

## NORTH CAROLINA LEA CASE STUDY

# POSITIVE BEHAVIOR SUPPORT

By Sonja Ralston Elder and Jessie Peed

Project 1.5 / August 2007



## EXECUTIVE SUMMARY

Positive Behavior Support, a school-wide student behavior improvement model, is thought to improve student behavior and thereby improve teacher working conditions, which may reduce teacher turnover. This study examined the implementation of PBS in the 2005-06 school year in North Carolina public schools to verify these claims. Evidence suggests that PBS does reduce short-term suspension rates, particularly in urban high schools. Implementing PBS may have a small positive effect on teacher retention, most notably in non-rural, non-urban schools but more study and more data are needed to verify this effect and isolate its cause.

## BACKGROUND

Positive Behavior Support (PBS) is a type of school-wide discipline program originally designed to prevent children from developing behavior problems requiring special education interventions. Today, PBS is implemented to improve the behavioral and academic outcomes for all children in a school; it is not a special education program but rather a broad-scale behavior improvement tool for all children. PBS is not an off-the-shelf behavior management system but rather a process for schools to develop their own systems with common elements, listed below. When 80% of a school's staff actively support the implementation of a PBS plan, the school is determined to have fully implemented PBS.

### ELEMENTS OF PBS

- Agreed upon and common approach to discipline
- Positive statement of purpose
- Few, positively stated expectations for all students and staff
- Procedures for teaching these expectations to students
- Continuum of procedures for encouraging displays and maintenance of these expectations
- Continuum of procedures for discouraging displays of rule-violating behavior
- Procedures for monitoring and evaluation the effectiveness of the discipline system on a regular and frequent basis

*(National PBIS website)*

North Carolina started supporting PBS on a state-wide basis in 2001-02. By 2005-06, 293 schools were participating state-wide and another 225 started in 2006-07. With so many schools trying out PBS, now is the optimum time for an investigation into its effects. Since PBS is designed to reduce discipline issues and create a school-wide positive atmosphere by involving the whole





faculty and staff in the process, it would make sense that schools successfully implementing PBS would improve their working conditions, thereby reducing teacher turnover. This study is designed to determine whether the implementation of PBS reduces teacher turnover. Because data on the quality of a school's implementation of PBS is inconsistent, the term "implementation" here means a school signing up for and receiving training on using PBS.

## DATA

We gathered a number of variables at the school and community level; unless otherwise noted, school-level data is from the 2005-06 School Report Card database maintained by the North Carolina Department of Public Instruction (see the chart below). School-level data included factors relating to students, teachers, and schools in general.

### STUDY VARIABLES

Students	Teachers	Schools	Community
Percent of students eligible for free and reduced lunches	Teacher turnover rates**	PBS implementation status	LEA Disadvantaged Student Supplemental Fund index††
Percent of students in various racial and ethnic categories	Per capita teacher absence rate	Years of PBS implementation	County-wide annual unemployment rate for 2006†††
Percent of students scoring at level III or above (proficient) on relevant state math and reading tests (EOC/EOG)	Percent of teachers with three or fewer years of experience ("inexperienced teachers")	Academic goal achievement (AYP, ABC growth, school improvement year)	
Per capita short-term suspension rates*	Percent of teachers leaving a school for various reasons	Principal turnover***	
Per capita long-term suspension rates*		Years of experience of the principal**	
Per capita expulsion rates*		Leadership quality†	
Per capita reportable acts*		School type	
		School size	
		Geographic location	

\* Data from SY 04-05 and SY05-06; \*\* Data from SY05-06 and SY06-07; \*\*\* Data from SY06-07; † Data from the 2006 Teacher Working Conditions Survey; †† Data from the formula adopted by the State Board of Education; ††† Data from the North Carolina Employment Security Commission

Teacher turnover is a one-year statistic measuring the percentage of teachers who taught at a school in March of one year who no longer teach at that same school in March of the following year. Turnover from SY 05-06, therefore, is the percentage of teachers at the school in the spring of 2005 who were no longer teaching there in the spring of 2006. To measure the impact of programs implemented in the SY05-06, we used turnover data from SY 06-07, which indicates how many teachers who were at a school when the program was implemented (March 2006) were no longer there a year later.

