Papers and Presentations Employing Data from the North Carolina Education Research Data Center

Presentations and publications since March 2007 are in bold text; the most recent are marked with *.

Minority Achievement Gap


*Tyson, Karolyn, William Darity, Jr., and Victor Wang. 2008. “Giftedness and
Black-White Achievement Gap.” Where was this presented/published?


**Teacher Quality and Student Outcomes**


Teachers.” Presented at the National Board for Professional Teaching Standards National Conference and Exposition.


Goldhaber, Dan. 2006. “National Board Teachers are More Effective, but are they in the Classrooms Where They’re Needed the Most?” *Education Finance and Policy* 1(3): 372-383.


**School Accountability and Choice**


Jones-Sanpei, Hinckley A. 2006. “Racial and Socioeconomic Segregation in a District with Controlled School Choice.” Paper presented at the Association for Public Policy Analysis and Management Fall Research Conference, Madison, WI.

Ladd, Helen F. 2003. “School Vouchers and Student Achievement: What We Know So Far.” *Center for Child and Family Policy, Policy Brief*, 3(1).


*The Academic Performance of At-Risk Children*


**Problem Behavior in Schools**


**Linking Data and Policy**


**Other Studies**

*Alfeld, Corinne, Yan Li, Rebecca Prince, and Martha Putallaz. 2008. “Effects of Summer Academic Programs in Middle School on High School Test Scores, Coursetaking, and College Major.” Submitted to the *Journal of Advanced Academics*.  


Using detailed administrative data for the public K-12 schools of North Carolina, we measure racial segregation in the public schools of North Carolina. With data for the 2005/06 school year, we update previously published calculations that measure segregation in terms of unevenness in racial enrollment patterns both between schools and within schools. We find that classroom segregation generally increased between 2000/01 and 2005/06, continuing, albeit at the slightly slower rate, the trend of increases we observed over the preceding six years. Segregation increased sharply in Charlotte-Mecklenburg, which introduced a new choice plan in 2002. Over the same period, racial and economic disparities in teacher quality widened in that district. Finally, we compare our basic measure to two alternative measures of segregation.


Extant literature, while sparse, suggests that the relationships between such peer evaluations and status-relevant behaviors such as aggression and academic involvement and achievement may not be invariant across racial-ethnic groups. Studies have demonstrated that preference is associated with both concurrent and later academic achievement among elementary school children but that this relation changes as youth transition into middle school and early adolescence. Too, several studies suggest that peer-perceived popularity is a risk factor for adolescent academic disengagement, especially among the subset of popular youth who are also aggressive. However, in the few studies that have examined these constructs among homogenous minority-group samples or among heterogeneous samples that also allow for cross-group comparisons, the relationships between popularity, aggression and academic disengagement are not as clear cut. The proposed study utilizes the racially-balanced Program II school-based sample of grade 7-9 students to examine peer-perceived popularity and social preference, or liking, aggression, and academic involvement/achievement. Whereas the prog II data set is rich in peer nomination and network data, it does not have a consistent measure of academic achievement and we currently rely upon participation in academic subject clubs as our measure of academic involvement. Working with the North Carolina Education Research Data Center will allow the authors to construct a measure of academic achievement at several time-points with the use of EOG scores for math and English and to more accurately operationalize academic involvement for the purposes of the study.


The current study is an attempt to investigate the racial achievement gap by focusing on two popular school programs: gifted programs, advanced placement (AP) courses. Our goal is to understand the role of these programs in the context of the racial gap in academic achievement by examining the performance of students from 3rd grade to 12th grade. In this study, we focus on four specific steps where these school programs can influence students’ academic performance.


