

Trenton Public School Study:
Martin Luther king Jr. School¹

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Introduction: Background

The Trenton Public School Study (TPSS) was a study to evaluate the effectiveness of two academic interventions in one school in Trenton, New Jersey: Martin Luther King Jr. (MLK). The motivation for the study was to launch a more formal partnership between Princeton University and TPS. In 2009 the Superintendent of Mercer County, Sam Stewart, and the former Superintendent of TPS, Rodney Lofton, requested assistance in conducting a study to generate research of high technical quality that can inform and assess policy and practice in the TPS. The study was funded by the Education Research Section at the Woodrow Wilson School of Public Affairs and was spearheaded by the Center for African American Studies (CAAS) at Princeton University as part of the Center's Civic Engagement Initiative on Urban Education Reform. As such, CAAS served as the coordinating unit for the University. One of the primary goals of the this study was to bring the programming offered through the Princeton Blairstown Center (PBC) and the Pace Center to Trenton and to generate survey data that allows for the evaluation of these programs as well as observational studies. Data generated from this study could help TPS build the capacity to address many of its concerns by identifying the factors that are related to students' academic, social, and emotional outcomes.

Although the problems found in TPS are quite common across urban school districts, TPS is unique in that it has received virtually no attention from the research community. This has not been the case for public schools in the neighboring cities of New York and Philadelphia. For example, the schools in New York benefit from the interest of scholars from major research institutions such as the CUNY Graduate center, Columbia University Teachers College, and New York University. Similarly, schools in Philadelphia have partnered with the Graduate School of Education at the University of Pennsylvania and with Temple University, both located in the center of Philadelphia. Therefore, in addition to the low levels of achievement throughout the k-12 system for students in TPS, there is a lack of data available to study the sources of the problem and their potential solutions. This awareness prompted both Mr. Lofton and Mr. Stewart to initiate a dialogue with CAAS about how best to address this problem.

Prior to this study, there had not been a formally established mechanism through which Princeton University could be effectively involved with TPS. However, there is currently a community of people affiliated with Princeton University with an interest in the issues relevant to TPS that would normally receive attention by schools of education. This study served as a

preliminary study to determine how a long-term collaboration between Princeton and TPS might be structured. Below we describe the study and some of the results that were generated from the data. We begin by outlining the research design followed by a description of the interventions that were administered. We then provide the results with regard to achievement and conclude with a discussion on the possibility of future collaboration between CAAS/ and TPS.

Study Design

This study was a randomized experiment in which two academic interventions were evaluated over the course of the academic year among students in grades 6 through 8 in MLK. Since students were randomly sorted into 11 classes (four, three, and four for grades 6, 7, and 8, respectively), this provided an opportunity to evaluate the interventions using experimental design. The first intervention (PBC) was administered by the Princeton Blairstown Center on Fridays to one class in each grade (6.1, 7.1, and 8.1). The second intervention (PACE) was administered to one 6th grade class (6.2). Students in the other seven classrooms did not receive the interventions and therefore served as the control group (see Table 1). Using the entire class as sample units for the interventions and control groups prevented the classroom disruption that would accompany removing certain students from their classrooms to receive the interventions if students themselves were randomly assigned into the treatment and control groups. The interventions were administered from the final week of October, 2010, through the first week of June, 2011.

Table 1. Chart for Treatment and Control Groups

		Grade		
		6	7	8
Class	1)	<i>PBC</i>	<i>PBC</i>	<i>PBC</i>
	2)	<i>PACE</i>	Control	Control
	3)	Control	Control	Control
	4)	Control		Control

Survey data were collected prior to the beginning to the intervention phase (first two weeks in October 2010) and again toward the end of the 2010-2011 school year (second and third week of June). These time points allow for charting student progress on survey items over the course of the academic year. Students completed an online questionnaire on critical indicators such as their feelings toward MLK, their teachers, the importance they attribute to

education, self-esteem, academic anxiety, and other social psychological factors. Data on achievement was obtained from students report cards in June. Complete survey data exists only for students that were enrolled in grades 6-8 for the entire school year resulting in a sample size of 171 students distributed across the 11 classrooms. Thus, the baseline (pre-intervention) and follow-up (post-intervention) data can support observational studies and allow for the evaluation of two educational interventions intended to improve students' achievement and social-emotional well-being. The survey data can also help to uncover some underlying mechanisms that might potentially explain how the interventions influence academic outcomes.

This study involved minimal risk to students. Parents were informed about the study in September of 2010 and reassured that participation was voluntary. Given that the student questionnaires did not ask about information pertaining to New Jersey Statutes 18A:36-34, only student assent was obtained. However, parents were given the opportunity to object if they did not want their child to be included in the study. Students were also allowed to withdraw from the study at any point without consequences. An incentive comprised of free passes for a movie, popcorn, and a small drink was offered to students after they completed each (pre- and post-) survey.

