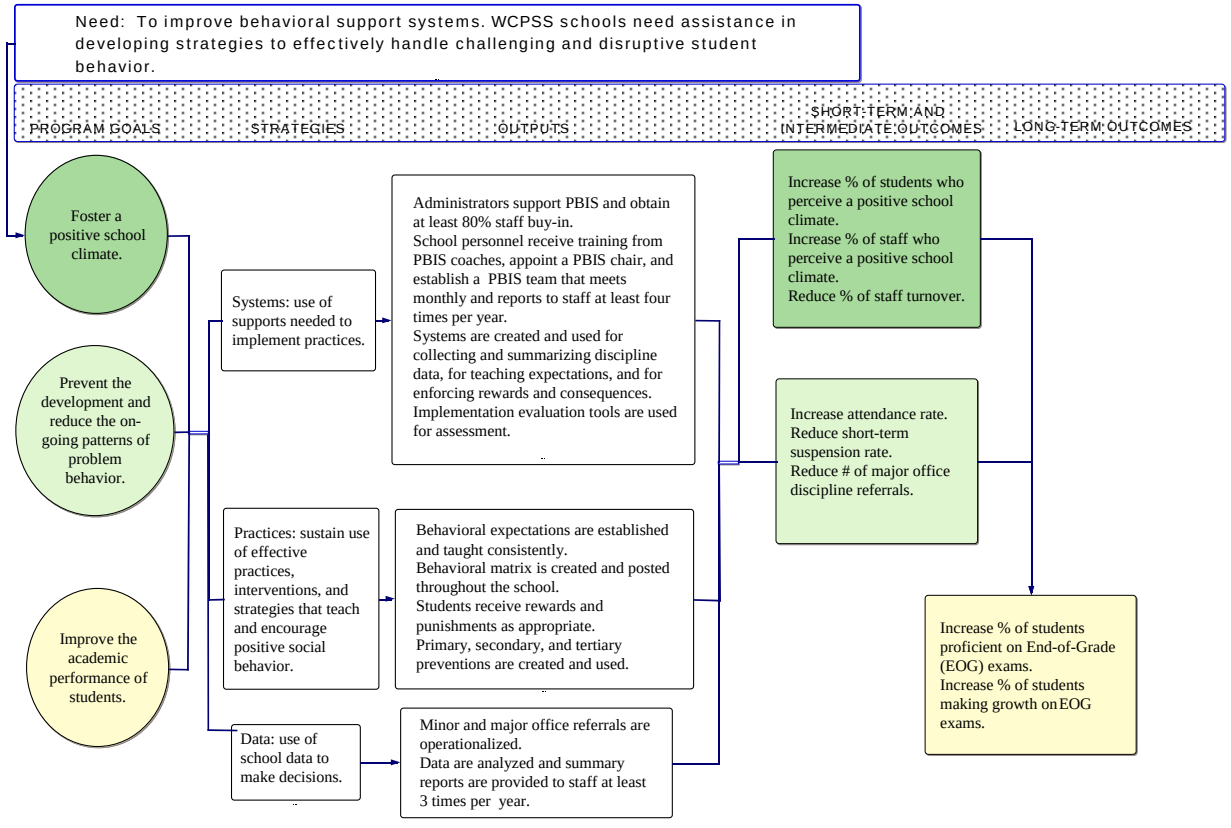
- **Systems:** use of supports needed to implement practices. The outputs range from school administrators and staff receiving training from PBIS coaches to creating systems for expectations, rewards, and violations.
- **Practices:** sustained use of effective practices, interventions, and strategies that teach and encourage positive social behavior. The direct products of these activities include consistently teaching behavioral expectations, publicly posting the school's behavioral matrix, establishing rewards and consequences, and using primary, secondary, and tertiary preventions. Primary strategies are designed to impact all students, while secondary and tertiary preventions are designed for students with occasional or severe issues related to discipline.
- **Data:** use of school data to make decisions. Minor and major office referrals are operationalized, disciplinary data are analyzed, and summary reports are provided to staff at least three times per year.

What are the goals of PBIS?

The goals of PBIS are to foster a positive school climate; prevent the development and reduce on-going patterns of problem behavior; and ultimately, improve the academic performance of students. PBIS promotes a preventive schoolwide approach to discipline which is important to ensure a positive school climate in which students and staff feel safe and secure, and consequently promotes an environment supportive of high levels of learning. If students are aware of rules and expectations and if teachers have the skills to efficiently deal with disruptions, there should be less opportunity for classroom disruptions and more time to focus on teaching

and learning. Proactive and consistent attention to discipline-related issues throughout the school can help minimize the time teachers and administrators spend reacting to inappropriate student behavior and increase the time available for teaching and learning (Shellard, Protheroe, and Turner, 2005). Figure 1 portrays the logic model that displays the program's assumptions of why desired change is expected to occur by linking the planned strategies and the desired outcomes.

Figure 1
PBIS Logic Model



What is the cost of the PBIS initiative in WCPSS?

The WCPSS PBIS initiative is funded through federal Title II funds (PRC 103). In 2007-08, the majority (82%) of the $663,889 budget was spent on personnel costs, such as salaries and benefits for six full-time PBIS coaches (equaling 72 months of employment), funds for a part-time coordinator, and substitutes for teachers who attend training. In 2007-08, approximately 12 PBIS schools were supported by one PBIS coach. The PBIS coach visits the school as often as needed. The frequency varies by school and often depends on the energy of the school team and how quickly they choose to implement the program.

Each year since 2005-06, the central PBIS coordinator has provided funding to all WCPSS PBIS schools to utilize the Schoolwide Information System (SWIS). SWIS is a web-based information system originating from the University of Oregon. It provides school personnel with accurate and timely student information for making decisions about discipline systems and costs approximately $200 per year per school. At least one person at each school is required to attend SWIS training that is conducted by the PBIS coaches. At their own discretion, WCPSS schools participating in PBIS may also receive monetary gifts from their PTA or utilize Fund 6 to help defray the cost of posters, banners, tokens, and other reinforcements.

Time spent attending PBIS team meetings or training sessions is an opportunity cost that may not be readily apparent. Opportunity costs occur when participation in one opportunity means that involvement in an alterative opportunity is sacrificed. Each PBIS school must establish a PBIS team consisting of approximately eight members, including at least one administrator and other representatives of the school population, such as teachers, teacher assistants, counselors, psychologists, social workers, parents, department heads, and others. The team selects one person to serve as the PBIS chair. Regular meetings are held throughout the school year, at which time the team discusses PBIS strategies, plans implementation, analyzes data and plans training for staff and students. During the first year of PBIS implementation, members of the PBIS team are required to attend six days of training throughout the school year: two days of Module 1 in August, two days of Module 2 at mid-year, and two days of Module 3 in March. The PBIS budget funds substitutes for teachers who attend these sessions. Given the rates of teacher and administrator turnover and the number of new schools that open in WCPSS every year, PBIS coaches offer additional refresher and condensed training days throughout the school year.

METHODOLOGY

What evaluation methods are used in this study?

During the 2005-06 school year, WCPSS implemented PBIS in 14 schools. As of 2007-08, 72 PBIS schools [14 from 2005-06 (Cohort 1), 28 from 2006-07 (Cohort 2), and 30 from 2006-07 (Cohort 3)] were supported by the six PBIS coaches. The primary focus of this report centers on PBIS schools in Cohort 1, with limited analysis conducted on schools in Cohorts 2 and 3. Unlike many other state evaluations that present evidence of the impact of PBIS in their school districts, this report uses individual PBIS schools as its unit of analysis. This report also utilizes the cluster analysis technique to select a group of schools that have not implemented PBIS to serve as a comparison group for empirical examination. Many state reports do make comparisons between their low and high implementing schools and between themselves and national PBIS data; however, few analyses have been conducted between PBIS and non-PBIS schools, primarily due to a lack of comparable data. The comparative analysis conducted for this study between individual PBIS schools and similar schools that are not participating in the initiative is an important methodological contribution to the educational literature. This report's use of multiple research methods that facilitate the following analyses is also noteworthy.

- The degree to which schools in Cohorts 1 and 2 have effectively implemented PBIS is examined through the analysis of evaluation results based on a nationally utilized schoolwide evaluation tool.
- Expected short-term outcomes of Cohort 1 elementary and middle schools are examined through school-level analysis of changes in certain climate and behavioral outcomes. Two achievement measures based on state tests are examined as possible long-term academic outcomes. The same analyses were conducted for comparison schools not participating in PBIS.
- Interviews and focus groups with personnel from PBIS schools were conducted to gain insight into staff perceptions of the impact of PBIS on implementation efforts and desired outcomes.

What are the limitations of the analyses?

Despite the strength of this report's methodology, some limitations are present. The empirical findings presented in this report reveal patterns and trends and cannot establish that PBIS caused any positive changes independent of other events in the schools. For example, teacher turnover rates can be affected by circumstances related to promotions, pregnancy, or illness. Additionally, changes in administration may have indirectly affected the success of PBIS schools in producing desired outcomes. The evaluation of implementation efforts at PBIS schools is limited to those schools that allowed PBIS staff to conduct evaluations, thus excluding Cohort 1 high schools. It is also worth noting that school climate, student behavior, and student achievement can be measured using a variety of indicators. This report relied on the most standard and universal measures available to maintain reliable comparisons. One measure of student behavior (office referrals) is not comparable between PBIS schools and non-PBIS schools. Every effort was made to provide baseline data prior to PBIS implementation; however, in some cases these data were unavailable. Finally, several questions asked in the interviews and focus groups required respondents to reflect back on their PBIS experience and look forward to what improvements might be made in the future. Some respondents were not employed at their present schools when PBIS was initially implemented.

FINDINGS

Was PBIS implemented appropriately?

A Schoolwide Evaluation Tool (SET) was developed by the National Positive Behavioral Interventions and Supports and Intervention Center and is used nationally to measure the level of implementation across seven schoolwide PBIS practices. SET results for WCPSS show that most elementary and middle schools in Cohorts 1 and 2 have fully implemented PBIS, with the highest SET scores found among elementary schools.

- The SET evaluations conducted in 2006-07 for Cohort 1 elementary and middle schools showed that 67% (five out of seven) of elementary schools and 60% (three out of five) of middle schools achieved high levels of implementation by their second year of participation. By the third year of implementation, all of the elementary schools and most of the middle

schools scored at least an 80% average, indicating full implementation. The two PBIS high schools within Cohort 1 did not participate in the SET.

- Among Cohort 2 schools, 15 of the 17 elementary schools achieved a SET implementation average that met or exceeded 80%, compared to four of the seven middle schools. None of the high schools in Cohort 2 earned high implementation scores.

Did PBIS schools meet their short-term and long-term goals?

Improving school climate and student behavior are short-term goals of PBIS, whereas improved achievement is a long-term goal. Longitudinal changes in these outcomes were reviewed among PBIS schools and relative to a set of matched comparison schools. A summary of the overall findings is presented in Table 1. School-level analysis of outcomes offered little evidence of the success of PBIS schools in producing consistent, positive changes in climate, behavioral, and academic outcomes. Some of the PBIS schools analyzed for this study experienced a significant change or a positive change in one of the outcome measures at some point since the first year of implementation. No school experienced improvements on each variable. Moreover, the general trends for PBIS schools were not considerably different from comparison schools, especially at the middle school level. When significant differences were found, they favored comparison schools in most cases.

Table 1
Summary of Quantitative Results for Cohort 1 PBIS and Comparison Schools Indicating the Group with the More Favorable Outcomes

Outcome		Elementary	Middle
Climate	*Student Climate*	Comparison	No difference
	Teacher Climate	PBIS	Comparison
	Teacher Turnover	Comparison	No difference
Behavior	*Attendance*	No difference	No difference
	Short-Term Suspensions	PBIS	No difference
	Office Discipline Referrals	Data not comparable	Data not comparable
Achievement	*Proficiency*	Comparison	Comparison
	Growth	Comparison	Comparison

Analysis of short-term outcomes among elementary schools yielded mixed results. Improvement in teachers' perceptions of school climate and short-term suspensions were more likely at PBIS schools, whereas changes in students' perceptions of school climate and teacher turnover rates favored comparison schools. Positive differences in academic outcomes were more likely to occur among comparison schools.

- In general, a greater number of elementary comparison schools than PBIS elementary schools had statistically significant increases in student climate. In contrast, teachers' perceptions of school climate were less favorable among comparison elementary schools, with the greatest gains occurring among PBIS schools. It appears that a greater number of elementary comparison schools than PBIS schools had reduced teacher turnover between 2004-05 and 2007-08.
- Attendance was over 90% in all schools initially and changed very little at PBIS and comparison elementary schools between 2004-05 and 2007-08. Most of the schools had low incidences of short-term student suspensions. At the elementary school level, PBIS schools experienced statistically significant reductions in the percentage of short-term suspension incidences at a greater frequency than did comparison schools. One of the seven PBIS elementary schools experienced a notable decline in office discipline referrals.
- Among the elementary schools, statistically significant increases in proficiency rates and student growth occurred in mathematics, but not in reading. These positive changes were more likely to occur at comparison schools. Comparisons of measures of achievement within each matched pair showed that in most instances, there was no significant difference in proficiency rates or student growth at any given year. When a significant difference was found in either measure, it tended to favor the matched comparison school.

Among middle schools, general trends in outcomes among PBIS schools in Cohort 1 were not considerably different from the comparison schools. Any resultant positive changes were more typical at comparison schools.

- Both middle school groups showed significant improvements in student climate by 2007-08, however, comparison schools showed more favorable changes in teacher climate compared to PBIS schools. There were no apparent differences in the trends of teacher turnover among middle school groups.
- Most WCPSS middle schools have high attendance rates, and neither PBIS nor comparison schools tended to experience improvements. Similarly, most of the schools had low incidences of short-term student suspensions and no differences were seen between PBIS and comparison schools. Two of the four PBIS middle schools experienced notable declines in office discipline referrals.
- Statistically significant increases in both reading and mathematics proficiency rates were not frequent among either PBIS or comparison groups at the middle school level. When a statistically significant difference was found between each matched pair in either measure of achievement, it tended to favor the matched comparison school.

Did PBIS schools view the program as a success?

Interview and focus group results suggested that PBIS schools benefit from strategies such as establishing consistent behavior expectations and using the "start on time" practice.

- Elementary administrators commonly mentioned that using schoolwide behavioral expectations as part of the PBIS initiative helped them to effectively handle problem behavior, improve school climate, and decrease office referrals.

- Middle and high school administrators cited the "start on time" practice, which encourages early and on-time arrival to school and classes, as an extremely effective PBIS strategy for reducing tardy rates.
- Stories of success in establishing staff buy-in of the PBIS initiative varied. Several PBIS chairs of PBIS teams at elementary and middle schools expressed concerns regarding the low levels of staff buy-in and motivation to implement the program. Conversely, elementary school administrators spoke of the high level of staff buy-in at their schools, whereas middle and high school administrators admitted that buy-in might be improved if the PBIS model were more amenable to their student populations. In general, middle and high school administrators expressed a need for continued support by PBIS coaches beyond the first few years of implementation to assist with the training of new staff, especially at schools that have recently opened and receive new staff annually.

RECOMMENDATIONS

What trends are evident from these evaluation results?

The quantitative and qualitative analyses of outcomes conducted for this study produced mixed results among PBIS schools. Although there was evidence that most elementary and middle schools had successfully implemented schoolwide behavior practices, there was less evidence of PBIS schools' success in producing positive changes in climate, behavioral, and academic outcomes. Whereas some of the PBIS schools in Cohort 1 experienced a significant and positive change in at least one measurable outcome, no school was successful in achieving the desired result within each indicator. In many instances, there was little to no difference in outcomes over time between PBIS and comparison schools. When a significant and positive change in climate, behavior, or academic achievement did occur, it was more likely to happen at comparison schools not implementing PBIS. Positive changes were more evident among PBIS elementary schools than PBIS middle schools. Personnel from PBIS schools did provide stories of success through interviews and focus groups, and concurrently made suggestions for improving the less effectual components of the initiative.

It may have been premature to expect to find consistent positive results at schools that were the first in the district to implement PBIS. In fact, the WCPSS PBIS staff believe that the PBIS program has become stronger since it was implemented with Cohort 1 in 2005-06. Additionally, PBIS schools may not have planned to produce changes in all of the various indicators that were examined for this study. Overall, while WCPSS schools may respect the general PBIS ideology, it appears that school practices, expectations, and goals are somewhat idiosyncratic, which may explain the mixed findings presented in this report.

Do the evaluation results suggest a need for improvement in PBIS implementation throughout WCPSS?

Based on the empirical evidence obtained from this evaluation, the WCPSS Evaluation and Research (E&R) Department staff offer several recommendations for improvement. Discontinuing the initiative at schools that are not actively monitoring the implementation of PBIS and its impact on student outcomes and eliminating schools that persistently fail to show

evidence of positive outcomes would make it possible to offer more funds to other participating schools. Additionally, postponing the addition of coaches or schools until PBIS program staff, in collaboration with school staff, can strengthen the model for secondary schools and address buy-in and other issues for all schools would allow Title II funds to be repurposed to other PBIS WCPSS schools or other district initiatives.

WCPSS staff committed to strengthening the PBIS initiative are encouraged to:

- Develop and institute more sufficient secondary and tertiary level interventions for educationally at-risk students (middle 15%) and students with severe behavioral issues (top 5%). The intervention triangle displaying the levels of support and risk of behavior is used as a heuristic (Irwin and Algozzine, 2008). As such, the percentages of students falling into each tier are metaphorical representations of what seems to be logical in most cases, rather than scientifically validated numbers. If the general pattern of schoolwide behavior is positive and not problematic, it may make fiscal sense to implement other programs that focus on the needs of students with moderate to severe behavioral problems rather than maintaining a commitment to the PBIS schoolwide initiative. An assessment of need should be conducted prior to PBIS implementation to ensure an appropriate match between the need of the school and the program intended to meet the need.

- Amend the PBIS program for students in higher grade levels by identifying developmentally appropriate behavioral expectations and finding reinforcements and rewards that will better motivate behavior. As the students progress to the upper grades, it is important to include them in the development of school expectations. Discussions that occur between students and staff during the expectation-setting process may provide students with a better understanding of the reasoning behind those expectations and promote more allegiance to them. Students may also offer suggestions for a rewards system that is appealing to them.

- Establish a mentoring program or Professional Learning Community (PLC) among first year and tenured PBIS schools. Creating PLC groups by school level may be a way to ameliorate the efforts of PBIS support in the coming years. These groups would provide a time to share best practices, generate new ideas, and solve problems.

- Revisit the level of support available to schools during each phase of implementation and beyond, and encourage schools to become more independent of external support. PBIS staff should discuss whether they will offer refresher training and nominal support to PBIS schools beyond the first years of implementation. The level of support provided to PBIS schools will depend on balancing available resources with the needs and desires of the schools. Ways to support schools with electronic support should be explored, such as providing training via Camtasia, an on-line audio/visual software program. The issue of leadership turnover should be explicitly discussed and addressed prior to participation and plans should be in place to make applicants aware of the program expectations during the hiring process and to train new staff immediately upon hiring.

- Obtain evidence of improvement by reviewing district and school-level results and create a plan of improvement for less successful schools. PBIS staff and PBIS school staff are encouraged to review expected outcome data annually, and E&R staff should plan another formal evaluation of the PBIS initiative in another three years to allow time for improvements to be implemented.

A STATUS REPORT OF POSITIVE BEHAVIOR INTERVENTION AND SUPPORT IN THE WAKE COUNTY PUBLIC SCHOOL SYSTEM

BACKGROUND

POSITIVE BEHAVIOR INTERVENTION AND SUPPORT: A SYSTEMATIC APPROACH

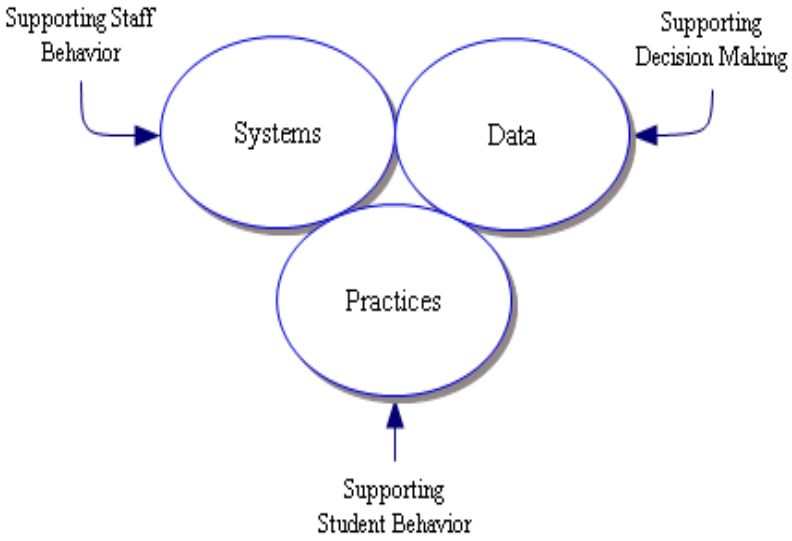
Traditionally, schoolwide discipline has focused mainly on reacting to specific student misbehavior by implementing punishment-based strategies including reprimands, loss of privileges, office referrals, suspensions, and expulsions. Teaching behavioral expectations and rewarding students for following them is a much more positive approach than waiting for misbehavior to occur before responding. The purpose of Positive Behavior Intervention and Support (PBIS) is to establish a climate in which appropriate behavior is the norm within the school (Office of Special Education Programs [OSEP] Technical Assistance Center on Positive Behavioral Interventions and Supports [PBIS] Web site www.pbis.org/main.htm).