This paper reports descriptive findings on the stability of measured teacher effectiveness.
Using a unique longitudinal dataset from North Carolina that includes the records of virtually all teachers and students in North Carolina, we estimate various measures of teacher effectiveness using different specifications of a value-added education production function model. We then compare these different estimates of teacher effectiveness to one another and use them to assess the extent to which measures of teacher value-added vary over time, and across subjects and teaching contexts. We find average correlations of 0.3 in reading and 0.5 in math in year-to-year estimates of teacher effectiveness, and cross-subject correlation that averages near 0.5. Chi-squared tests support the notion of some stability with these effectiveness measures; however, the year-to-year variation is greater than what is predicted were random error the only unstable component, implying that teacher job performance does vary over time.

Not surprisingly, having more information about teachers in the form of larger classes or additional years of matched teacher-student data increases the precision of estimated teacher effects, but various investigations show the change in rankings that result from introducing more student observations within a class are generally small—fewer than 10 percent of teachers move their relative rankings by more than one quintile equivalent in math. Introducing more information from a successive year of teaching, however, has a considerable impact on relative rankings—in this case, close to 50 percent of teachers change relative rankings by more than one quintile equivalent in math.

We conduct additional investigations into the stability of estimated effectiveness focused around other variations within the context of teaching: before and after obtaining tenure, before and after transferring schools, across various student demographics, and at different points along teachers’ career paths. Generally, we find estimated effectiveness in math is considerably more stable over time than in reading; however, estimates did not support the notion of “stable” performance over time in either subject.


In this paper, we describe the results of a study assessing the relationship between the certification of teachers by the National Board for Professional Teaching Standards (NBPTS) and elementary-level student achievement. We examine whether NBPTS assesses the most effective applicants, whether certification by NBPTS serves as a signal of teacher quality, and whether completing the NBPTS assessment process serves as a catalyst for increasing teacher effectiveness. We find consistent evidence that NBPTS is identifying the more effective teacher applicants and that National Board Certified Teachers are generally more effective than teachers who never applied to the program. The statistical significance and magnitude of the “NBPTS effect,” however, differs significantly by grade level and student type. We do not find evidence that the NBPTS certification process itself does anything to increase teacher effectiveness.


In this paper, we use a unique data set that includes a panel of all teachers in North Carolina over a 4-year period (1996–1997 through 1999–2000) to describe the distribution of teachers certified by the National Board for Professional Teaching Standards (NBPTS) across classrooms, schools, and districts. The sorting of National Board Certified Teachers (NBCTs) across students is an important equity issue both because these teachers are thought to be exceptionally qualified teachers and because in North Carolina (and many other states) state-level financial incentives are provided to NBCTs, creating an implicit subsidy to those districts and schools where they are employed. Our findings on the sorting of NBCTs across districts, schools and students reflects the research on the distribution of teacher credentials across students: the most disadvantaged districts, schools, and students are least likely to have access to those teachers who are recognized by NBPTS as being exceptionally qualified teachers.
Research on teacher attrition has fueled concerns about retaining high quality teachers. Evidence suggests that the most academically proficient teachers are the most likely to leave the profession (Murnane & Olsen, 1989, Podgursky, Monroe, & Watson, 2004). When this is considered in light of the positive correlation between teachers’ academic proficiency and student achievement (Clotfelter, Ladd, & Vigdor, 2007; Goldhaber, 2006), it is tempting to conclude that public schools are losing their best teachers. However, many challenge the value of traditional quality indicators instead favoring teacher value-added measures. Using a variety of teacher value-added measures to explore the mobility of teachers, we found that the most effective teachers tended to stay in teaching and stay despite challenging school contexts.

Certification from the National Board of Professional Teaching Standards (NBPTS) represents a significant policy initiative for the nation’s public school teachers as outlined in the No Child Left Behind Act. This paper analyzes how obtaining NBPTS certification impacts teachers’ career paths. Using a competing risks model on data from North Carolina public schools, we find evidence suggesting that National Board Certified Teachers (NBCTs) exit the school, district, and state more frequently than others. These findings are robust to instrumental variables and other tests for robustness. We also employ regression discontinuity methods that support these conclusions, and use this design for further inquiry into the characteristics of teaching assignments for certified teachers relative to unsuccessful applicants. With these tests, we find only limited evidence that NBCTs might utilize the credential to select into teaching assignments with relatively fewer minorities in the student population.

