



Working to My Potential: The Postsecondary Experiences of CPS Students in the International Baccalaureate Diploma Programme

Conducted by the Chicago Postsecondary Transition Project at the University of Chicago Consortium on Chicago School Research

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Introduction

“If we don’t offer parents of all our schoolchildren citywide more options for college prep programs, they will leave our school system, and they will leave the city.”-Gery Chico, Chicago Public Schools Board of Education President, 1995-2001 (Chicago Catalyst, 1997)

In 1997, Chicago Public Schools (CPS) announced an ambitious plan to open 13 International Baccalaureate Diploma Programs (IBDP) in neighborhood high schools throughout the city. Hoping to replicate the success achieved in the long-standing IB program at Lincoln Park High School, the scale of the IB experiment was unmatched by any other school district in the United States at that time. According to then Chief Executive Officer Paul Vallas, the objective was to “upgrade the quality of the neighborhood high school and to stop the brain drain (Rossi 1997).” Specifically, policymakers at CPS saw the IBDPs as a way to prevent bright CPS elementary students – those with test scores that are above average but not high enough to gain admittance to the highly competitive selective enrollment high schools – from attending private high schools in the city or leaving the city to attend suburban public high schools.

The move to expand IBDPs to neighborhood schools across Chicago was met with some skepticism. Some believed the district was naive to think it could replicate the exceptional outcomes of students in the IBDP at Lincoln Park High School – one of the most selective magnet programs in CPS.¹ Other critics were skeptical that CPS could expand IBDPs at such a rapid rate, doubting that CPS had the students or the teachers necessary to create a “true” IB experience (Kelleher 2001). Still others cried “elitism” and claimed that the new IB programs would track “gifted” students away from regular classrooms and possibly create racial/ethnic segregation within schools (Sharp 2001). The real question seemed to be whether a program designed to serve the children of diplomats could properly serve students in urban school districts. More than 10 years has passed, and while the major concerns about expansion of IBDPs have not come to pass, there has been no research to date on whether IB has succeeded in providing a high-quality, college-preparatory experience for Chicago students.

This report rigorously examines the impact of Chicago’s neighborhood IB programs on the postsecondary outcomes of graduates of the classes of 2003-2007. We draw on quantitative data to estimate effects on college enrollment and persistence using a propensity matching

¹ Lincoln Park limits admission to the program to students who score at the 90th percentile and above on their seventh-grade math and reading exams. An entrance test, which includes written literature interpretation, is also required.

technique and use student interview data from our longitudinal qualitative study to investigate students' experiences in college. Key findings include:

- When compared to a matched comparison group, IBDP students are 40 percent more likely to attend a four-year college and 50 percent more likely to attend a more selective college.
- IBDP students in four-year colleges are significantly more likely to persist in four-year colleges for two years.
- Only 62 percent of students who enter the IB Cohort in ninth grade subsequently enroll in the IBDP in eleventh grade. There are no effects of IB participation for the 38 percent of students who do not complete the program.
- When in college, IBDP students report feeling prepared to succeed and indeed excel in their coursework, often stating explicitly that their experiences in the IBDP taught the specific skills and behaviors demanded of them in college.
- Despite strong academic qualifications, IBDP students often have limited access to the social capital necessary to successfully navigate college course selection and establish relationships with college faculty.

These findings have important implications for other urban districts interested in implementing IB programs. More broadly, they can help policymakers and practitioners better understand what it takes to promote college readiness in urban high schools.

What Is the International Baccalaureate Diploma Programme?

The International Baccalaureate (IB) program and its associated curriculum began in 1968 in Geneva, Switzerland as a way of creating a common curriculum across countries for internationally mobile students. Schools that wish to offer IB programming must undergo a rigorous authorization process and invest in extensive professional development for teachers, who must achieve certification to teach IB. Students who perform sufficiently well on a universal set of rigorous written products, timed tests, and oral examinations can receive an IB Diploma, which is recognized by many colleges and universities across the world. Since its inception, the program has increasingly been used by schools and districts as a means of providing a high-quality education to high-achieving students, regardless of their mobility.

Curriculum

The IB Diploma Programme consists of two years of coursework, typically beginning in junior year for American students. IBDP coursework typically consists of six courses across core subject areas. In CPS and many other US cities, these courses are taken over two years –

amounting to a total of 12 high school course credits. In addition, the program has three core requirements that are included to broaden the educational experience and challenge students to apply their knowledge and understanding:

- **Theory of Knowledge** is the seventh course in a student's IB schedule and is, in many ways, the centerpiece of the IB experience. The course is designed to encourage each student to reflect on the nature of knowledge by critically examining different ways of knowing (perception, emotion, language, and reason) and different kinds of knowledge (scientific, artistic, mathematical, and historical);
- **The Extended Essay** is a requirement for students to engage in independent research through an in-depth study of a question relating to one of the subjects they are studying;
- **Creativity, Action, Service** requires that students actively learn from the experience of doing real tasks beyond the classroom. Students can combine all three components or do activities related to each one of them separately.

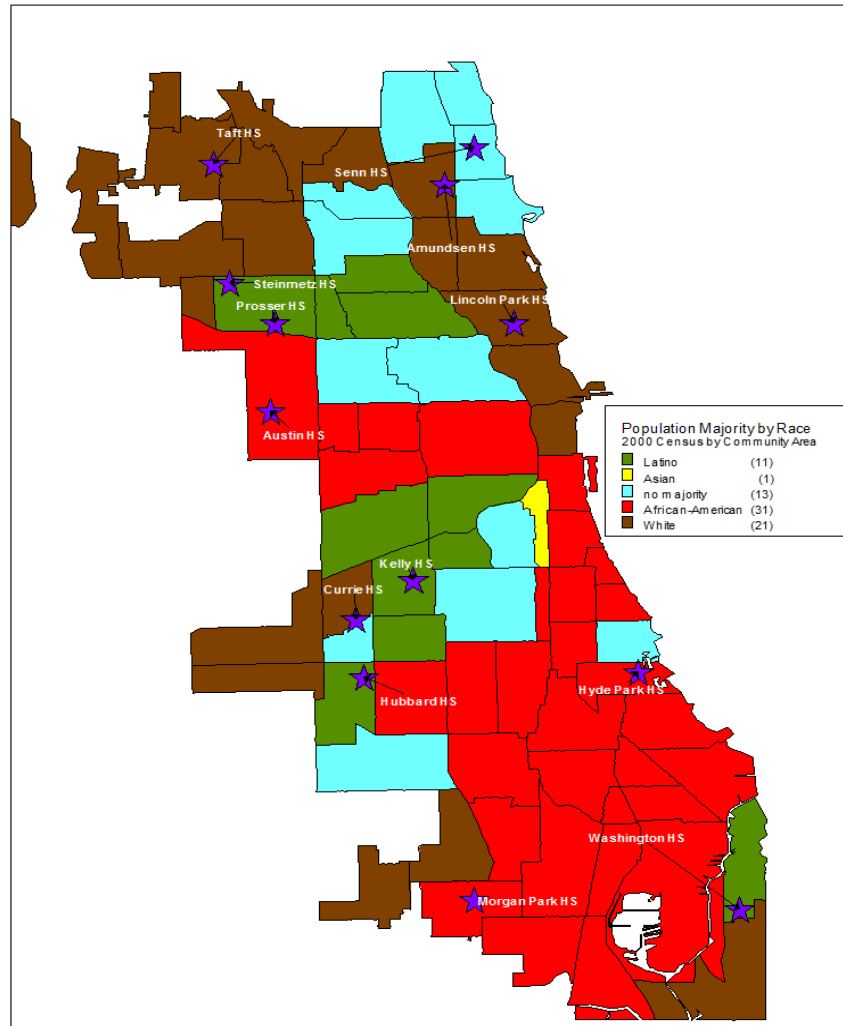
Assessment

At the end of the program, students take written examinations, which are marked by external IB examiners. Students also complete within-school assessment tasks, which are either initially marked by teachers and then graded by external moderators or sent directly to external examiners. The diploma is awarded to students who gain at least 24 points, subject to certain minimum levels of performance across the whole program and to satisfactory participation in the Creativity, Action, Service requirement. The highest total that a Diploma Programme student can be awarded is 45 points.

Setting the Context of IB in CPS

In 1997, when IB programs opened across the city, many wondered which types of students these programs would serve. Our analysis shows that they serve students who look quite similar demographically to students across the district. As of 2006 (the period we are studying), there were 13 IB programs in the city. Figure 1 shows the locations of IB programs across the city and the racial/ethnic composition of surrounding neighborhoods. Though IB programs are spread throughout the city, there is a concentration of programs on the North and Southwest sides of the city, with many serving majority Latino communities. With the exception of Lincoln Park's longstanding program, most of these programs are very small, serving one or two classrooms of IB students per grade, resulting in approximately 400 graduates per year.

Figure 1: Map of IB Programs in Chicago



Compared with students in IB, students in selective enrollment schools were much less likely to be demographically similar to the typical CPS student (Table 1). Selective enrollment students were much *more* likely than the typical CPS student to be white or Asian, were significantly more likely to come from advantaged neighborhoods (see note), and significantly less likely to come from neighborhoods with high rates of poverty. In comparison, three-quarters of IBDP students are African American or Latino, although the IBDP serves a higher proportion of Latino students than the system average. IBDP students come from neighborhoods that are no more advantaged than the typical neighborhood, and they are predominantly first-generation college students. Notably, males are underrepresented in all of these groups.

Table 1: Demographic and Academic Characteristics of High-Achieving Students in CPS

	ALL CPS Stanine 6 Students (N=13,107)	Selective Enrollment Students (N=14,656)	IBDP students (N=1,971)
African American	50%	28%	37%
Latino	32%	30%	38%
White	13%	27%	15%
Asian	5%	14%	14%
Male	44%	37%	33%
Concentration of Poverty in Students' Neighborhoods	0.16	-0.019	0.06
Socioeconomic Status in Students' Neighborhoods	-0.23	0.10	-0.26

Note: Table 1 displays the demographic and incoming (eighth grade) academic qualifications of students participating in IBDP in the eleventh grade compared to students in Chicago's six selective enrollment schools, as well as the population of all students in CPS who scored at Stanine 6 or above on the Iowa Test of Basic Skills, a test score that would presumably make them eligible to apply to IB. Students included in this table graduated from high school in 2003-2009. Students who were in special education, alternative high schools, or charter high schools were not included in these analyses. Students in the "CPS Stanine 6" group were not in IB in ninth grade, in a selective enrollment school, or in a Lincoln Park IB Diploma Programme in the ninth grade. Concentration of Poverty and Socioeconomic Status in students' neighborhoods are based on 2000 U.S. Census information on the block group in which students lived. Concentration of Poverty measures the percentage of unemployed males and the percentage of families living below the poverty line, and negative numbers mean less poverty than the average CPS neighborhood. Socioeconomic Status measures the average education level of adults as well as the proportion of adults who work in professional jobs, and positive numbers mean higher proportions of educated and professional adults.

	CPS Average (N=54,563)	IBDP students (N=748)	Selective Enrollment Students (N=7,931)
Eligible for Free or Reduced- Price Lunch	77%	77%	49%
Student Not Born in US	20%	24%	14%
Mother Not Born in US	45%	58%	47%
Mothers' Education Less Than College	79%	80%	62%

Note: This table is reproduced from the 2009 report Making Hard Work Pay Off and uses a different sample from the table above. These numbers do not include students who were in special education or attended an alternative high school. Student's birthplace, mother's birthplace, and mother's education level information come from CCSR surveys in 2001 or 2005.

Box 1: A Note on International Baccalaureate Terminology

The complex way that IB operates in CPS creates some difficulty in terminology. As we will discuss in greater detail in Chapter 1, while the official International Baccalaureate Diploma Programme does not begin until eleventh grade, students who participate in IBDPs are typically selected for the program in ninth grade and tracked into honors or informal “pre-IB” coursework as a cohort. Further complicating matters, not all students who enroll in the IB track in ninth grade follow through with their intentions and enroll in official IB coursework in eleventh grade. Therefore, for our quantitative analyses in Chapter 1, we describe the cohort of ninth-graders tracked for the IB program as the “IB Cohort.” We describe students who officially enroll in the IB program in eleventh grade as “IBDP Students.” Our qualitative analysis in Chapter 2 required a slightly different lens. Though all of the students we interviewed were IBDP students in eleventh grade, when discussing their experiences in the program, they did not draw a clear distinction between their pre-IB courses and the official IBDP coursework, but rather referred to all four years as being “IB” or “the IB program” or “IB courses.” For this reason, when we are describing students’ accounts of their experiences in the program, we use these less specific terms to align with students’ characterizations.