PBIS is a systematic approach, not a specific curriculum, which establishes and reinforces clear expectations for positive behavior. The intent of PBIS is to foster a positive climate in an effort to promote behavioral and academic success. The goals within PBIS schools are to prevent the development of problem behavior, to reduce ongoing patterns of problem behavior, and to improve the academic performance of students through development of a positive, predictable, and safe school culture. These goals are achieved through active teaching and rewarding of appropriate social skills, establishing and implementing consistent consequences for problem behavior, and ongoing collection and use of data for making decisions (Horner, Sugai, Lewis-Palmer, 2005). Figure 2 displays these three interconnecting components or activities of PBIS programs (as presented in Irwin and Algozzine, 2006; OSEP PBIS Web site).

- **Systems**: emphasis on systematically teaching social behavior using effective instructional methodology and systematically implementing behavioral interventions for the most difficult students. PBIS provides systems and supports needed to implement the PBIS practices and to design, apply, and evaluate effective classroom, non-classroom, and student specific plans.
- **Data**: emphasis on continuous decision-making based on the school data that describes the school's status, informs the need for change, and shows the effects of interventions. This is an innovative problem-solving process that involves the entire school population.
- **Practices**: adoption and sustained use of effective practices, primarily evidence-based interventions and strategies, that will teach and encourage positive social behavior in students. Within PBIS, the individual behaviors of students and faculty are the basis for targeting intervention efforts; however, the essential goals of PBIS are to create a schoolwide context in which individuals are more successful. The schoolwide practices are intended for all students and all staff in all settings.

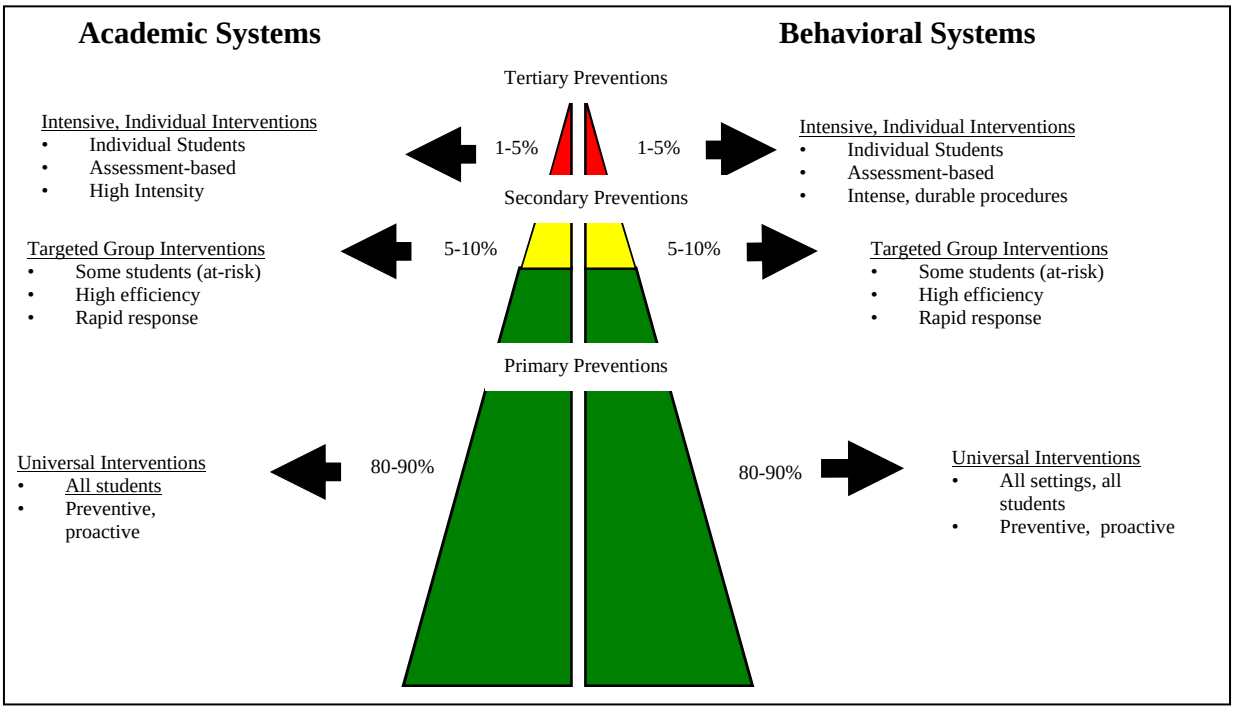
The author would like to acknowledge the contributions of Nancy Baenen and David Holdzkom of the WCPSS Evaluation and Research Department (E&R), Bindiya Shajith (contractor to E&R), and the WCPSS Positive Behavior Intervention and Support staff who provided program data and information.

Figure 2
PBIS Components



An important feature of PBIS, which originated within the field of public health and disease control, is the prevention framework for improving outcomes in both academics and behavior (Sugai, 2007). PBIS practices, systems, and data outcomes follow this three-tired model for designing schoolwide instructional and behavior support systems, as illustrated in Figure 3. Behavior support in schools has historically and primarily targeted children engaging in severe, chronic problem behaviors. Horner, Todd, Lewis-Palmer, Irvin, Sugai, and Boland (2004) described a shift that has occurred over the past 15 years in which schools are focusing more on the prevention of problem behaviors and implementation of schoolwide practices and less on the remediation of problem behaviors among a limited number of students. Although the need for intensive, individualized interventions for students with high risk behavior (tertiary preventions) persists, two additional approaches are also necessary. To improve the overall climate and behavioral culture of the school, schools should also respond to the needs of students who are at risk for developing consistent patterns of problem behavior by using targeted interventions (secondary preventions). Additionally, schoolwide behavior support practices should be established for all students (primary preventions) to prevent the development of problem behavior and to identify students whose behaviors are not responsive to the core expectations (Sugai, 2007).

Figure 3
Three-Tiered Model for Designing
Schoolwide Instructional and Behavior Support Systems



According to Sugai (2007), to engage schoolwide positive behavioral support programs, it is important to establish and reinforce clear behavioral expectations throughout the school building and school day (i.e. provide universal interventions). The school staff must adopt a common approach to discipline that is proactive, instructional and outcome-based. Simple, clear, and fair rules should be developed and the behavioral expectations taught and practiced. It is expected that appropriate behaviors will be acknowledged regularly, with the goal of having four positive interactions to every one negative interaction. A key assumption of investing in schoolwide PBIS is that many students are more likely to behave appropriately when expectations are clearly defined, actively taught, and appropriately rewarded. Another assumption is that if all students have been taught and know the school's behavioral expectations, they are likely to encourage appropriate behavior within their peer groups. If both of these assumptions are met, the school should experience a reduction in overall problem behaviors. Consequently, administrators, teachers, and staff can direct intensive supports to students with more severe behavior support needs. For instance, additional opportunities for meeting school expectations and practicing social skills such as self-control, problem solving, and anger management can be made available to students who continue to have behavioral difficulties in spite of the schoolwide behavioral program.

Several states across the United States that have schools participating in the PBIS initiative have published reports illustrating the effects of PBIS in their school districts. Although results are variable, the analyzed outcomes almost always include SET evaluation results and office discipline referrals with occasional examinations of suspension and achievement data. Most states rely on the district as the unit of analysis for their evaluations. It is also typical for results to be compared between low and high PBIS implementing schools. Most states find that participating schools achieve full implementation levels in one or two years, and that high implementing schools tend to yield more positive outcomes than low implementing schools.

In a recent analysis of the first cohort of New Hampshire schools to implement PBIS, researchers found that between their first and second years of implementation, available data for 22 schools showed a collective reduction in the number of office discipline referrals and suspensions, with the greatest change occurring at the secondary level. The vast majority of the schools that had fully implemented PBIS also experienced academic gains in mathematics (Muscott, Mann, and LeBrun, 2008). As with most states implementing the PBIS initiative, Maryland schools use SWIS to monitor office discipline referrals. Taken together, the schools' data for 2005-06 showed lower rates of referrals compared to the national average. Considering data from 62 elementary and middle schools, a reduction in suspension rates also occurred in as little as one year after implementation (Barrett, Bradshaw, Lewis-Palmer, 2008). Declines in office discipline referrals were apparent for some, but not all PBIS cohorts within an Iowa school district (Mass-Galloway, Panyan, Smith, and Wessendorf, 2008). Collective data for fully implementing PBIS schools in Illinois during 2005-06 and 2006-07 showed lower rates of office discipline referrals compared to the national average. Data for the fully implementing schools also showed lower suspensions, improved school safety, and a higher percentage of 3rd-grade students meeting state reading standards compared to partially implementing schools (Illinois PBIS Network End of Year Report, 2007). No research studies were identified that conducted an examination of outcomes between PBIS and non-PBIS schools. This report's use of comparative analysis between individual PBIS schools and similar schools not participating in the initiative is an important methodological contribution to the educational literature.

THE NORTH CAROLINA POSITIVE BEHAVIORAL SUPPORT INITIATIVE

The use of PBIS in schools is supported by federal legislation. PBIS was recommended by the 1997 Amendments to the Individuals with Disabilities Education Act (IDEA) as an intervention approach for dealing with students with challenging behaviors. The North Carolina Positive Behavioral Support Initiative is part of the North Carolina State Improvement Program funded through the IDEA. The North Carolina Positive Behavior Intervention and Support sites work to integrate their Safe Schools Plans, Character Education efforts and strategies, and discipline efforts in order to make schools caring and safe communities for learning (North Carolina Department of Public Instruction [NCDPI] PBIS Web site: www.ncpublicschools.org/positivebehavior/background/).

The Exceptional Children Division and the North Carolina State Improvement Project sponsor training activities related to PBIS. This training prepares additional persons and school teams in their own and other local education agencies (LEAs) (Irwin and Algozzine, 2006). In North Carolina, a school that wants to start implementing PBIS must have strong administrator support, identify a school team that is representative of the entire school staff, collect available school data, and obtain buy-in from at least 80% of the school staff (www.ncpublicschools.org/positivebehavior/background/). Each PBIS school must invest in training on schoolwide PBIS strategies, have a team that is coordinating implementation, and actively monitor the impact of implementation on student outcomes. According to an evaluation report of the North Carolina Positive Behavioral Support Initiative (Irwin and Algozzine, 2006): effective PBIS systems all have a common approach to improving behavior, a statement of purpose, a number of positively stated expectations for all students and staff, a variety of ways for teaching these expectations to students, a continuum of procedures for encouraging and sustaining these expectations and one for discouraging violations of these expectations, and procedures for regularly monitoring and evaluating the effectiveness of the discipline system.

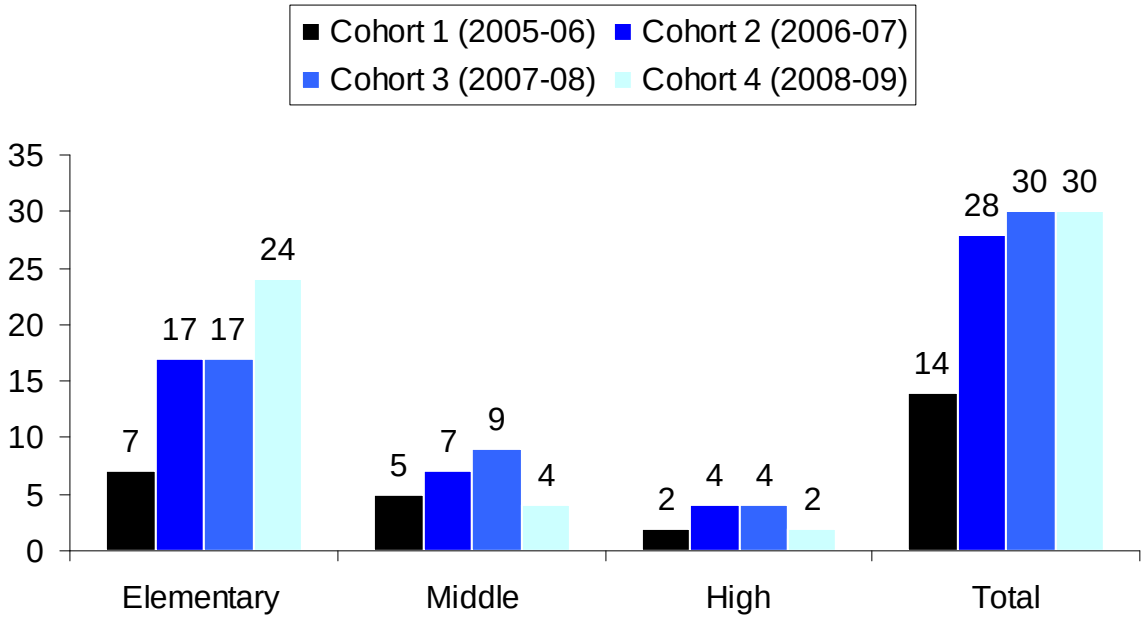
The North Carolina PBIS initiative began with the creation of a single Positive Behavior Intervention and Support Center in the fall of 2000 (Irwin and Algozzine, 2006). By June of 2007, 81 school systems in North Carolina had PBIS trainers or potential trainers and schools participating at some level. Slightly more than 20% of the public schools in North Carolina (528 schools) were participating in PBIS at the end of the 2006-07 school year. Several LEAs implemented PBIS in all their traditional schools systemwide (Asheboro City Schools, Elkin City Schools, Elizabeth City/Pasquotank Schools, Nash/Rocky Mount Schools, Perquimans County Schools, Roanoke Rapids City Schools, Warren County Schools, Whiteville City Schools and Washington County Schools). According the NCDPI PBIS Web site, five additional LEAs--Charlotte/Mecklenburg Schools, Pender County Schools, Wake County Public Schools, Brunswick County Schools, and Iredell/Statesville Schools--also have plans to implement PBIS systemwide (www.ncpublicschools.org/positivebehavior/background/). Across North Carolina PBIS schools, rates of office discipline referral data for 2006-07 were lower than the national average, and there was a steady decline in short-term suspensions between 2004-05 and 2006-07 (Irwin and Algozzine, 2008).

THE WAKE COUNTY PUBLIC SCHOOL SYSTEM POSITIVE BEHAVIORAL SUPPORT INITIATIVE

The fundamental purpose of the PBIS initiative within WCPSS is to provide assistance to schools in developing more effective strategies targeted to students with challenging behavior. During the 2007-08 school year, six PBIS coaches were responsible for conducting training sessions and worked closely with the PBIS schools to develop schoolwide Positive Behavior Intervention and Support plans, provide professional development on best practices, work with teachers to master new strategies, and provide assistance in developing individualized plans for specific students. The mission of the WCPSS PBIS staff is to "empower teachers and other adults with the skills needed to improve overall classroom and school climate to achieve higher academic performance for all students" (WCPSS PBIS Web site: www.wcpss.net/positive-behavior).

In 2005-06, PBIS was adopted in 14 WCPSS schools (see Figure 4). These 14 schools are currently in their fourth year of implementation. In 2006-07, 28 additional WCPSS schools implemented the PBIS program. By 2007-08, the total number of PBIS schools was 72, with 30 schools in their first year of implementation. As of the 2008-09 school year, 30 additional schools joined the PBIS initiative, bringing the total number of PBIS schools to 102 districtwide. To effectively serve the rising numbers of PBIS schools in WCPSS, two additional coaches were hired. An enumerated list of schools by year of implementation is located in Appendix A.

Figure 4
Number of Schools Adopting PBIS by Year of Implementation



Note: River Oaks Middle and Mount Vernon Middle Alternative Schools are included.

The Wake County Public School System PBIS Budget

The WCPSS PBIS initiative is funded through federal Title II funds (PRC 103). In 2007-08, the majority (82%) of the $663,889 budget was spent on personnel costs, such as salaries and benefits for six full-time PBIS coaches (equaling 72 months of employment), funds for a part-time coordinator, and substitutes for teachers who attend training. Each year since 2005-06, the PBIS coordinator has provided funding to all PBIS schools to utilize the Schoolwide Information System (SWIS). SWIS is a web-based information system originating from the University of Oregon. It provides school personnel with accurate and timely student information for making decisions about discipline systems and costs approximately $200 per year per school. At least one person at each school is required to attend SWIS training conducted by the PBIS coaches. At their own discretion, WCPSS schools participating in PBIS may also receive monetary gifts from their PTA or utilize Fund 6 to help defray the cost of posters, banners, tokens, and other reinforcements.

Table 2
PBIS Funding

Instructional Support (Six Coaches; 72 Months of Employment)	357,078.24
Employee Benefits (Social Security, Retirement, Hospitalization, Worker's Compensation, and Dental Insurance)	96,376.96
Contracted Services	55,000.00
Supplement	53,561.74
Substitute Teacher	37,000.00
Workshop Expenses	36,000.00
Longevity Pay	14,372.40
Travel Reimbursement	12,000.00
Teacher Assistant Salary	2,500.00
Total Budget	**$663,889.34**

Time spent attending PBIS team meetings or training sessions is an opportunity cost that may not be readily apparent. Opportunity costs occur when participation in one opportunity means that involvement in an alterative opportunity is sacrificed. Each PBIS school must establish a PBIS team consisting of approximately eight members, including at least one administrator and other representatives of the school population, such as teachers, teacher assistants, counselors, psychologists, social workers, parents, department heads, and others. The team selects one person to serve as the PBIS chair. Regular meetings are held throughout the school year, at which time the team discusses PBIS strategies, plans implementation, analyzes data and plans training for staff and students. Some teams meet weekly, while others met every two weeks to every month. Supplementary compensation is not provided to these staff members for the time they contribute to PBIS implementation. Team members must find time to participate in PBIS team meetings, facilitate schoolwide PBIS training, participate in districtwide PBIS training events, and complete auxiliary duties, such as monitoring the SWIS database and generating reports, in addition to fulfilling their regular job responsibilities. During the first year of PBIS implementation, members of the PBIS team are required to attend six days of training throughout

the school year: two days of Module 1 in August, two days of Module 2 at mid-year, and two days of Module 3 in March. The PBIS budget funds substitutes for teachers who attend these sessions.

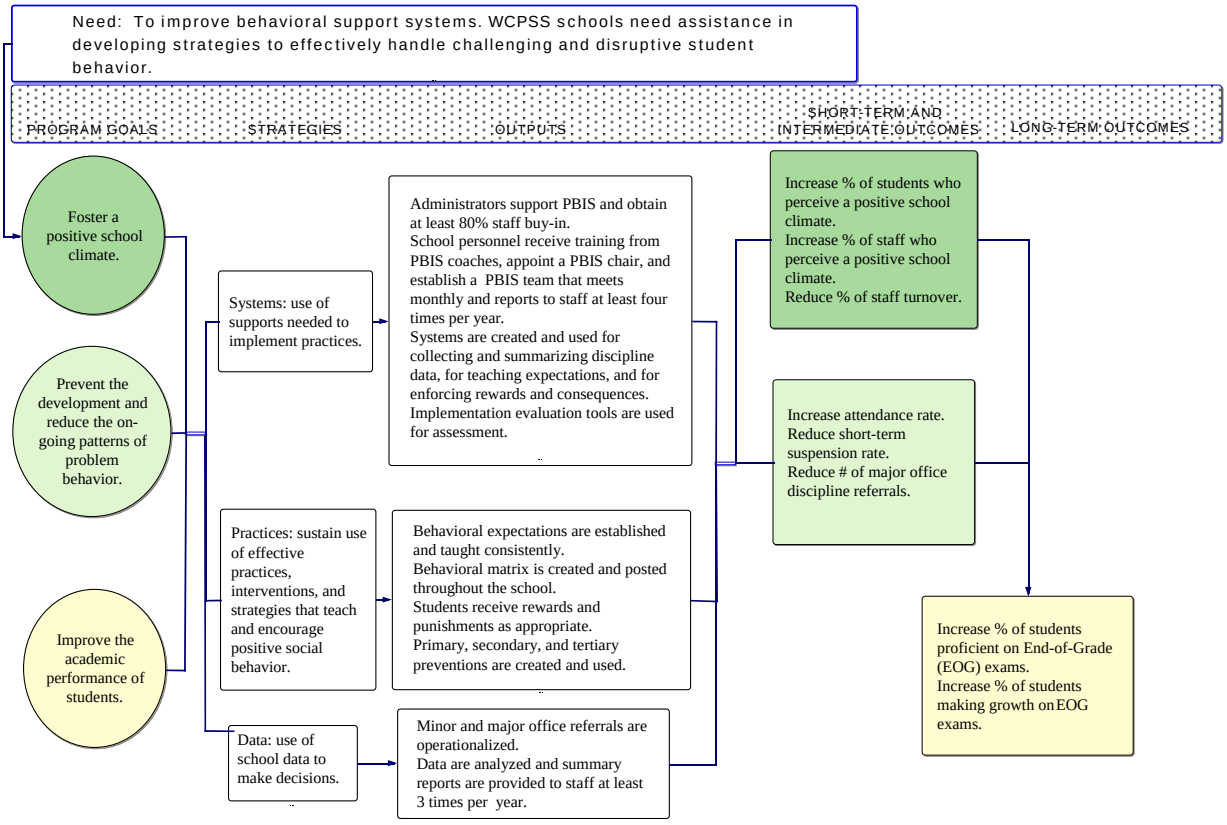
Given the rates of teacher and administrator turnover and the number of new schools that open in WCPSS every year, providing sufficient and frequent training days is a priority for the PBIS staff. In the spring before a school initiates the PBIS program, PBIS coaches provide a one-day training session for PBIS chairs to help them make plans for organizing the team and to train them on ways to be an effective chair. During subsequent years of implementation, a districtwide, condensed version of Module 1-3 training is conducted during two days at the beginning of the school year. This training is appropriate for anyone new to the PBIS team. A one-day spring overview for new principals of PBIS schools and a one-day fall training session for any administrator interested in PBIS are also offered. Informational sessions for schools currently implementing PBIS beyond the first year of training are also offered off-site and include topics such as establishing student expectations for riding the school bus, using data to improve PBIS implementation, organizing school-level PBIS information, and preparing annual PBIS data collection summaries.