Interventions

PBC

The PBC intervention was administered by the Princeton Blairstown Center, a supporting organization of Princeton University that has worked to improve high school graduation rates for youth from urban areas in New Jersey, New York City, and Philadelphia. The intervention emphasized Social and Emotional Learning (SEL), which is a strategy based on the model of experiential education—a learning experience between a teacher and a student that infuses direct experience with the learning environment. Focused reflection—the “how, why, and so what” of learning—is a major component and helps increase knowledge, develops skills, and clarifies students' values. Numerous studies show that SEL is associated with students' academic success in terms of grades and test scores, increased motivation and academic engagement, improvements in behaviors and study habits, and feelings of attachment to school (for a review, see Zins, Weissberg, Wang, and Walberg 2004). Research by the National Center for Education Statistics (2002) shows that among the major reasons cited for dropping out of school, several involve social and emotional factors. Among these were not getting along with teachers or peers (35.0% and 20.1%, respectively), feeling left out (23.2%), and not feeling safe (12.1%).

Students in the PBC intervention received the first year of a six year curriculum intended to promote self-awareness, social awareness, self-management, relationship skills, and responsible decision-making. Through a series of activities that were constantly reinforced by professional staff, the students were encouraged to trust, cooperate, collaborate, persevere, and accept challenges as a path to success. The SEL programs were provided weekly by three staff members from the Princeton Blairstown Center for one class period (40 minutes) during the second Media class of the week for each class.

PACE

The second intervention was an intense tutoring program administered by The Pace Center (PACE), Princeton University's central resource for civic engagement. The Pace Center currently sends volunteer tutors (Princeton University undergraduates) into Trenton through the Student Volunteers Council's (SVC) weekly projects with Emily Fisher Prep Charter School, Isles Youth Build High School, Foundation Academy Charter School, Young Scholars Institute, and the Princeton-Trenton Student-Tutor Partnership (Pitstop). For this study, the Pitstop project was transformed from a drop-in, homework-help program in which volunteer tutors are available after at a branch of the public library, into a school-based program that utilizes a highly structured tutoring curriculum in MLK. The volunteers were provided training in this curriculum to employ best practices guided by research done through Dr. Rooks' freshmen seminar course at Princeton University. In order to avoid the transportation challenges that might arise from holding tutoring sessions after the normal school day, the tutoring sessions took place once a week during students' Library class period. Given that the PACE intervention relied on a modest number of undergraduate students as volunteers, the intervention was administered to only one class (6.2).

Analytic Plan

The primary goal of this study was to determine whether the interventions can lead to substantial improvement in achievement. In order to address this, we examined whether the change in achievement was different for students across the three groups. Specifically, did students exposed to the interventions experience greater increases in achievement than those in the control group? We employed the following analytic strategy:

$$\Delta \text{Ach}_{3-1} = \alpha + \beta_1 (\text{PBC}) + \beta_2 (\text{PACE}) + \varepsilon$$

where the change in achievement from the first to the third marking period (ΔAch_{3-1}) is a function of α (the average change for the control group), the average change for students that

received the PBC intervention *relative* to those in the control group (β_1), the average change for students that received the PACE intervention *relative* to those in the control group (β_2), and an error term, which represents the portion of the change in achievement attributable to factors other than group membership (i.e., control, PBC, or PACE).