Virtually all states require teacher candidates to undergo teacher testing as a prerequisite to participation in the public school teacher labor market. This paper analyzes the role of teacher licensure tests in shaping the demographic composition of the workforce and its subsequent effect on student achievement. Using a dataset on public school teachers in North Carolina, we find minorities in the teacher labor market have substantially lower performance on licensure tests, but find mixed evidence on whether these performance differences impact student achievement. It appears that utilizing teacher-testing policies in general screens out disproportionately more minorities from the teaching profession, though their quality as teachers may potentially be higher than their counterparts. Further, holding all other teacher characteristics constant, we find the Praxis II exams, which are utilized heavily in teacher-testing policies, generally under-predict minority (and specifically African American) teachers’ performance. We further analyze and discuss the resulting impacts these policies have on student outcomes.
I propose a generalization to the standard career concerns model and apply it to the public teacher labor market. In particular, this model provides three testable hypotheses: optimal teacher effort levels decline with experience all things equal, optimal effort declines with tenure at a particular school, and teachers shirk as incentives break down at the end of a teacher’s career or tenure. Using administrative data from North Carolina spanning 13 school years through 2007, I find significant changes in teacher absenteeism consistent with the generalized career concerns model. These findings are robust to various empirical specifications, showing consistent within-teacher behavioral changes. I also investigate the effects of career concerns incentives breaking down, and find evidence suggestive of teacher shirking. While the career concerns effect is compounded with a learning curve early in a teacher’s career, I find shirking among exiting teachers is significantly predictive of negative outcomes in student testing.

Growing concerns over the achievement of U.S. students have led to proposals to reward good teachers and penalize (or fire) bad ones. The leading method for assessing teacher quality is "value added" modeling (VAM), which decomposes students' test scores into components attributed to student heterogeneity and to teacher quality. Implicit in the VAM approach are strong assumptions about the nature of the educational production function and the assignment of students to classrooms. In this paper, I develop falsification tests for three widely used VAM specifications, based on the idea that future teachers cannot influence students' past achievement. In data from North Carolina, each of the VAMs' exclusion restrictions are dramatically violated. In particular, these models indicate large "effects" of 5th grade teachers on 4th grade test score gains. I also find that conventional measures of individual teachers' value added fade out very quickly and are at best weakly related to long-run effects.

Using evidence from Durham, North Carolina, we examine the impact of school choice programs on racial and class-based segregation across schools. Theoretical considerations suggest that how choice programs affect segregation will depend not only on the family preferences emphasized in the sociology literature but also on the linkages between student composition, school quality and student achievement emphasized in the economics literature, and on the availability of schools of different types. Reasonable assumptions about how these factors differ for students of different races and socio-economic status suggest that the segregating choices of students from advantaged backgrounds are likely to outweigh any integrating choices by disadvantaged students. The results of our empirical analysis are consistent with these theoretical considerations. Using information on the actual schools students attend and on the schools in their assigned attendance zones, we find that schools in Durham are more segregated by race and class as a result of school choice programs than they would be if all students attended their geographically assigned schools. In addition, we find that the effects of choice on segregation by class are larger than the effects on segregation by race.

Durham, NC, is a large, countywide district that, like many urban districts across the country, combines geographic attendance zones with a variety of parental choice programs. Using administrative data that includes addresses for individual students, we examine whether the likelihood of opting out of one’s geographically assigned school varies across different groups defined by race, parent education level, and student achievement. We also examine how the characteristics of a student’s geographically assigned school and the characteristics of nearby school choice options influence the likelihood of opting out. Finally, we compare the peer composition in neighborhood schools to what the peer composition in those schools would be if all students attended their neighborhood schools. We find that school choice programs in Durham have allowed higher achieving schools to cream-skim educationally advantaged students from many neighborhood schools. Although, cream-skimming has only small effects on the peer composition of non-choosers on average, schools with concentrations of disadvantaged students and schools located near choice schools attractive to high achievers are particularly hard hit by cream-skimming.