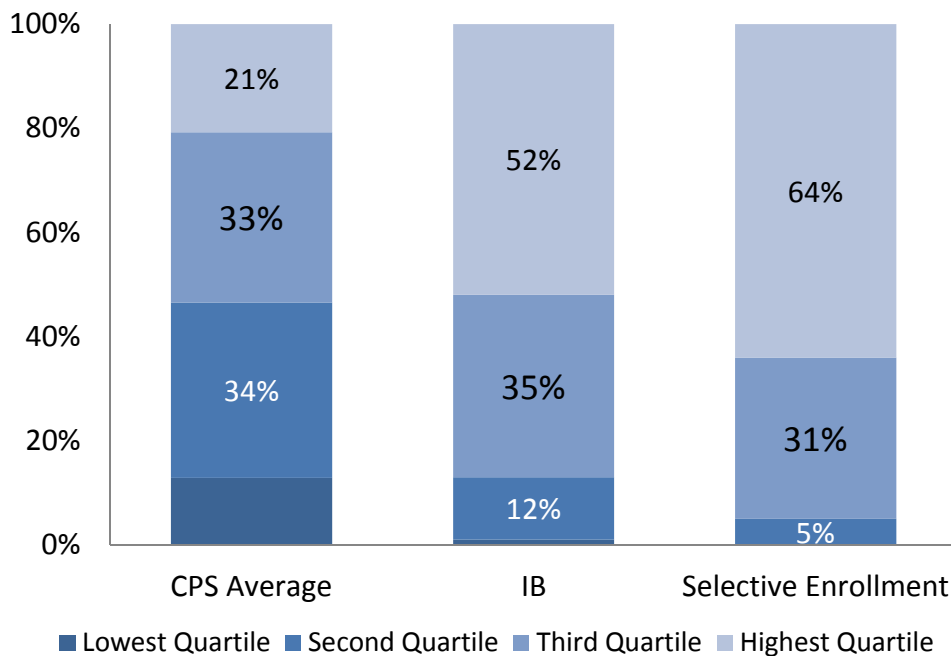
Previous Work on IB in CPS: Making Hard Work Pay Off

This report is a part of the Chicago Postsecondary Transition project, a multi-year research project that is tracking the post-high school experiences of successive cohorts of graduating CPS seniors and systematically analyzing the relationship between high school preparation, college choices, and postsecondary outcomes. In addition to this enormous quantitative undertaking, project researchers completed a qualitative longitudinal study of 105 graduates of the class of 2006, 25 of whom participated in the IBDP across three high schools. This report is a follow-up to two reports in this series that looked specifically at how students participated in college search and selection. The first, *Potholes on the Road to College*, looked at all graduates of CPS, and one of the most important findings was that many of the highest-achieving students in the system were enrolling in colleges far below their qualifications – or not enrolling in college at all. The second report, *Making Hard Work Pay Off*, focused specifically on the system’s highest-achieving students (students in AP programs, IB programs, and selective enrollment schools) and highlighted the distinctive challenges these students faced in translating their college qualifications into college enrollment.

One of the most striking findings in the *Hard Work* report was IB students’ high level of qualification for college. These qualifications were particularly notable as IB students were

nearly demographically identical to non-IBDP students in those same high schools and had slightly lower test scores entering high school than their peers in selective enrollment high schools, who were also more socially advantaged. In short, the IBDP seemed to be taking academically weaker, less advantaged students coming into high school and producing graduates with academic achievement comparable to graduates of selective enrollment schools. Figures 2-4, reproduced from the *Making Hard Work Pay Off* report, illustrate these findings.

Figure 2: Incoming Achievement of Students in Academically Advanced Programs

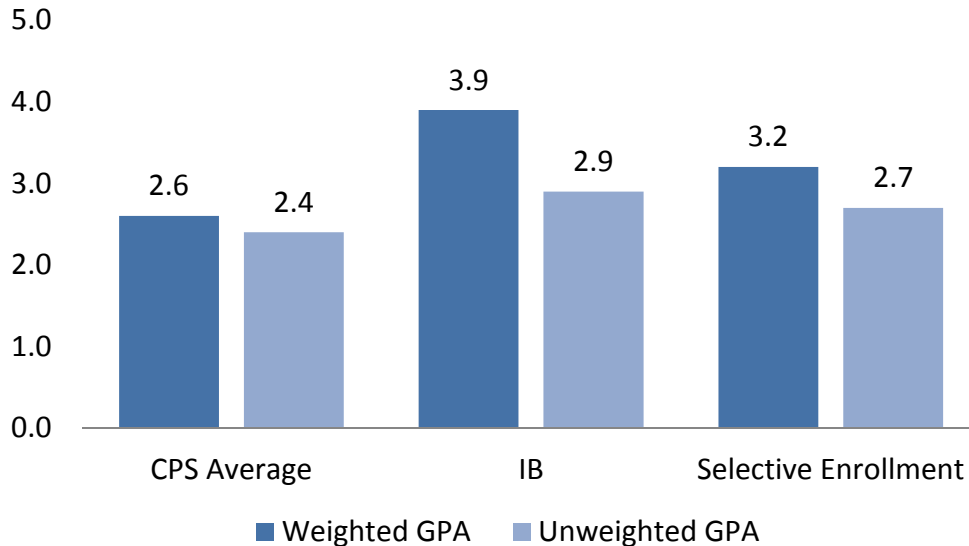


Note: Quartiles are eighth grade national quartiles on the Iowa Test of Basic Skills. These numbers are from graduating classes of 2003-2006 and do not include students who were in special education or attended an alternative high school. The IB category excludes Lincoln Park.

Analysis from *Hard Work* indicated that IBDP students may have made significant academic strides throughout high school. As seen in Figure 2, students in all academically advanced programs were higher-achieving than the CPS population overall, but students in IB programs were slightly less likely to be in the top achievement quartile than students in selective enrollment schools. At the end of high school, however, IB students were slightly outperforming their peers. Figure 3 shows students' average weighted and unweighted GPAs, with IB students earning stronger grades than selective enrollment students, and also earning much higher weighted GPAs – which is unsurprising, given the large number of advanced courses students take as a part of the IBDP. In a deeper investigation of differences in unweighted GPAs, the gap between IBDP students and selective enrollment students grows when

controlling for background characteristics and entering test scores. IBDP students' ACT scores were slightly lower than those of students in selective enrollment schools, but a similar analysis controlling for student background and incoming characteristics removed the gap entirely.

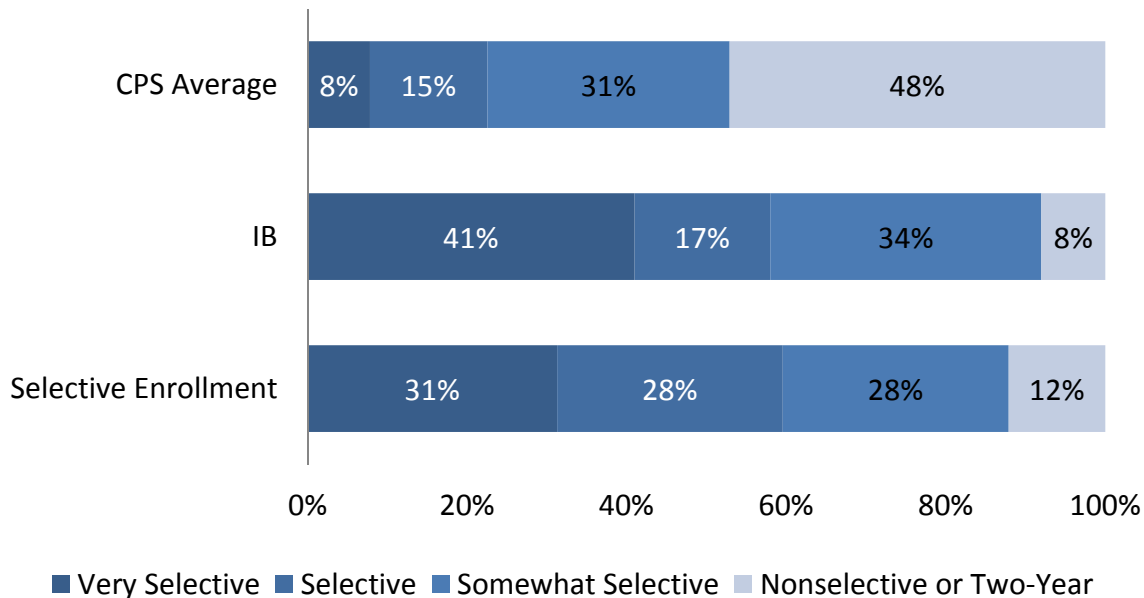
Figure 3: Weighted and Unweighted GPAs of Students in Academically Advanced Programs



Note: This figure is reproduced from the 2009 report From High School to the Future: Making Hard Work Pay Off. These numbers are from graduating classes of 2003-2006 and do not include students who were in special education or attended an alternative high school. The IB category excludes Lincoln Park.

IBDP students' strong grades, strong concentration of advanced courses, and relatively high ACT scores made them highly qualified for college. As seen in Figure 4, well over half of IBDP graduates were qualified to attend a selective or very selective college. Additionally, 41 percent of these students were qualified to attend a very selective college, compared to only 31 percent of students at selective enrollment schools. These findings brought attention to the IB programs in Chicago and suggested that IB programs were very effective in serving first-generation college students.

Figure 4: College Qualifications of Students in Academically Advanced Programs



Note: This figure is reproduced from the 2009 report From High School to the Future: Making Hard Work Pay Off. These numbers are from graduating classes of 2003–2006 and do not include students who were in special education or attended an alternative high school. The IB category excludes Lincoln Park. See Appendix D for more information on our college selectivity variables.

The analysis in the *Hard Work* report was not, however, intended to be a rigorous evaluation of the IBDP or the outcomes of its graduates. Comparisons to students in selective enrollment schools were provocative, but did not provide adequate measures of the effect of IB participation. In addition, the analysis was not designed to disentangle the effects of the program from characteristics of the students and/or high schools IBDP served. This report advances this analysis in two ways: First, it moves our analysis past students’ qualifications for college and investigates their outcomes and experiences while in college. Second, it evaluates the impact of the IB program on college enrollment and persistence using rigorous controls for selection into the program. It also takes into account students’ movement through the program from ninth to twelfth grade.

In this report, we investigate two main questions:

- 1) Is there evidence that students in IB programs are more likely to enroll in a four-year college, enroll in a more selective college, or persist in college for two years than similarly high-achieving peers, even when using robust controls for selection bias? How different are these effects if we look at all students who enroll in the IB Cohort

in ninth grade, versus those who persist through the official IB Diploma Programme in eleventh grade?

- 2) How do IBDP graduates describe their college experiences? How well-prepared do IBDP students feel to engage and succeed in college-level coursework? Do IBDP students feel they have the skills and behaviors required to be successful? How do these students manage the challenges faced by first-generation college students in the transition to college?

Chapter 1 provides a rigorous quantitative analysis of the postsecondary outcomes of IBDP students, using a modified propensity score matching approach to examine whether IBDP students are more likely than similar students not enrolled in IBDP to enroll in four-year colleges, enroll in more selective four-year colleges, and persist for at least two years in a four-year college.

In Chapter 2, we turn to our longitudinal qualitative investigation of students' transition to college in order to examine the experiences of IBDP students in college and consider their reports of their capability to succeed in college-level coursework, as well as their broader challenges in the postsecondary transition.

This report paints a relatively positive picture of the success of the IB program in Chicago, but challenges remain. In the Interpretive Summary, we focus on lessons for the International Baccalaureate Organization nationally, as it considers expanding the IB program in urban school districts. We also summarize local implications as the IB program in Chicago continues to improve and expand. More generally, however, we believe this report has broader implications for the national discussion on college readiness, particularly for racial/ethnic minority and first-generation college students.

Chapter 1: College Outcomes of IBDP Students

In this chapter, we focus on three straightforward questions: Do students in the IB program attend four-year college at higher rates; do IB students enroll in more selective colleges at higher rates; and do students stay enrolled in four-year colleges for two years at higher rates than their non-IB classmates? These are seemingly simple questions, but answering them requires struggling with two central problems: first, determining who to count as IB students; and second, determining who to compare them to.

Determining who to count as an IB student is not a straightforward matter. Nationally, the International Baccalaureate Organization (IBO) defines an IB diploma student as a student who is enrolled in the formal IBDP, which starts in eleventh grade in CPS schools. From a student's perspective, the IB program begins when he or she applies and is accepted into the IB program at the beginning of high school. For the first two years students are grouped together into honors classes in preparation for the IBDP in eleventh grade. If we evaluated the IB program from the perspective of the IBO, we would only look at the students who enroll in the IBDP in the eleventh grade. As we will show, this perspective excludes the 38 percent of students who enroll in the ninth-grade IB Cohort but do not subsequently enroll in the IBDP, a group of students for which there are substantially different outcomes.

The second analytical obstacle is even more significant. Students who choose to apply to and enroll in an IB program are clearly different from similarly high-achieving students who do not make that choice. We would expect that these students would be more motivated, have higher levels of parental support, or have other unobservable characteristics that would, in turn, make them more likely to attend college. Academics call this problem "selection bias." Additionally, students who leave the program probably are also systematically different than students who stay, introducing a second source of selection bias. This makes it difficult to disentangle the effects of the program from the effect of being a more motivated or supported student.

Our analysis addresses both of these issues. First, we look at multiple groups of students: We first consider all students who were a part of the IB Cohort starting in ninth grade. We then split these students into those who continued into the formal IBDP in eleventh grade and those who did not. Second, we address the issue of selection bias by finding students who would have had a high likelihood of attending an IB program had they lived in a different part of the city. We used this group of students as a comparison for our IB students to measure the effect of the program. **Our central findings from these analyses are that IBDP students are more likely to enroll in a four-year college, enroll in a more selective college, and persist for two years at a**

four-year college once enrolled. However, these effects are not mirrored for students who do not complete the program, a group that makes up 38 percent of the original IB Cohort.

Prior Research

In the last 10 years there have been several important IB studies that suggest that IBDP participation may improve qualifications for college and college performance, including graduation. A number of studies describe positive postsecondary experiences for students who participate in IBDP (Vanderbrook, 2006; Shaunessy, Suldo, Hardesty, & Shaffer, 2006). More specifically, other studies find that completing the IBDP has positive effects on students' college admissions, college grades, and college graduation rates (Duvel, 1999; Geraghty, 2003; Caspary, 2011; IB Global Policy & Research Department, 2010; Caspary & Bland, 2011). Additionally, Taylor and Porath (2006) found that IBDP graduates from two public high schools in a large Canadian city reported being better prepared for their postsecondary studies compared with their peers who were not in the IBDP.