In 2007-08, approximately 12 PBIS schools were supported by one PBIS coach. The PBIS coach visits the school as often as needed. The frequency varies by school and often depends on the energy of the team and how quickly they want to implement the program. It is typical for a PBIS coach to attend PBIS team meetings at the school, provide training, and offer support throughout the school year. In addition, coaches do on-site training on various topics requested by the school such as classroom management, de-escalation, bullying prevention, or bus safety. The coaches work with teachers, teacher assistants, bus drivers, parents, and other audiences the school wishes to target.

METHODOLOGY

Logic models or flowcharts are helpful tools to use during the planning, implementation, and evaluation phases of a program. A logic model displays a program's assumptions of how desired change is expected to occur by illustrating the links between the planned activities and the desired outcomes expected to result from the activities (Hughes, Oberleithner, and Wrisley, n.d.). Figure 5 portrays the logic model that was created to facilitate this evaluation of the PBIS program.

Figure 5
PBIS Logic Model



STUDY OBJECTIVES AND LIMITATIONS

The purpose of this study is to examine the extent to which PBIS schools have achieved the goals of fostering a positive school climate, preventing the development of and reducing on-going patterns of problem behavior, and ultimately improving the academic performance of students. A mixed methods approach employing primary and secondary sources is used to evaluate implementation efforts of PBIS schools and examine their goal attainment success. Cohort 1 schools offer the most comprehensive examination of the effectiveness of schoolwide Positive Behavior Intervention and Support. Limited analysis is conducted on Cohort 2 and 3 schools. Unlike many other state evaluations that present evidence on the impact of PBIS in their school districts, this report uses individual PBIS schools as its unit of analysis. This report also utilizes the cluster analysis technique to select a group of schools that have not implemented PBIS to serve as a comparison group for empirical examination. Many state reports do make comparisons between their low- and high implementing schools and between themselves and national PBIS data; however, few analyses have been conducted between PBIS and non-PBIS schools, primarily due to a lack of comparable data. Nationwide, several randomized control trials assessing PBIS are being proposed and conducted or were recently completed (see OSEP Center on PBIS Web site: www.pbis.org/main.htm).

Despite the strength of this report's methodology, some limitations are present. The empirical findings presented in this report reveal patterns and trends and cannot establish that PBIS caused any positive changes independent of other events in the schools. The evaluation of implementation efforts at PBIS schools is limited to those schools that allowed PBIS staff to conduct evaluations, thus excluding Cohort 1 high schools. It is also worth noting that school climate, student behavior, and student achievement can be measured using a variety of indicators. This report relied on the most standard and universal measures available to maintain reliable comparisons. One measure of student behavior (office referrals) is not comparable between PBIS schools and non-PBIS schools. Student office referral data are not systematically captured at comparison schools as they are at PBIS schools via SWIS. Every effort was made to provide baseline data prior to PBIS implementation; however, in some cases these data were unavailable. Finally, several questions asked in the interviews and focus groups required respondents to reflect back on their PBIS experience and look forward to what improvements might be made in the future. Some respondents were not employed at their present schools when PBIS was initially implemented at those schools.

Several questions are posed for this study and the following paragraphs describe the analysis used to answer them.

Have schools successfully implemented PBIS?

PBIS coaches have assumed the responsibility of conducting evaluations of PBIS schools in their second and third years of implementation using a nationally utilized Schoolwide Evaluation Tool (SET). To review this evaluation process, WCPSS Evaluation and Research (E&R) Department staff assisted PBIS coaches in conducting some SET evaluations for the 2007-08 school year. A description of the SET is provided in this report and the results from the 2006-07 and 2007-08 implementation evaluations are summarized.

The examination of SET results is limited to those schools that allowed PBIS staff to conduct evaluations. Most Cohort 1 schools, with the exception of one elementary school and both high schools, have received two annual SET evaluations, which allow for comparisons to be made across time. Cohort 2 schools were reviewed for the first time in 2007-08.

Have schools been successful at attaining desired outcomes?

Using various data sources, expected short-term outcomes of Cohort 1 elementary and middle schools were examined through school-level analysis of changes in the climate and behavioral outcomes before and after PBIS implementation (2004-05 to 2007-08). Cohort 1 schools were chosen for this analysis because they participated in the program long enough for all outcomes to potentially be met. Quantitative analyses of measureable short- and long-term outcomes were not conducted on Cohort 1 high schools because there is no empirical evidence (e.g., SET results) to suggest that full implementation had occurred at these two schools. It was anticipated that Cohort 1 schools would begin to see improvements in academic outcomes by their third year of implementation (2007-08). As such, standard measures of student achievement were examined as possible long-term outcomes of PBIS practices. To compare the patterns of improvement, the same analyses of short and long-term changes were conducted for a set of matched schools not participating in PBIS. Complete descriptions of comparison school selection, data sources, and findings are presented in succeeding sections. Appendix B provides additional data on changes in node assignments for Cohort 1 PBIS schools and their comparison schools for 2005-06 to 2007-08. These data may serve as useful context for changes that appear or fail to occur. An enumeration of outcome data for these schools is also provided in Appendix C.

What insights can PBIS chairs and administrators offer on the impact PBIS has made at their schools?

Success stories provide qualitative ways to highlight prevention program status and progress, as these programs are not expected to demonstrate measurable outcomes for several years. Qualitative analyses were conducted in an effort to gain insight into the impact of PBIS on implementation efforts and desired outcomes. Telephone interviews with a small, random sample of PBIS chairs from schools in Cohorts 1, 2, and 3 were conducted, as well as focus groups with a small, self-selected sample of PBIS administrators from Cohorts 1 and 2. All interviews and focus groups were conducted at the end of the 2007-08 school year. Details on sample selection, procedures for each method of data collection, and findings are provided in subsequent sections of this report.

IMPLEMENTATION ANALYSIS

SCHOOLWIDE PBIS IMPLEMENTATION EVALUATION TOOL

The Schoolwide Evaluation Tool (SET) is a research instrument developed by the National Positive Behavior Intervention and Supports and Interventions Center (Horner et al., 2004) to assist external evaluators in determining the extent to which a school is implementing schoolwide Positive Behavior Intervention and Support. This instrument is used to evaluate PBIS schools within North Carolina and across the United States. The results are compiled in a secure access web application maintained by the University of Oregon. The SET is intended for assessing primary prevention approaches, such as the level of defining, teaching, and rewarding schoolwide behavioral expectations. It does not provide information pertaining to secondary and tertiary prevention efforts. The SET results can be used by schools to determine annual goals for schoolwide effective behavior support, to evaluate ongoing efforts toward schoolwide behavior support, to design and revise procedures as needed, and to compare annual accomplishments toward schoolwide effective behavior support. PBIS schools may also choose to evaluate their implementation efforts using available assessment tools supported by the National Technical Assistance Center on Positive Behavioral Interventions & Support (PBIS). Research by Horner et al. (2004) shows that the SET meets basic psychometric criteria for measurement tools in research, can be administered with high inter-observer agreement, demonstrates excellent test-retest reliability, and produces a valid index of schoolwide PBIS.

The SET evaluates a total of 28 research questions across seven schoolwide PBIS practices including expectations defined, behavioral expectations taught, acknowledgement procedures, correction procedures, monitoring and evaluation, management, and district level support. Each evaluation consists of a review of the school's permanent products including the discipline handbook, school improvement plans for safety related goals, instructional materials, and meeting minutes; school observations; and staff and student interviews. It is conducted by two evaluators who use a scoring guide to assess the level of implementation on each of the 28 research questions. Using each question's established criteria for scoring, each SET evaluator assigns a value of 0, 1, or 2 (0 = not implemented, 1 = partially implemented, 2 = fully implemented) for each question, and then a mean summary score is calculated. The goal is to obtain a summary score of at least 80% implementation; however the range is 0% to 100%.

SET Results

To date, WCPSS PBIS coaches have conducted SET evaluations during a school's second year of implementation. This decision was based on the rationale that the first year of implementation serves as a planning year for schools to develop and engage schoolwide PBIS practices. Additionally, as the number of PBIS schools has steadily increased over the years while the number of PBIS coaches has remained constant, the task of conducting SET evaluations within a short time frame has become a challenge. Excluding first-year PBIS schools has been a way of managing staff time and resources.

Between November and May of the 2006-07 school year, PBIS staff conducted the first round of SET observations at the PBIS Cohort 1 schools. During the 2007-08 school year, all SET observations for Cohorts 1 and 2 were conducted in April or May. Schools were randomly assigned two PBIS coaches who served as primary and secondary interviewers. To maintain objectivity, no school was evaluated by its PBIS coach.

Table 3 shows the 2006-07 SET observation results for Cohort 1 schools. Scores on each research question were generally higher for elementary schools than middle schools. Irwin and Algozzine (2008) reported similar results in their report on North Carolina PBIS schools in 2006-07.

- Five out of six elementary schools achieved an average SET implementation score of at least 80%.
- Three of the five middle schools had a summary score of at least 80%.
- The three schools with implementation averages below 80% scored within one to nine percentage points of achieving this goal.
- The lowest subscale results for all schools were found among district support practices such as securing school budget allocations for building and maintaining schoolwide behavior support and identifying an out-of-school liaison.

Table 3
SET Results for Cohort 1, 2006-07

	Elementary (*n*=6)			**Middle (*n*=5)**		
	Min	*Max*	*Mode*	*Min*	*Max*	*Mode*
Expectations Defined	75.0	100.0	100.0	50.0	100.0	100.0
Expectations Taught	80.0	80.0	80.0	40.0	100.0	100.0
Reward System	66.7	100.0	100.0	66.7	100.0	66.7
Violations System	75.0	100.0	87.5	87.5	100.0	100.0
Decision Making	75.0	100.0	100.0	87.5	100.0	100.0
Management	68.8	93.8	81.3	62.5	100.0	none
District Support	50.0	50.0	50.0	50.0	50.0	50.0
Implementation Average Summary Score	**78.0**	**86.0**	**86.0**	**71.0**	**88.0**	**88.0**

Note: In 2006-07, SET evaluations were not conducted at one elementary school and both high schools in Cohort 1.

SET results for Cohort 2 schools are presented in Table 4. Similar to the 2006-07 results for Cohort 1 schools, Cohort 2 elementary schools achieved the highest SET subscale scores and implementation averages in 2007-08, followed by middle schools and high schools. In general, defining and teaching school expectations are two practices of schoolwide positive behavior that need to be more fully implemented within all education levels. The implementation of these practices is less evident in high schools than in elementary and middle schools. All but two schools in Cohort 2 reported 100% district support, which is an improvement from Cohort 1 results. The levels of implementation for the remaining practices are more diverse across education levels.

- Fifteen of the 17 elementary schools achieved a SET implementation average that met or exceeded 80%. The remaining two elementary schools were two percentage points away from an 80% summary score.
- Four of the seven middle schools had implementation scores of at least 80%, and three of these schools scored above 90%.
- None of the four high schools achieved an implementation score of 80%, although one high school was within one percentage point of meeting this goal. The remaining schools had average SET scores well below 80%.

Table 4
SET Results for Cohort 2, 2007-08

	Elementary (*n*=17)			**Middle (*n*=7)**			**High (n=4)**		
	Min	*Max*	*Mode*	*Min*	*Max*	*Mode*	*Min*	*Max*	*Mode*
Expectations Defined	50.0	100.0	100.0	50.0	100.0	50.0	0.0	75.0	75.0
Expectations Taught	30.0	100.0	100.0	20.0	100.0	90.0	0.0	80.0	none
Reward System	66.7	100.0	100.0	16.7	100.0	100.0	0.0	100.0	100.0
Violations System	75.0	100.0	100.0	62.5	100.0	87.5	50.0	100.0	87.5
Decision Making	62.5	100.0	100.0	87.5	100.0	100.0	50.0	87.5	75.0
Management	68.8	100.0	87.5	50.0	100.0	100.0	62.5	100.0	100.0
District Support	100.0	100.0	100.0	50.0	100.0	100.0	50.0	100.0	100.0
Implementation Average Summary Score	78.0	100.0	86.0	68.0	98.0	94.0	**58.0**	**79.0**	**none**

Table 5 allows for an annual comparison (2006-07 to 2007-08) between the SET implementation averages for Cohort 1 schools. On average, most schools experienced improvements in implementing schoolwide PBIS practices during their second year of PBIS participation.

- Four of the elementary schools that were fully implementing PBIS practices in 2006-07 increased their summary score by improving their score on various SET measures such as teaching expectations, creating a system for responding to behavioral violations, and attaining district support.
- One elementary school moved from overall partial implementation to full implementation between SET evaluations due to a major increase in district support.
- Four of the five middle schools experienced an increase in their implementation summary score, with the greatest improvement occurring at North Garner Middle School.

Table 5
SET Implementation Averages for Cohort 1, 2006-07 and 2007-08

Elementary Schools	06-07	07-08	Middle Schools	06-07	07-08
Apex	84.0	92.0	Centennial	88.0	92.0
Brentwood	--	83.0	E. Millbrook	79.0	75.0
Fuller	86.0	97.0	Moore Square	82.0	91.0
Hodge Road	86.0	92.0	N. Garner	71.0	94.0
Lynn Road	82.0	88.0	River Oaks	88.0	92.0
Reedy Creek	78.0	83.0			
Rolesville	85.0	81.0			

Note: Excludes two high schools with no SET evaluation data for 2006-07 and 2007-08.
Brentwood did not conduct a SET evaluation in 2006-07.

SET Implementation Analysis Summary

Elementary schools achieved the highest SET implementation averages, according to SET results for Cohorts 1 and 2. The SET evaluations conducted in 2006-07 for Cohort 1 elementary and middle schools showed that 67% (five out of seven) of elementary schools and 60% (three of out five) of middle schools achieved high levels of implementation by their second year of participation. By the third year of implementation, all of the elementary schools and most of the middle schools scored at least an 80% average, indicating full implementation. The two PBIS high schools within Cohort 1 did not participate in the SET. Among Cohort 2 schools, 15 of the 17 elementary schools achieved a SET implementation average that met or exceeded 80%, compared to four of the seven middle schools. None of the high schools in Cohort 2 earned high implementation scores.

ANALYSIS OF STAFF AND STUDENT OUTCOMES

METHODOLOGY

In order to examine the effectiveness of the PBIS program within Cohort 1 elementary and middle schools, it was important to compare the climate, behavior, and academic achievement data of those schools to other WCPSS schools. Cluster analysis, a classification technique for constructing homogeneous groups within complex data sets, was employed to match the PBIS schools to similar schools that had not implemented the PBIS program as of 2007-08. Although this restriction did reduce the number of potential matches for PBIS schools, especially at the middle school level, it also established the best opportunity for seeing the positive outcomes that PBIS intends to produce.

All clustering methods are based on the hierarchical clustering procedures in which each observation begins in a cluster by itself. Then, the two clusters with the smallest distance between them are merged to form a new cluster. Merging of the two closest clusters is repeated until only one cluster is left (Aldenderfer and Blashfield, 1984). The various methods used for clustering differ in how they measure the distance between the two clusters. The centroid method, which computes the squared Euclidean distance between their centroids or means, was used for this analysis. Other clustering methods were tested and produced the same results as the centroid method. The standardization option was also utilized to standardize the variables to a mean of zero and a standard deviation of one. This option was necessary because of the unequal variances of the variables. This scaling of the variables was also important as variables with large variances tend to produce a greater effect on the resulting clusters than those with small variances (StatSoft Homepage: www.statsoft.com/textbook/stathome.html).

Separate cluster analyses were conducted for elementary schools and middle schools serving students during the 2004-05 school year. The schools were classified into groups based on their values on three school-level variables obtained from the 2004-05 Healthy School data: End-Of-Grade (EOG) performance composite, percentage of free or reduced-price lunch (FRL) students, and 20th day membership. The output of this analysis presented the clusters of schools that had similar performance composites, percentage of FRL students, and 20th day membership. Schools that yielded the smallest distance between variable means were presented first. The clusters that contained PBIS schools were selected and examined. In some instances, clusters included only two schools, a PBIS school and a non-PBIS school, whereas other clusters grouped PBIS schools with multiple non-PBIS schools. In this situation, the decision was made to limit the number of comparison schools selected for analysis to one per PBIS school by selecting the most similar school from the cluster (based on the closest cluster). The cluster analysis results for middle schools grouped two PBIS schools in a cluster; therefore, additional analyses were conducted in which each PBIS school was removed sequentially in order to obtain non-PBIS school matches. The resultant matches are presented in Table 6 for elementary and middle schools.

Table 6
Cohort I PBIS and Comparison Schools Clustering Results

PBIS Schools				Comparison Schools			
	2004-05 Pre-PBIS Data				*2004-05 Data*		
Elementary Schools	***PC***	***20th Day Membership***	***% FRL***	***Elementary Schools***	***PC***	***20th Day Membership***	***% FRL***
1. Apex	94.09	647	30.6	1. Middle Creek	93.99	710	27.3
2. Brentwood	81.42	509	72.3	2. Fox Road	83.90	962	53.8
3. Fuller	88.59	511	40.5	3. Briarcliff	88.71	453	39.5
4. Hodge Road	83.89	606	57.1	4. Forestville Road	85.92	645	49.5
5. Lynn Road	85.12	542	48.5	5. Joyner	85.48	422	49.5
6. Reedy Creek	90.46	793	41.7	6. Lockhart	93.29	851	53.9
7. Rolesville	90.70	667	31.3	7. Fuquay-Varina	90.27	681	38.0
Middle Schools				***Middle Schools***			
1. Centennial	88.11	543	31.7	1. Leesville Road	92.30	1187	21.8
2. East Millbrook	88.77	968	40.7	2. Wake Forest-Rolesville	87.85	1034	30.7
3. Moore Square	83.54	582	34.0	3. Durant Road	91.48	1390	26.8
4. North Garner	80.98	862	51.4	4. East Wake	82.97	913	52.4

Data source: Healthy Schools Data 2004-05
Note: PC = Performance Composite

MEASUREABLE OUTCOMES

Successful implementation of PBIS is intended to generate an improvement in the overall climate of a school and positively affect behavioral and academic outcomes for students. Several measures were used to examine short-term changes in climate and behavioral outcomes and long-term changes in academic outcomes before and after PBIS implementation and between the matched pairs of schools. Tests of significance were conducted on various measures where positive change was apparent, as this was the desired outcome.

Cohort I Elementary School Outcomes

Climate Indicators

The climate of a school was analyzed using measures of student perceptions of school climate, teacher perceptions of school climate, and the teacher turnover rate.

Student Perceptions of School Climate

At the end of each school year, E&R staff conduct a survey of 4th- and 7th-grade students. A composite measure of two items from this survey was used to measure student perceptions of school climate for 2005-06, 2006-07, and 2007-08. Data for 2004-05, which could have measured climate prior to PBIS implementation, were not usable.

1. The percentage of students at the school who strongly agreed or agreed with the statement "My school is a safe place to learn."
2. The percentage of students at the school responding affirmatively to the statement "The rules of my school are fair."

Despite the already high percentages of students who agreed with the above statements in 2005-06, most PBIS and comparison schools showed improvements in student climate by 2007-08. As presented in Table 7, the positive changes in school climate were statistically significant for three PBIS schools and five comparison schools.

- Brentwood Elementary School stands out as the school with the lowest initial climate data.
- Between 2005-06 and 2006-07, Brentwood and Lynn Road elementary schools each experienced a statistically significant increase in the percentage of students who responded affirmatively to both measures of school climate. These schools had more favorable outcomes than their matched comparison schools (Fox Road and Joyner elementary schools).
- Apex and Brentwood elementary schools also experienced a significant positive increase in students' perceptions of school climate between 2005-06 and 2007-08.

Table 7
Percentage of Elementary Student Survey Respondents
Indicating a Positive Perception of School Climate

	2005-06	2006-07	2007-08	Change in % 05-06 to 06-07	Change in % 05-06 to 07-08
PBIS					
1. Apex	94.3	96.9	97.6	2.6	3.3*
2. Brentwood	80.3	93.0	91.4	12.7**	11.1*
3. Fuller	87.4	88.0	91.8	0.6	4.4
4. Hodge Road	89.3	93.5	92.7	4.2	3.4
5. Lynn Road	92.8	97.7	93.9	4.9*	1.1
6. Reedy Creek	94.5	96.9	--	2.4	--
7. Rolesville	94.0	89.3	89.9	-4.7	-4.1
Comparison					
1. Middle Creek	90.9	96.4	98.2	5.5*	7.3**
2. Fox Road	87.6	87.5	96.8	-0.1	9.2**
3. Briarcliff	94.6	94.1	97.0	-0.5	2.4
4. Forestville Road	88.6	94.3	89.1	5.7*	0.5
5. Joyner	95.3	95.0	97.5	-0.3	2.2
6. Lockhart	92.7	95.5	98.4	2.8	5.7*
7. Fuquay-Varina	87.7	94.5	95.5	6.8*	7.8*

Data Source: WCPSS Annual Student Survey
Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level. ** indicates significance at the 0.01 level. – means data are missing. Green shaded cells indicate that the percentage of surveyed students who indicated positive perceptions of school climate increased since the first year of PBIS implementation.

Teacher Perceptions of School Climate

Three items from Governor Easley's Teacher Working Conditions (TWC) Survey conducted at the end of the 2005-06 and 2007-08 school years were analyzed to assess the climate of a school from a teacher's perceptive. The TWC Survey was not conducted in 2004-05 or 2006-07. In the 2005-06 and 2007-08 surveys, teachers were asked to report their level of agreement with the following statements. For this report, a composite measure was computed to show the percentage of respondents who strongly agreed or agreed with the statements:

1. The school leadership communicates clear expectations to students and parents,
2. The school leadership consistently enforces rules for student conduct, and
3. The school leadership supports teachers' efforts to maintain discipline in the classroom.