School leadership quality is a composite score from a series of questions on the Teacher Working Conditions Survey about the quality of leadership, the atmosphere of trust, and other factors influenced by school leaders. Scores were reported on a scale of 1-5 for all schools with more than 40% of their teachers responding.

Geographic location was based on the eight levels designed by the census and reported in the Report Card database but was condensed to three levels: urban, rural, and neither. Urban areas include the central city areas of Charlotte, Raleigh, Asheville, Durham, Winston-Salem, Greensboro, Wilmington, Greenville, and Fayetteville. Rural areas include anything classified by the Census Bureau as rural, small or large town, and some areas that are the “fringe” of mid-sized cities. Non-urban, non-rural areas included the “fringe” of Raleigh and Charlotte along with areas outside mid-sized cities that were not rural and smaller cities such as Burlington, Rocky Mount, and Asheboro.

## METHODOLOGY

We began by limiting the data set. First, we excluded all charter schools because there was not sufficient data. Next, we excluded all alternative and special education schools as categorized by the Education Directory of Public Schools of North Carolina because they differed from traditional schools in terms of student population,

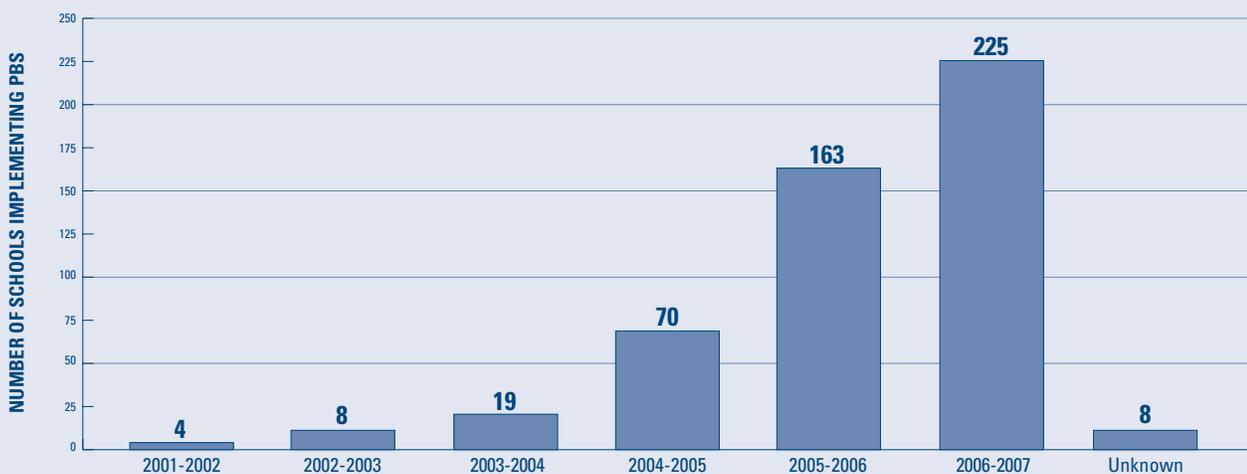
organization, and mission in ways that could not be controlled for in our models. Finally, we excluded schools that were no longer operating in SY 06-07 as well as about two dozen schools with fewer than 10 teachers or with 100% turnover rates, all of which were outliers or had incomplete data.

The final data set included 2,079 schools and 272 PBS schools, of which 163 implemented PBS in SY 05-06. To provide a quasi-experimental data set, the 89 schools that implemented PBS prior to SY 05-06 were excluded from all of the regression analyses and other tests designed to evaluate one-year implementation. To clarify, “all PBS schools” includes all 272 schools that had implemented PBS by SY 05-06 while “new PBS schools” includes only those 163 that implemented the program in SY 05-06 and “old PBS schools” counts the remaining 89.

To determine if there were differences between new PBS schools and non-PBS schools in the averages of our key variables, we conducted t-tests on each variable using PBS implementation status as the treatment. This procedure was repeated on data sets including all PBS schools and only new PBS schools as well as the subset of the new PBS schools data set for each geographic area. Because the geographic variable was nominal and had three settings (instead of two), most of the procedures we did included four types of tests: one for the inclusive data set and one each for the three geographic subsets. In this report, “statistically significant” indicates a p-value of less than 0.05.