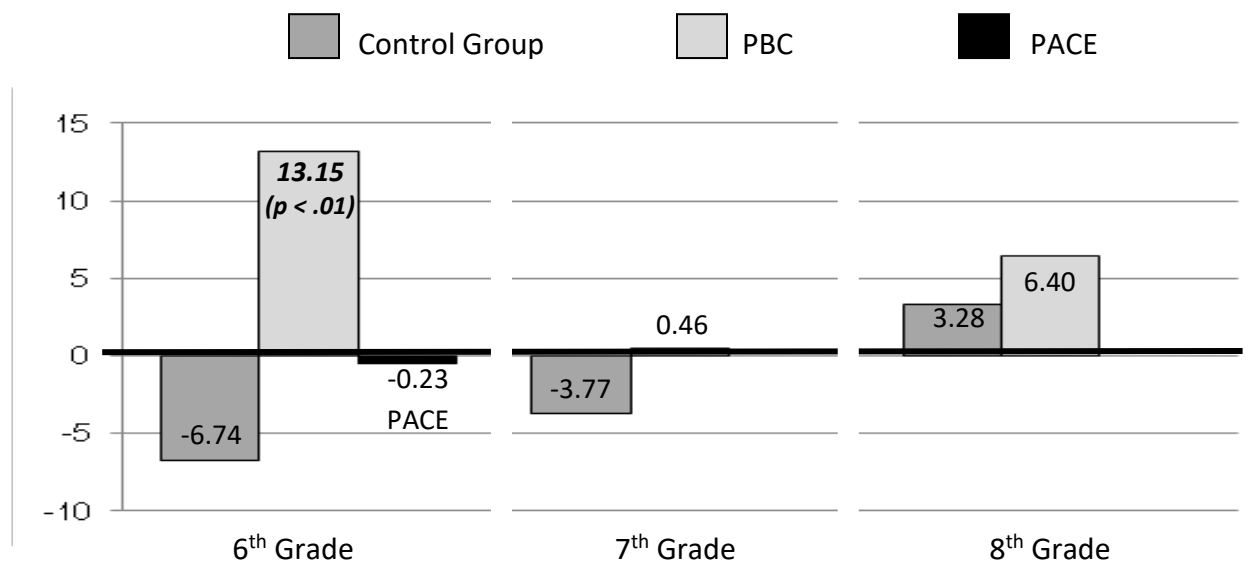
There is an important point worthy of note in order to interpret the results. Although, the findings are based on the population of MLK students in grades 6-8, these students represent a sample of the larger population of students in grades 6-8 in TPS. Since the findings are based on a sample of students from TPS, they are estimates of the “true” value that would be observed if all TPS students in grades 6-8 were to be surveyed. Estimates have a margin of error, which are referred to standard errors. Standard errors are useful in illustrating the size of uncertainty in estimates. They represent the average discrepancy of the estimate that would be obtained among all possible samples (of a given size) drawn from the population (in this case TPS students in grades 6-8) and the real population estimate that would be obtained if the study were conducted among all 6-8th graders in TPS. Given the assumption of normality (that the values in the population are distributed in a manner that can be described by a bell-shaped curve), an estimate is significant only if it is twice the size of the standard error. This means that in the case of a positive estimate (say, 0.3), the standard error (say, 0.1) could be subtracted from the estimate twice and the estimate would still remain above zero, which would suggest that we could be 95 percent confident that the true value in the population is greater than zero—or simply significant. However, since subtracting a standard error of 0.2 from an estimate of 0.3 twice would equal -0.1, we could not be 95 percent certain that the population value we are estimating is greater than zero. In this case, the estimate would be described as not significant.

In sum, estimates that are not statistically significant should be regarded as having a value of “zero” because one cannot be confident that the estimate would be different from zero over repeated trials. Conversely, statistical significance suggests that the estimate will differ from zero (positively for positive estimates and negatively for negative estimates) consistently over repeated trials. For the sake of parsimony, we do not report the standard errors (though they are available upon request). Although analysis can be conducted on all of the factors contained within the survey, we limit our discussion to achievement. Specifically, we show the “effect” of the interventions on achievement.

Preliminary Results

Figure 1 contains the results of group membership (control, PBC, or PACE) on achievement in literature (or reading) for grades 6 (left panel), 7 (center panel), and 8 (right panel). The findings show that significant differences in achievement exist between groups only in grade 6. Specifically, whereas sixth grade students who did not receive an intervention (control group) experienced declines in reading of nearly 7 percent over the course of the school year, those who received the PBC intervention experienced a gain in reading of slightly more than 13 percent. Student in the PACE intervention, which was offered only to sixth graders, did not experience a change in reading achievement over the course of the school year. The next two panels show that there was no difference in the achievement gains between students in the PBC intervention and those in the control group for youth in grades 7 and 8.

Figure 1. Average Percentage Change in Literature (Reading) for Students in each Group