Overall, teachers' perceptions of school climate were generally lower than students' perceptions. Statistically significant increases in the percentage of teachers who responded affirmatively to the above statements occurred more frequently among the PBIS schools than the comparison schools.

- Between 2005-06 and 2007-08, Brentwood, Fuller, and Reedy Creek elementary schools had between 23 to 37 percentage point increases in teachers' level of agreement regarding school climate.
- None of the comparison schools experienced significant improvements in teachers' perceptions of school climate.

Table 8
Percentage of Elementary Teacher Respondents
Indicating a Positive Perception of School Climate

	2005-06	2007-08	Change in % 05-06 to 07-08
PBIS			
1. Apex	75.0	54.6	-20.4
2. Brentwood	32.1	68.9	36.8**
3. Fuller	59.5	82.3	22.8**
4. Hodge Road	51.8	60.9	9.1
5. Lynn Road	67.9	64.3	-3.6
6. Reedy Creek	60.6	84.6	24.0**
7. Rolesville	66.7	58.9	-7.8
Comparison			
1. Middle Creek	89.3	82.1	-7.2
2. Fox Road	59.8	54.8	-5.0
3. Briarcliff	81.3	76.1	-5.2
4. Forestville Road	46.2	46.1	-0.1
5. Joyner	73.7	67.0	-6.7
6. Lockhart	51.4	59.7	8.3
7. Fuquay-Varina	86.0	86.1	0.1

Data Source: Governor Easley's Teacher Working Conditions (TWC) Survey

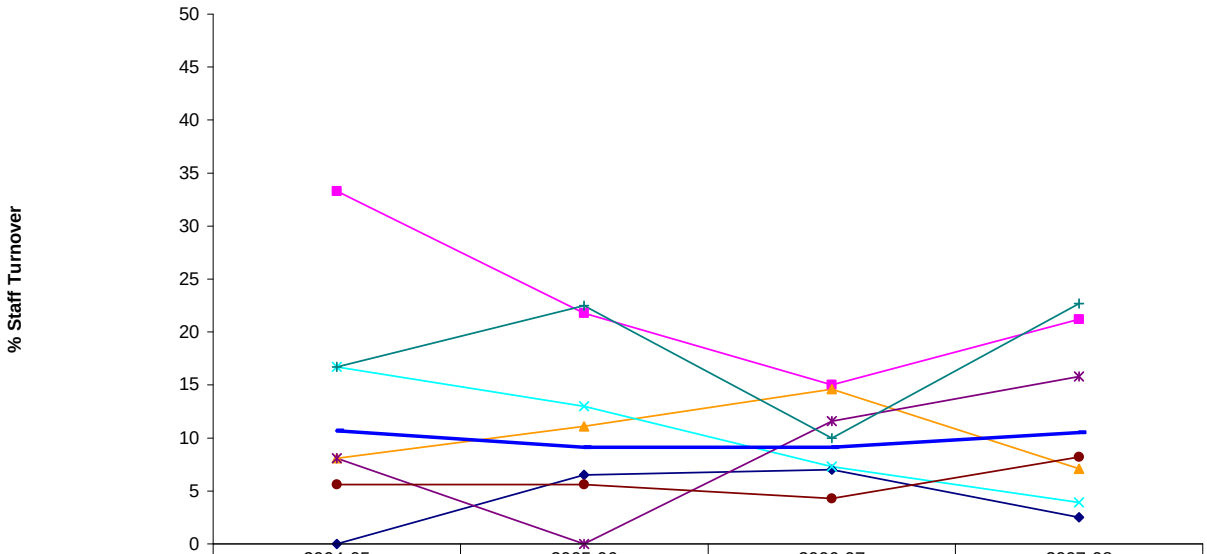
Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level. ** indicates significance at the 0.01 level. Green shaded cells indicate that the percentage of surveyed teachers who indicated positive perceptions of school climate increased since the first year of PBIS implementation.

Teacher Turnover Rate

The total percentage of teacher turnover at each school was obtained from WCPSS Human Resources Department for school years 2004-05 through 2007-08. Figure 6, which presents the percentage of teacher turnover among PBIS schools, shows wide variation in the teacher turnover rate at each school. Comparison schools had more similar turnover rates and the general change pattern was more uniform across the years (Figure 7). The average turnover rate for all WCPSS elementary schools has remained at approximately 10% across the years. It appears that a greater number of comparison schools than PBIS schools were able to reduce teacher turnover between 2004-05 and 2007-08.

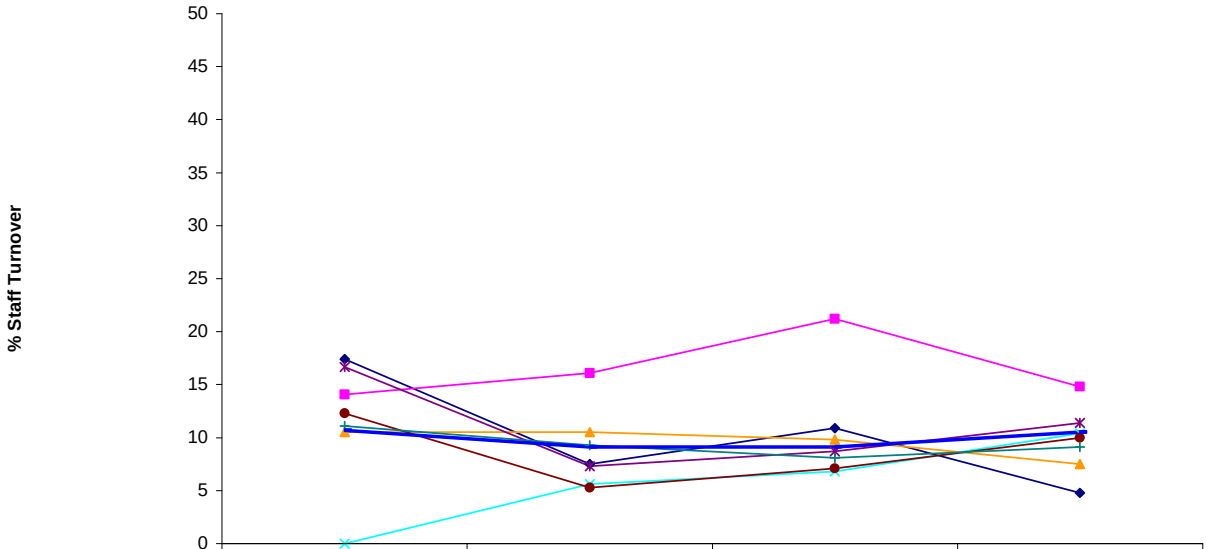
- By 2007-08, two schools, Brentwood and Hodge Road elementary schools, showed percentage point decreases since 2004-05.
- In 2007-08, five comparison schools had declines in turnover rates since 2004-05.
- Hodge Road was the only PBIS school with a steadily declining turnover rate during the four-year period.

Figure 6
Teacher Turnover at PBIS Elementary Schools



	2004-05	2005-06	2006-07	2007-08
Apex E	0.0	6.5	7.0	2.5
Brentwood E	33.3	21.8	15.0	21.2
Fuller E	8.1	11.1	14.6	7.1
Hodge Road E	16.7	13.0	7.3	3.9
Lynn Road E	8.1	0.0	11.6	15.8
Reedy Creek E	5.6	5.6	4.3	8.2
Rolesville E	16.7	22.5	10.0	22.7
WCPSS	10.7	9.1	9.1	10.5

Figure 7
Teacher Turnover at Comparison Elementary Schools



	2004-05	2005-06	2006-07	2007-08
Middle Creek	17.4	7.5	10.9	4.8
Fox Road	14.1	16.1	21.2	14.8
Briarcliff	10.5	10.5	9.8	7.5
Forestville Road	0.0	5.6	6.8	10.4
Joyner	16.7	7.3	8.7	11.4
Lockhart	12.3	5.3	7.1	10.0
Fuquay-Varina	11.1	9.3	8.1	9.1
WCPSS	10.7	9.1	9.1	10.5

Behavioral Indicators

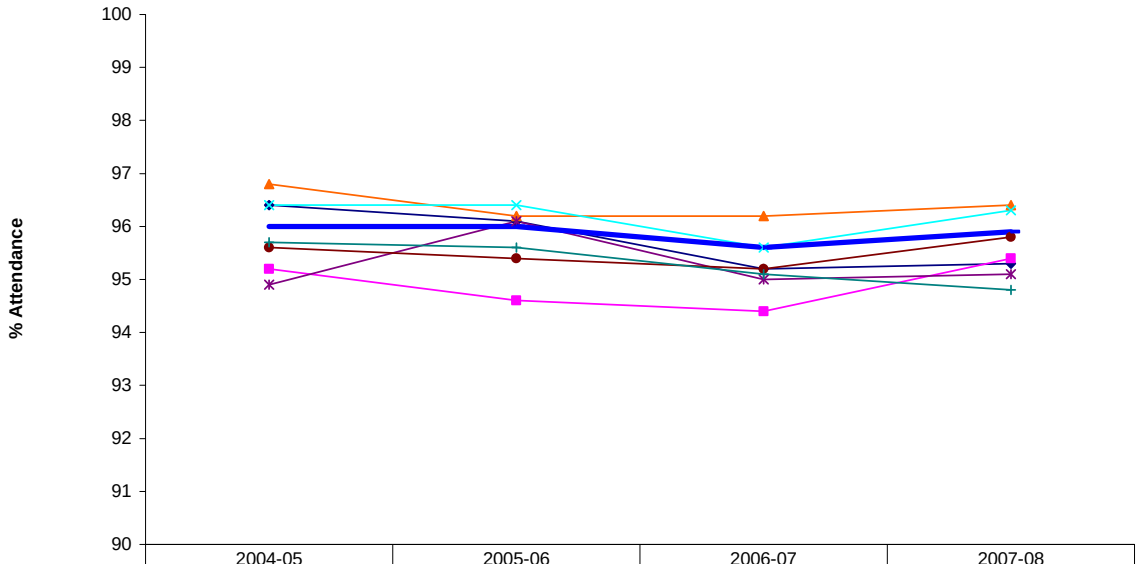
School attendance, short-term suspensions, and the number of major office referrals were used to assess improvements in student behavior at PBIS and comparison schools.

School Attendance

School attendance percentages are based on the number of days a student is in membership at a school divided by the number of days in a school month or school year. These data were obtained from Healthy Schools Data for school years 2004-05 through 2007-08.

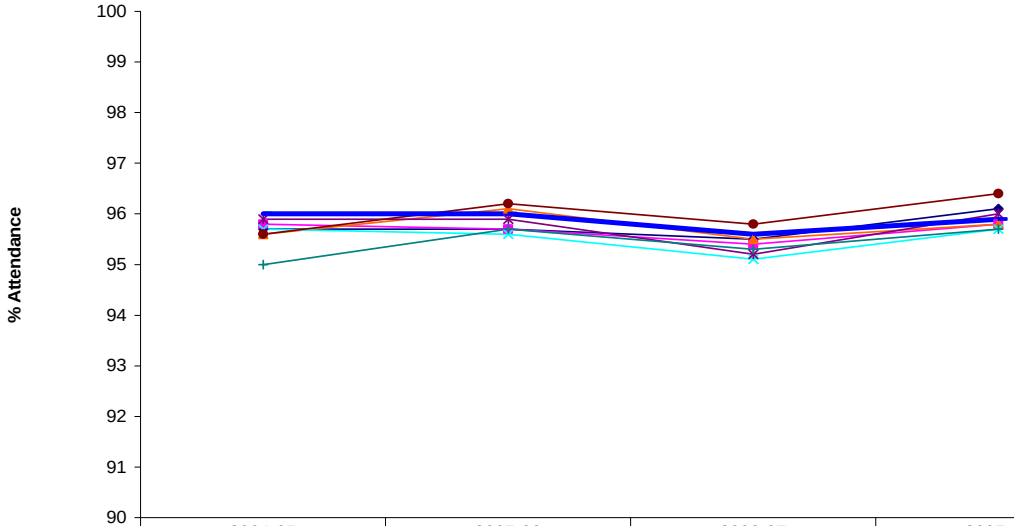
Attendance data for PBIS schools and comparison schools are shown in Figures 8 and 9, respectively. The average attendance rate among WCPSS elementary schools has remained steady at roughly 96% between 2004-05 and 2007-08. In general, attendance rates among PBIS and comparison elementary schools have been very high, with almost all falling within a couple of percentage points of the average rate. Improvements in attendance within both groups between 2004-05 and 2007-08 tend to be very small (around or below one percentage point).

Figure 8
Attendance at PBIS Elementary Schools



	2004-05	2005-06	2006-07	2007-08
Apex E	96.4	96.1	95.2	95.3
Brentwood E	95.2	94.6	94.4	95.4
Fuller E	96.8	96.2	96.2	96.4
Hodge Road E	96.4	96.4	95.6	96.3
Lynn Road E	94.9	96.1	95.0	95.1
Reedy Creek E	95.6	95.4	95.2	95.8
Rolesville E	95.7	95.6	95.1	94.8
WCPSS	96.0	96.0	95.6	95.9

Figure 9
Attendance at Comparison Elementary Schools



	2004-05	2005-06	2006-07	2007-08
Middle Creek	95.7	95.7	95.5	96.1
Fox Road	95.8	95.7	95.4	95.8
Briarcliff	95.6	96.1	95.5	95.8
Forestville Road	95.7	95.6	95.1	95.7
Joyner	95.9	95.9	95.2	96
Lockhart	95.6	96.2	95.8	96.4
Fuquay-Varina	95	95.7	95.3	95.7
WCPSS	96.0	96.0	95.6	95.9

Short-Term Suspensions

For this study, the percentage of short-term suspensions was computed based on the number of short-term incidents at a school divided by the end-of-year student population count. Any suspension that lasts at least one and no more than ten days is considered short term. A single student may have multiple short-term suspensions. These data were obtained from WCPSS Mainframe reports.

Table 9, shows the change in the percentage of short-term suspension incidents between the pre-implementation year (2004-05) and each year of implementation across individual PBIS schools and across comparison schools. Overall, PBIS schools experienced statistically significant reductions in the percentage of short-term suspensions at a greater frequency than did comparison schools.

- The suspension incidents at Reedy Creek and Rolesville declined each year when compared to pre-implementation rates in 2004-05. Although, Rolesville experienced a rise in incidents in 2007-08 compared to the previous year.
- During the first year of implementation, Lynn Road, Reedy Creek, and Rolesville PBIS elementary schools had statistically significant declines in their percentage of short-term suspension incidents. Fuller Elementary School began experiencing significant declines during its second implementation year.

- Five of the seven PBIS schools also experienced significant decreases in their short-term suspension incidents in the second year of implementation compared to 2004-05.

Table 9
Percentage of Elementary Short-Term Suspension Incidents

	2004-05	2005-06	2006-07	2007-08	Change in % 04-05 to 05-06	Change in % 04-05 to 06-07	Change in % 04-05 to 07-08
WCPSS	5.5	6.0	4.7	4.4	0.5	-0.8**	-1.1**
PBIS							
1. Apex	3.0	3.6	2.1	6.3	0.6	-0.9	3.3
2. Brentwood	4.6	9.0	20.3	6.8	4.4	15.7	2.2
3. Fuller	8.9	13.2	2.6	1.1	4.3	-6.3**	-7.8**
4. Hodge Road	13.4	12.7	4.0	3.2	-0.7	-9.4**	-10.2**
5. Lynn Road	11.5	4.9	5.4	12.5	-6.6**	-6.1**	1.0
6. Reedy Creek	9.5	4.5	3.9	3.2	-5.0**	-5.6**	-6.3**
7. Rolesville	9.8	6.5	3.6	7.4[1]	-3.3*	-6.2**	-2.4**
Comparison							
1. Middle Creek	5.2	4.8	0.7	3.2	-0.4	-4.5**	-2.0*
2. Fox Road	14.0	1.1	2.9	1.8	-12.9**	-11.1**	-12.2**
3. Briarcliff	5.5	7.0	6.4	2.2	1.5	0.9	-3.3**
4. Forestville Road	2.6	4.2	4.7	3.0	1.6	2.1	0.4
5. Joyner	11.5	16.8	24.1	13.3	5.3	12.6	1.8
6. Lockhart	9.5	8.2	9.6	8.6	-1.3	0.1	-0.9
7. Fuquay-Varina	1.5	2.0	4.3	5.0	0.5	2.8	3.5

Data Source: WCPSS Mainframe reports

Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level. ** indicates significance at the 0.01 level. Green shaded cells indicate that the percentage of suspensions incidents declined since pre-PBIS implementation.

[1] Revised May 7, 2009 to reflect correct data.

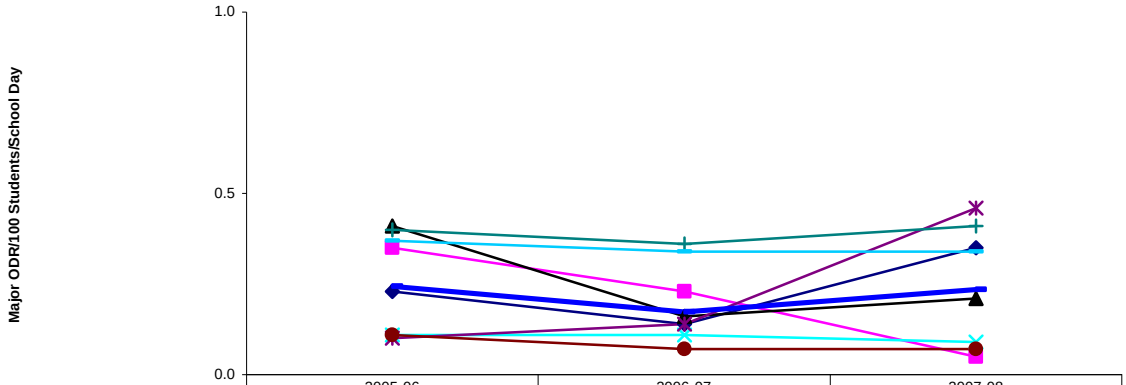
Office Discipline Referrals (ODR)

PBIS schools collect and document major office referral data using SWIS. SWIS generates reports that indicate the times and/or locations prone to elicit problem behaviors, and allows teachers and administrators to shape schoolwide environments to maximize students' academic and social achievements. Although each school decides on the set of behaviors that warrant documentation, according the PBIS coaches, the definition of major office referrals is fairly consistent across the schools. The numbers of major office referrals at Cohort I PBIS schools for 2005-06, 2006-07, and 2007-08 were provided by the PBIS coaches who retrieved these data from SWIS. Although some non-PBIS schools may collect office discipline referral data by other methods, there are no comparable data for the comparison schools.

In 2007-08, the national average for PBIS schools was 0.34 major office discipline referrals (ODRs) per 100 students per school day (or 1 ODR per 300 students per school day). Lynn Road and Rolesville were the only PBIS schools with average ODRs above the national average in 2007-08. The WCPSS average for Cohort 1 PBIS schools has been below the national average each year. As shown in Figure 10, the inconsistent pattern of ODRs across PBIS schools.

- Brentwood had the most consistent and dramatic declines in ODRs across the three years.
- Hodge Road and Reedy Creek also experienced slight declines, with Hodge Road experiencing change in 2007-08 and Reedy Creek declining in 2006-07 and then holding steady.

Figure 10
Office Discipline Referrals at PBIS Elementary Schools



	2005-06	2006-07	2007-08
Apex	0.23	0.14	0.35
Brentwood	0.35	0.23	0.05
Fuller	0.41	0.16	0.21
Hodge Rd.	0.11	0.11	0.09
Lynn Rd	0.1	0.14	0.46
Reedy Creek	0.11	0.07	0.07
Rolesville	0.4	0.36	0.41
WCPSS PBS Average	0.24	0.17	0.23
National (K-6)	0.37	0.34	0.34

Academic Indicators

Trends in the percentage of students scoring proficient on North Carolina End-Of-Grade (EOG) exams and the percentage of students that met growth targets on EOG exams were used to examine long-term improvements in academic performance among students attending PBIS schools and comparison schools. All data were obtained from WCPSS Student Rosters.

EOG Reading and Mathematics Proficiency

EOG tests are given to students in reading and mathematics at the end of each school year. These tests consist of multiple-choice items that are derived directly from the Standard Course of Study, which is the state's official curriculum. Individual student scores are reported as scale scores as well as achievement levels. The achievement level score categorizes student performance on EOG tests according to four broad levels, defined by the North Carolina Department of Public Instruction (NCDPI). General descriptions are shown below in Table 10. Levels III and IV are considered proficient. A small number of students who, for various reasons, are unable to demonstrate their learning on the multiple-choice EOG tests take alternate assessments. The results for this study do not include the results of those alternate assessments.

Table 10
Achievement Levels for the North Carolina Testing Program

Level I: Students performing at this level do not have sufficient mastery of knowledge and skills in this subject area to be successful at the next grade level.	**Level III:** Students performing at this level consistently demonstrate mastery of grade level subject matter and skills and are well prepared for the next grade level.
Level II: Students performing at this level demonstrate inconsistent mastery of knowledge and skills in this subject area, and are minimally prepared to be successful at the next grade level.	**Level IV:** Students performing at this level consistently perform in a superior manner clearly beyond that required to be proficient at grade-level work.

Note: Official descriptions vary by course and are listed in NC State Board of Education Policy HSP-C-018 http://sbepolicy.dpi.state.nc.us/policies/HSP-C-018.asp?pri=01&cat=C&pol=018&acr=HSP).

