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Paper 2 Title:

Mapping Pathways to College: An In-depth Examination of College Readiness in New York City

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Background

Over the last decade, New York City and other large urban districts have shifted their reform efforts from increasing high school graduation rates to increasing the number of students ready for college. Furthermore, there is a growing consensus that efforts to improve college readiness should focus more on outcomes beyond college enrollment such as type of college attended, persistence, and degree attainment (Bowen, Chingos & McPherson, 2009; Haskins, Holzer, & Lerman, 2009). These efforts are particularly important for school districts who serve mainly disadvantaged populations who are often found to be less likely to attain postsecondary degrees (Bailey & Dynarski, 2011; Baum & Ma, 2007; Kirst, 2004). As school districts shift their focus to preparing students for college success, it is important that they have valid indicators and early warning systems using which to assess and track student progress towards this goal. However, there is some uncertainty on what college readiness means and which measures should matter for improving college readiness.

Traditionally, school districts and researchers have focused on the use of high school exit exams or college entrance exam scores to predict college success. However, researchers also find that, after controlling for test scores, grades are also strong (and sometimes better) predictors of college outcomes (Bowen, Chingos & McPherson, 2009; Geiser & Santelices, 2007; Roderick, Nagaoka & Allensworth, 2006; Adelman, 2006; Zwick & Sklar, 2005). There is also a large body of research that suggests that taking a higher-level curriculum (e.g. Advanced Placement courses, Calculus, Physics, etc.) is associated with postsecondary success (ACT, Inc., 2005 & 2007; Adelman, 1999 & 2006; Barth, 2003; Berkner, He and Cataldi, 2002; Chen, 2005; Rose and Betts, 2001; Warburton, Bugarin, and Nunez, 2001). Yet more recent research that addresses selection bias suggests that the benefits of simply adding coursework are likely overstated (Allensworth et al., 2009; Lee & Ready, 2009; Teitelbaum, 2003). Taken together, these findings suggest that college-readiness indicators should include multiple measures high school performance and engagement.

This study attempts to investigate how grades, test scores, and other factors come together to shape whether NYC students enroll and persist in college so that the high schools and districts may develop benchmarks based on multiple validated indicators.

Objective

Building off the work of Kemple, Segeritz, & Stephenson (submitted) on developing an on-track to high school graduation indicator for students in New York City public schools, the objective for this paper is to develop a similar early indicator system whereby students, schools, and districts can assess whether students are on track for college readiness. We evaluate if and in what way high school performance in grades 9 to 12 is indicative and predictive of student enrollment and persistence in college as an analog to freshman on-track indicators that predict graduation from high school. More specifically, we compare various measures of high school performance (e.g., grades, test scores, attendance, coursework, etc.) with actual postsecondary outcomes (e.g., college enrollment and persistence) and determine which measures in which grades should be included in a
college-readiness indicator. Given the diversity of the student population in New York City school district, we also investigate the extent to which the relationships between these measures of high school performance and postsecondary outcomes vary by student characteristics (i.e. race/ethnicity, gender, and poverty).

More specifically, our research questions are:

• What high school performance measures best predict college outcomes of NYC students?
• Does the importance and predictive power of these measures vary by college outcome (e.g. enrollment versus persistence)
• Does the importance and predictive power of these performance indicators differ by characteristics of students or the high schools they attend?

Setting

New York City provides a unique context for studying college readiness. The New York City Department of Education (NYCDOE) is the largest education system in the country serving nearly 1.1 million students and employing more than 85,000 teachers and 35,000 administrative and support staff with a budget of more than $22 billion per year. Under the governance of Mayor Michael Bloomberg since 2002, the City’s schools have undergone a dramatic transformation organizationally, culturally, and in terms of student performance. Indicators that were stagnant for decades have begun to show improvement. Most notably, longitudinal cohort high school graduation rates have risen from 50 percent in 2002 to nearly 66 percent in 2011.

Recognizing the diminishing value of a high school diploma as a terminal degree, the NYCDOE has continued to raise the bar by taking steps to assess whether their students leave high school ready for college. First, the NYCDOE has built comprehensive data systems that link student high school performance to postsecondary outcomes using data from the National Student Clearinghouse and data from the City University of New York system. Additionally, the NYCDOE has also partnered with organizations like New Visions for Public Schools, City University of New York and the Research Alliance for New York City Schools to study the issue of college readiness and develop early warning systems. Furthermore, the NYCDOE is now beginning to use a preliminary set of indicators to hold high schools accountable not just for graduating their students, but for preparing them for college-level coursework and for doing what it takes to get students to apply to and enroll in college. Beginning in 2011-2012, 10 percent of a school's progress report grade will include indicators for the proportion of students who complete college preparatory courses and subsequently enroll in college. While the NYC New York City Department of Education (NYCDOE) has taken important steps towards building these college-readiness indicators, more work can be done to fully understand and validate these indicators.