As t-tests only allow for control of one variable, we needed to run regression tests to control for multiple variables and isolate the impact of PBS implementation. But first, we examined our independent variables for colinearity (a high level of correlation that would disrupt the regression model). All of the discipline variables were correlated, and we selected short-term suspensions as the representative variable in that group because it contained the most variation between schools. The remaining student variables (race, poverty, achievement in math and reading)

### NUMBER OF SCHOOLS IMPLEMENTING PBS EACH YEAR



were also all highly correlated. We selected “poverty percentage” as the representative variable because it has less possibility for reverse causation with teacher turnover than achievement. That is, while low student achievement may induce teachers to leave a school, high teacher turnover and instability may also contribute to low student achievement, making the causal relationship a two-way, rather than a one-way phenomenon. Poverty is also more objective than race. None of the remaining variables exhibited colinearity problems.

Then we constructed a variety of regression models to explain the greatest amount of variation in turnover rates with the fewest variables and the most statistical significance. In each model, we included SY05-06 turnover as a control variable to help isolate the impact of one-year changes, such as implementing PBS. Our best models explained around one-third of that variation, indicating that there are other, unidentified or unidentifiable variables influencing teacher turnover.

## FINDINGS

***STARTING PBS: student demographics and short-term suspension rates are strongly correlated with a school’s decision to start PBS.***

Schools serving disadvantaged students that are struggling to meet high academic demands and suffering from teacher-involved discipline issues are significantly more likely to

undertake PBS than those schools that are not. High teacher turnover from the prior school year, high percentages of students receiving free and reduced lunch, low academic achievement numbers, and high short-term suspension rates for the prior year were all statistically significant predictors of whether a school starts PBS.

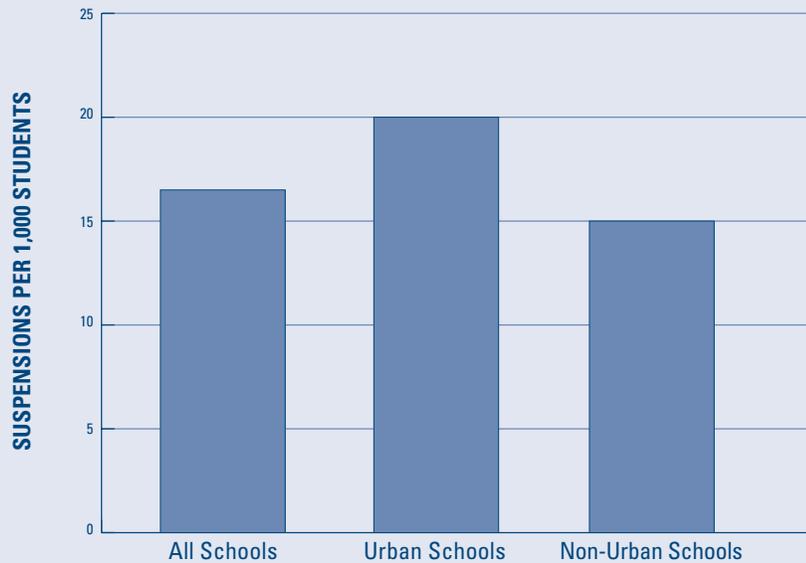


### WHY IMPLEMENT PBS?

Variable	Highly Significant *	Significant **	Not Significant
Teacher turnover, SY 05-06		X	
Percentage of inexperienced teachers			X
Teacher absence rate			X
LEA DSSF index rating		X	
Percentage of students in poverty	X		
Percentage of minority students	X		
School not making AYP	X		
School not meeting ABC expected growth			X
School not meeting ABC high growth		X	
Percentage of students failing EOC/EOG exams	X		
Short-term suspension rates, SY 04-05	X		
Long-term suspension rates, SY 04-05			X
Expulsion rates, SY 04-05			X
Rate of reportable acts, SY 04-05			X
Rural school		X	
Urban school			X
Low principal experience		X	
School size			X
Low leadership quality		X	