Valid comparisons of academic performance on EOG exams vary by subject based on when NCDPI produced revised tests. The EOG reading test changed in 2007-08 when the state made proficiency standards more rigorous. This followed changes in the reading curriculum that emphasize thinking skills, as well as reading, decoding, and comprehension. Longitudinal comparisons of reading proficiency rates were therefore made between 2004-05 and 2006-07, which reflects pre-implementation and two years of implementation. In 2005-06, students were administered a new version of the mathematics test that reflected more rigorous achievement level cut scores than in the past. Consequently, longitudinal comparisons between mathematics proficiency rates in 2005-06 (the first year of PBIS implementation) and 2007-08 are made. Cross-sectional analysis of reading EOG results for 2007-08 and mathematics EOG results for 2004-05 are included.

In Table 11, the change in the percentage of students scoring proficient on reading EOG exams is compared between 2004-05 and 2006-07 across individual PBIS schools and across comparison schools. Whereas most PBIS schools experienced positive changes in reading proficiency rates, statistically significant increases in proficiency rates occurred in mathematics only.

- Five of the seven PBIS schools had percentage point increases in reading proficiency, compared to only two comparison schools, although none of the changes was statistically significant.
- Five of the seven PBIS schools had percentage point increases in mathematics proficiency, whereas all comparison schools experienced such changes.
- Brentwood (9.2 percentage points) and Rolesville (4.9 percentage points) were the two PBIS schools that significantly improved their mathematics proficiency between the first year of implementation in 2005-06 and 2007-08.
- Three comparison schools experienced significant improvements in mathematic proficiency rates, Forestville Road, Joyner, and Fuquay-Varina (the matched school for Rolesville) elementary schools by 13.6, 10.9, and 12.3 percentage points, respectively.

Table 11
Percentage of Elementary Students Proficient on EOG Reading and Mathematics

	Reading				Mathematics			
	2004-05	2005-06	2006-07	Change 04-05 to 06-07	2005-06	2006-07	2007-08	Change 05-06 to 07-08
WCPSS	90.4	91.0	91.1	0.7	74.5	76.1	78.0	3.5**
PBIS								
1. Apex	94.2	94.9	94.0	-0.2	85.1	83.8	83.9	-1.2
2. Brentwood	78.1	69.8	75.1	-3.0	51.1	51.8	60.3	9.2*
3. Fuller	85.8	89.6	89.9	4.1	74.1	73.4	78.2	4.1
4. Hodge Road	81.8	86.9	84.4	2.6	67.6	63.1	68.2	0.6
5. Lynn Road	86.9	87.8	90.6	3.7	72.8	75.0	72.3	-0.5
6. Reedy Creek	88.4	88.8	90.9	2.5	67.9	73.5	72.3	4.4
7. Rolesville	90.2	91.5	90.8	0.6	69.3	77.1	74.2	4.9**
Comparison								
1. Middle Creek	93.7	92.2	89.1	-4.6	79.1	78.6	81.3	2.2
2. Fox Road	81.9	82.7	85.8	3.9	62.2	64.5	67.3	5.1
3. Briarcliff	88.8	85.2	86.2	-2.6	70.9	76.8	77.5	6.6
4. Forestville Road	85.8	85.0	86.8	1.0	64.5	75.9	78.1	13.6*
5. Joyner	85.0	81.6	83.8	-1.2	67.3	73.9	78.2	10.9*
6. Lockhart	93.0	93.6	90.3	-2.7	74.7	74.9	78.7	4.0
7. Fuquay-Varina	88.8	85.3	88.4	-0.4	65.2	73.2	77.5	12.3*

Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level. ** indicates significance at the 0.01 level. Green shaded cells indicate positive change.

Table 12 presents cross-sectional comparisons of EOG proficiency rates between the matched pairs of PBIS and comparison schools within a given year. The yellow shaded cells indicate a statistically significantly higher percentage of total students scoring proficient on EOG exams at the PBIS school compared to the matched school. Red shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the comparison school. Chi-square statistic results show that in most instances, there was no significant difference in proficiency rates between the PBIS and its matched comparison school in 2004-05, 2005-06, 2006-07, and 2007-08. When a significant difference was found, it was more common for the matched comparison school to have a significantly higher reading or mathematics proficiency rate.

- Among PBIS schools, Apex had a significantly higher percentage of students scoring proficient in reading than Middle Creek in 2006-07 (94% compared to 89.1%) and similar results were found in mathematics in 2005-06 (85.1% compared to 79.1%).
- Lynn Road's reading proficiency rate in 2006-07 (90.8%) was also found to be significantly higher than Joyner's at 83.8%.
- Rolesville had a significantly higher percentage of students who were proficient in reading than Fuquay-Varina (91.5% and 85.3% respectively).

Table 12
Elementary Matched Pair Comparison of EOG Proficiency in Reading and Mathematics

Matched Pairs	Significantly Higher Percentage of Total Students Proficient within Matched Pairs							
	Reading				Mathematics			
	04-05	05-06	06-07	07-08	04-05	05-06	06-07	07-08
1	ns	ns	PBIS	ns	ns	PBIS	ns	ns
2	ns	Compare	Compare	Compare	ns	Compare	Compare	ns
3	ns	Ns	ns	ns	ns	ns	ns	ns
4	ns	Ns	ns	Compare	ns	ns	Compare	Compare
5	ns	Ns	PBIS	ns	ns	ns	ns	ns
6	Compare	Compare	ns	ns	ns	ns	ns	Compare
7	ns	PBIS	ns	ns	ns	ns	ns	ns

Notes: Compare = comparison school. Yellow shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the PBIS school compared to the matched school (*p* is less than or equal to 0.05). Red shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the comparison school (*p* is less than or equal to 0.05).

EOG Reading and Mathematics Growth

The basic assumption of meeting growth targets is that a student should be expected to do at least as well on each EOG test as he or she has done on prior EOG tests compared to all other students who took the test in the standard-setting year. The standard-setting year is typically the first year that a test becomes operational and students receive scores for the test. Each student who is tested and has previous test results is assigned an "academic change" value. A positive "academic change" indicates academic progress, while a negative value indicates a loss of academic progress. The average of all students' academic change values across all EOGs is calculated and if it is zero or higher, the school has met expected growth. When at least 60% of the school's student population has met its growth target, the school makes high growth.

Comparisons between the percentages of students meeting growth targets are made between 2005-06 and 2007-08 across individual PBIS schools and across comparison schools. The results shown in Table 13 indicate that only a few schools experienced such an improvement. However, most PBIS and comparison schools had positive changes in student growth in mathematics and for some PBIS school and many comparison schools, these changes were statistically significant.

- Only two PBIS and one comparison school experienced gains in the percentage of students meeting growth targets in reading, and none of the gains was statistically significant.
- Positive change in growth occurred at five of seven PBIS schools and six of seven comparison schools between 2005-06 and 2007-08 in mathematics. These increases were statistically significant at Brentwood and Rolesville (10.9 and 24.1 percentage points respectively) and at five comparison schools.
- Fox Road, the comparison school for Brentwood, had a slightly greater percentage point increase in mathematics. However, Rolesville produced a greater percentage point increase than its comparison school, Fuquay-Varina.

Table 13
Percentage of Elementary Students Meeting Growth on EOG Reading and Mathematics

	Reading				Mathematics			
	2004-05 to 2005-06	2005-06 to 2006-07	2006-07 to 2007-08	% Change Meeting Growth 05-06 to 07-08	2004-05 to 2005-06	2005-06 to 2006-07	2006-07 to 2007-08	% Change Meeting Growth 05-06 to 07-08
WCPSS	53.4	53.2	48.4	-5.0	54.8	59.4	63.5	8.7**
PBIS								
1. Apex	57.8	49.7	47.5	-10.3	67.9	57.0	72.9	5.0
2. Brentwood	35.1	43.9	50.0	14.9	60.8	45.6	71.7	10.9*
3. Fuller	58.7	48.9	47.3	-11.4	58.7	51.9	56.4	-2.3
4. Hodge Road	57.9	45.3	40.8	-17.1	67.3	56.5	59.6	-7.7
5. Lynn Road	59.1	59.0	45.8	-13.3	60.5	66.4	63.7	3.2
6. Reedy Creek	47.8	58.7	50.9	3.1	48.0	54.1	55.1	7.1
7. Rolesville	49.8	53.8	41.5	-8.3	34.2	58.5	58.3	24.1**
Comparison								
1. Middle Creek	46.9	47.2	35.9	-11	50.7	56.1	58.8	8.1*
2. Fox Road	49.3	51.4	46.6	-2.7	53.9	60.3	67.2	13.3**
3. Briarcliff	50.3	46.0	56.6	6.3	51.3	64.2	64.6	13.3*
4. Forestville Road	55.5	55.3	45.7	-9.8	63.6	72.0	70.3	6.7
5. Joyner	51.3	52.1	47.2	-4.1	69.1	63.0	53.6	-15.5
6. Lockhart	57.0	56.7	54.3	-2.7	59.1	61.4	66.0	6.9*
7. Fuquay-Varina	48.6	57.0	45.4	-3.2	52.6	56.7	68.6	16.0**

Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level ** indicates significance at the 0.01 level. Green shaded cells indicate positive change.

Table 14 shows the results when the percentage of students meeting growth on reading and mathematics EOG exams in 2005-06, 2006-07, and 2007-08 are compared between the matched pairs. Statistical tests show few significant differences in growth results between the PBIS school and its matched comparison school in reading; however, in several cases, students at comparison schools were more likely to have met their mathematics growth targets than students at PBIS schools.

- A significantly higher percentage of students at Apex than at Middle Creek made a year's worth of growth in a year's worth of time in 2005-06 and 2007-08 in both reading and mathematics.
- In 2007-08, Lynn Road also had a higher percentage of students who made growth in mathematics compared to students at Joyner.

Table 14
Elementary Matched Pairs Comparison of Growth in Reading and Mathematics

Matched Pairs	Significantly Higher Percentage of Students Who Met Growth within Matched Pairs					
	Reading			Mathematics		
	04-05 to 05-06	05-06 to 06-07	06-07 to 07-08	04-05 to 05-06	05-06 to 06-07	06-07 to 07-08
1	PBIS	ns	PBIS	PBIS	ns	PBIS
2	Compare	ns	ns	ns	Compare	ns
3	ns	ns	ns	ns	Compare	ns
4	ns	Compare	ns	ns	Compare	Compare
5	ns	ns	ns	ns	ns	PBIS
6	Compare	ns	ns	Compare	ns	Compare
7	ns	ns	ns	Compare	ns	Compare

Notes: Compare = comparison school. Yellow shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the PBIS school compared to the matched school (*p* is less than or equal to 0.05). Red shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the comparison school (*p* is less than or equal to 0.05).

Elementary School Analysis Summary

There is evidence of modest improvement in climate and behavior outcomes among PBIS elementary schools. Results show less positive changes in academic outcomes than were expected. The majority of students at all the elementary schools examined for this study tended to have positive perceptions of school climate throughout the analytical years. As such, any noticeable empirical improvements in student climate between 2005-06 and 2007-08 were small. In general, a greater number of comparison schools than PBIS schools produced statistically significant increases in student climate. In contrast, teachers' perceptions of school climate were less favorable, with the greatest gains occurring among PBIS schools. However, it appears that a greater number of comparison schools than PBIS schools were able to reduce teacher turnover between 2004-05 and 2007-08.

Although some individual students may have poor attendance, WCPSS elementary schools generally have high attendance rates (around 95%). Any improvements in school-level attendance fell within a gain of one percentage point between 2004-05 and 2007-08. Similarly, most of the elementary schools had low incidences of short-term student suspensions; however, PBIS schools experienced statistically significant reductions in the percentage of short-term suspensions at a greater frequency than did comparison schools. Brentwood had the most consistent and dramatic declines in office discipline referrals.

Among the elementary schools, statistically significant increases in proficiency rates and student growth occurred in mathematics only. These positive changes were more likely to occur at comparison schools. When comparing measures of achievement within each matched pair, chi-square statistic results showed that in most instances, there was no significant difference in proficiency rates or student growth at any given year. When a significant difference was found in either measure, it tended to favor the matched comparison school.

Cohort 1 Middle School Outcomes

Climate Indicators

Student Perceptions of School Climate

Student perceptions of school climate were generally lower among middle schools than elementary schools. All PBIS middle schools and all comparison schools with data experienced a significant positive increase in students' perceptions of school climate between 2005-06 and 2007-08, as presented in Table 15.

- East Millbrook Middle School stands out as the school with the lowest initial climate data.
- Between 2005-06 and 2006-07, East Millbrook Middle and its comparison school Wake Forest-Rolesville Middle School each experienced a statistically significant increase in the percentage of students who responded affirmatively to both measures of school climate. The percentage point increases were larger at East Millbrook.

Table 15
Percentage of Middle School Student Respondents
Indicating a Positive Perception of School Climate

	2005-06	2006-07	2007-08	Change in % 05-06 to 06-07	Change in % 05-06 to 07-08
PBIS					
1. Centennial	83.4	84.7	91.0	1.3	7.5*
2. East Millbrook	59.1	72.4	76.9	13.2**	17.8**
3. Moore Sq.	72.4	64.0	80.5	-8.4	8.1*
4. North Garner	66.2	71.5	86.9	5.3	20.7**
Comparison					
1. Leesville Road	--	68.0	85.3	--	--
2. Wake Forest-Rolesville	64.9	70.9	78.7	6.0**	13.8**
3. Durant Road	83.6	86.8	95.3	3.1	11.7**
4. East Wake	60.5	70.1	82.6	9.6**	22.1**

Data Source: WCPSS Annual Student Survey

Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level. ** indicates significance at the 0.01 level. – means data are missing. Green shaded cells indicate that the percentage of surveyed students who indicated positive perceptions of school climate increased since the first year of PBIS implementation.

Teacher Perceptions of School Climate

Among the middle schools, teachers' perceptions of school climate varied greatly by school and in general, were much lower than students' perceptions. Teacher survey results at the comparison schools showed more favorable changes in climate than seen at PBIS schools.

- None of the PBIS middle schools experienced significant improvements in teachers' perceptions of school climate.
- Statistically significant increases in teacher reports of positive perceptions of school climate occurred at two comparison schools (Wake Forest-Rolesville and East Wake middle schools).

Table 16
Percentage of Middle School Teachers
Indicating a Positive Perception of School Climate

	2005-06	2007-08	Change in % 05-06 to 07-08
PBIS			
1. Centennial	63.2	65.5	2.3
2. East Millbrook	54.8	60.0	5.2
3. Moore Sq.	29.4	18.0	-11.4
4. North Garner	76.9	83.1	6.1
Comparison			
1. Leesville Road	47.2	48.6	1.4
2. Wake Forest-Rolesville	39.2	56.6	17.3**
3. Durant Road	66.9	65.5	-1.4
4. East Wake	28.2	46.3	18.1**

Data Source: Governor Easley's Teacher Working Conditions (TWC) Survey

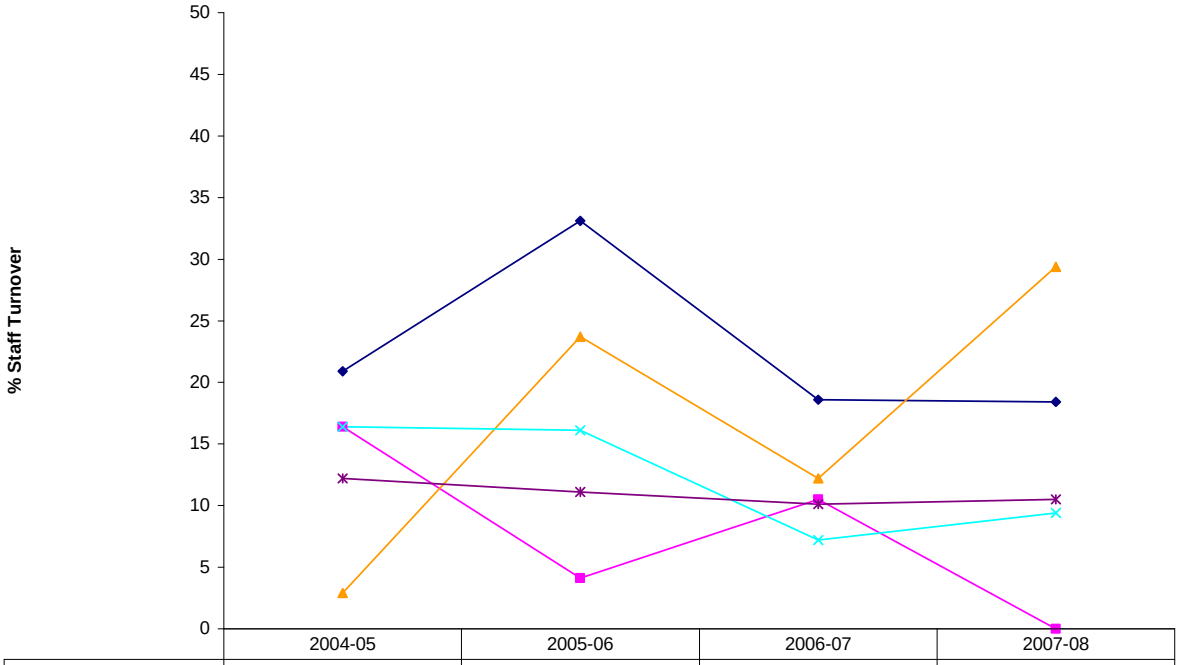
Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level. ** indicates significance at the 0.01 level. Green shaded cells indicate that the percentage of surveyed teachers who indicated positive perceptions of school climate increased since the first year of PBIS implementation.

Teacher Turnover Rate

Figure 11, which presents the percentage of teacher turnover among PBIS middle schools, shows wide variation in the teacher turnover rate among the schools. The variation in school turnover rates was actually smaller before implementation in 2004-05 than in the first (2005-06) and third (2007-08) years of implementation. Closer ranges and more uniform trends in teacher turnover are seen among comparison middle schools (Figure 12).

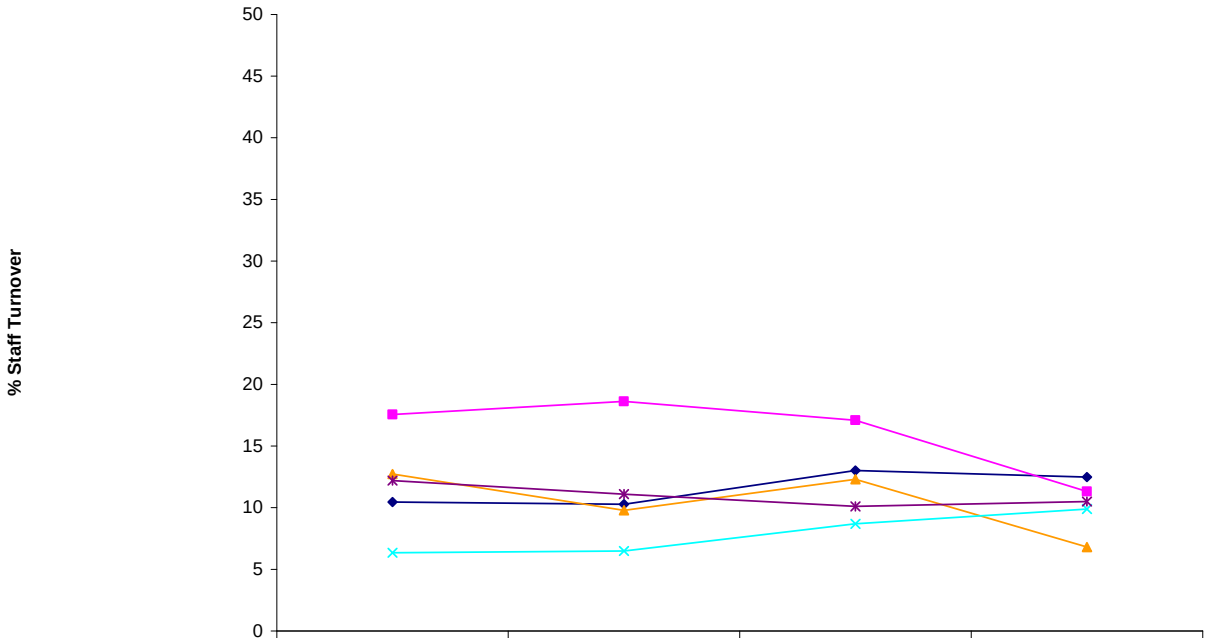
- Three of four PBIS and two of four comparison schools showed declines in turnover between 2004-05 and 2007-08.
- East Millbrook and North Garner middle schools were the two PBIS schools that had solid declines in turnover rates between 2004-05 and 2007-08, as did their comparison schools Wake Forest-Rolesville and Durant Road middle schools.