On the surface, these findings suggest strong, positive effects of IBDP participation on a range of outcomes associated with success in the postsecondary transition. However, these prior studies suffer from at least three substantial shortcomings. First, many of the studies cited fail to account for how students' self-selection into the IBDP may affect the college outcomes of IBDP students. That is, the positive findings of prior studies may be misleading if the strong college outcomes of IBDP students are due less to the IBDP and more to some set of preexisting, unmeasured characteristics of the students (e.g., motivation, intelligence, family support) that set IBDP students apart as *ex ante* different from their peers. Failing to account for this form of selection-bias may produce findings that overstate the benefits of the IBDP substantially. Therefore, to be as accurate as possible, we account for how students enter the IBDP in the design of our analysis.

Second, research on IB tends to focus on students who take the IB exams, which fails to take into account the complexity of the pathways that students take before the exams. In CPS, students begin to be identified as IB students in ninth grade; however, many do not enter the formal IBDP in eleventh grade. In this report, we examine both students who are identified as IB students in ninth and students who enter the IBDP program in eleventh grade. As we will describe in greater detail, because of high rates of program attrition, we pay close attention to finding an appropriate comparison group for both stages of program entry.

Finally, previous research on IB has not fully explored the particular experiences of low-income, racial/ethnic minority, first-generation college students participating in IBDP programs within urban, neighborhood high schools. IBDP students in CPS represent both a racially/ethnically and

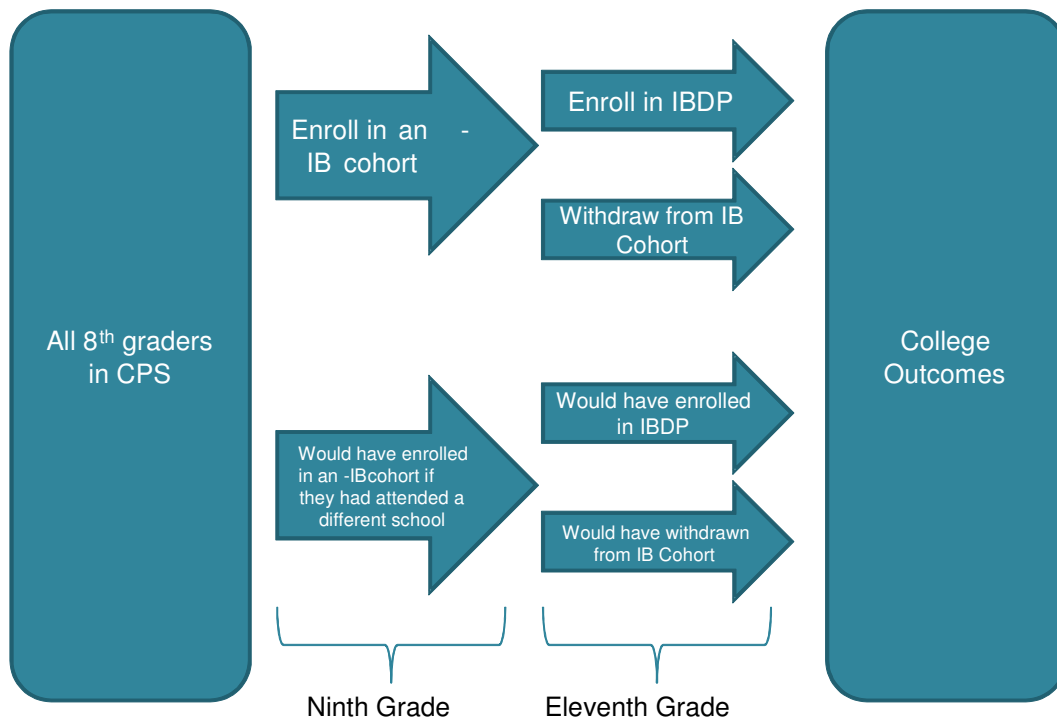
socioeconomically more diverse population than IB has historically served; this additional perspective is critical, particularly given the distinctive challenges that previous research suggests these students face in the transition to college. Taken together, findings from the *Hard Work* report and prior studies of the IBDP suggest that IBDP participation may have substantial effects on students' college prospects. This report provides a rigorous analysis of the effect of IBDP participation on CPS students' college enrollment and persistence and introduces important new findings about how IBDP participation affects the postsecondary transition experiences of low-income, racial/ethnic minority, and first-generation college students in Chicago.

The Complex IB Pathway in CPS

Although the IB diploma program formally begins in eleventh grade, a number of informal school-level practices highlight the importance of examining the pathway students take into the formal IBDP. In CPS, students apply to the IB program during eighth grade as part of the process of choosing a high school. In some instances, students may be enrolled in a formal IB Middle Years program, bridging them into the eleventh-grade program, depending on which high school they attend. Informally, in the absence of middle years' programs, CPS high schools almost universally group ninth-graders who have been accepted into the IB program together in an IB Cohort. From the start of ninth grade, these students take the same ninth- and tenth-grade honors courses together. However, on average, only 62 percent of students in each of these IB cohorts will go on to enroll in the formal IBDP in the eleventh grade.

The informal operation of this unofficial pre-IBDP pathway or track (a practice also found in other schools and districts across the nation implementing IBDPs) creates a group of students that we will refer to as the "IB Cohort," which includes both students who persist in the program through the official IBDP curriculum, as well as students who withdrew from the program before the official programming began. This significantly complicates the analysis of how the IBDP affects student outcomes (Bland & Woodworth, 2008). On one hand, students' experience in this IB Cohort may be beneficial, both in terms of their performance in the formal eleventh- and twelfth-grade IBDP and in terms of eventual college enrollment, performance, and graduation. On the other hand, the substantial attrition within these IB Cohorts raises significant concerns, both about how and why that attrition occurs, as well as how that attrition may lead researchers to overstate the benefits of the IBDP. If again, for example, only the most motivated students in an IB Cohort actually make it to the formal eleventh- and twelfth-grade IBDP, estimates of the IBDP's effect on college outcomes may be inflated by these exceptional students.

Figure 5: The Complex IB Pathway



In order to obtain an accurate estimate of how participating in the IBDP might affect a student’s college outcomes, our analysis must account for how students in Chicago enroll in and advance through the IBDP itself. How we define who is and who is not counted as an “IB student” largely determines the size and accuracy of the measured IBDP effect and has crucial policy implications for the IB program in Chicago. In this analysis, we define three groups of students based on their progress against a series of steps between the spring of eighth grade and the completion of students’ IBDP requirements at the end of twelfth grade (Figure 5). First, we examine the effect of IBDP participation on all students who enter the IB Cohort in the ninth grade, regardless of whether or not those students enroll in or complete the IBDP during eleventh and twelfth grade.² This is the broadest possible interpretation of who could be considered to be in IB, and the results of this analysis represent the outcomes – on average – of

² Because there are no official records of who actually applies and gets accepted to the IBDP in the ninth grade, we take several steps to determine who those students are. First, we identify eleventh-grade IBDP students as those who took six or more semesters of IBDP courses in their junior year, excluding students who attend the IBDP at Lincoln Park High School. Second, we classify IB Cohort ninth graders as those students who were in multiple freshman classrooms with students we identify as eleventh-grade IBDP students (see Appendix C and information on our method of identifying IB Cohort ninth graders).

all of the students who choose to enroll in the program, regardless of persistence. This set of outcomes is important for policymakers and those considering adopting IB programming at a district or school level, as it represents an average effect of the program.

However, our finding that 38 percent of students who enroll in an IB Cohort in ninth grade withdraw from IB before eleventh grade underscores how important it is to consider the outcomes separately for those who persist through the IBDP in eleventh grade and those who withdraw from the IB Cohort before the official curriculum begins. Building on the analysis of the IB Cohort students, we look more closely at a second group of students who enroll in the IB program as part of an IB Cohort in ninth grade but withdraw from the program before eleventh grade. These students are the 38 percent – those who leave IB Cohorts before beginning the official IBDP curriculum in eleventh grade. These students' outcomes are also of particular interest to parents because they help answer a critical question: *what happens to students who start but do not finish IB?* Though the group of students that persists in IB is larger than the group that withdraws, this is still critical information for students and families choosing among high school options.

Finally, we look at a third group of students: those students who begin ninth grade in an IB Cohort and remain enrolled in the IB program through the formal IBDP in eleventh and 12 grade. This group of students represents an important kind of best-case scenario – what students and their families can expect if a student completes the full IBDP. Additionally, in this third group of students, we focus on the effect of completing the IBDP, not of achieving the IB diploma itself (for a discussion of IB diploma pass rates in Chicago, see Box 4).

Box 2: Sample

The sample in this study is based on students who graduated from CPS between 2003 and 2009 but were not classified as being in special education programs or attending alternative high schools or charter high schools. This sample includes 85,663 graduates in 122 high schools. Of the 2003-2009 graduates, 60 percent were female and 40 percent were male. Also, 48 percent of students were African American, 34 percent were Latino, 6 percent were Asian/Pacific Islander, and 12 percent were white. In our analyses of college retention, we further restrict our sample to students who immediately enrolled in a four-year college after high school and include only cohorts 2003 through 2007 (the cohorts for which we can examine two-year persistence rates).

Addressing Selection Bias

In addition to describing and accounting for the complex pathway high school students in Chicago follow through the IB program from eighth to twelfth grade, our analysis must also rigorously address how selection bias may affect our estimates of an IB effect on college outcomes. Admission into IB programs is competitive and based on a combination of students' elementary school grades, seventh grade test scores, a writing sample, and a parent-student interview. From the perspective of school-based IB coordinators, these admissions requirements ensure that a strong, talented pool of students enters the IB program each year. From a research standpoint, these admissions requirements and the fact that IB students had to make an active choice to participate in the program ensure these students are by definition higher-achieving than the average CPS student. They may also be more likely to possess other unmeasured characteristics (e.g., high motivation, strong achievement orientation) when compared with CPS students of similar ability levels who did not enroll in an academically advanced program. Absent an effort to address how the selection of students into the IB program might affect those students' eventual outcomes, we run the risk of attributing a student's success or failure to the IB program, when in fact differences in student outcomes could be due to other factors such as student motivation. To address the issue of selection into IB, we use a variation on propensity score matching to establish appropriate comparison groups of students.

Ordinarily, a single propensity score would be enough, but this analysis is complicated by two factors. First, although students are accepted into the program in ninth grade, the official coursework for IBDP does not actually begin until eleventh grade. This means that although these students take their classes together and have a curriculum designed to prepare them for IBDP, their outcomes cannot be specifically attributed to the IB Diploma Programme, as it is defined internationally. Second, the significant issue of program attrition in the intervening years means that not all students who enroll an IB Cohort in the ninth grade receive the full IBDP effect. In fact, withdrawal from the program could potentially harm their high school trajectories.

Box 3: Two-Stage Propensity Score Matching

We investigated a variety of ways to build an appropriate comparison group for students in the IBDP. In the end, we used a multi-stage propensity scoring method for reducing selection bias in our analysis. First, we reduced our initial sample of CPS eighth-graders to those with qualifications necessary to be eligible for enrollment in IBDP (ITBS Stanine 6 or above).

Using this reduced sample, we estimated the propensity for enrolling in the IB Cohort in the ninth grade using eighth-grade achievement and demographic information, as well as elementary school fixed effects (see Appendix D for more information on what is included in each of our propensity models). Based on this propensity score, we then created a matched sample, wherein we matched each student classified as part of the IB Cohort in ninth grade to a student who had the same baseline characteristics but did not enroll in the program because he or she attended a high school without the IBDP. This comparison serves as the basis for our first outcome model, which measures the effect of simply enrolling in the IB cohort.

Next we created a second propensity score: the propensity for a student enrolled in a IB Cohort in the ninth grade to enroll in IBDP in the eleventh grade. For this second propensity score model, we included an indicator of students' eighth-grade test scores relative to the eighth-grade test scores of other students in the high school they attend, an indicator of their test score relative to other students that were in the elementary school they came from, as well as the average test scores of the elementary school that they came from, compared with the CPS average. We found that students who are likely to be in the IB Cohort in ninth grade are not necessarily the same students who are likely to be in the IBDP by the junior year. Moreover, we found that race/ethnicity operates quite differently for enrolling in the IB Cohort versus staying in IBDP. That is, while white and Latino students are only slightly more likely than African American students to enroll in the IB cohort in the ninth grade, they are far more likely to stay enrolled in IBDP by junior year. Using this second propensity score, we were able to simulate the probability of a student in our comparison group withdrawing from the IB cohort or enrolling in the IBDP in the 11th grade. Thus, we can engage in a second round of matching: students who actually withdrew from the IB cohort with students who would have withdrawn, according to our simulations; and students who enrolled in the IBDP with students who would have enrolled, according to our simulation. These two sets of comparison groups form the samples that we use to measure the effect of withdrawing from and remaining in the IB Cohort.

A Descriptive Look at College Enrollment and Persistence

Before we attempted to rigorously analyze the college persistence rates of IBDP students, we looked descriptively at the college enrollment rates of IB Cohort and IBDP students (ninth and eleventh grade) who graduated from CPS in 2003-2009. We found that the majority of IB Cohort students (59 percent) enrolled in a four-year college and an additional 13 percent enrolled in a two-year college (Table 2). A surprising number of IB Cohort ninth-graders students (29 percent) did not enroll in any college immediately after graduating from high school. Given the qualifications of many of these students by the time they graduated, we would expect them to attend more selective four-year colleges. However, under one-quarter (24 percent) attended a Selective or Very Selective four-year college. Our college selectivity categories are based on Barron’s college competitiveness ratings (see Appendix D for details on Barron’s categories).