Giving parents a choice among schools within their district is one of the most widely used school assignment policies in the United States. Coupled with standardized testing, public school choice is a key component of the school accountability movement and was institutionalized nationwide through the provisions of the 2001 No Child Left Behind Act (NCLB). Three interrelated expectations underlie the policy. First, choice will increase allocative efficiency by encouraging schools to differentiate their products and allowing parents to choose the curriculum and pedagogy most appropriate for their children. Second, choice encourages technical efficiency by forcing schools to compete. This competition pushes schools to adopt more efficient production methods. Third, choice promotes equity by allowing students who reside in areas served by poorly performing schools to enroll in better schools. This paper evaluates the logic and empirical evidence concerning these expectations.


This paper explores the relation between school performance and dropout rates under North Carolina’s accountability system. We evaluate competing hypotheses. The first posits that accountability systems help all students succeed by increasing test performance and decreasing dropout rates. The alternative hypothesis states that accountability systems give schools incentives to encourage difficult students to leave. By “pushing out” these students, schools can increase their overall test performance. Utilizing data on every dropout in the state, we examine the relation between changes in dropout rates and changes in the schools’ academic performance. Using a fixed-effects model clustering schools within years, we find that schools improve test performances when dropout rates rise; they add to their overall composite by subtracting problematic students.


Although the federal No Child Left Behind program judges the effectiveness of schools based on their students’ achievement status, many policy analysts argue that schools should be measured, instead, by their students’ achievement growth. Using a ten-year student-level panel dataset from North Carolina, we examine how school-specific pressure associated with the two approaches to school accountability affects student achievement at different points in the prior-year achievement distribution. Achievement
gains for students below the proficiency cut point emerge in response to both types of accountability systems. In contrast to prior research highlighting the possibility of educational triage, we find little or no evidence that schools in North Carolina ignore the students far below proficiency under either approach. Importantly, we find that the status, but not the growth, approach reduces the reading achievement of higher performing students, with the losses in the aggregate exceeding the gains at the bottom. Our analysis suggests that the distributional effects of accountability pressure depend not only on the type of pressure for which schools are held accountable (status or growth), but also the tested subject.


Using administrative data on public school students in North Carolina, we find that sixth grade students attending middle schools are much more likely to be cited for discipline problems than those attending elementary school. That difference remains after adjusting for the socioeconomic and demographic characteristics of the students and their schools. Furthermore, the higher infraction rates recorded by sixth graders who are placed in middle school persist at least through ninth grade. An analysis of end-of-grade test scores provides complementary findings. A plausible explanation is that sixth graders are at an especially impressionable age; in middle school, the exposure to older peers and the relative freedom from supervision have deleterious consequences. These findings are relevant to the current debate over the best school configuration for incorporating the middle grades. Based on our results, we suggest that there is a strong argument for separating sixth graders from older adolescents.


Childhood lead poisoning remains a critical environmental health concern. Low-level lead exposure has been linked to decreased performance on standardized IQ tests for school-aged children. This study seeks to determine whether blood lead levels in early childhood are related to educational achievement in early elementary school as measured by performance on end-of-grade testing. Educational testing data for fourth grade students from the 2000-2004 NC Education Research Data Center were linked to blood lead surveillance data for seven counties in NC and then analyzed using exploratory and multivariate statistical methods.

The discernible impact of blood lead levels on end-of-grade testing is demonstrated for early childhood blood lead levels as low as 2 μg/dL. A blood lead level of five is associated with a decline in EOG reading (math) scores that is roughly equal to 15% (14%) of the interquartile range, and this impact is very significant in comparison with the effects of covariates typically considered profoundly influential on educational outcomes. Early childhood lead exposures appear to have more impact on performance on the reading rather than the math portions of the tests.