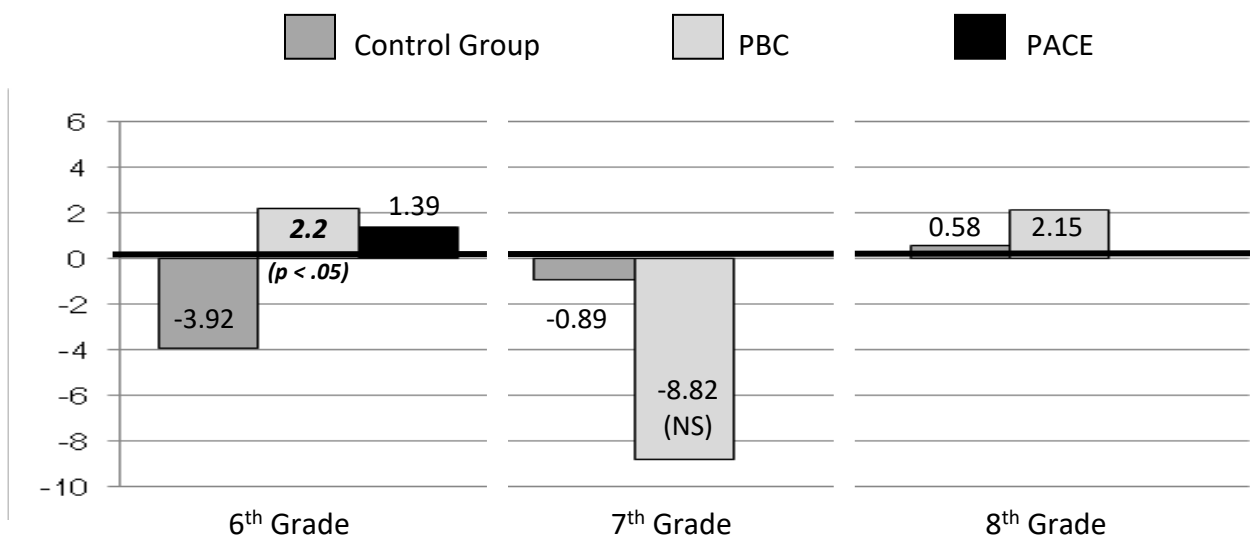


Notes: The PACE intervention was administered only in grade 6. The 13.15 gain in achievement for sixth graders in PBC is statistically significant at the .001 level. The R^2 is .283 for grade 6 ($n = 59$), .025 for grade 7 ($n = 46$), and .02 for grade 8 ($n = 58$).

The same information is displayed for math achievement in Figure 2. The results for math achievement parallel those for reading. Specifically, the figure shows that whereas students exposed to the PBC intervention in grade 6 experienced a greater gain in math achievement over the academic year than those in the control group, the PACE intervention did not have an effect on math achievement; the change (or gains) in achievement for student who

received the PACE intervention was not *statistically* different from those in the control group. For grades 7 and 8, the change in math achievement for students in the PBC intervention did not differ from those in the control group.

Figure 2. Average Percentage Change in Math for Students in each Group



Notes: The PACE intervention was administered only in grade 6. The gain in achievement for sixth graders in PBC is statistically significant at the .05 level. NS denoted that this estimate is not statistically different from that of the control group for grade 7. The R^2 is .114 for grade 6 ($n = 58$), .016 for grade 7 ($n = 45$), and .006 for grade 8 ($n = 57$). NS denotes that this estimate is not significantly different from the control group.

There are a number of measures from the survey for which the PBC intervention seemed to show an effect. For example, relative to students in the control group, students exposed to PBC experienced a greater increase in the belief that they learn a lot from their homework, and felt more comfortable speaking in front of their classmates and expressing their feelings. These results are preliminary, however, as indexes/scales still need to be constructed to provide a more complete analysis of the survey items.

Conclusion/Next Steps

During the 2011-2012 school year we would like to build on these results and engage in another research study at the Martin Luther King School with the goal of further determining if educational interventions may be deployed in the Trenton Public Schools that might help to raise achievement of specific grades and in specific subjects. We would also like the opportunity to further explore some of what we learned but don't fully understand. For example, we

discovered that some of the Black and Latino students felt more comfortable working with white tutors, as opposed to African American tutors at PACE because their “real” teachers are white. It is possible that this dynamic may have in some ways compromised the effectiveness of the project. Also, given the finding that PBC did not show effectiveness for improving achievement for youth in the higher grade levels (7 and 8), perhaps the intervention should be administered to students in lower grade levels.

These findings also have implications for the importance of understanding the link between socio-emotional well-being and academic outcomes. Despite the belief on the part of staff at Princeton Blairstown Center that their intervention does not target achievement, the students exposed to the PBC intervention in grade 6 showed substantial non-random improvement in reading and math relative to those in the control group. It seems that student achievement is responsive to the factors that their intervention is designed to target such as self and social awareness, self-esteem, interpersonal conflict resolution, and problem solving skills. We would like to have the opportunity to refine and build upon what we have learned thus far in the hopes that the results will be useful to the Trenton School District.

Specifically, we are proposing to invite the Princeton Blairstown Center to work with sixth, seventh and eighth grade classes at the school and to track the achievement of the students in those classes. Additionally, we would like to have the Algebra Project, founded and lead by Civil Rights icon, Bob Moses, bring math literacy programming into the school in a program that will be administered during gym class and that takes the shape of a game, or competitive sport that helps to teach math at the same time. The goal of The Flagway game is to create environments where students can practice and celebrate learning math. The Flagway game can be played with students as early as 1st grade and has been enjoyed by adults. In general the game is played with 3rd - 6th graders. During game play students navigate a Flagway or course of radial “paths” based on the Flagway rules (derived from the “Mobius” Function). Speed counts, so as students develop into skilled players several may be running through the course simultaneously, creating dynamics similar to that of a sporting event. Part of

the beauty of Flagway is that students can play the game without knowing the rules, allowing all students access to the game and the underlying mathematical principles.