The college enrollment patterns of students who were in the IB Cohort as of freshman year look better than those of high-achieving students not in the IB Cohort (49 percent enrolled in a four-year college and 15 percent enrolled in a selective four-year college). Despite different college outcomes, IB students did not have grossly different GPAs or ACT scores. The GPAs and ACT scores of even the IBDP students were only one half of a standard deviation above the population of students who scored at Stanine 6 or above on their ITBS.

Table 2: Descriptive Outcomes

	CPS Stanine 6 or Above (N=13,598)	IB Cohort (N= 2,589)	IBDP in 11th grade (N=1,888)
ACT Composite	19.9	20.7	21.3
Cumulative GPA at the End of Senior Year	2.51	2.49	2.73
No College	36%	29%	23%
Two-Year College	15%	13%	8%
Four-Year College	50%	59%	69%
Selective Four-Year College	31%	40%	48%
Two-year Persistence in a Four-year College (2003-2007 only)	64%	71%	75%

Note: Students included in this table graduated from high school in 2003-2009. Students who were in special education, alternative high schools, or charter high schools were not included in these analyses. Students in the “CPS Stanine 6” group were not in the IB Cohort in ninth grade or in a Lincoln Park IBDP in the ninth grade.

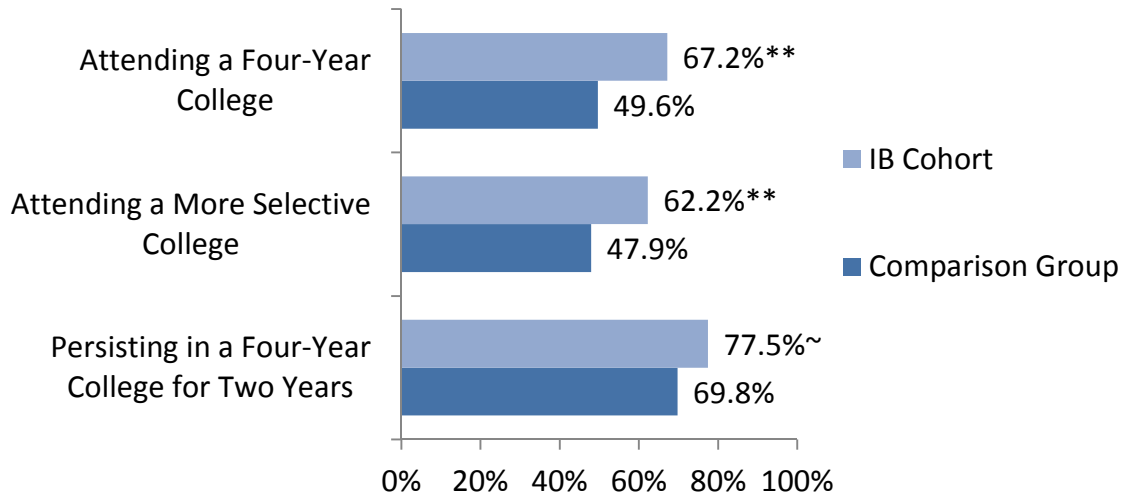
When examining the persistence rates of IB Cohort students who enrolled in a four-year college immediately after graduating from high school (graduating cohorts 2003-2007), we found that the majority (75 percent) stayed in college two years after starting (Table 2; see Appendix E for more information on how we measure college persistence). This rate was 11 percentage points above the average rate of students with high test achievement (64 percent). We also examined two-year persistence rates of IBDP students by the college type. IBDP students who attended more selective colleges had a higher two-year persistence rate (80 percent for those attending a very selective or a selective college) compared with IBDP students who enrolled in less selective colleges (65 percent attending a Somewhat Selective or a Nonselective college).

After Controlling for Selection, IBDP Students Have Better College Outcomes than Similar Students

We run three different set models for our three outcomes (four-year college enrollment, selective college enrollment, and college persistence) on our three sets of comparison groups in an effort to fully capture the different ways in which different types of participation in IB programming could impact students' postsecondary outcomes (see Appendix F for information on these models).

Our first set of outcomes compares all students who enrolled in the IB Cohort in the ninth grade – regardless of persistence – to a matched comparison group. Even in this analysis, when we start to rigorously estimate the effects of IB participation, we find large effects (Figure 6). We find significant positive effects on rates of enrolling in a four-year college, enrolling in a more selective college and staying enrolled in a four-year college for two years (for full results from our models, see Appendix F). That is, students who enrolled in the IB Cohort in ninth grade, regardless of whether or not they remained in IBDP through eleventh grade or completed the Diploma Programme, were still more likely to enroll in a four-year college, more likely to enroll in a more selective four-year college, and more likely to stay enrolled in a four-year college than similar students who never enrolled in the IBDP at all.

Figure 6: Enrolling in Pre-IBDP in the 9th Grade, Regardless of Persistence in the Program, Improves Access to College



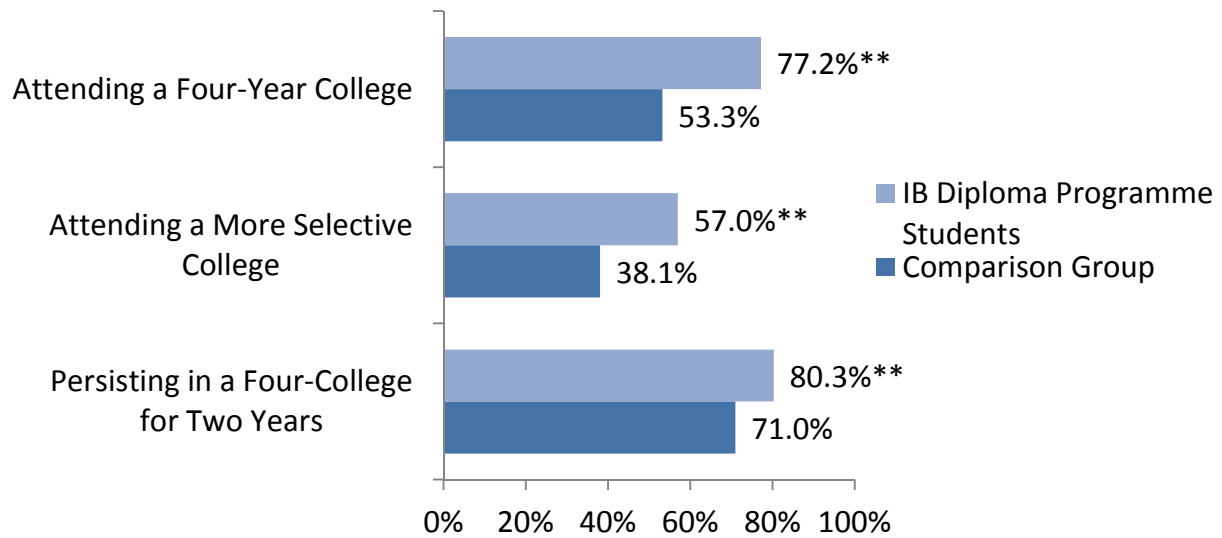
** = $p\text{-value} < 0.01$, * = $p\text{-value} < 0.05$, ~ = $p\text{-value} < 0.10$

Note: Students in this figure graduated between 2003 and 2007. They represent all students who enrolled in the IB Cohort in the ninth grade and a set of matched students with similar characteristics. See Appendix F for more information on the results.

These results are encouraging from a policy perspective, but they are limited in their meaning from a practical perspective. In truth, students who enroll in the IB Cohort are not one group of students, but rather two distinct groups of students: the 62 percent of students who persist in the program through eleventh-grade IBDP coursework and the 38 percent of students who withdraw. These two groups of students might have very different outcomes. We now consider those two groups of students separately to evaluate whether the effects we see above are different depending on persistence in the program.

Our second analysis compares only the students who enrolled in the IBDP in eleventh grade and their matched comparison group. Here, we can see that these students who persisted in the program were driving the effects seen in the broader population of IB cohort students, showing much stronger effects than the IB Cohort students (Figure 7). Students who are in the IBDP as of junior year are more likely to enroll in college, more likely to enroll in a more selective college, and more likely to stay enrolled in college compared to the matched students who did not enroll in the IBDP.

Figure 7: There Are Large Effects for Students Who Stay Enrolled in the IBDP until 11th Grade

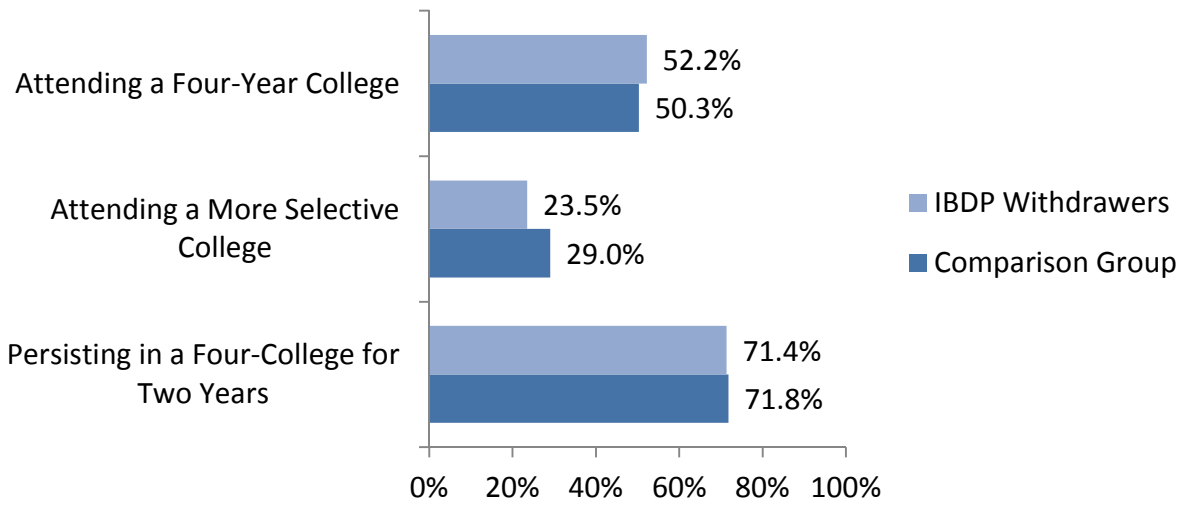


** = p -value < 0.01, * = p -value < 0.05, ~ = p -value < 0.10

Note: Students in this figure graduated between 2003 and 2007. They represent all students who enrolled in the 'pre-IB' program in the ninth grade and then enrolled in the formal eleventh grade IBDP, as well as a set of matched students with similar characteristics. See Appendix F for more information on the results.

Our final analysis compares the outcomes of the students who enrolled in the IB Cohort but withdrew from the program before eleventh grade to their matched comparison group. For these students, we see no significant effects of participating in pre-IB programming. At the same time, it is worth noting that there is also an absence of negative effects for this set of students in relation to their comparison group. It is easy to construct a hypothesis that these students would suffer worse grades test scores and as a result worse college outcomes either as a result or as a cause of their withdrawal from this program. However, this does not seem to be the case (Figure 8).

Figure 8: Positive Post-Secondary Effects Disappear When Looking at Students Who Withdrawed from the Program, Compared to Similar Students



** = $p\text{-value} < 0.01$, * = $p\text{-value} < 0.05$, ~ = $p\text{-value} < 0.10$

Note: Students in this figure graduated between 2003 and 2007. They represent all students who enrolled in the IB Cohort in the ninth grade and then withdrew from the program before eleventh grade as well as a set of matched students with similar characteristics. See Appendix F for more information on the results.

One could hypothesize that higher grades and ACT scores explain the large effects we see for IBDP students. If this were the case, we would see the effects of the IBDP treatment decline or disappear when we include test scores and grades in our outcome models. However, when we do so, we find that strong IBDP effects remain, though the effect of the IBDP is reduced marginally. In fact, IBDP students graduate high school with ACT scores and GPAs that are similar to their respective comparison group. This finding is interesting given that we use no information from students' high school performance to create our comparison groups.

Our most surprising result--the fact that IBDP students are more likely to persist at four-year colleges--requires closer scrutiny to get a more robust picture of the mechanism through which this effect is possible. Research has shown that one of the most predictive factors of college persistence and graduation is college choice itself. Given the wide variety in quality of colleges that CPS students attend, it is imperative to examine whether IB students persist at higher rates as a result of the college choices that they make. There are a number of ways to control for college choice. While our sample is not large enough to nest students within individual colleges, we can control for the selectivity of the college that a student attends, whether that college is in- or out-of-state, and whether the college is public or private. When controlling for these additional factors, we find that none explains away the effect that the IBDP seems to have. That

is, it seems as though IB students are both going to better colleges at higher rates than their non-IB counterparts and doing better at those colleges once there.

Thus far, we have been unable to uncover evidence for precisely how the IB program is able to achieve these tremendous outcomes. One other possible hypothesis is that teachers and/or high schools may be targeting resources to IBDP students, increasing their likelihood of applying to and enrolling in more selective colleges. However, our findings from previous studies seem to indicate that this is not the case. In earlier work, we found that many IBDP students and their teachers seemed overwhelmed by the requirements of the program and lacked additional resources to guide students through the more complex application process of more selective colleges. Finally, findings from this investigation could suggest that the IBDP is serving as a credentialing mechanism, giving college admissions offices in more selective colleges an early indication of which students are likely to succeed in college, based on their IBDP coursework. However, while this theory could explain why IBDP students are more likely to enroll in a four-year college and enroll in more selective colleges, it does not explain why they persist at higher rates once in these colleges.

Worth keeping in mind is the fact that these analyses do not take into account how well a student performed in the IBDP (e.g., grades or IB exam scores), whether the student received a certificate or diploma, or even whether the student was still enrolled in the IBDP in twelfth grade (though we find a rather small dropout rate between eleventh and twelfth grade). These are areas that need to be further examined in future analyses.