Figure 11
Teacher Turnover at PBIS Middle Schools



	2004-05	2005-06	2006-07	2007-08
Centennial M	20.9	33.1	18.6	18.4
East Millbrook M	16.4	4.1	10.5	0.0
Moore Sq. M	2.9	23.7	12.2	29.4
North Garner M	16.4	16.1	7.2	9.4
WCPSS Middle Avg	12.2	11.1	10.1	10.5

Figure 12
Teacher Turnover at Comparison Middle Schools

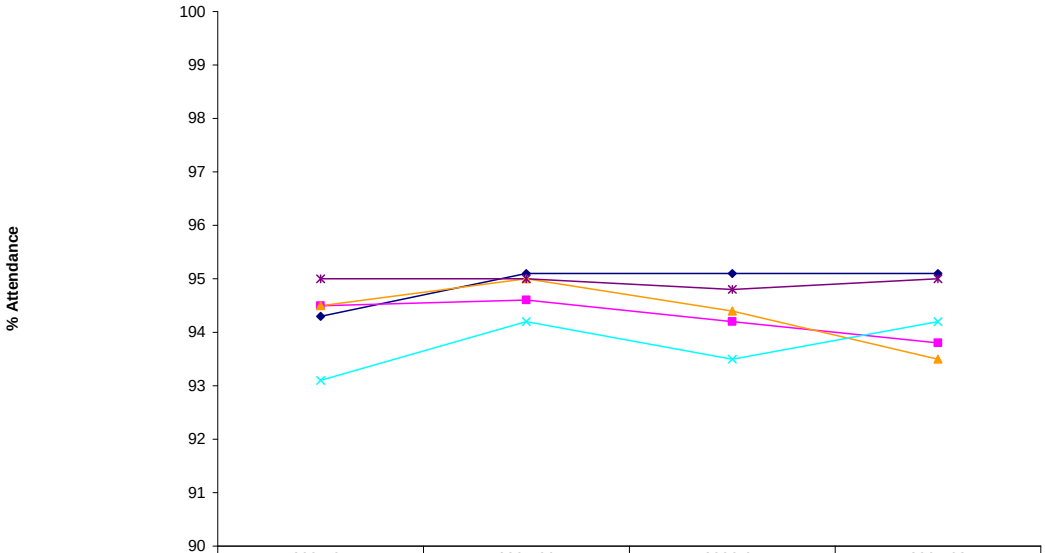


	2004-05	2005-06	2006-07	2007-08
Leesville Road	10.4	10.3	13.0	12.5
Wake Forest-Rolesville	17.6	18.6	17.1	11.3
Durant Road	12.7	9.8	12.3	6.8
East Wake	6.3	6.5	8.7	9.9
WCPSS Middle Avg	12.2	11.1	10.1	10.5

Behavioral Indicators

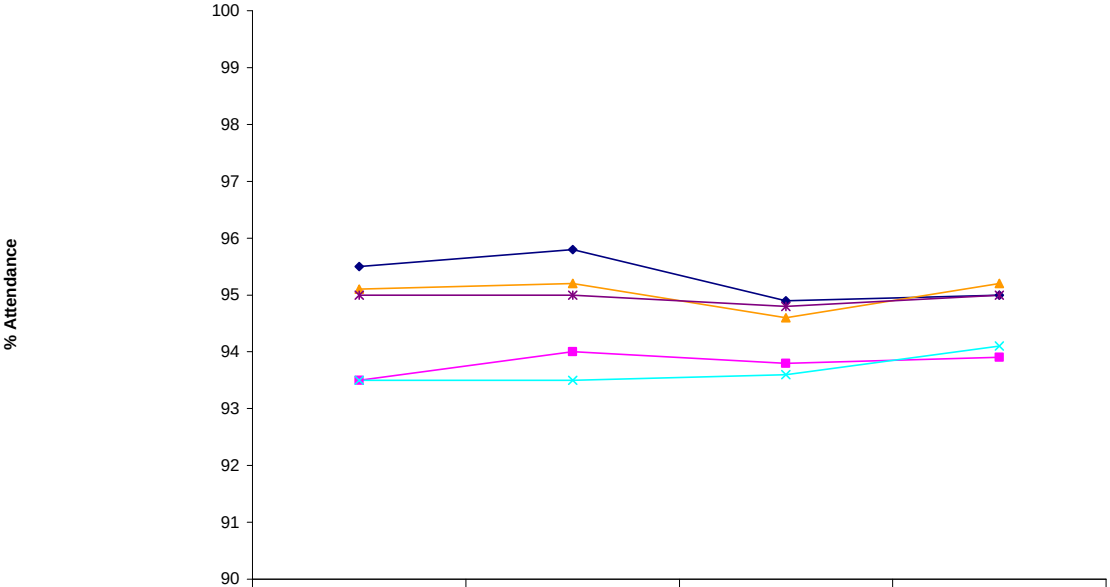
Attendance data for PBIS schools and comparison schools are shown in Figures 13 and 14, respectively. Similar to elementary schools, average attendance rate among all WCPSS middle schools remained constant (around 95%) between 2004-05 and 2007-08. PBIS and comparison middle school attendance rates tended to fall within a couple of percentage points of the district average. Improvements in attendance within both groups between 2004-05 and 2007-08 were very small (around or below one percentage point).

Figure 13
Attendance at PBIS Middle Schools



	2004-05	2005-06	2006-07	2007-08
Centennial M	94.3	95.1	95.1	95.1
East Millbrook M	94.5	94.6	94.2	93.8
Moore Sq. M	94.5	95	94.4	93.5
North Garner M	93.1	94.2	93.5	94.2
WCPSS Middle Avg	95	95	94.8	95

Figure 14
Attendance at Comparison Middle Schools



	2004-05	2005-06	2006-07	2007-08
Leesville Road	95.5	95.8	94.9	95
Wake Forest-Rolesville	93.5	94	93.8	93.9
Durant Road	95.1	95.2	94.6	95.2
East Wake	93.5	93.5	93.6	94.1
WCPSS Middle Avg	95	95	94.8	95

Short-Term Suspensions

Table 17 shows the change in the percentage of short-term suspension incidents between the pre-implementation year (2004-05) and each implementation year, across each PBIS and comparison middle school. Overall, most schools in both groups experienced statistically significant reductions in the percentage of short-term suspension incidents during one or more of the implementation years.

- Centennial and North Garner middle schools experienced statistically significant reductions in short-term suspension incidents at each point of comparison. Their percentage point declines were greater than those seen at Leesville Road and East Wake middle schools.
- Both Centennial and North Garner cut their rates by more than half between 2004-05 and 2007-08. Wake Forest-Rolesville also reduced its suspension incidents by more than half, which was not the case for East Millbrook.

Table 17
Percentage of Middle School Short-Term Suspension Incidents

	2004-05	2005-06	2006-07	2007-08	Change in % 04-05 to 05-06	Change in % 04-05 to 06-07	Change in % 04-05 to 07-08
WCPSS	30.4	29.0	26.2	26.4	-1.4**	-4.2**	-4.0**
PBIS							
1. Centennial	38.3	25.5	18.7	10.0	-12.8**	-19.6**	-28.2**
2. East Millbrook	36.2	40.3	31.5	41.4	4.1	-4.7*	5.2
3. Moore Sq.	43.7	38.7	35.5	47.5	-5.0	-8.2**	3.8
4. North Garner	64.6	47.2	47.2	33.2	-17.4**	-17.4**	-31.4**
Comparison							
1. Leesville Road	34.5	28.7	27.0	35.5	-5.9**	-7.5**	0.9
2. Wake Forest-Rolesville	42.8	34.5	32.2	20.9	-8.3**	-10.5**	-21.8**
3. Durant Road	11.7	13.0	15.9	20.1	1.2	4.2	8.4
4. East Wake	55.3	60.0	46.1	44.4	4.7	-9.3**	-10.9**

Data Source: WCPSS Mainframe Reports

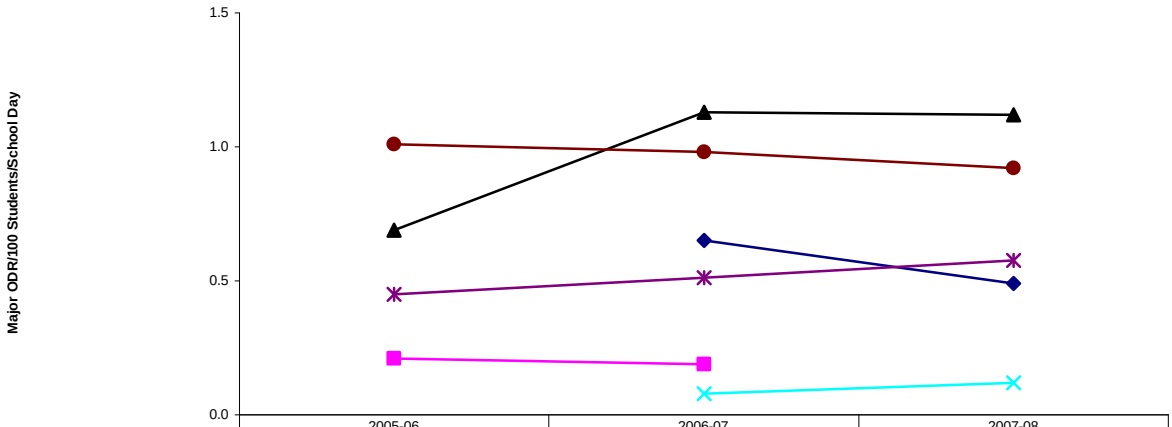
Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level. ** indicates significance at the 0.01 level. Green shaded cells indicate that the percentage of suspensions incidents declined since pre-PBIS implementation.

Office Discipline Referrals (ODR)

In 2007-08, the national average for PBIS middle schools was .92 major office discipline referrals (ODRs) per 100 students per school day (or about 1 ODR per 100 students per school day). The WCPSS average for Cohort 1 PBIS middle schools was below the national average each year. As shown in Figure 15, there is an irregular pattern of ODRs across PBIS middle schools.

- Moore Square Middle School is the only middle school in Cohort I with three years of comparable office referral data. Its increase in ODRs, beginning the second year of implementation, pushed the school slightly above the national PBIS average.
- In 2005-06, Centennial did not begin entering ODR data into SWIS soon enough to obtain complete data for that year. Rates declined between 2006-07 and 2007-08.
- Inaccurate data entry occurred at North Garner in 2005-06 and East Millbrook in 2007-08. The two years of available data at each school show fairly stable ODR rates.

Figure 15
Office Discipline Referrals at PBIS Middle Schools



	2005-06	2006-07	2007-08
Centennial		0.65	0.49
East Millbrook	0.21	0.19	
Moore Square	0.69	1.13	1.12
North Garner		0.08	0.12
WCPSS PBS Average	0.45	0.51	0.58
National (6-9)	1.01	0.98	0.92

Academic Indicators

The change in the percentage of students who were proficient on EOG exams is compared between 2004-05 and 2006-07 in reading and between 2005-06 and 2007-08 in mathematics across individual PBIS and comparison schools as shown in Table 18. Statistically significant increases in proficiency rates were not frequent among either PBIS or comparison middle schools.

- Centennial had a statistically significant 3.4 percentage point increase in reading proficiency between pre-implementation and the second implementation year. None of the comparison schools had significant increases.
- Significant increases in mathematics proficiency occurred at North Garner and its comparison school, East Wake. Both had increases of approximately 10 percentage points.
- Another comparison middle school, Wake Forest-Rolesville, had a significant and positive outcome change in mathematics.

Table 18

	Reading				Mathematics			
	2004-05	**2005-06**	**2006-07**	**Change 04-05 to 06-07**	**2005-06**	**2006-07**	**2007-08**	**Change 05-06 to 07-08**
WCPSS	90.4	91.0	91.1	0.7	74.5	76.1	78.0	3.5**
PBIS								
1. Centennial	87.4	89.1	90.8	3.4*	74.5	74.9	72.3	-2.2
2. East Millbrook	86.0	87.0	85.7	-0.3	55.4	55.5	54.3	-1.1
3. Moore Sq.	86.2	83.7	84.6	-1.6	53.8	60.7	55.3	1.5
4. North Garner	83.5	84.3	83.7	0.2	56.4	59.5	66.3	9.9**
Comparison								

Percentage of Middle School Students Proficient on EOG Reading and Mathematics

1.	Leesville Road	93.5	93.0	91.1	-2.4	76.3	72.9	74.8	-1.5
2.	Wake Forest-Rolesville	90.5	88.3	88.3	-2.2	67.2	66.1	72.7	5.5*
3.	Durant Road	91.4	90.5	90.9	-0.5	73.3	75.1	75.6	2.3
4.	East Wake	82.7	85.5	85.2	2.5	57.9	61.1	67.6	9.7**

Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level ** indicates significance at the 0.01 level. Green shaded cells indicate positive change.

Table 19 presents comparisons of EOG proficiency rates between the matched pairs of PBIS and comparison middle schools within a given year. Red shaded cells indicate a significantly higher percentage of students scoring proficient on EOG exams at the comparison school. Comparison schools tended to have higher proficiency levels in 2004-05 (before PBIS was implemented in any school) and maintained their advantage throughout the years.

- For three of the four pairs, comparison schools had significantly higher proficiency rates in 2004-05 (based on chi-square results).
- The gap in reading and mathematics proficiency between the first matched pair did start to close after PBIS implementation due to slight increases in proficiency rates at Centennial and slight declines at its comparison school, Leesville Road.
- The fourth pair, North Garner and its comparison school East Wake, started and ended with similar proficiency percentages.

Table 19
Middle School Matched Pairs Comparison of Proficiency in Reading and Mathematics

Matched Pairs	Significantly Higher Percentage of Total Students Proficient within Matched Pairs							
	Reading				Mathematics			
	04-05	05-06	06-07	07-08	04-05	05-06	06-07	07-08
1	Compare	Compare	ns	ns	Compare	ns	ns	ns
2	Compare	ns	ns	Compare	Compare	Compare	Compare	Compare
3	Compare	Compare	Compare	NA	Compare	Compare	Compare	NA
4	ns	ns	ns	ns	ns	ns	ns	ns

Notes: NA = the assumptions for use of the chi-square test are not met. Compare = comparison school. ns = not significant. Red shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the comparison school (*p* is less than or equal to 0.05).

EOG Reading and Mathematics Growth

Changes in the percentages of students meeting growth targets were compared between 2005-06 and 2007-08 across all schools. Table 20 shows that neither PBIS nor comparison middle schools from Cohort I had positive changes in student growth in reading. Student growth in mathematics was positive for the same three schools that experienced significant increases in mathematics proficiency rates.

- Statistically significant increases in student growth occurred in mathematics between 2005-06 and 2007-08 at North Garner and its comparison school, East Wake (7.1 and 11.7 percentage points, respectively).
- Another comparison school, Wake Forest-Rolesville, also increased the percentage of students who met their mathematic growth targets by 12.6 percentage points.

Table 20
Percentage of Middle School Students Meeting Growth on EOG Reading and Mathematics

	Reading				Mathematics			
	2004-05 to 2005-06	**2005-06 to 2006-07**	**2006-07 to 2007-08**	**Change in % Meeting Growth 05-06 to 07-08**	**2004-05 to 2005-06**	**2005-06 to 2006-07**	**2006-07 to 2007-08**	**Change in % Meeting Growth 05-06 to 07-08**
WCPSS	55.7	53.9	48.2	-7.5	57.2	60.4	62.3	5.1**
PBIS								
1. Centennial	56.4	54.3	48.5	-7.9	58.7	63.3	51.4	-7.3
2. East Millbrook	53.1	49.4	41.0	-12.1	51.1	45.3	46.2	-4.9
3. Moore Sq.	53.9	53.0	42.7	-11.2	43.9	56.8	47.1	3.2
4. North Garner	53.8	52.0	42.6	-11.2	54.1	52.8	61.2	7.1*
Comparison								
1. Leesville Road	58.2	50.8	48.1	-10.1	57.9	50.1	53.3	-4.6
2. Wake Forest-Rolesville	49.7	54.4	45.9	-3.8	53.3	54.6	65.9	12.6**
3. Durant Road	56.6	55.5	46.2	-10.4	60.7	66.1	63.6	2.9
4. East Wake	58.5	54.9	41.8	-16.7	46.9	54.3	58.6	11.7**

Note: z statistic was computed to test for significance. * indicates significance at the 0.05 level ** indicates significance at the 0.01 level. Green shaded cells indicate positive change.

Comparisons of the percentage of students meeting growth on reading and mathematics EOG exams in 2005-06, 2006-07, and 2007-08 were compared between the matched pairs. Statistical test results are presented in Table 21. There tends to be a few instances when a significant difference in reading growth occurred between the PBIS and its matched comparison school, with the results favoring the comparison school. With two exceptions, students at comparison schools were more likely to have met their mathematic growth targets than students at PBIS schools.

- In the first pair, a significantly higher percentage of students at Centennial (63.3%) than at Leesville Road (50.1%) made a year's worth of growth in mathematics in a year's worth of time (2006-07).
- In 2005-06, North Garner (54.1%) also had a higher percentage of students who made growth in mathematics compared to students at its comparison school, East Wake (46.9%).

Table 21
Middle School Matched Pairs Comparison of Growth in Reading and Mathematics

Matched Pairs	Significantly Higher Percentage of Students Who Met Growth within Matched Pairs					
	Reading			Mathematics		
	04-05 to 05-06	05-06 to 06-07	06-07 to 07-08	04-05 to 05-06	05-06 to 06-07	06-07 to 07-08
1	ns	ns	ns	ns	PBIS	ns
2	ns	Compare	Compare	ns	Compare	Compare
3	ns	ns	ns	Compare	Compare	Compare
4	ns	ns	ns	PBIS	ns	ns

Notes: Compare = comparison school. ns = not significant. Yellow shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the PBIS school compared to the matched school (*p* is less than or equal to 0.05). Red shaded cells indicate a significantly higher percentage of total students scoring proficient on EOG exams at the comparison school (*p* is less than or equal to 0.05).

Middle School Analysis Summary

Among PBIS middle schools, there is some evidence of improvement in climate and behavior outcomes. The effects of PBIS on academic outcomes were less positive than anticipated. Student perceptions of school climate were generally lower at middle schools than at elementary schools. Nevertheless, all middle schools showed significant improvements in student climate by 2007-08. Teachers' perceptions of school climate varied greatly by school and were much lower than students' perceptions. Comparison schools showed more favorable changes in teacher climate compared to PBIS schools. The rates of teacher turnover at comparison schools were more uniform than PBIS schools. Three of the four PBIS schools experienced declines between 2004-05 and 2007-08 compared to two of the four comparison schools.

Average attendance rates among WCPSS middle schools have also remained steady at 95%. Each middle school's attendance rate tended to fall within a couple of percentage points of the district average and no school made notable annual improvements. Statistically significant reductions in the percentage of short-term suspension incidents were found at most of the middle schools during one or more of the analytical years. The total rate of office discipline referrals for PBIS middle schools was lower than the national PBIS average, yet change in individual school rates was very erratic over time.

Statistically significant increases in both reading and mathematics proficiency rates were not frequent among either PBIS or comparison middle school groups. North Garner had the most notable improvements in mathematics proficiency and growth rates. Similar to elementary school findings, comparisons of proficiency and student growth rates within each matched pair indicated more positive gains in achievement among students attending the comparison schools.

ANALYSIS OF STAFF PERCEPTIONS

The previous quantitative analysis offered little evidence of PBIS schools experiencing considerably different outcomes when compared to similar schools that do not use schoolwide behavior practices. However, several individual PBIS schools did make desirable changes in climate, behavioral, and academic outcomes. Interviews with PBIS chairs and focus groups with PBIS principals and assistant principals were conducted to obtain staff perceptions on the effectiveness of schoolwide Positive Behavior Intervention and Support at their schools and to gather ideas for improvement.

INTERVIEWS

PBIS Chair Interview Procedures

In 2007-08, a total of 72 WCPSS schools were participating in the PBIS initiative. E&R staff randomly selected 22 elementary schools, 10 middle schools, and five high schools to serve as the interview sample. Between May 27 and June 6, 2008, E&R staff attempted to complete short telephone interviews with the PBIS chairs from the sample schools. The interview included four questions for which PBIS chairs offered their perspective on the program's effectiveness at their school. Prior to making phone calls, E&R staff sent emails to PBIS chairs to inform them of the study and to request their participation.

Interview Results

Interviews were completed with 27 PBIS chairs, yielding a total response rate of 73%. Sixteen interviews with elementary PBIS chairs and six interviews with middle school PBIS chairs were completed. All five of the PBIS chairs at the selected high schools were successfully contacted and interviews were completed. Slightly more than half (52%) of the 27 successful interviews were completed on the first or second attempt of contact.

Q1. What was the need at your school that you expected PBIS to meet?

The most common needs cited by elementary school PBIS chairs were the desire to implement positive behavior strategies and to create a positive climate for staff and students. Other reasons elementary schools had for adopting the PBIS program included promoting consistent behavior management throughout the entire school and establishing a common language for behavior expectations and consequences. According to the PBIS chairs who were interviewed, elementary schools were interested in reducing discipline issues and thus increasing instruction time; using a positive approach to discipline; having specific guidelines in place for discipline; and maintaining consistency in reporting major and minor referrals.

Improving the overall school climate, reducing discipline issues, and establishing consistency in behavioral expectations were the most common needs cited by middle school PBIS chairs. Other needs that the chairs mentioned included reducing tardies, office referrals, and suspensions, and unifying different tracks and different buildings in the school within one school plan. The most common needs mentioned by PBIS chairs of high schools were reducing tardies and problem

student behavior. Using PBIS to help create school policies and expectations that were consistent throughout the school and reasonable for students to follow was also mentioned.

Q2. Has PBIS been effective at producing the outcomes you anticipated? Please explain.

Elementary school PBIS chairs who responded to this question gave mixed responses. Whereas some chairs agreed that PBIS was effective in their school, some thought it was not effective, and others thought it was effective only in some areas. PBIS chairs at elementary schools who answered this question affirmatively cited the aspects of the program that they saw as beneficial in their schools. Some referred to a major improvement in their school's climate, which they attributed to posting the expectations in the school building and acknowledging positive behaviors. Some PBIS chairs said that PBIS was effective in helping them create consistent expectations for common areas of the school, in promoting a common language for teachers, and implementing rewards. Other positive outcomes they observed in their elementary schools included a reduction in office referrals and the use of information provided by SWIS data.

Most elementary school PBIS chairs who disagreed that PBIS had been effective mentioned that they thought the failure of PBIS to produce the desired outcomes in their schools was attributed not to the program but to other school factors, such as staff buy-in of the program, a lack of consistency among the staff in implementation, and the inability of the school to maintain momentum towards the end of the school year. One elementary school PBIS chair mentioned that the program was effective for the lower grades but not for the higher grades and that the rules should be revised to meet the needs of students at various grade levels.

With one exception, all middle school PBIS chairs thought that PBIS was beneficial. The most significant outcome attributed to PBIS was an overall improvement in the school climate, with students and teachers holding themselves accountable and responsible for the school behavioral expectations. A reduction in tardies and office discipline referrals were two other commonly reported outcomes. PBIS high school chairs said PBIS was effective at reducing tardies, although not eliminating them, and at establishing a common, uniform language for schoolwide procedures and expectations. Other outcomes mentioned included reducing disruptive incidents in the classroom and serving as a tool to assist teachers in classroom intervention.