\* p-value < 0.01; \*\* p-value < 0.10

## SHORT-TERM SUSPENSIONS, 04-05



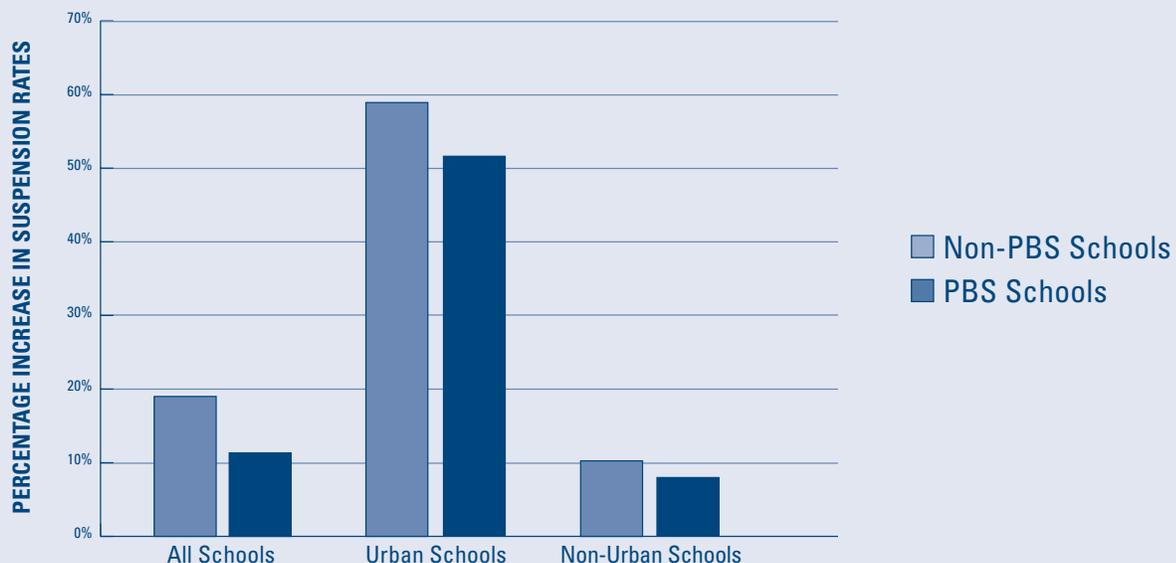
### **DISCIPLINE: PBS has a mild, positive impact on student discipline**

Prior DPI reports on PBS indicate that the program substantially reduces office discipline referrals and in-school suspensions (Irwin & Algozzine). Each year, schools report a number of discipline statistics to the state, including short- and long-term suspensions, criminal acts (“reportable offenses”), and expulsions. The design of PBS suggests, and prior studies confirm, that the discipline measure most likely to be heavily influenced by PBS is office discipline referrals (Irwin & Algozzine). However, data on office referrals are not collected in a consistent way to allow for large-scale comparisons. Of the available data, short-term suspension

rates show the greatest variation among schools and are most likely to be the problems dealt with by classroom teachers, such as insubordination and tardiness. Therefore, of the reliable measures, PBS is most likely to influence short-term suspension rates.

While overall short-term suspension rates per 1,000 students rose about 16% between SY 04-05 and SY05-06 (from 15.8 to 18.4), rates in all PBS schools rose only 12% (from 19.9 to 22.3) and rates in non-PBS schools rose 19% (from 14.9 to 17.8). The effect was most pronounced in urban schools, which had a six percentage point difference (58% increase in non-PBS schools compared to a 52% increase in PBS schools).

## CHANGE IN SHORT-TERM SUSPENSION RATES



**IMPACT ON TEACHER RETENTION:**

The implementation of PBS could lower teacher turnover rates either directly or indirectly, by affecting one of the factors correlated with increased retention. First, there is currently no evidence indicating the PBS implementation directly lowers teacher turnover rates. Second, non-urban, non-rural schools, PBS implementation showed a small, positive correlation with teacher retention. In both cases, the effect was roughly the same as the effect of retaining the school's principal. It was statistically significant only in the non-urban, non-rural schools and was the strongest in high schools. In urban schools, there was a similar impact on retention but in the opposite direction: implementing PBS was correlated with higher rather than lower turnover rates. In all cases, the strength of

PBS implementation as a predictor of teacher turnover was substantially lower than that of SY 04-05 turnover rates and percentages of inexperienced teachers.