Summary

The effects of the IBDP are dramatic. Not only are IBDP students more likely to attend a four-year college, as well as a more selective four-year college, but they are also more likely to persist for two years in a four-year college. These effects exist even when we control for selection by comparing IBDP students to similarly high-achieving students who did not enroll in IBDP. Given the obstacles presented in *Making Hard Work Pay Off*, it is heartening to see that the IBDP is having a significant impact in ensuring that students complete the pathway to college and that students are given a significant boost towards enrolling in a more selective college that is more suited to their academic qualifications. In regards to the persistence effect of the IBDP, it is important to note that similar work being done currently on the impact of taking Advanced Placement or advanced math courses in senior year of high school has *not* found any impact of taking such courses on college persistence, using similar controls for student selection. Indeed, these are the first college persistence effects that have been identified throughout the entire *From High School to the Future* series of reports.

The analysis conducted in this chapter, however, does raise an important issue about program completion within the IBDP in CPS. While these results are impressive for students who complete the program, our analysis indicates that only about 62 percent of students who entered the IB Cohort in ninth grade remained in the IBDP in eleventh grade. It is encouraging that students who withdraw from the program are no worse off than those who never enroll, but the large effect that IBDP seems to have on program completers suggests that program coordinators may benefit from examining how better to retain students within the program and offer this benefit to a greater number of students. These results indicate that the IBDP has effects that go beyond a student's transcript and instead alter the way a student behaves once in college. Though we do not have the ability to rigorously analyze the differences in behavior or experience among college students, our qualitative data allow us to begin exploring what the college experience is like for this group of students.

Box 4: IB Exam Passing Rates and Diploma Rates in CPS

The International Baccalaureate (IB) defines the diploma assessment as a “summative assessment, designed to record student achieving at, or towards the end of, the course of study.” The assessment differs from other exams, such as the Advanced Placement exams, in that it is not a single test that students sit and take at the end of the school year. Rather, it is a longer process that students complete over the course of the year. It involves six subject areas in conjunction with students’ extended essays; theory of knowledge exams; and Creativity, Action, and Service (CAS) requirements. Grades on individual subjects are awarded based on an end-of-year exam graded by IB-selected graders, as well as an internal evaluation and a third component that varies by class. This third component might include labs in a science class or completed works in an arts class. The grades on each of these components are combined to form a single exam score (graded from one to seven, with seven being the highest), which in turn is part of determining a student’s eligibility to receive the IB diploma.

Diploma receipt is contingent upon multiple factors. First, a student must receive a combined score on all exams of at least 24. These points must also satisfy distributional requirements across Higher and Standard Level classes. Moreover, students must also complete their CAS requirement, an Extended Essay on one subject, and their Theory of Knowledge (TOK) exam. Up to three extra points can be awarded based on a student’s TOK exam.

Across the IB Diploma Programme (IBDP), the Diploma receipt rate has been relatively constant over the past eight years, staying at approximately 80 percent worldwide. While there is no published data on the U.S. rates specifically, the Diploma passing rate is slightly lower at 70 Percent for the IB program in the Americas. Over the past four years, IBDP students have maintained an average of 29 total points on the IB exams, scoring an average of 4.6 points on each exam. Worldwide, it seems, passing both individual exams and the wider diploma requirements is the norm.

Chicago IBDP students have a vastly different experience with their exams. Between 2003 and 2008, about 20 percent of diploma candidates in CPS received a diploma, significantly lower than the overall average of all IBDP students. Moreover, the average individual test score received on an exam for CPS IBDP students is 3.5, a full point less than the IBDP average as a whole.

	English	Math	Science	Social Science	World Language	Arts
Average Score Worldwide	4.0	3.26	2.71	3.35	3.96	3.43

As discussed in Box 4, it is unclear whether these low exam scores can be attributed to lack of content knowledge or to students not making a concerted effort to do well. Regardless, the fact that we see significant effects of IBDP participation despite these low diploma completion rates indicates that it is not the diploma itself that confers the IBDP benefit.

Chapter 2: IBDP Students in College

The analysis presented in the previous chapter suggests that IB students were not only academically prepared for college, but also successfully persisting in college. This raises questions about how these students experienced the transition to college. In this chapter, we draw on extensive interviews with IB students from our longitudinal study of the transition to college to explore how well prepared IB students felt to engage and succeed in college coursework and to understand how they attributed their preparation.

Much of the research on closing racial gaps in college attainment focuses on minority students' low levels of academic achievement. The *CCSR From High School to the Future* series shows time and again that closing the racial gap in postsecondary attainment depends on improving minority students' academic qualifications. The analysis presented in the previous chapter strongly suggests that the IB program in Chicago has managed to do this. Research that looks at minority students' transition to college identifies four main barriers: poor academic preparation for college, limited noncognitive skills, limited resources for positive identity formation, and distinctively low levels of social capital for college-going. In this chapter, we organize our analysis around the following four areas:

- First, we examine how academically ready IB students felt to engage and succeed in their college courses (Academic Preparation).
- Second, we explore the extent to which IB students feel ready to manage new academic and developmental demands in the college transition. We explore how IB students describe the academic behaviors and mindsets underpinning their academic performance in college courses (Academic Behaviors and Mindsets).
- Third, we investigate the extent to which IB students developed academic identities that reinforced their beliefs that they belonged and could be successful on college campuses (Identity Formation and Belonging).
- Finally, we consider whether IB students were well-equipped to navigate the institutional demands of college campuses, particularly surrounding registering for courses and developing relationships with faculty (Social Capital and Institutional Support).

In each of the following sections, we briefly review the literature on low-income, minority, and first-generation college students' transition experiences across these four domains. Relying on our analysis of extensive interviews with IBDP students in high school and college, our qualitative analysis focuses primarily on the extent to which these students felt their participation in the IB program prepared them to engage and succeed in college-level work (see Box 5 for a description of our qualitative sample and methods). We rely on a general framework

for understanding college readiness that distinguishes between academic content (which is subject-specific); core academic skills (such as writing, critical thinking, or problem-solving, which cut across subject areas); academic behaviors and mindsets (sometimes called noncognitive skills, such as organization or study skills that are not readily measured by cognitive tests but are developmentally necessary for academic success); and college knowledge (understanding of the complex college admission process, college norms and culture) (Conley, 2007; Roderick, Nagaoka, & Coca, 2009).

Box 5: Sample and Methods for Qualitative Analysis

Data for the qualitative analysis in this chapter are drawn from interviews conducted with our longitudinal qualitative sample of 105 students in CPS. Specifically, this analysis focuses on a sub-sample of 25 students in the International Baccalaureate Diploma Programme (IBDP). Of these 25 students, 19 enrolled in four-year colleges -- eight attended very selective colleges, seven attended selective colleges, and four attended somewhat selective or nonselective colleges.

Our qualitative sample of IBDP students mirrors the racial/ethnic diversity of IBDP students across the city. Of the 25 students included in the sample, 11 (44 percent) were Latino, 10 (40 percent) were African American, and two (8 percent) were Asian and white, respectively. Notably, though programs for high-achieving students in CPS tend to serve a much higher proportion of females than males, the design of this study explicitly over-sampled males in these programs, making the sample nearly gender-balanced, with 40 percent of the sample being male and 60 percent female. These students also left high school with extremely strong qualifications for college, with 17 (68 percent) having access to a very selective college; three (12 percent) having access to a selective college, and 5 (20 percent) with access to a somewhat selective college. The students were sampled in roughly equal numbers from three high schools in Chicago: one on the far South Side with a nearly 100 percent African American student body; one on the Southwest Side serving mostly Latino (Mexican) students; and one on the Northwest Side, serving a diverse group of Latino (most of whom were Mexican and Puerto Rican), African American, and white students (the vast majority of whom were Eastern European and first-generation immigrants). The high schools themselves were slightly higher-performing in terms of academic achievement and college-going rates than the system average.

Interviews for this project were in-depth and followed semi-structured interview protocols (Weiss, 1994). Interview transcripts and fieldnotes were analyzed using typological analysis (Hatch, 2002; LeCompte, Milroy, & Preissle, *The Handbook of Qualitative Research in Education*). Data for the high school and college interviews were each coded in two stages: First, researchers read and coded interview transcripts categorically, sorting data into broad types of information (e.g., the perceived value of the IB diploma, students' descriptions of experiences in college English classes, or their reports about registering for college courses); second, they followed a more intentional, focused coding approach that tightened the focus on particular themes and supported an on-going process of data collection and analysis. Researchers re-read interview transcripts within these broad categories and coded data according to emerging themes (Emerson, Fretz, & Shaw, 1995).

Thematic codes were used to construct a series of qualitative data arrays, summarizing students' high school and postsecondary experiences across multiple dimensions, including academic preparation, work habits and academic behaviors, and social and institutional integration. From these summaries, we developed a framework for classifying IBDP students' high school and postsecondary experiences. We used this framework to analyze and describe each case – each IBDP student in our qualitative sample – individually. This analytical framework allowed us to explore and describe patterns across cases in detail and led to several early findings surrounding IBDP students' perceptions about their experiences in the IBDP, their preparation for college-level coursework, and the relative importance of college choice among IBDP students in CPS.

Academic Preparation

Previous research consistently finds that many low-income, minority students enter college substantially less academically prepared than their white peers (Bowen, Chingos, & McPherson). Studies suggest that racial differences in academic preparedness are primarily a function of the typically very low-achieving, racially segregated high schools that low-income, minority students attend (Massey, 2006). The racially segregated, low-achieving high schools in which minority students are overwhelmingly concentrated provide those students with consistently inferior educational experiences, characterized by higher levels of exposure to family and environmental stressors, particularly disorder and violence (Massey, p. 407). In addition to greater exposure to environmental stressors during high school, prior and ongoing research from the Consortium on Chicago School Research's (CCSR) *From High School to the Future* series suggests that, among students with similar incoming academic qualifications, black and Latino students' access to rigorous academic courses during their senior year of high school is constrained by the types of schools they attend, indirectly acting as a brake on minority students' college access and enrollment (Roderick et al., *forthcoming*). This finding is particularly important, given that previous studies have repeatedly underscored the importance of the quality of students' high school courses to their postsecondary outcomes.

Research done for the US Department of Education (Adelman, 1999, 2006) has consistently found that "the intensity and quality of one's secondary school curriculum" is the single strongest influence not only on students' college access but also on college completion. This research demonstrates the importance of the academic rigor of students' high school experiences--over and above the predictive power of standardized test scores (e.g., SAT, ACT) and high school GPA--in understanding and explaining patterns in college enrollment, persistence, and completion (Adelman, 2006). Recent research by Arum & Roksa (2011) argues that racial disparities in elementary and secondary education help to explain persistent racial gaps in students' scores on tests of critical thinking, complex reasoning, and analytical writing in college. As Arum & Roksa note, minority students score lower on tests of critical thinking, complex reasoning, and analytical writing at both the time of college entrance and again two years later; this suggests that patterns of academic preparation in high school may have lasting effects on students' performance in college, even as colleges themselves continue to exert a powerful influence on student learning.

Overall, the IBDP students whom we interviewed generally felt that they were academically well-prepared to engage and succeed in college coursework. Our analysis indicates three separate areas of academic preparedness that were important for students. First, students felt that the IB program provided them with a strong foundation for college, both by building core academic skills (e.g., critical thinking, analytical writing) and by transmitting specific content

knowledge (e.g., literary forms, world languages). Students were particularly confident about the strength of their analytical writing skills. Second, although the IBDP students whom we interviewed were generally positive about their preparation for college-level math and science courses, a nontrivial minority – particularly those students who entered math-heavy undergraduate professional programs such as engineering – felt they lacked sufficient background in advanced math (e.g., calculus) and science (e.g., physics). Finally, the IBDP students whom we interviewed consistently described their own academic behaviors – their motivation, work habits, organization, and time management – as strengths. Overall, the story of IBDP students’ assessment of their academic preparedness for college is extremely promising. In this chapter, we describe each of these findings in detail.

Analytical Writing Skills

IBDP students were engaged in English courses and writing assignments in college, largely without difficulty. Many of the IBDP students whom we interviewed explicitly credited their work in the IB program for developing their analytical writing skills when discussing their readiness to tackle college writing assignments. Acacia, an IBDP student who enrolled at a private, selective four-year college, recalled a specific IBDP English teacher she had in high school:

[Do] you remember Ms. Stuart? Her class has really prepared me for college English ... I don’t mean to ring my own bell, but I’m such a good writer, thanks to her.

Acacia attributed her success to her experience in IB, explaining that she didn’t think she would have been prepared for college had she been in “the general population” at her high school – meaning the non-IB track. “If I was not in the IB program,” she laughed, “I wouldn’t be prepared ... the IB program definitely prepared me.” Similarly Jennie, an IBDP student who enrolled in a local two-year college, said that she felt IBDP had prepared her well for her English and Communications courses in college. She explained that, in her communications course, “[they] [were] going over [the same things as in high school]... some of the things, it’s just like, ‘Oh, I already knew this!’” Grady, an IBDP student who attended a selective public university, echoed Acacia and Jennie’s sentiments when it came to writing: “If I was a general student” – referring, like Acacia, to the non-IB, track in his high school – “I wouldn’t have had all the work that ... I had to do.”

In a number of cases, former IBDP students were underwhelmed by what they saw as less challenging, often shorter, and more infrequent writing assignments in their college classes. Students repeatedly described college writing assignments as easy, brief, and not requiring a lot of work. Some expressed surprise at their college classmates’ reactions to what IBDP students saw as excessively short, easy writing assignments. Gizela, an IBDP student who enrolled at a

selective public university, described college classmates “freaking out, writing two-page essays. I’m just like, ‘What are you doing?’” she laughed. “It’s just a two page essay – don’t worry about it!”