Q3. Please describe any areas in which you believe PBIS has not been effective at your school.

The issue of low faculty buy-in, which some PBIS chairs attributed to poor administrative support, was the most common response given by elementary school PBIS chairs. The second most common response related to the need for more tertiary prevention measures. For instance, PBIS chairs spoke of the program's ineffectiveness at reaching students with high risk behaviors (the top 5%). Some PBIS chairs mentioned having limited time to devote to implementing the program and training new staff. Inconsistent implementation of the program was a challenge for some schools. The inconsistency among teachers in enforcing schoolwide expectations and the absence of a formalized process for teaching expectations were also mentioned by some elementary school PBIS chairs.

The main concern mentioned by middle school PBIS chairs related to staff buy-in of the program, including limited cooperation from teachers and administration. The challenges of implementing the program on a year-round schedule, and the inability of the program to influence the behavior of students with the most severe problems (the top 5%) were also identified as areas where PBIS has been ineffective within middle schools. Two PBIS chairs at high schools noted that their schools were in the early implementation phase of PBIS; however, one observed a problem in the staff's ability to use SWIS data to make decisions, and the other mentioned the dilemma of staff finding sufficient time to devote to meetings and process implementation. One PBIS chair mentioned student internalization of PBIS procedures as an ineffectual area.

Q4. Do you have any ideas for improvement to make PBIS more effective?

The elementary school PBIS chairs mentioned a variety of ideas for improving the program at their respective elementary schools. Some suggestions were including parents in the program, focusing more attention on providing secondary prevention measures for educationally at-risk students (the middle 15%), and specifying role expectations for the PBIS chairs. Most elementary school PBIS chairs spoke favorably of the efforts of the PBIS coaches and suggested that they provide training for the entire school staff instead of just the PBIS team, create a timeline or checklist for objectives, and regularly attend team meetings. Another idea elementary chairs shared was getting feedback and assessing performance from the previous year to improve on the following year. Some mentioned that they wanted to share referral data and work on clearly defining the major and minor behaviors and making changes to the referral process, creating more incentives for classroom behavior, devoting more time to PBIS, and creating action plans and determining deadlines for the teams and for themselves.

Middle school PBIS chairs' responses included a wide range of recommendations for improving the PBIS program. Some of the ideas for improvement included more support for year-round schools in implementing the program, support from the school administration, better communication within the school regarding the program, and process checks to see whether teachers are implementing the program. The chairs also expressed a desire for the PBIS coaches to be more open to schools implementing the program at their own pace and tailoring parts of PBIS to fit the needs of the individual school. They also recommended that the PBIS coaches provide a periodic briefing to schools on the districtwide status of the program and about their goals for the coming years.

Suggestions for improvement mentioned by PBIS high school chairs included establishing a universal plan for teachers to implement and increasing buy-in from the principals, assistant principals, community, and parents. These chairs also expressed a need for continual, long-term training for teachers with time to practice skills. One PBIS chair stated that PBIS reinforcements such as tokens or tickets are not good motivators for high school students. Finally, the chairs suggested establishing mentor relationships between schools that have successfully implemented PBIS and schools beginning the initiative.

Interview Summary

According to the PBIS chairs who were interviewed, establishing and promoting consistent behavior expectations for students and reducing discipline issues/problem behavior were common needs at the elementary, middle, and high school levels. These needs served as an impetus for PBIS implementation. Elementary and middle schools also sought after PBIS to help create and foster a positive school climate, whereas middle and high schools hoped the schoolwide positive behavior initiative would be a catalyst for reducing tardies.

Some PBIS chairs in elementary and middle schools mentioned that since adopting PBIS they had noticed overall improvements in the climate of their school, which was an outcome that they attributed to the operating school expectations. They also perceived a decline in their office referrals, which they correlated to a reduction in disciplinary problems at their schools. Middle and high school PBIS chairs said that PBIS had been effective at reducing but not eliminating tardiness within their student populations.

Although most PBIS chairs offered insight into the success of PBIS at their schools, they also spoke of the ineffectual areas of the program and of the challenges their schools faced in effectively implementing the program. At the elementary and middle schools, several PBIS chairs expressed their concern regarding the low levels of staff buy-in and implementation of the program. The representatives at these schools also mentioned that the secondary and tertiary level interventions for educationally at-risk students (middle 15%) and students with severe behavioral issues (top 5%) were not sufficient for producing positive changes within these student populations. Elementary and high school PBIS chairs spoke of the challenge of staff having adequate time to devote to PBIS implementation, whereas the logistics of program implementation was a concern shared by year-round middle schools.

The vast majority of PBIS chairs offered suggestions for how PBIS could be improved in general. For instance, the desire for timely, continual, and extensive training for schools in their first year of PBIS implementation and for more tenured PBIS schools was a common request among PBIS chairs at each school level. Chairs also reported ideas for improving PBIS implementation at their schools. Some elementary schools were interested in using SWIS data more frequently to make decisions. Common improvement plans for middle and high schools included increasing administrator support and staff and community buy-in of the program. Adjusting the PBIS model to match the developmental needs of their student populations was also an interest among upper school levels (middle and high schools). PBIS staff were viewed as serving an important role in assisting these schools with these modifications to ensure that the integrity of the program was not compromised.

FOCUS GROUPS

PBIS Principal Focus Group Procedures

By the end of 2007-08 school year, a total of 42 WCPSS schools were completing their second or third year of PBIS implementation. In June of 2008, the principals of these schools were invited to attend a focus group to be conducted by E&R. Principals were informed that they could send their assistant principals to represent their school if they were unable to attend. Two sessions were conducted on June 20, 2008. In the first session, a panel of five elementary school principals and two assistant principals were interviewed. The second session involved middle and high school administrators. Principals and assistant principals offered input about schoolwide behavior support practices at eight PBIS middle schools and high schools.

E&R staff developed an interview protocol as well as a set of procedures that were implemented in each interview. One E&R staff person was assigned to act as the interviewer, while a second E&R staff member served as the recorder. A third staff member was assigned to each panel. All interviews were tape recorded, although the tapes were intended to provide back-up to the individual note-taker. The procedure followed in each interview allowed the interviewer to introduce herself and other E&R staff, and to set the primary purpose for the interview:

> You were invited to participate in this focus group because your school has been involved with the Positive Behavior Intervention and Support program for more than a year. There are five questions that will drive today's discussion, for which we have allocated about an hour and 15 minutes. Your input will provide valuable feedback on the effectiveness of Positive Behavior Intervention and Support at your school.

Following this introduction, the interviewer invited each participant to introduce her/himself. Then the interviewer initiated the panel discussion with the first question. Due to the voluntary nature of the focus group participation, the results may have limited generalizability among PBIS schools in their second or third year of implementation. Furthermore, the findings do not represent first year PBIS school experiences. All seven of the elementary administrators who chose to participate in the focus groups came from high implementing schools (per 2007-08 SET results). Half of the participating administrators from middle and high schools represented high implementing PBIS schools.

PBIS Principal Focus Group Results

Q1. Why did you want to become a PBIS school? Was there a specific challenge or goal at your school that you thought PBIS would help you meet or accomplish?

Reducing discipline issues and referrals were the most common challenges that elementary school administrators thought PBIS would help meet. These administrators wanted to adopt a positive approach to discipline and to have more strategies available for teachers to use to solve discipline problems. Another reason for becoming a PBIS school that was mentioned by the administrators was to improve the overall culture/climate of the school.

Although many middle and high schools administrators were not employed in their current school during the initiation of PBIS, all offered varied responses on why they thought their schools adopted PBIS. Two high schools opened as PBIS schools because they wanted to set behavior expectations from the first day of school and PBIS seemed to be a natural fit. Other reasons given by the administrators included reducing discipline referrals given during transition periods, using more positive and structured ways to affect student behavior, and getting all the staff on the same page to ensure consistency.

Q2. What PBIS practices do you think have been most beneficial in helping you produce these desired outcomes?

Using acronyms to define and list the behavioral expectations of the school, posting the behavioral matrix throughout the school, and offering tokens as rewards for students adhering to these expectations were cited by most administrators as the most beneficial PBIS practices. Some administrators mentioned the proactive nature of PBIS as one of the most beneficial aspects. The use of a buddy or mentoring system, where a student is paired with a staff member or an administrator, was mentioned as an important strategy some schools use to reach the middle tier students (15%). Some elementary administrators said that PBIS is less like a program at their school and more an internalized culture because it has been so fully embraced and implemented.

The most frequently cited benefit of PBIS at middle and high schools was the "start on time" practice. Three administrators specifically mentioned this practice as being very effective in reducing tardies at their schools. These administrators were also very supportive of the basic PBIS model of teaching a set of common expectations and using the expectation matrix, making consequences clear, and keeping students focused on making good choices and rewarding them accordingly.

Q3. What support do you provide to the PBIS team in implementing schoolwide positive behavior practices?

All of the elementary school administrators said that they were fully involved with PBIS at their school. They provided support by attending all PBIS meetings and participating in other PBIS related activities. For example, one administrator said that she conducted classroom observations to check the language used by the teachers. She marked the positive statements in green and the negative statements in red to offer teachers a concrete example of their use of positive practices. Some administrators also mentioned that they recognize and reward staff and students who visibly practice the PBIS model.

Most of the middle and high school administrators said that they supported the PBIS program at their school with time, effort, and/or funding. For example, they offered support by providing faculty meeting time at the beginning of the school year to discuss PBIS, allotting time for the PBIS team to present information at faculty meetings, and through attendance at monthly PBIS team meetings. One administrator mentioned that his school has a two-day planning retreat, and another said that she devoted two early release days this year to staff development related to

PBIS. One administrator commented on the importance of administrators imparting the value of PBIS to their staff and making it a priority. Several administrators mentioned the financial support they provide to PBIS through the use of Fund 6 and directing resources to PBIS when necessary.

Q4. What is the level of buy-in of PBIS at your school? What impact has this had on implementation?

All elementary schools administrators agreed that the level of staff buy-in of PBIS at their schools was very high; however, the intensity and enthusiasm often diminished throughout the year. An important component of buy-in discussed by the administrators was student and staff accountability for PBIS behavior. They thought it was important for staff to model PBIS behavior and for them to feel comfortable gently correcting other staff when they behaved in a manner contradictory to the PBIS model.

Various reasons for the lack of buy-in of PBIS among some staff and some strategies for increasing the buy-in were discussed in the middle and high school focus group. Several administrators voiced their opinion that PBIS is more applicable to elementary students. They discussed the dilemma of finding rewards that the older students care about and the challenge of getting students and teachers to want to participate in schoolwide behavioral practices. Another problem was training new staff. For example, one administrator stated that he currently has good teacher buy-in, but he is concerned about the buy-in of new staff. One administrator counterpointed that PBIS is such an internalized part of her school's culture that new staff automatically buy into it because they see others doing it. One administrator shared that at her school the most vocal critic of PBIS was assigned the PBIS chair position and now this person is one of the biggest supporters of the program.

Q5. Recall why you became a PBIS school and what you hoped PBIS would help you accomplish. Now looking forward to the 2008-09 school year, please describe any plans you have for improving PBIS implementation at your school.

All elementary administrators shared promising ideas for improving the PBIS efforts in their schools. Some of the ideas mentioned were initiating a mentoring system between younger and older students and educationally at-risk students and staff, using data to drive decisions, implementing PBIS consistently across all areas of the school, using PBIS to reduce referrals, and making more connections between PBIS and achievement.

The middle and high school administrators mentioned that the focus group had been a good opportunity to share effective practices. One year-round school administrator stated that his school has an ongoing practice of providing an orientation to PBIS for the new teachers. He is also planning to require that the PBIS matrix and expectations be taught to students on the first school day after each track-out session. Another administrator mentioned plans for the coming year, such as posting expectations throughout the building and using the most effective PBIS implementers as role models. She is also planning to have teachers spend 30 minutes of their planning period visiting the classrooms of the effective teachers. Two administrators stated that their future focus will include reaching students with the most severe problems (the top 5%).

Middle and high school administrators expressed a desire for continual support by PBIS coaches beyond the first few years of implementation.

Focus Group Summary

Administrators' comments gathered in the focus groups tend to be very positive in nature, even when they were relating ideas for improvements. Most described stories of success in several of the desired outcomes. Administrators representing all education levels thought that becoming a PBIS school would help the staff deal with discipline issues in a positive manner, and ultimately reduce the frequency of troublesome behavior occurrences at their schools. Using schoolwide behavioral expectations was commonly mentioned by elementary administrators as one practice that helped them effectively handle problem behavior. Likewise, the "start on time" practice, which encourages early and on-time arrival to school and classes, has helped middle and high school administrators and staff to deal more effectively with students who are tardy. It is also attributed to reducing the overall frequency of tardies at these schools.

The administrators who participated in the focus groups stated that they are highly supportive of PBIS at their school with many offering support to their PBIS teams through time, attention, and funding. Elementary administrators spoke of the high level of staff buy-in, whereas middle and high school administrators admitted that buy-in might be improved if the PBIS model was more amenable to their student populations. Administrators gave varied responses regarding how they planned to improve PBIS implementation at their specific schools. A general agreement among middle and high school administrators was the desire and need for continual support by PBIS coaches beyond the first few years of implementation.

DISCUSSION

The quantitative and qualitative analyses of outcomes conducted for this study produced mixed results among PBIS schools. Although there was evidence that most PBIS elementary and middle schools had successfully implemented schoolwide behavior practices, there was less evidence of PBIS elementary and middle schools experiencing consistent positive changes in climate, behavioral, and academic outcomes. Some of the PBIS schools analyzed for this study experienced a significant change or a positive change in one or more of the outcome measures at some point since the first year of implementation. The PBIS schools with the most favorable outcomes within each area of desired change are presented in Table 22. Brentwood Elementary and Centennial Middle Schools are two examples of PBIS schools that made improvements on several of the indicators measuring climate, behavior, and achievement. No school experienced improvements on each variable.

Table 22
Summary of Quantitative Results for Cohort 1 PBIS
Indicating the School with the Most Favorable Outcomes

Outcome		Elementary	Middle
Climate	*Student Climate*	Apex, Brentwood & Lynn Road	Centennial, East Millbrook, Moore Square & North Garner
	Teacher Climate	Brentwood, Fuller & Reedy Creek	none
	Teacher Turnover	Brentwood & Hodge Road	East Millbrook & North Garner
Behavior	*Attendance*	none	none
	Short-Term Suspensions	Fuller, Hodge Road, Lynn Road, Reedy Creek & Rolesville	Centennial, East Millbrook, Moore Square & North Garner
	Office Discipline Referrals	Brentwood	Centennial
Achievement	*Reading or Mathematics Proficiency*	Apex, Lynn Road Brentwood & Rolesville	Centennial & North Garner
	Reading or Mathematics Growth	Apex, Lynn Road, Brentwood & Rolesville	Centennial & North Garner

Note: Schools were identified with the most favorable outcomes based on having an instance of a statistically significant change in any of the measureable outcomes at any given year, or having a positive change in an outcome that was statistically different from the comparison school at any given year, or experiencing a notable positive change.

Unlike many state PBIS initiative reports that only examine changes within PBIS schools, this report conducted comparative analyses between PBIS and non-PBIS schools. The inclusion of a comparison group offers a more robust and comprehensive examination of the effectiveness of PBIS. Results showed that in many instances, there was little to no difference in outcomes over time between PBIS and comparison schools. Additionally, when a significant and positive change in climate, behavior, or academic achievement did occur, it was more likely to happen at comparison schools not implementing PBIS (see Table 23).

Table 23
Summary of Quantitative Results for Cohort 1 PBIS and Comparison Schools Indicating the Group with the More Favorable Outcomes

Outcome		Elementary	Middle
Climate	*Student Climate*	Comparison	No difference
	Teacher Climate	PBIS	Comparison
	Teacher Turnover	Comparison	No difference
Behavior	*Attendance*	No difference	No difference
	Short-Term Suspensions	PBIS	No difference
	Office Discipline Referrals	Data not comparable	Data not comparable
Achievement	*Proficiency*	Comparison	Comparison
	Growth	Comparison	Comparison

It is important to note that ten WCPSS schools (three from Cohort 1 and seven from Cohort 2) participating in the PBIS initiative were recognized at the North Carolina PBIS conference in the fall of 2008. Participating schools across the state were honored for successfully implementing PBIS as measured by SET scores and implementation inventory scores and results on similar indicators that were measured for this study: office discipline data, suspension data, and achievement data. However, it is unclear how success on these measures was determined. Swift Creek Elementary was recognized with a plaque as an Exemplar School, the top PBIS recognition. Mount Vernon School and River Oaks Middle were named Banner Schools. Apex Elementary, Carver Elementary, Kingswood Elementary, Reedy Creek Elementary, Underwood Elementary, York Elementary and Heritage Middle were recognized as Green Ribbon Schools (see Appendix D for a description of the various awards).

The mixed results presented in this evaluation may, in part, arise from several factors.

Emphasis on Different Outcomes

It is possible that some of the indicators of success measured for this study did not reflect the outcome areas on which PBIS schools were concentrating their efforts to improve. For example, the qualitative data suggest that schools did not view improved attendance, suspensions and achievement as the focus of their efforts, whereas, improvement in tardiness, which was not analyzed, was viewed as important to secondary schools. Likewise, changes in attendance and suspensions would likely be more visible if they were monitored for students with excessive absences or more severe problem behaviors. Given the high school-level attendance rates and low school-level suspension rates at elementary schools, it might also be useful to observe the impact of PBIS on individual students in addition to the entire student body. It is also likely that the measures of school climate and behavior that were available for analysis are not completely compatible with the indicators used by schools to monitor such improvements. For instance, many PBIS chairs and school administrators reported seeing positive changes in school climate. It is not clear, though, how they operationalized school climate or whether they had documentation that their school climate had indeed improved.

It is also possible that some of the schools analyzed for this study may have implemented the PBIS initiative without first identifying a need for it. If this statement is accurate, then schools should not expect to see improvements as a result of PBIS implementation. It is unclear whether a meaningful assessment of need was conducted at each school as the logic model suggests (see Figure 1). In fact, some new schools have opened as PBIS schools, which suggests that the initiative was viewed more as a preventive than as a response to a need.

Personnel Issues

Some of the measures used for this study may have been sensitive to external factors. Teacher turnover rates can be affected by circumstances related to promotions, pregnancy, or illness. Additionally, changes in administration may have indirectly affected the success of PBIS schools in producing desired outcomes. Changes in administrative personnel, including principals and assistant principals, that occurred between the 2005-06 school year and the 2007-08 school year are noted in Table 24. During the three-year span, PBIS schools were more likely than comparison schools to hire a new principal, whereas they did not experience a change in their assistant principals as often. These changes could have affected the rates of teacher turnover at a school, which tended to increase in the year following an administrative leadership change, as well as the school's vision of incorporating PBIS into the its culture.

Table 24
Change in Administrative Personnel

PBIS Schools	05-06	06-07	07-08	Comparison Schools	05-06	06-07	07-08
Elementary Schools							
1. Apex				1. Middle Creek			
2. Brentwood		P		2. Fox Road			
3. Fuller	P			3. Briarcliff			P/AP
4. Hodge Road		P		4. Forestville Road		AP	
5. Lynn Road		P		5. Joyner			
6. Reedy Creek		AP	P/AP	6. Lockhart			
7. Rolesville		P		7. Fuquay-Varina			
Middle Schools							
1. Centennial	P		AP	1. Leesville Road		P/AP/ AP	P
2. East Millbrook		P		2. Wake Forest-Rolesville	AP		AP
3. Moore Square	P			3. Durant Road	P/AP	AP	AP
4. North Garner			AP	4. East Wake			

Note: P = Principal; AP = Assistant Principal.

Timing of Evaluation and Sample Selection

PBIS is a schoolwide initiative that may necessitate a paradigm shift for school staff from reactive, punitive, and solitary behavior to more proactive, positive, and collaborative action. It is possible that PBIS has not been implemented in WCPSS schools long enough for such a shift to have occurred and for consistently positive results to be seen at the school level. Likewise, although participating schools may respect the general PBIS ideology, it appears that school practices, expectations, and goals are idiosyncratic to some extent. Schools have a great deal of autonomy in setting expectations of behavior for both students and teachers and in defining infractions that result in office referrals. Additionally, some school staff mentioned school-level buy-in as a barrier to successful implementation, and the relevance of the model for secondary students was questioned. Program evaluations may continue to yield inconsistent results until participating schools fully embrace the PBIS ideology and practices and a higher level of uniformity is enforced among primary and secondary schools across the district.

The quantitative analysis of outcomes conducted for this study was limited to the first cohort of PBIS schools in WCPSS. It is possible that subsequent cohorts will eventually see greater long-term improvements, as they benefit from the knowledge and experience that PBIS staff have gained from working with the program throughout the years. According to PBIS staff, changes have occurred in the nature of the relationships between the schools and their PBIS coaches and in the training schedule since the initial implementation of the PBIS program in 2005-06.

RECOMMENDATIONS

Fostering positive school climates in which problem behavior is reduced may lead to improved academic performance and increased graduation rates. However, PBIS in WCPSS must be strengthened if it is to meet these needs. Based on the empirical evidence obtained from this evaluation, E&R staff recommend some modifications to the PBIS initiative and believe that some repurposing of funds may be both possible and necessary. Further expansion of the program is not recommended until modified strategies are established.