Second, regarding indirect impact, there were five variables that had statistically significant effects on teacher turnover in almost all models:

- Short-term suspension rates
- Percentage of students receiving free and reduced-price lunches
- Percentage of inexperienced teachers
- Leadership quality
- Principal turnover



If PBS positively impacted any of these variables, it should have an impact on teacher turnover.

On the student level, as discussed previously, PBS does seem to lower short-term suspension rates somewhat. In turn, suspension rates impacted turnover significantly in all non-urban schools, with the strongest impact in elementary schools. But, even in these schools, the impact of reduced suspensions was less than 10% of the impact of lower poverty rates. PBS implementation will not lower the percentage of students in a school who are in poverty.

The variable with the strongest impact on turnover in all types of schools was the percentage of inexperienced teachers in a school. Available data indicate a small, positive correlation between PBS implementation and higher rates of inexperienced teachers. This effect persists even when controlling for student poverty, prior year turnover, school leadership, AYP status, and unemployment rates. However, without data on teacher experience from SY06-07, we cannot tell whether PBS is an accurate predictor of higher

percentages of inexperienced teachers or vice-versa.

While higher leadership scores and principal retention both had significant, positive but mild impacts on teacher turnover, neither was positively impacted by the implementation of PBS. Leadership scores were significantly lower in all PBS schools compared with all non-PBS schools. Leadership scores were lower in old PBS schools compared with new PBS schools. Principals were also more likely to leave schools implementing PBS in SY05-06 than non-PBS schools, although PBS implementation had only a mild impact on principal turnover when controlling for other school factors.

Because PBS is a process built by each school individually, many schools spend the first year gathering data, planning their systems, and generating faculty and staff support for the program. Therefore, a one-year evaluation such as this may fail to capture important aspects of the PBS program, and it is critical that this study be continued when data from the recent 06-07 school year is available.



## RECOMMENDATIONS

Based on the above research, we recommend that LEAs and the Department of Public Instruction consider the following action steps.

**Continued evaluation** – As more data becomes available, a follow-up study would be beneficial to isolate impacts of PBS on teacher experience, discipline, school leadership quality, and teacher turnover.

**Universal PBS evaluation** – Each PBS school should use the School-wide Evaluation Tool (SET) to evaluate its fidelity

with the PBS model. SET is a nationally-recognized means of evaluating the degree of PBS implementation in each school. This data would allow for a continuous rather than dichotomous variable measuring PBS implementation and provide a more nuanced view of the program's impacts.

**Leadership continuity** – When making decisions about reassigning principals among schools, district leaders should consider that principal turnover increases teacher turnover and also threatens the success of a newly implemented PBS program, which is based on the collaborative process of each school's staff.



---

### WORKS CITED

Irwin, D., & Algozzine, B. (2007). *North Carolina Positive Behavior Support Initiative Evaluation Report 2005-2006*. Raleigh, NC: Department of Public Instruction, Exceptional Children Division, Behavioral Support Services.

Office of Special Education Programs, U.S. Department of Education, National PBIS website, [www.pbis.org](http://www.pbis.org) (last visited August 2, 2007).

---



By Sonja Ralston Elder and Jessie Peed

The Financial and Business Services Area established the Research Intern Program in FY 2006-07. The Program is designed to help build a quality research program within DPI to supplement and supply data for discussions related to procedural, process, and policy changes. The inaugural program includes five graduate students from four area universities. The intern program is managed by Jackson Miller (919) 807-3731 | [intern\\_research@dpi.state.nc.us](mailto:intern_research@dpi.state.nc.us).

NC DEPARTMENT OF PUBLIC INSTRUCTION :: **June St. Clair Atkinson, Ed.D., State Superintendent** :: **301 N. Wilmington Street** :: **Raleigh, NC 27601-2825**  
In compliance with federal law, NC Public Schools administers all state-operated educational programs, employment activities and admissions without discrimination because of race, religion, national or ethnic origin, color, age, military service, disability, or gender, except where exemption is appropriate and allowed by law.

*Inquiries or complaints regarding discrimination issues should be directed to:* Robert Logan, Associate State Superintendent :: Innovation and School Transformation  
6301 Mail Service Center :: Raleigh, NC 27699-6301 :: Telephone 919-807-3200 :: Fax 919-807-4065