Even those students who faced a greater writing demand in college felt prepared to succeed. Moises, an IBDP student who attended a private selective college, explained that he did a fair amount of lengthy writing – papers of 10 pages or more – for his college English courses, but felt that he’d been well-prepared by IB to write. Assessing his writing ability in college, Moises describes: “I find myself being able to write easier,” Moises offered. “I’ve matured as a writer over time,” he said – “[and] I’m getting better grades,” he added. During his first semester at college, Grady told an interviewer that he was doing a lot less writing in college than he did during high school in IB. “I only have one class that really requires writing,” he explained. For that class, he continued, “we have nine 500 word essays,” which he said offhandedly, “is nothing.”

Advanced Mathematics Skills and Preparation

IBDP students whom we interviewed generally had strong, consistently positive feelings about how well-prepared they were for college-level English courses and writing assignments. Their perceptions of how well-prepared they were for college-level math courses varied substantially, depending on students’ placement in college math courses. Broadly, students who were enrolled in off-level or remedial college math courses were underwhelmed, frequently describing those classes as repetitive and uninteresting. On balance, students who enrolled in on-level college math courses, felt prepared to meet the challenge of more complex and more accelerated courses.

As students explained, off-level or remedial courses were typically dominated by review of material these students had covered in IB high school math classes. MoSean, an IBDP student who enrolled in a local four-year, nonselective college, told an interviewer that he had been placed into a lower-level math course as a result of a low placement exam score. He described the content of the course as “a little algebra, some statistics . . . stuff like that.” When pressed to elaborate, he explained that much of the course material was “[stuff] we’ve already done. Some of it is just review,” he continued – “when I see it, I recognize it.” Because of a unique policy at the college he attended, MoSean was able (if he chose) to test out of a course at any time using an online exam system (provided he was able to score above an established threshold). However, other students’ course placements were less flexible.

Moises also felt underwhelmed by the challenge of his first-year college math courses. Like MoSean and Diego, Moises felt that his math course was not particularly challenging. Although he did not specifically describe the content of the courses as review, Moises pointed out that

his first-year college math courses required relatively little attention on his part in order to do well:

For my math class . . . I don't really feel the need to take notes, [because] it's all right there in the book... It's pathetic. So, I normally sit there and see how [the professor is] doing it, [because] maybe I'll pick up on it. And if I don't understand how [the professor] got [it], I'll write that down, even if it's in the book, you know?

While off-level or remedial math courses were perhaps too easy for most IBDP students, IBDP students who were placed into on-level college math courses experienced those courses as more appropriately challenging. Grady explains that the demands of his college math courses were more complex than the demands of his IB math classes had been. Grady observes that, in college “we don't have the international focus that we did in high school,” referring to the consistent use of metric measurements throughout IB math classes. But, more significantly, he explains,

[College math is] a lot more about ... not just computation, but explanations, too. They're huge on interpretations – it's one thing to get an answer, [but] what does the answer *mean*? What do derivatives mean? So, that's something that I never had to do in high school, really.

In addition to the greater complexity of problem-solving and interpretive tasks in college math courses, other IBDP students highlighted the accelerated pacing of their college math courses as challenging but manageable. Elena, an IBDP student who enrolled at a large, selective public university, explained that her college math courses “moved pretty fast” and covered “info that [we] didn't learn in Math Studies.” She went on to say, “It takes time to understand the concepts” being covered.

Struggles with particular content deficits in college-level math courses were most acute among the small handful of IBDP students whom we interviewed that enrolled in undergraduate professional programs, such as mechanical and aeronautical engineering (see Box 6). To a greater degree than the students quoted above, this smaller group of students struggled with the unfamiliarity of key mathematical concepts and background. Though these content deficits were significant, these struggles were not representative of the experiences of students whom we interviewed. On balance, the IBDP students we interviewed felt their preparation for college-level math courses was adequate, although the quality of their experiences in those courses varied substantially based on students' course placement (e.g., remedial versus on-level).

Box 6: Math for IBDP Students in Undergraduate Professional Programs

While some students like Grady and Elena faced a manageable challenge in tackling the greater complexity of problem-solving or the accelerated pace of college math courses, a much smaller number of students faced a more problematic struggle with deep, concrete content deficits, particularly around pre-calculus and calculus concepts. These students described feeling unprepared to meet the demands of college math and science courses, primarily because they felt they had not been sufficiently exposed to pre-calculus and calculus materials in high school, in contrast to many of their college peers. Hector, an IBDP student who enrolled in a selective private university, described struggling to get up to speed with his required college math courses. As Hector explained, he felt unprepared for the content in his first-year math courses, in part because it seemed to him that his professors assumed (although they did not require) that students would have a background in calculus concepts. Without a strong grounding in those concepts, Hector explained, it was difficult to get on top of the work in his math courses:

Apparently, they don't expect you to have knowledge of calculus, but I guess so many students do, [that] [the university] act[s] like, 'Oh well, everybody [already] knows [calculus] . . . It was definitely harder at first to get used to everything.

Hector pointed out that his IB Math Studies courses didn't provide sufficient background in calculus concepts for him to feel confident in his college-level math courses. Math Studies, as he explained, covered "a little bit of geometry, a little bit of, like, Algebra II, a little bit of calculus, a little bit of stats...it was just all combined." Rafael, another IBDP student who enrolled in a selective, private college, explained that the little bit of calculus they had covered in IB during high school had been helpful, but it was not enough. Rafael struggled with the transition to college math as well, explaining how his high school and college math classes overlapped, to some extent:

[At] the beginning [of his college math course], [the material] was from what we learned from [IB math teachers], like, her introduction to calculus that she did with us . . . That was familiar and it helped out a lot. Like, just, even though she didn't really go into depth with it, it still helped in trying to understand the way [my college professor] taught it.

Despite having covered some of this material in IB during high school, college-level math remained a struggle for Rafael. He continued to struggle with trigonometry functions, an area in which he felt many of his college classmates had more background knowledge.

Academic Behaviors and Mindsets

Thus far, our analysis of the experiences of IBDP students in college has made a strong case for the academic capabilities of IBDP students from Chicago in college: students felt comfortable, even confident, engaging in college-level writing, having a nearly universal feeling that the core academic skills and academic content they were expected to master in order to complete their IB coursework in high school had prepared them exceedingly well for the demands of college-level analytical writing. IBDP students' experiences in college-level math courses appeared to vary widely based on course placement – students who were placed in remedial courses found the work to be repetitive and uninteresting; students who enrolled in math-heavy undergraduate professional programs felt overwhelmed by unfamiliar concepts, new content knowledge, and weak skills.

Nationally, the discussion of what it means to be “college ready” is frequently limited to a focus on mastering content and skills. However, researchers across multiple disciplines are increasingly focusing on an additional set of competencies, sometimes called noncognitive skills, metacognitive skills, academic habits, or academic mindsets. Previous research suggests that college courses differ substantially from high school classes in terms of the pace, emphases, and goals; this research finds that to be successful in college courses, students must adapt to new demands:

[College instructors] expect students to make inferences, interpret results, analyze conflicting explanations of phenomena, solve complex problems that have no obvious answer, reach conclusions, offer explanations, conduct research, engage in the give-and-take of ideas, and generally think deeply about what they are being taught (Conley, 2007: 6; cf. National Research Council, 2002).

These are competencies that are difficult to measure directly on a cognitive test but that underpin students' academic success, such as study habits, help-seeking behaviors, organization, and time management. Noncognitive skills include:

A range of behaviors that reflect greater student self-awareness, self-monitoring, and self-control – study skills, work habits, time management, help-seeking behavior, and social problem-solving skills. Meeting the developmental demands of college requires behavioral, problem-solving, and coping skills that allow students to successfully manage new environments and the new academic and social demands of college (Roderick, Nagaoka, & Coca, 2009 p. 190).

Here, we refer to these competencies as academic behaviors and mindsets. These behaviors and beliefs play a substantial role in learning and can be critical in the transition to college,

particularly for the racial/ethnic minority, low income, and first-generation college students served by the IBDP in Chicago.

When discussing how or why they felt prepared for college, the IB students whom we interviewed did not limit their descriptions to competencies like writing ability or knowledge of mathematical principles. Rather, they discussed a wide range of behaviors and beliefs that they felt were critical to their success. We have categorized these competencies into three themes that students consistently cited as important: organization and time management skills, help-seeking behaviors, and motivation. IBDP students generally described themselves as highly motivated and goal-oriented students; many of them described how deeply they had internalized strong achievement orientations. They were, in large measure, confident in their abilities and excited by the challenge of becoming successful college students.

Even so, for many students, the demands and expectations of college were substantial. Students frequently credited their experiences in IB with having accustomed them to working hard and managing a large workload; however, many students also explained that the transition to college presented specific challenges in the form of a simultaneously larger workload and fewer, more dispersed, and correspondingly more consequential assignments. IBDP students described working to adapt the strategies and approaches that had made them successful in high school to meet the added challenges of college-level work – learning, in effect, to work not only harder, but also smarter. In addition to individual-level strategies that IBDP students described deploying to meet these new challenges, the IBDP students whom we interviewed also underscored the importance of exploring and mastering a range of novel ways to seek help in college, including reaching out to professors, teaching assistants (TAs), and peers for support.

Organization and Time Management

Many of the IBDP students whom we interviewed described possessing strong organizational and time management skills. These skills were important, particularly to our IBDP students – who were all first-generation college students – because they played an important role in helping students eventually master the workload and pace of college courses. IBDP students described specific ways in which the workload and pacing of college courses were different from their IB classes in high school, but almost always described adapting to these new demands as a manageable challenge. Students noted in particular that college assignments were often fewer in number, spread out across the term, and frequently of greater weight in determining grades. IBDP students also noted that, in many cases, college professors communicated due dates and expectations for assignments less directly, putting the onus on students to follow the syllabus closely and complete assignments – including major projects, papers, and exams – on their own. As Jennie pointed out, in college “the [professor is] not

constantly nagging you” about your work, as her high school teachers might have done. “If it’s in the syllabus,” she explained, professors “[are] not going to keep reminding you that it’s due.” Ultimately, she told an interviewer during her first term at college, it’s the student’s responsibility: “You should be looking at the syllabus and keeping up with it,” she stated flatly. Kenya echoed Jennie’s point:

I just realized that [in college], I have to step up and do everything— this is my responsibility, and my life, and my education. Nobody is gonna do it for me . . . So, I learned. So far, it’s been pretty cool.

As Jennie and Kenya pointed out, taking full responsibility for keeping abreast of what work was assigned and when it was due, was one challenge; organizing the work was another. Not all of the IBDP students whom we interviewed believed they had particularly strong organizational and time management skills coming out of high school. In the IB program, many students felt challenged to keep up with the constant volume of work on a day-to-day basis. For many students, the pacing and independence of college workloads required a different approach. During her first term at college, Kenya laughingly admitted to an interviewer that she had been much less organized in high school than she was in college.

In high school, [my strategy] was “Oh my God, panic!” [Laughing] . . . I mean, in high school, I had no study system whatsoever, at all . . . and that just wreaked havoc on everything. Now [in college], having that planner really works. I mean, I had [a planner] in high school, but I’d have so much stuff in it, I couldn’t read it! . . . Here [in college], I actually make myself sit down and plan out my day, how I’m gonna do this thing – because if I don’t, I’d probably be like, “Hah, I’ll just do whatever.”

A number of other IBDP students, like Kenya, described adapting strategies they had used in IB during high school to meet the new challenge of organizing and managing their college workloads. Briana, an IBDP student who attended a selective, private college, highlighted the additional problem of not only keeping up with assignments and due dates, but actually beginning work on them in time to complete them. Briana underscored how much reading she had to do, particularly for biology and chemistry courses she took during the same term. Reflecting on the amount of work (and reading in particular) she was juggling, she observed that “it’s kinda hard, adjusting from high school to college.” When pressed, she elaborated: “I didn’t schedule my time as I should have.” She continued laying out the strategy she developed mentioning that she used a day planner to get organized, manage her time, and keep up with all of her reading:

I have these little time things . . . and it works so much better. Cause, it’s like . . . [the planner] like splits your day out each hour and so it’s much better. It helps you manage

your time. So, I didn't have to do that in high school though. 'Cause everything . . . I don't know . . . it was just different. Now, you just really have to be [organized] . . . there's more reading now. That's the thing: more reading now.

Like Briana, during his first term at college, Grady also quickly developed a strategy for managing his time and workload. Grady described his strategy, which reflected the additional challenge of balancing his coursework with his involvement in a business fraternity, to an interviewer:

Well, I kind of try and spread [my work] around, so I'm not always doing homework that's due the next day. If I know I have, like – Tuesday's my busiest day, so I know I don't have much time to do homework on Tuesday night ... so I try to do homework on Monday, then maybe do [more] Wednesday.

In addition to keeping up with the volume and pace of work in college, and balancing those challenges with involvement in student activities and campus organizational life, many of the IBDP students whom we interviewed also described using specific strategies for completing assignments, which they adapted from their experiences in IB during high school. Leah, an IBDP student who attended a selective, private college, described a strategy for managing her work and allowing herself enough time to fully engage with an assignment and complete it to her satisfaction. She described to an interviewer how she began to strategize a modified approach to working on assignments in her second term at college.

What I tried to do [in high school]... if I knew there was an essay due, I'd try to start it before, [but] I didn't *really* start it. Like, I would start thinking about it without doing it . . . but [now, in college], I want to try to actually do it before.