Discontinuing the initiative at schools that are not actively monitoring the implementation of PBIS and its impact on student outcomes and eliminating schools that persistently fail to show evidence of positive outcomes would have financial implications for the district. Although most PBIS schools in their second or third year of implementation welcomed, or at least accommodated, a SET evaluation, a few schools did not. Participation in a system of accountability for PBIS schools should be specified as an expectation of joining the district PBIS initiative. If a school continually declines to be evaluated, then the PBIS coordinator and the principal should discuss if participation in the program should be discontinued or the school wants to change its actions to align with program expectations. Eliminating schools that do not want to fully participate in the PBIS initiative would make more Title II funds available for other participating schools. Additionally, postponing the addition of coaches or schools until PBIS program staff, in collaboration with school staff, can strengthen the model for secondary schools and address buy-in and other issues for all schools would allow funds to be repurposed to other PBIS schools or other district initiatives.

WCPSS staff committed to strengthening the PBIS initiative are encouraged to:

- Develop and institute more sufficient secondary and tertiary level interventions for educationally at-risk students (middle 15%) and students with severe behavioral issues (top 5%). The intervention triangle displaying the levels of support and risk of behavior is used as a heuristic (Irwin and Algozzine, 2008). As such, the percentages of students falling into each tier are metaphorical representations of what seems to be logical in most cases, rather than scientifically validated numbers. If the general pattern of schoolwide behavior is positive and not problematic, it may make fiscal sense to implement other programs that focus on the needs of students with moderate to severe behavioral problems rather than maintaining a commitment to the PBIS schoolwide initiative. An assessment of need should be conducted prior to PBIS implementation to ensure an appropriate match between the need of the school and the program intended to meet the need.

- Amend the PBIS program for students in higher grade levels by identifying developmentally appropriate behavioral expectations and finding reinforcements and rewards that will better motivate behavior. As the students progress to the upper grades, it is important to include them in the development of school expectations. Discussions that occur between students and staff during the expectation-setting process may provide students with a better understanding of the reasoning behind those expectations and promote more allegiance to them. Students may also offer suggestions for a rewards system that is appealing to them.

- Establish a mentoring program or Professional Learning Community (PLC) among first year and tenured PBIS schools. Creating PLC groups by school level may be a way to ameliorate the efforts of PBIS support in the coming years. These groups would provide a time to share best practices, generate new ideas, and solve problems.

- Revisit the level of support available to schools during each phase of implementation and beyond, and encourage schools to become more independent of external support. PBIS staff should discuss whether they will offer refresher training and nominal support to PBIS schools beyond the first years of implementation. The level of support provided to PBIS schools will depend on balancing available resources with the needs and desires of the schools. Ways to support schools with electronic support should be explored, such as providing training via Camtasia, an on-line audio/visual software program. The issue of leadership turnover should be explicitly discussed and addressed prior to participation and plans should be in place to make applicants aware of the program expectations during the hiring process and to train new staff immediately upon hiring.

- Obtain evidence of improvement by reviewing district and school-level results and create a plan of improvement for less successful schools. PBIS staff and PBIS school staff are encouraged to review expected outcome data annually, and E&R staff should plan another formal evaluation of the PBIS initiative in another three years to allow time for improvements to be implemented.

The E&R Department is planning to conduct a follow-up study of the PBIS initiative in the spring of 2009. Case studies will be conducted to explore behavioral expectation setting practices and to identify additional indicators of success. The SET evaluation, although designed for PBIS schools, will be completed in an amended manner at several comparison schools to examine whether and how they set behavioral expectations for students. Finally, E&R staff will examine school-level tardy data before and after the implementation of the “start on time” practice. This practice is being used by a number of PBIS middle and high schools to effectively deal with and reduce tardies.

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Appendix A
PBIS Schools by Year of Implementation

Elementary Schools	Middle Schools	High Schools
Cohort 1 (2005-06, 2006-07, & 2007-08)		
1. Apex	1. Centennial	1. Garner
2. Brentwood	2. E. Millbrook	2. Middle Creek
3. Fuller	3. Moore Square	
4. Hodge Road	4. North Garner	
5. Lynn Road	5. River Oaks	
6. Reedy Creek		
7. Rolesville		
Cohort 2 (2006-07 & 2007-08)		
1. Barwell	1. Carroll	1. Broughton
2. Carver	2. E. Garner	2. Fuquay-Varina
3. Combs	3. Fuquay-Varina	3. Holly Spings
4. Durant Road	4. Heritage	4. Panther Creek
5. Forest Pines	5. Ligon	
6. Green	6. Mt. Vernon	
7. Holly Grove	7. W. Millbrook	
8. Holly Ridge		
9. Kingswood		
10. River Bend		
11. Swift Creek		
12. Underwood		
13. Wakelon		
14. Wilburn		
15. Wildwood Forest		
16. Wiley		
17. York		
Cohort 3 (2007-08)		
1. Bugg	1. Carnage	1. Athens Drive
2. Conn	2. Daniels	2. E. Wake School of Integrated Technology
3. Dillard Drive	3. Dillard Drive	
4. Douglas	4. E. Cary	3. Wake Early College
5. E. Garner	5. Reedy Creek	4. Wakefield North (9^{th} Grade Center)
6. Green Hope	6. Wake Forest-Rolesville	
7. Heritage	7. Wendell	
8. Holly Springs	8. West Lake	
9. Hunter	9. Zebulon	
10. Jones Dairy		
11. Lincoln Heights		
12. N. Forest Pines		
13. Northwoods		
14. Poe		
15. Sanford Creek		
16. Smith		
17. Vance		

Elementary Schools	Middle Schools	High Schools
Cohort 4 (2008-09)		
1. Briarcliff	1. Durant Rd	1. Southeast Raleigh
2. Brier Creek	2. East Wake	2. Wakefield
3. Cary	3. Longview	
4. Creech Rd	4. Wakefield	
5. Fox Road		
6. Laurel Park		
7. Lead Mine Rd		
8. Leesville Rd		
9. Lockhart		
10. Middle Creek		
11. Millbrook		
12. Mills Park		
13. North Ridge		
14. Olds		
15. Partnership		
16. Root		
17. Stough		
18. Sycamore Creek		
19. Timber Drive		
20. Wakefield		
21. Washington		
22. Weatherstone		
23. Wendell		
24. West Lake		

Appendix B
Change in Student Population Frequency Due to Annual Student Assignment

Over the past several years, some WCPSS schools have experienced dramatic changes in their student assignment. Elementary schools were more affected by reassignment than middle schools, as several new elementary schools have opened in WCPSS over the past several years to accommodate population growth. The comparison schools appear to have experienced greater changes in student assignment than PBIS schools. Two schools in particular, Forestville and Middle Creek Elementary Schools had well over half of their student population change in a single year (73.1% and 62.9% respectively).

		# Students Gained from New Nodes			# Students Exiting due to Lost Nodes			% Gross Change in Population		
		05-06	06-07	07-08	05-06	06-07	07-08	05-06	06-07	07-08
Elementary Schools										
PBIS	1. Apex	-	-	-	-	-	-	-	-	-
	2. Brentwood	-	-	-	-	58	128	-	11.0	30.8
	3. Fuller	-	-	-	-	35		-	6.0	-
	4. Hodge Road	-	92	31	-	49	17	-	21.3	7.6
	5. Lynn Road	-	49	-	-	-	80	-	8.8	16.9
	6. Reedy Creek	-	-	-	90	203	-	12.6	35.2	-
	7. Rolesville	-	-	-	-	127	273	-	21.3	42.1
Comparison	1. Middle Creek	-	82	271	-	112	293	-	19.8	62.9
	2. Fox Road	-	-	210	-	-	132	-	-	40.0
	3. Briarcliff	18	-	47	18	-	-	8.0	-	8.0
	4. Forestville Road	79	-	-	-	414	-	10.3	73.1	-
	5. Joyner	-	-	-	-	-	67	-	-	12.8
	6. Lockhart	100	-	6	100	79	-	25.7	10.4	0.8
	7. Fuquay Varina	-	-	-	-	-	118	-	-	12.6
Middle Schools										
PBIS	1. Centennial	-	-	-	-	-	-	-	-	-
	2. East Millbrook	-	-	-	-	153	-	-	14.4	-
	3. Moore Square	-	-	-	-	-	-	-	-	-
	4. North Garner	-	-	-	-	-	-	-	-	-
Comparison	1. Leesville Road	-	-	100	-	-	-	-	-	7.6
	2. Wake Forest Rolesville	-	110	-	-	-	-	-	9.7	-
	3. Durant Road	-	-	-	-	-	-	-	-	-
	4. East Wake	-	-	-	-	-	-	-	-	-

Data Source: WCPSS Student Assignment Data from Growth and Planning

Note: Columns show the number of students gained from new nodes assigned to the school, the number of students who left the school because their node was assigned to another school, and the gross change in student population. Gross change is computed by taking the sum of students who were newly assigned to the school and students who exited the school due to reassignment, divided by the 20th day membership and multiplying by 100.

Appendix C
Staff and Student Outcome Data

Climate Data for PBIS and Comparison Elementary Schools

	School is Safe			Rules are Fair		
	05-06	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*
Apex	99.0	100	96.2	89.6	93.8	99.1
Middle Creek	96.2	98.0	96.4	85.6	94.7	100
Brentwood	83.9	98.6	87.9	76.7	87.3	94.8
Fox Road	90.0	90.2	94.5	85.2	84.8	99.1
Fuller	96.9	89.1	87.3	77.9	86.8	96.2
Briarcliff	94.6	97.1	95.2	94.6	91.2	98.8
Hodge Road	95.1	98.8	92.0	83.5	88.1	93.3
Forestville Road	93.6	100	88.6	83.6	88.7	89.6
Lynn Road	97.4	100	91.4	88.2	95.3	96.4
Joyner	100	100	96.6	90.7	90.0	98.4
Reedy Creek	97.6	96.3	missing	91.5	97.5	missing
Lockhart	94.0	100	96.7	91.5	90.9	100
Rolesville	98.7	99.1	84.3	89.3	79.5	95.4
Fuquay-Varina	94.0	99.2	94.0	82.0	89.9	97.0

	Expectations Communicated		Rules Consistently Enforced		Discipline Efforts Supported		Staff Turnover			
	05-06	*07-08*	*05-06*	*07-08*	*05-06*	*07-08*	*04-05*	*05-06*	*06-07*	*07-08*
Apex	73.7	66.0	72.2	47.1	78.9	51.0	0.0	6.5	7.0	2.5
Middle Creek	91.7	86.4	85.7	76.2	89.6	83.6	17.4	7.5	10.9	4.8
Brentwood	44.4	66.7	14.8	67.4	37.0	72.7	33.3	21.8	15.0	21.2
Fox Road	65.4	78.0	56.7	33.9	57.7	52.5	14.1	16.1	21.2	14.8
Fuller	61.5	95.7	50.0	72.3	66.7	78.7	8.1	11.1	14.6	7.1
Briarcliff	85.2	82.7	72.0	66.7	85.7	78.8	10.5	10.5	9.8	7.5
Hodge Road	55.6	58.3	44.8	54.1	55.2	70.3	16.7	13.0	7.3	3.9
Forestville Road	52.4	61.7	31.6	37.3	54.1	39.3	0.0	5.6	6.8	10.4
Lynn Road	77.8	72.3	61.1	59.6	64.7	60.9	8.1	0.0	11.6	15.8
Joyner	83.3	69.2	63.0	64.1	76.0	67.6	16.7	7.3	8.7	11.4
Reedy Creek	70.3	86.7	52.9	77.0	57.6	90.2	5.6	5.6	4.3	8.2
Lockhart	69.4	81.0	35.1	39.0	50.0	59.3	12.3	5.3	7.1	10.0
Rolesville	66.7	80.0	61.1	48.0	72.2	49.0	16.7	22.5	10.0	22.7
Fuquay-Varina	90.6	89.6	83.3	83.8	83.9	84.8	11.1	9.3	8.1	9.1

Implementation and Behavior Data for PBIS and Comparison Elementary Schools

	SET		Attendance				Short-Term Suspensions				ODRs		
	06-07	*07-08*	*04-05*	*05-06*	*06-07*	*07-08*	*04-05*	*05-06*	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*
Apex	84.0	92.0	96.4	96.1	95.2	95.3	3.0	3.6	2.1	6.3	0.23	0.14	0.35
Middle Creek	--	--	95.7	95.7	95.5	96.1	5.2	4.8	0.7	3.2	--	--	--
Brentwood	--	83.0	95.2	94.6	94.4	95.4	4.6	9.0	20.3	6.8	0.35	0.23	0.05
Fox Road	--	--	95.8	95.7	95.4	95.8	14.0	1.1	2.9	1.8	--	--	--
Fuller	86.0	97.0	96.8	96.2	96.2	96.4	8.9	13.2	2.6	1.1	0.41	0.16	0.21
Briarcliff	--	--	95.6	96.1	95.5	95.8	5.5	7.0	6.4	2.2	--	--	--
Hodge Road	86.0	92.0	96.4	96.4	95.6	96.3	13.4	12.7	4.0	3.2	0.11	0.11	0.09
Forestville Road	--	--	95.7	95.6	95.1	95.7	2.6	4.2	4.7	3.0	--	--	--
Lynn Road	82.0	88.0	94.9	96.1	95.0	95.1	11.5	4.9	5.4	12.5	0.1	0.14	0.46
Joyner	--	--	95.9	95.9	95.2	96.0	11.5	16.8	24.1	13.3	--	--	--
Reedy Creek	78.0	83.0	95.6	95.4	95.2	95.8	9.5	4.5	3.9	3.2	0.11	0.07	0.07
Lockhart	--	--	95.6	96.2	95.8	96.4	9.5	8.2	9.6	8.6	--	--	--
Rolesville	85.0	81.0	95.7	95.6	95.1	94.8	9.8	6.5	3.6	7.4[2]	0.4	0.36	0.41
Fuquay-Varina	--	--	95.0	95.7	95.3	95.7	1.5	2.0	4.3	5.0	--	--	--

Note: -- means no data collected.

Academic Achievement Data for PBIS and Comparison Elementary Schools

	Reading Proficiency			Mathematics Proficiency			Reading Growth			Mathematics Growth		
	04-05	*05-06*	*06-07*	*05-06*	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*
Apex	94.2	94.9	94.0	85.1	83.8	83.9	57.8	49.7	47.5	67.9	57.0	72.9
Middle Creek	93.7	92.2	89.1	79.1	78.6	81.3	46.9	47.2	35.9	50.7	56.1	58.8
Brentwood	78.1	69.8	75.1	51.1	51.8	60.3	35.1	43.9	50.0	60.8	45.6	71.7
Fox Road	81.9	82.7	85.8	62.2	64.5	67.3	49.3	51.4	46.6	53.9	60.3	67.2
Fuller	85.8	89.6	89.9	74.1	73.4	78.2	58.7	48.9	47.3	58.7	51.9	56.4
Briarcliff	88.8	85.2	86.2	70.9	76.8	77.5	50.3	46.0	56.6	51.3	64.2	64.6
Hodge Road	81.8	86.9	84.4	67.6	63.1	68.2	57.9	45.3	40.8	67.3	56.5	59.6
Forestville Road	85.8	85.0	86.8	64.5	75.9	78.1	55.5	55.3	45.7	63.6	72.0	70.3
Lynn Road	86.9	87.8	90.6	72.8	75.0	72.3	59.1	59.0	45.8	60.5	66.4	63.7
Joyner	85.0	81.6	83.8	67.3	73.9	78.2	51.3	51.3	47.2	69.1	63.0	53.6
Reedy Creek	88.4	88.8	90.9	67.9	73.5	72.3	47.8	58.7	50.9	48.0	54.1	55.1
Lockhart	93.0	93.6	90.3	74.7	74.9	78.7	57.0	56.7	54.3	59.1	61.4	66.0
Rolesville	90.2	91.5	90.8	69.3	77.1	74.2	49.8	53.8	41.5	34.2	58.3	58.3
Fuquay-Varina	88.8	85.3	88.4	65.2	73.2	77.5	48.6	57.0	45.4	52.6	56.7	68.6

[2] Revised May 7, 2009 to reflect correct data.

Implementation and Climate Data for PBIS and Comparison Middle Schools

	School is Safe			Rules are Fair		
	05-06	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*
Centennial	94.7	98.8	89.5	72.2	70.6	92.5
Leesville Road	--	81.5	82.3	--	54.3	88.4
E. Millbrook	65.9	81.6	71.1	52.4	63.0	82.7
Wake Forest-Rolesville	80.4	81.1	74.5	49.4	60.7	82.8
Moore Square	79.0	68.7	69.5	66.0	59.3	91.6
Durant Road	94.4	97.1	94.8	72.8	76.3	95.9
N. Garner	67.1	82.1	84.0	65.4	60.9	89.8
E. Wake	72.9	84.7	81.3	48.0	55.3	83.9

	Expectations Communicated		Rules Consistently Enforced		Discipline Efforts Supported		Staff Turnover			
	05-06	*07-08*	*05-06*	*07-08*	*05-06*	*07-08*	*04-05*	*05-06*	*06-07*	*07-08*
Centennial	75.0	73.5	42.9	54.0	71.4	69.4	20.9	33.1	18.6	18.4
Leesville Road	52.0	56.3	37.3	38.1	55.3	51.8	10.4	10.3	13.0	12.5
E. Millbrook	76.2	73.2	41.5	46.3	46.3	60.5	16.4	4.1	10.5	0.0
Wake Forest-Rolesville	48.0	54.9	33.3	51.2	37.0	63.5	17.6	18.6	17.1	11.3
Moore Square	35.3	23.7	17.6	10.3	35.3	20.6	2.9	23.7	12.2	29.4
Durant Road	82.8	67.0	50.9	55.1	66.1	73.7	12.7	9.8	12.3	6.8
N. Garner	89.7	86.1	71.0	79.7	71.0	83.3	16.4	16.1	7.2	9.4
E. Wake	29.5	53.7	20.9	33.3	34.1	52.2	6.3	6.5	8.7	9.9

Behavior Data for PBIS and Comparison Middle Schools

	SET		Attendance				Short-Term Suspensions				ODRs		
	06-07	*07-08*	*04-05*	*05-06*	*06-07*	*07-08*	*04-05*	*05-06*	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*
Centennial	88.0	92.0	94.3	95.1	95.1	95.1	38.3	25.5	25.5	10.0	--	0.65	0.49
Leesville Road	--	--	95.5	95.8	94.9	95.0	34.5	28.7	28.7	35.5	--	--	--
E. Millbrook	79.0	75.0	94.5	94.6	94.2	93.8	36.2	40.3	40.3	41.4	0.21	0.19	ina
Wake Forest-Rolesville	--	--	93.5	94.0	93.8	93.9	42.8	34.5	34.5	20.9	--	--	--
Moore Square	82.0	91.0	94.5	95.0	94.4	93.5	43.7	38.7	38.7	47.5	0.69	1.13	1.12
Durant Road	--	--	95.1	95.2	94.6	95.2	11.7	13.0	13.0	20.1	--	--	--
N. Garner	71.0	94.0	93.1	94.2	93.5	94.2	64.6	47.2	47.2	33.2	ina	0.08	0.12
E. Wake	--	--	93.5	93.5	93.6	94.1	55.3	60.0	60.0	44.4	--	--	--

Note: -- means no data collected, ina = inaccurate data.

Academic Achievement Data for PBIS and Comparison Middle Schools

	Reading Proficiency			Mathematics Proficiency			Reading Growth			Mathematics Growth		
	04-05	*05-06*	*06-07*	*05-06*	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*	*05-06*	*06-07*	*07-08*
Centennial	87.4	89.1	90.8	74.5	74.9	72.3	56.4	54.3	48.5	58.7	63.3	51.4
Leesville Road	93.5	93.0	91.1	76.3	72.9	74.8	58.2	50.8	48.1	57.9	50.1	53.3
E. Millbrook	86.0	87.0	85.7	55.4	55.5	54.3	53.1	49.4	41.0	51.1	45.3	46.2
Wake Forest-Rolesville	90.5	88.3	88.3	67.2	66.1	72.7	49.7	54.4	45.9	53.3	54.6	65.9
Moore Square	86.2	83.7	84.6	53.8	60.7	55.3	53.9	53.0	42.7	43.9	56.8	47.1
Durant Road	91.4	90.5	90.9	73.3	75.1	75.6	56.6	55.5	46.2	60.7	66.1	63.6
N. Garner	83.5	84.3	83.7	56.4	59.5	66.3	53.8	52.0	42.6	54.1	52.8	61.2
E. Wake	82.7	85.5	85.2	57.9	61.1	67.6	58.5	54.9	41.8	46.9	54.3	58.6

Appendix D
North Carolina Positive Behavior Intervention and Support Initiative School Recognition Program

North Carolina PBIS Green Ribbon School	North Carolina PBIS Banner School	North Carolina PBIS Exemplar School
Active Administration PBIS Team in place PBIS Team meets monthly Identified In-School Coach Completed Training Module 1	Active Administration PBIS Team in place PBIS Team meets monthly Identified In-School Coach Completed Training Modules 1 & 2	Active Administration PBIS Team in place PBIS Team meets monthly Identified In-School Coach Completed Modules 1-3
All Required Forms Submitted on Time: • Implementation Inventories (Level 1) • SET (80%) • Achievement data • Office Referral Data • Suspension/Expulsion	All Required Forms Submitted on Time: • Implementation Inventories (Level 2) • SET (90%) • Achievement data • Office Referral Data • Suspension/Expulsion	All Required Forms Submitted on Time: • Implementation Inventories (Level 3 or 4) • SET (95%) • Achievement data • Office Referral Data • Suspension/Expulsion Other multiple and consecutive data elements aggregated, reviewed and reported (one or more of the following): • EBS Self Assessment • Staff retention data • Climate Surveys • Special Education Referral Information • Attendance • Individual student data (direct behavior rating) Data shows improvement in both behavioral and achievement indicators (at least 2 years of data required for comparison)

A STATUS REPORT OF POSITIVE BEHAVIOR INTERVENTION AND SUPPORT IN THE WAKE COUNTY PUBLIC SCHOOL SYSTEM

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