The work presented in this symposium will not only provide a NYC-specific context on what college readiness means, but will also shed light on how comprehensive data systems can be used to develop valid indicators of college success and create tools to track student performance on these indicators.
Population

Our analytic sample includes 326,347 first-time ninth graders from 2002 to 2006 from the New York City public school system. These students were enrolled in more than 200 regular high schools (237 in 2010) in the NYC school system. We exclude students who were in special education, were English language learners (ELL), or were enrolled in a specialized high school program in the ninth grade. These students accounts for about 17 percent of each ninth-grade cohort. We exclude these students because these students may have very different high school and postsecondary trajectories compared the average NYC public school student. Furthermore, because we are interested in student trajectories through high school, we exclude students who may have entered the New York City public school system after ninth grade.

The New York City school system serves a large proportion of students who have historically been underrepresented in the college-going population (see Appendix B, Table B-1). Almost three quarters of our sample of students are African-American or Latino students and more than half (and upwards of three-quarters) of these students come from poor homes that qualify them for free or reduced-price lunch. In addition, many NYC students come from families that are most likely unfamiliar with the U.S. education system. About 20 percent of our sample was born outside of the U.S. and about 40 percent speak a language other than English at home. This diverse population of students has major implications for how we study and understand their postsecondary outcomes.

In terms of their academic outcomes, about half of the 2002 cohort graduated from high school by 2006. By 2010, 60 percent of 2006 ninth grade cohort graduated from high school. Gains have also been made in the realm of college enrollment. While only little over a third of the 2002 cohort enrolled in college, about half of the 2006 cohort attended either a four-year or two-year college four years after entering high school. However, the enrollment rate at four-year colleges has grown to a lesser extent; from 27 percent for the 2002 cohort to 31 percent for the 2006 cohort.

Research Design, Data Collection and Analysis

We are in a unique position to test and develop early college-readiness indicators given our extensive individual-level longitudinal database. This database contains all New York City public school students stretching back more than 15 years. It includes information about student demographics (gender, race/ethnicity, free lunch status, etc.), enrollment patterns, attendance rates, New York State achievement scores (third grade – eighth grade exams), Regents test scores (ninth – twelfth grade exams), high school transcripts (i.e. grades and course taking), Advanced Placement scores, SAT test scores, and high school completion statuses. We have also compiled extensive information on school practices through analyses of the New York City school surveys that are administered annually to students, teachers, and parents.

Since 2006, the NYCDOE has tracked the postsecondary enrollment of its graduates through an agreement with the National Student Clearinghouse (NSC), a non-profit college

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1 We exclude special education, alternative, and specialized high schools from the analysis.
tracking system. Using this postsecondary database, we are able to link the NYCDOE student archive files to three types of college outcomes (college enrollment, college persistence, and degree attainment) of successive cohorts of NYC public school graduates.

As a first step, to explore the relationships between high school performance and college outcomes, we mainly use descriptive analyses to map the various pathways into college (both four-year and two-year postsecondary institutions) for New York City public high school graduates.

We then use (ordered) logistic regressions to identify student engagement and achievement factors appropriate for inclusion in college-readiness indicators. After developing our preliminary college-readiness indicators, we cross-validate them with samples of students from different cohort years to test the stability and validity of the indicator over time.

We also use student-level information to investigate how the probability of being identified as college-ready (as measured across several dimensions) fluctuates for various subpopulations of students before, during, and shortly after the high school years. Furthermore, using a variety of different definitions of college readiness (i.e. college enrollment and persistence), we will be able to test whether the relationship between high school performance and college success vary depending on the definition used. Finally we will use survival analysis to relate college persistence to previously identified high school on-track and college-readiness indicators.

**Findings**

Initial findings show that measures of early high school (ninth grade) performance are very accurate in correctly predicting both high graduation as well as dropping out from high school. However, these measures are not very good predictors of college enrollment and persistence. Early explorations of variables from later years in high school seem to be more accurate in predicting postsecondary outcomes and therefore seem to be more appropriate for inclusion in the construction of college-readiness indicators. Initial analyses also seem to indicate that academic variables included in the on-track for high school graduation and college-readiness indicators do not fully explain group differences.

**Conclusion**

Our preliminary results demonstrate the importance of going beyond the practice of using test score cutoffs to define college readiness. These findings suggest that multiple factors contribute to college readiness and should be considered when developing early warning indicator systems. Moreover, there are wider implications to our research in that these college-readiness indicators could allow districts and schools to align interventions and supports for struggling students and schools. At the same time, they may be used to hold schools accountable for helping students attain college readiness.
Appendices

Appendix A. References


Appendix B. Tables and Figures

Table B-1: Demographic Characteristics of NYC Public School Students (by 9th grade cohort year)

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<td>% Enrolled in any College four years after entering HS</td>
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