Leah explained that in high school she would begin thinking about and working over an assignment well before it was due, to give herself time to develop her approach in advance, whereas in college, she shifted not only to planning, but to working on and writing papers in advance, to give herself more time to develop and edit her writing. Acacia, introduced above, also described a similar, if more detailed, approach to time management and assignment planning. She explained her strategy for writing papers in college, which she called "The Plan." Acacia's plan was adapted from the writing process she'd been taught by her IB English teacher during high school: research, planning, pre-writing, and finally drafting. Acacia explained how she uses "The Plan:"

I can't just have the topic and just start writing. You know how some people just start typing, then they'll edit later? That's not me. I have to plan *everything*, and it's basically like brainstorming. And I just follow it to a T. And I think that's why I'm such a good writer – not to toot my own [horn].

Acacia continued, laying out the details of her planning:

Right, so I do my research first. And then I read over it . . . blah blah blah blah . . . and then I think I create a writer's board to . . . like, you know, [determine] what my stance is gonna be or whatever. Then, [I] think [of] the thesis and [bam]: like that!

The IBDP students whom we interviewed highlighted the challenges of adjusting their own organizational and time management strategies to meet the increased demand of college work. As college work became simultaneously longer, more time-consuming, and more widely distributed across a term, students relied heavily on organizational and time management strategies adapted from and developed out of their experiences in IB. Many students, like Hector directly credited the experiences in IB with sharpening their skills in managing a heavy, demanding workload:

It's not like I am really overwhelmed [in college]... You know, the IB program really helped me [in] managing the amount of workload that all [my college] classes give me.

Hector also observed about himself that he still had some poor habits that were holdovers from high school, highlighting what he described as a tendency to procrastinate, in particular. However, like many of our IBDP students, Hector also said that his work habits have changed over the transition to college: like many of his IBDP peers, he reflects carefully on the shift from the strategies and approaches that worked for assignments IB during high school to a more sophisticated set of strategic behaviors required for success in college courses. In particular, Hector underscores how help-seeking – reaching out to professors, TAs, and classmates – became much more critical to his success in college.

Help-Seeking

In addition to relying on time management strategies adapted from high school, a number of the IBDP students whom we interviewed also described relying on peers in college – often creating informal partnerships or study groups with other students to work on concepts or questions they were struggling with. MoSean described linking up with another student in a computer science course during his first term at college. As MoSean described it to an interviewer, the two students made a casual pact to call one another for help if they got into difficulty with the course material.

[There's] a guy in my [computer science] class – we exchanged numbers, 'cause we sit near each other, and we help each other out with understanding what we're doing [during class]. So, we exchanged numbers in case we ever needed the help for homework or something.

Other IBDP students relied on relatively more elaborate arrangements for studying together with other students in college in order to get help when they needed it. Moises, introduced

above, described what he saw as the important perks of studying with other students in college. Although he noted that he and his IBDP classmates had used study groups occasionally in high school (primarily to prepare for the IBDP exams), college work required a different kind of attention and engagement, which, Moises reflected, study groups helped him cultivate. Working with other students, he explained, sometimes helped him maintain his focus for longer than he otherwise might; studying together with classmates, he also noted, often challenged his perspective and expanded his thinking on a given issue or question. He described a small group of classmates he occasionally worked with during his first term at college:

[We've had] pow-wows a couple [of] times. That's about it. It's very beneficial. You know, studying alone [is] like, you study for a little bit, then you just get [bored]. I study with a lot of people, and. . . you mix ideas and get ideas from each other, and, it seems to be a lot easier for me to . . . study. And, it's also more successful. I was more successful on the test [afterwards].

Other IBDP students whom we interviewed relied less on their college classmates for help and, instead, sought out more formal resources, taking advantage of office hours for professors and teaching assistants and utilizing tutoring services provided by their colleges. A number of IBDP students observed that their TAs – particularly for college math and science courses – were available and generally helpful when they had questions or weren't able to understand a concept or question. Carl, an IBDP student who enrolled at a selective, private college, described relying on TAs for help in a calculus class where he was struggling to keep up with the material during his first term at college. Carl told an interviewer that he often went to his calculus TAs when he was confused: “[you] ask ‘em questions, and then they’ll help you answer,” he said simply – adding that the TAs’ help was “not straightforward,” meaning that they weren't just giving him answers. When pressed, Carl explained that he didn't feel it was difficult to find help when he needed it, observing that “you just need[ed] to email the TAs or meet with the [professors] during their office hours,” to get the help you required. Carl continued, explaining that his TAs were really helpful – “they really explain a lot,” he said. “When I have a question,” he told an interviewer, “they always come to me, and then I ask them, and they just show me what to do during my labs.”

Hector had a similar experience with seeking out help in a particularly challenging chemistry course he struggled with during his first term at college. Hector explains to an interviewer that, in addition to relying on his own strategies for managing his time and the workload associated with the class, he became more adept at using his professors, TAs, and classmates as resources. He described his professor as an excellent teacher, but also explains that he strategically sought out help from the TA as well:

I go to his office hours . . . he also gave us his phone number and his email, if we have any questions, and he pretty much gets to us right away. . . I go to his office

hours, the discussion, if I have any questions, I go to him. But we also have our peers . . . the day before the homework is due, or before the lab is due, we meet and talk about what we're missing, or anything that we don't understand. So we have the professors, we have the TA, and then we have the peers.

Beyond professors and TAs, a number of IBDP students also noted that when they struggled they had access to tutoring services on their college campuses. MoSean described "a little room with a tutoring lab" at his college, "where you can go to for help with some classes." Interestingly, however, MoSean, like a number of other IBDP students who readily went to professors, TAs, or classmates for help, largely shunned the tutoring center. "I've heard of it," he explained warily, "although I've never went, because I haven't really felt where I needed it." He offered weakly, "I know they have to do it." IBDP students' preference for seeking help from professors, TAs, and peers with whom they had good, if often informal relationships over reliance on formal tutoring centers and services points to a crucial dimension of their broader experience in the college transition.

Analytically, among the IBDP students whom we interviewed, the primary distinction between assistance from faculty, teaching assistants, and peers from assistance received through a tutoring service or help center is the degree of personal connectedness implied: the help they sought from adults and peers was embedded in social relationships. The help that campus tutoring services and help centers provide was in some instances more difficult for students to access, in part because seeking help at those institutional sites adds an additional layer of institutional bureaucracy to the task of asking for assistance – itself an interpsychically freighted exercise for many low-income, minority students who may be already be conscious of the ways in which their race and class affect others' perceptions of their intelligence and capability as students. The preference of the IBDP students whom we interviewed for direct contact with college faculty, teaching assistants, and their peers over tutoring services may suggest that locating and activating these distinctively relational forms of help-seeking comprise a key part of negotiating the college transition for low-income, minority, first-generation college students.

IBDP students' ability to seek help from peers and mentors in college is perhaps not surprising, given their experiences in high school. It appears to be very clear that IBDP students developed a strong belief in the necessity of having and relying upon an academic community during their high school years in the program. In IBDP students' interviews in high school, a strong sense of community – both among peers and between students and teachers – emerged in each program. Students often talked about their cohorts as a family and stressed that the IB program often felt like a "school within a school." Given their limited interaction with students and faculty outside of IB and the demands of the program, students came to rely on the IB community as a support network. For many students, this shared experience manifested in a "pact" of sorts, often providing each other with homework assistance, encouraging classmates

to finish overwhelming assignments, and offering general personal support. MoSean admits “a few of us have considered leaving, and we’re all like, ‘No, we’re not going to let you leave,’ you know, we try to encourage each other to stay. We help each other out with homework if we know that there’s a risk of us failing a class. We might encourage the other person to do the homework, even though they might not feel like doing it or whatever...” Grady also described occasions (particularly toward the end of his senior year) when his friends convinced him to do his work when he did not feel like completing it. Many students insisted that this level of support had a positive impact on their grades.

The sense of community among IBDP students was articulated in other ways beyond feeling like a family; according to IBDP students, the longevity of the program also created a different dynamic with teachers. The rapport built with teachers during the course of the program fostered a sense of mutual respect in the classroom and allowed teachers to push IBDP students outside of their comfort zone. Comparing IB teachers to those who taught regular and honors courses, Sakaarah commented,

All of our teachers are like over achievers. It’s like the regular classes and the honors classes their teachers are probably pretty good teachers. I wouldn’t know...But our IB teachers know the potential that we have and what we can do. And they’ve seen our scores and they are like ‘you can do this, you can do this’... And then when we get lazy, it is like ‘why are you getting lazy.’ So, I guess...my teachers are a little rough especially rougher than those in honors or regular classes. [I: So you think they push you guys harder?] Yes, they do. And they give us more work and they expect more of us. So, that’s all factors that lead to why they are harder on us.

Clara also noted the dedication and support she felt from IB teachers: “...they try to get your hopes up and like raise your enthusiasm. Like they don’t give up on us, like some people would.”

Though it is clear from our analysis of students’ high school experiences that this sense of community among peers as well as adults was a critical component of how the IB program developed in Chicago, it is not entirely clear how this experience of coming from a tightly knit academic community might have affected them in college. A case could be made, for example, that this strong and readily available support system in high school might have prevented IBDP students from learning how to seek help on their own and therefore been detrimental to them in college. More neutrally, this experience could simply have been a notable artifact of their experience in high school: important in the past, but irrelevant in college. It could also be the case, however, that this experience in high school served to teach students the value of having an academic community and strong support from peers and adults for their own learning, as

well as the skills necessary to do so. Our analysis of IBDP students in college does not present a single clear answer to this question, but the help-seeking behaviors these students demonstrated in college suggest that students valued the support and perspective provided by an intellectual community.

Identity Formation and Belonging

Previous research on racial/ ethnic minority students' postsecondary transitions suggests that low-income, minority students – like those IBDP students whom we interviewed – may require additional competencies to manage complex and often imperceptible forms of psychosocial pressure associated with the racial climates of college campuses. These pressures, often captured under the broad rubric of stereotype threat, can have indirect negative effects on minority students' academic performance and overall sense of belonging in institutions of higher education. Previous research suggests that racial/ethnic minority students on college campuses often compete with heavily racialized and stigmatized images of minority intellectual inferiority (Steele, 1992). Both the fear of confirming negative stereotypes about one's own racial group and the frustrating work of actively combating racist stereotypes about minority intelligence can exhaust students, depress their academic performance in classes and on exams, and fundamentally undermine their sense of belonging on college campuses.

The IBDP students whom we interviewed were highly motivated and goal-oriented. In some ways, this is unsurprising: the IB program is an academically selective program, and one which students and families must actively apply to as early as the eighth grade. For many of the families of students in our study, the opportunity to participate in the IB program played an important role in the process of choosing a high school.³ In addition, as Chapter 1 points out, these IBDP students are the students who beat the 38 percent attrition rate and stuck with the program. Still, the extent to which these students continued to describe themselves as confident and driven was striking. In addition, during their first year of college coursework, many of these students were already discussing possible majors and still others were talking with some specificity about graduate school aspirations.

A number of the IBDP students whom we interviewed described gradually realizing that they *belonged* in college, that they were as smart as (and, in some cases, smarter than) their college peers. Kenya, an IBDP student who attended a private, selective college, explained that during

³ A number of different configurations of the IB program exist within CPS. Although the IB program recognizes itself primarily as a sequence of coursework during eleventh and twelfth grade in preparation for the IB exams, high schools with IB programs often begin tracking their IB students immediately when they enroll in ninth grade, effectively creating at least an IB cohort experience that begins at the start of high school. In addition, some elementary schools in CPS also have IB Middle Grades programs designed to select and groom students as early as seventh grade for eventual enrollment in an IB diploma program in high school.

high school, perhaps because she was surrounded by other talented students in the IB program, “it was hard to consider yourself smart, even though you’re up there.” In college, however, Kenya reflected that she had a more secure sense of herself as intelligent, and particularly as a quick study of new material:

I’m actually finding that I really get things really quickly. I’m a really good listener and I can pick things up really well. My [professors], can just lecture and I took some really good notes because I actually really listened.

Acacia, like Kenya, also described a process of becoming more confident in and correspondingly, more committed to academic work during the transition to college. “It’s college – you’ve gotta man up and focus,” Acacia joked to an interviewer. In the next breath, however, she laid out just how seriously she took the challenge:

I sit in the front row, in the first chair, in every class. Right in the middle. I put on my little glasses [laughs], I have my little pen . . .

Many of the IBDP students whom we interviewed shared high motivation and a strong commitment to their education. Gizela, introduced above, echoed many of these same sentiments. She explained that she began college knowing that she *had* to be successful; failure, in her mind, was not an option. Gizela, along with her mother and older brother, came to the United States as a young child, shortly after the death of her father. College, she explained, was “the only thing my mom wanted for us.” For Gizela, the pressure to go to college and do well bolstered the confidence she already had in her own ability:

For me, college just seems like the only choice. I never saw a different option . . . and so, being successful was the only option. I never thought I would come here and not be able to do good . . . Even if [other] people thought that I wouldn’t be able to succeed, . . . I never actually imagined that to be a reality. I just knew I was gonna come here and rock it . . . and graduate.

Like Gizela, Acacia found that her experiences in the transition to college strengthened her commitment to doing well in college. Acacia explained that, starting in high school and building into her experiences across her first year of college, her confidence and determination grew. “I think I look at my life as a bigger picture now,” she told an interviewer. Whereas in IBDP during high school, Acacia felt she had focused primarily on just getting by – doing enough each day to make it through her required work and stay on top of what had been assigned – she explains that in college, her goals and motivation expanded and her orientation to education changed:

I set bigger goals for myself. Last year [in high school], I still had a [just] do it all mentality – just planning day by day, what am I gonna do today . . . That was my

mindset. But I feel like now [in college], I have such a broader [mindset]. I kind of got . . . my head on straight. I know that there's a bigger picture that I'm looking at . . . I'm working for something more than just little things.