Our emphasis on population level analyses of children who are roughly the same age linked to previous (rather than contemporaneous) blood lead levels using achievement (rather than aptitude) outcome complements the important work in this area by previous researchers. Our results suggest that the relationship between blood lead levels and cognitive outcomes are robust across outcome measures and at low levels of lead exposure.
In a variety of important domains, there is considerable correlational evidence suggestive of what are variously referred to as social norm effects, contagion effects, information cascades, or peer effects. It is difficult to statistically identify whether such effects are causal, and there are various non-causal mechanisms that can produce such apparent norm effects. Lab experiments demonstrate that real peer effects occur, but also that apparent cascade or peer effects can be spurious. A curious feature of American local school configuration policy provides an opportunity to identify true peer influences among adolescents. Some school districts send 6th graders to middle school (e.g., 6th-8th grade "junior high"); others retain 6th graders for one additional year in K-6 elementary schools. Using administrative data on public school students in North Carolina, we have found that sixth grade students attending middle schools are much more likely to be cited for discipline problems than those attending elementary school, and the effects appear to persist at least through ninth grade. A plausible explanation is that these effects occur because sixth graders in middle schools are suddenly exposed to two cohorts of older, more delinquent peers.

*Alfeld, Corinne, Yan Li, Rebecca Prince, and Martha Putallaz. 2008. “Effects of Summer Academic Programs in Middle School on High School Test Scores, Coursetaking, and College Major.” Submitted to the *Journal of Advanced Academics*.

This set of two studies investigates the high school and college outcomes of middle school students who participated in a summer residential program for the academically talented, using a control group of qualified students who did not attend such a program. Through their participation in a 7th grade talent search in 1996-97 the students qualified to attend a summer program at Duke University’s Talent Identification Program (TIP). Of the North Carolina students in this group, 141 (72 female) attended at least one summer program in middle school (7th and 8th grades). The control group consisted of 2,649 students from the state of North Carolina who had qualified for but did not attend a summer program at TIP in middle school. The two groups did not differ significantly on gender, parent education level, or ethnicity. For Study 1, the students’ high school end-of-course (EOC) standardized test scores were obtained from state public school records and compared across the two groups in a series of multiple regression analyses by subject area. Results showed that the effects of summer program on high school achievement appear to depend on the subject area and the students’ level of qualification. For Study 2, surveys were mailed to program participants (N= 92) and non-participants (N=184) from the same talent search cohort to assess students’ high-school coursetaking, GPA, college major, and educational aspirations. Some associations were found between program participation and later academic choices.


Longitudinal self-report data from 4,071 students are used to examine the degree to which students’ perceptions of their social environments (people and places) are associated with changes in three school success outcomes: school engagement, trouble avoidance, and grades. Specific variable dimensions within the neighborhood, peer, and family domains had significant effects on one or more of these school outcomes. Implications of the findings for further research and intervention practice are discussed, including the availability of a Web-based resource for linking these findings with evidence-based intervention and prevention strategies.

The Andrew W. Mellon Foundation is trying to understand how low-income students and their parents make decisions about college and how their pre-college characteristics interact with the college environment to shape outcomes, including graduation rates. Please see attached “General Notes” for a fuller description of motivation and guiding questions. The data (including personal identifiers), to which only the individuals specified in the attached document “College & Beyond Database,” below, will have access, will be stored on secure networked drives in Mellon’s offices in accordance with the attached “Information Security Plan.” The project is part of the larger College & Beyond study more fully described in the attachment below. The stripped data will become part of the expanded College & Beyond database. Procedures governing that database are also described in the “College & Beyond” section below.

The project has been ongoing since October 2005. The bulk of the last year was spent collecting data for the project from other universities. Around a quarter of the data was just received in the last few months. Currently, the project is in the preliminary analysis stage. Early results have shown a strong, positive, monotonic relationship between graduation rates and income quartiles. This correlation holds across race, ethnicity, and SAT/ACT scores. Also, some work has been done employing hazard rate analysis to observe the determinants of the probability of students dropping out across semesters.

*Edmunds, Julie, Elizabeth Glennie, and Larry Bernstein. 2008. “Early Results and Methodological Issues from an Experimental Study of Early College High Schools Symposium.”

Funded by a four-year grant from the Institute of Education Sciences, the Study of the Efficacy of the Learn and Earn Early College High School Model is a longitudinal, experimental study that will examine the impact of the Early College High School model on student outcomes and will associate aspects of program implementation with specific outcomes. This session includes four presentations that present early results from the study as well as methodological issues that have been encountered. The four presentations include: an overview of the study and model; a discussion of the development and piloting of an instrument to measure attitudinal and behavioral outcomes; early student outcomes from one school that used random assignment prior to the study; and proposed analysis strategies for dealing with the issue of endogenous outcomes that impact student achievement.


Researchers conducting non-experimental studies of panel data often attempt to remove the potentially biasing effects of individual heterogeneity through the inclusion of fixed effects. I evaluate so-called “Value Added Models” (VAMs) that attempt to identify teachers’ effects on student achievement. I develop falsification tests based on the assumption that teachers in later grades cannot have causal effects on students’ test scores in earlier grades. A simple VAM like those used in the literature fails this test: 5th grade teachers have nearly as large effects on 4th grade gains as on 5th grade gains. This is direct evidence of non-random assignment. I use a correlated random effects model to generalize the test to more complex estimators that allow for tracking on the basis of students’ permanent ability. The identifying restrictions of these estimators are again rejected. Teacher assignments evidently respond
dynamically to year-to-year fluctuations in students’ achievement. I propose models of this process that permit identification. Estimated teacher effects are quite sensitive to model specification; estimators that are consistent in the presence of (some forms of) dynamic tracking yield very different assessments of teacher quality than those obtained from common VAMs. VAMs need further development and validation before they can support causal interpretations or policy applications.


The purpose of this report is to provide the North Carolina Department of Public Instruction (NCDPI) with information about teachers’ responses to School-wide Positive Behavioral Support (PBS) and key educational outcomes on students in North Carolina elementary schools implementing School-wide (PBS). A web-based survey of teachers at eight elementary schools implementing School-wide positive behavior support according to national criteria was administered to assess teacher response to School-wide PBS. Data from the North Carolina Education Data Center was used to assess student outcomes related to academic performance, school suspensions, and teacher turn-over rates in the eight study schools compared with 264 NC elementary schools that had started School-wide PBS.


The Teach for America (TFA) program selects graduates from the most competitive undergraduate institutions and, after a short intensive training program, places them as teachers in the lowest-performing schools in the country. The few studies that have examined the effectiveness of TFA have focused on the elementary and middle school level. The findings have been somewhat mixed by grade level, subject and comparison group, but the studies with the strongest designs show some positive effects on student learning relative to traditional teachers.

The research here is based on the first study that examines TFA effects in high school. We estimate TFA effects with a rich longitudinal dataset from North Carolina that allows us to examine student test performance over time and to link students to their teachers. Looking at years 2001-2006, we focus on 23 school districts that have at least one TFA teacher in any of these years. We conduct a series of student and school fixed-effects models that take advantage of multiple end-of-course exam scores for students. We find that TFA high school teachers have a positive effect relative to other high school teachers, including other teachers who are certified in-field. The findings are particularly strong for math and science teachers. Moreover, the findings suggest that the TFA effect exceeds the impact of additional years of experience. The findings are informative to policy debates on teacher recruitment and retention, as we discuss in the concluding section of the paper.