For many of the IBDP students whom we interviewed, experiences in IB seemed to play a key role in reinforcing their already strong orientations towards college. The IB students whom we interviewed attended a range of different colleges; individual experiences of campus racial climate varied widely. Despite this range of collegiate experiences of race, the consistency of IB students' strong motivation, strong academic identity, and sense that they belonged and could be successful on college campuses underscores a powerful aspect of students' IB experience. The IB students whom we interviewed described the atmosphere of the IB program and its orientation in particular to hard work and academic achievement as playing a crucial role in cementing their already considerable determination to be successful students in high school and college. Despite encounters with campus racial climates that students experienced as ranging from overtly discriminatory to open and welcoming, the IB students whom we interviewed were armored, in a sense, against common threats to their motivation and attachment to college. As Grady explained, the experience of an almost palpable IB "culture" of hard work and determination set him and other IBDP students apart from their peers in college, inspiring confidence in their ability to persevere and succeed:

Being in the IB program and being in a culture where you had to work hard, [to] get anything out of it . . . a lot of [other] people [in college] came from high schools where they just didn't do anything hardly, [where] you had to really work hard to fail and [you were] guaranteed to pass. That's not the case here [in college] . . . [and] I came from [IB], a place where it was kind of like college [already].

Social Capital and Institutional Support

In addition to poor academic preparation, low noncognitive skills, and limited access to resources supporting the development of strong academic identities, researchers have emphasized the importance of students and families' social capital in the college transition as an explanation of how and why low-income, minority students enroll in and complete college at lower rates than their white peers. Much of the recent literature on college access and attainment, including two prior CCSR reports *Potholes on the Road to College* (2006) and *Making Hard Work Pay Off* (2008), focuses on the role that social capital (e.g., norms, information, and supports, cf. Coleman, 1988) plays in students' college access. In *Potholes on the Road to College*, we highlighted the fact that many CPS students with strong qualifications for college have very limited access to the kind of information and guidance they need in order to effectively participate in college search and enrollment decisions (p. 67). More recent

research points out the role that social capital plays, not only in students' college search processes, but also in their early experiences on college campuses.

A number of recent studies find that low-income, minority, first-generation students may be at a relative social capital disadvantage, not only during the college search, but also in fundamentally important ways during the transition onto college campuses (Arum & Roksa, 2011). This research suggests that students' social capital may effectively condition their access to college faculty. Students and families' SES, financial resources, race, immigration status, facility with the dominant language, and working knowledge of bureaucracy are all fundamentally in play in every encounter with colleges and universities as dominant institutions. These dimensions of students and families' identity and social status, conceived broadly, matter tremendously. As Lareau & Weininger argue,

Students and parents differ . . . in their ability to comply with institutionalized standards of evaluation or, put differently, they have different skill levels for managing institutional encounters . . . [and] these specialized skills are transmissible across generations, are subject to monopoly, and may yield advantages or "profits" (p. 597).

Arum and Roksa find that lower-achieving, racial/ethnic minority, and first-generation college students have less contact with college faculty than their white and Asian peers. Contact with college faculty is an important early resource for students, representing access to both direct assistance with course material and learning, but also to key early opportunities for mentoring and development. There is good reason to be concerned that constrained access to faculty and to institutional resources may have a negative effect on the college persistence of even highly-qualified low-income, minority, first-generation college students. Our analysis identifies the extent and quality of academic advising students received and the extent and quality of students' opportunities to develop mentoring relationships with college faculty as keys to understanding college persistence among the IBDP students whom we interviewed.

Academic advising played an important role in the college transition experiences of the IBDP students whom we interviewed. In addition to representing a critical early entry point for students seeking to form relationships and receive support from college faculty members, initial encounters with faculty advisors frequently set a tone for subsequent interactions with other faculty and staff.

Unfortunately, IBDP students experienced a great deal of frustration during course registration—a process that, particularly for the IBDP students whom we interviewed who enrolled at large, public universities, was frequently confusing, seemingly arbitrary, and in some cases, virtually non-existent. In some instances, IBDP students explained that they were sorted without explanation into classes on the basis of ACT or placement exam scores. In other instances, IBDP

students enrolled at public universities complained vociferously that they had been ignored and even misled by their assigned advisors. These poor experiences with academic advisors not only set a negative tone for their interactions with their respective universities early on, it also fed into students' frustrations with the remedial and below-level course placements that often resulted.

Cassandra, an IB student who enrolled at a somewhat selective, public, four-year college told an interviewer during her first term of college that she had never even met with an academic advisor during registration. Instead, she described being placed in a computer lab with dozens of other students and allowed to register for courses. The only resources she had access to, Cassandra explained, were a course catalog that was passed around and "someone" – she could not even identify whom – who "like, tried to help you out, but not really."

Yeah, they put us all in a computer lab. They [didn't] told us [*sic*] what classes to register for, but it's all up to you. You can register for whatever you want. But I registered – I knew then that I wanted to go into . . . business, so basically I picked classes that were in the college of business.

Cassandra explained that she already knew not to sign up for classes that would not get her credits towards graduation, but only because she had read the course catalog closely. By the time she spoke to an interviewer again during her second term at college, Cassandra explained that it was time to register for courses again, but that she still had no advisor as far as she knew. "[Friends] told me I have an academic advisor," she explained to her interviewer, "but I [don't] know who that person is. I've never seen him or anything." Cassandra was deeply frustrated with the entire experience and felt disrespected by the university.

Although Cassandra had discouraging experiences with her academic advising, or lack thereof, her status at college was not jeopardized by the lack of guidance she received in choosing courses. However, Gizela, who attended a very selective, public, four-year college, had a potentially more troubling experience with extremely poor academic advising, which almost cost her a scholarship she needed to stay enrolled. She described to an interviewer her experience with her assigned advisor during a summer orientation event she traveled to attend:

I [showed] up for orientation. So, we came down here, and it was a busy, long day. And we ended up getting our classes picked [for us by] our advisors. But, I feel like [my advisor] didn't really listen to me at all. She was just trying to fill in my schedule, just to have, like, my hours. [And] she ended up doing it wrong. I only had 14 hours, even though specifically, I *need* 15 [to keep my scholarship].

Gizela was furious with her advisor. Eventually, Gizela realized that she was not registered for enough credits to keep her scholarship. Just before the deadline to drop or add courses, she was able to get in touch with a friend's academic advisor, who helped her change her entire schedule around, dropping a course and adding two others, but ultimately allowing her to keep her scholarship.

As Cassandra and Gizela's stories illustrate, poor academic advising had the potential to derail IBDP students in their transition to college. At a minimum, decisions that the IBDP students whom we interviewed made without strong, skilled guidance from an academic advisor had the potential to land students in non-credit bearing courses. At worst, poor quality academic advising, meant that some students were allowed, and even encouraged, to register for classes that did not satisfy distribution or graduation requirements and that, in at least two instances, appeared to delay students' progress through their course of study. Ultimately, on balance, there were relatively few instances of students who were able to receive college credit or advanced standing on the basis of their IB transcripts or exam scores. Many of these students were deeply disappointed, in their minds, to have "gotten nothing" from colleges in exchange for the hard work they had done in IBDP during high school.

While our ability to make a strong argument here is limited by our data, recent research on low-income, minority students' access to college faculty and resources suggests that these struggles with advising and support during college are both widespread and likely to continue for even highly qualified minority students. This underscores the earlier finding from the *Hard Work* report that even CPS students with high academic achievement struggled to conduct informed and effective college searches without strong support from their high schools. As the IB program's success serving students in CPS grows, the issue of low social capital and poor support (at both the high school and college levels, during both college search and in the transition to college) is likely to persistently limit postsecondary attainment.

Summary

Previous research indicates that many low-income, racial/ethnic minority students enter college less prepared and often substantially behind more privileged white students. There is also evidence that the often poor quality of minority students' preparation for college is attributable to the poor quality, racially segregated, low-achieving high schools they attend (Massy, 2006). The IBDP students whom we interviewed, like the IBDP students throughout CPS, fit the profile of most first-generation college-goers: they are overwhelmingly African American and Latino, very likely to be low-income, and unlikely to have a family history of college-going; they come from neighborhoods that have high concentrations of poverty and few college-educated adults; and they are concentrated in racially segregated high schools with

very limited histories of sending graduates to four-year colleges. Nevertheless, the IBDP students we interviewed thrived in college.

The stories these students tell of their own experiences in college defy what previous research suggests we should expect of them. They described college courses as an experience that they felt they were prepared – perhaps even over-prepared – for academically. They described their strong academic skills, especially related to analytical writing, and consistently cited academic behaviors and mindsets (e.g., work ethic, motivation, time management, and help-seeking) as sources of strength in the transition to college-level work. Although we are limited in making strong causal attributions by our data, IBDP students' own attributions suggest how particular dimensions of their high school experiences may have shaped their preparation for college. The IBDP students whom we interviewed repeatedly described the rigor and workload of their courses, as well as the depth and quality of their relationships with teachers and peers, as key elements of their experiences in IB.

Because IBDP students often have the same teachers and set of peers for at least two years, these small-scale IB programs may provide a more stable and cohesive experience for its students than more traditional classroom settings. Previous research examining the IBDP suggests that the smaller environment of the IB program is associated with positive reports of school attachment and academic performance (Shaunessy, Suldo, Hardesty, & Shaffer, 2006; Mayer, 2008; Kyburg, Hertber-Davis, & Callahan, 2007). Though the qualitative findings from previous research on the experiences of IBDP are limited, student reports from two examinations of the IBDP in an urban context captured the exact same language we find among the IBDP students whom we interviewed – IBDP students frequently characterize IB as “a family” (Mayer, 2008; Bland & Woodworth, 2008).

Overall, students believed that IB provided them with a supportive, tight-knit community of peers and teachers, which supported students through the rigorous curriculum and protected them from becoming overwhelmed by academic demands of the program. The strong sense of community IB students identified among their peers and teachers may help to partially explain how students' experiences in IB helped to shape the development of their academic behaviors and attitudes towards learning. Particularly in the context of the demanding workload and challenging curriculum, the tight network of supportive peer and adult relationships that IBDP students described may have been a key factor in developing both their academic skills and their strong sense of positive academic identity – both of which figured prominently in their postsecondary transition experiences.

These results are extremely promising in the context of the goal of expanding the IBDP to traditionally underserved students in urban areas. It must be noted, however, that there are

caveats to this extremely positive story. Though not specifically analyzed in this report, much of the work in the *From High School to the Future* series has focused on the lack of social capital for college planning that has been pervasive throughout CPS, and IBDP students suffer from the same constraints of a lack of information, resources, and structured support for college planning as do their less academically successful peers – which is not surprising, given that they come from no more advantaged families, communities, and schools. This issue of the intentional supports necessary to ensure academic success with even very bright first-generation college students once again surfaced as important in this analysis in the form of institutional support from colleges. It is apparent from our analysis that many students moved from high school environments that provided them little support or guidance to college environments that provided them little support or guidance – and that institutional support is important for persistence.

These issues aside, the success these students experienced in college is a laudable accomplishment and points to a need for further work to understand the determinants of that success. Were there specific elements of the IBDP curriculum that prepared students academically? Is there something unique about the program that builds students capacity to stay motivated, organize their time, and seek help when needed in college? How large a role does this idea of forming and maintaining closely knit academic communities play in these students' academic lives? Most importantly, can the success of this group of students be replicated on a larger scale? Answering these questions could have a substantial impact on one of the most important policy questions raised in education today: how can we ensure that more low-income students are successful in college? The IBDP students in this study provide a powerful example of what that success looks like.

IB Interpretive Summary

Fifteen years ago, CPS took a bold risk, opening small-scale IB programs in neighborhood high schools as a strategy to create more options for high-achieving students in underserved communities. There was substantial skepticism about the feasibility of this plan. Critics feared that the program would struggle to get off the ground operationally, would fail to recruit or train high-quality teachers, or would suffer from a lack of program fidelity. It was difficult then to imagine how the IB program – based around a curriculum designed for the internationally mobile children of diplomats – could succeed in CPS neighborhood high schools. Though not the worst high schools in Chicago, most of the schools participating in the IB experiment fall into a category that most Americans would describe as failing: racially segregated institutions with high drop-out rates, low test scores, and student populations from extremely disadvantaged backgrounds. In short, critics argued, there was every reason to believe that IB in Chicago would end up on the growing list of failed school reform initiatives.

The analysis presented in this report belies the expectations of critics. IB students are more likely than similar peers to attend college, to attend a selective college, and to persist for two years in college, even when using extremely rigorous controls for selection. IB students in college describe a confidence in their academic ability rarely seen in studies of first-generation, low-income, racial/ethnic minority college students. Not only did they feel they could keep up with their more advantaged peers, they felt they could eclipse them. Indeed, the IB program in Chicago appears to have accomplished something very rare in urban education: it took economically and socially disadvantaged students and radically changed their long-term educational prospects by making them world-class learners with an arsenal of academic skills. Though these results are exciting, significant challenges remain for the IB program in CPS, challenges that prevent the program from maximizing its impact on the district and living up to its potential. Though the program has a substantial impact on those who complete it, it has no impact on the sizable population of students who do not persist in the program through eleventh grade. Also, many of these students encountered bureaucratic challenges to navigating their new college environments that had the potential to seriously undermine their strong academic capabilities, highlighting once again the importance of college choice and the vulnerabilities associated with low social capital for first-generation college students.

When assessing the success of this program, it is important to consider not just the things that IB seems to have changed, but also the things that IB cannot or did not change. The IB program has no capacity to change the demographics of the students served by the program, who are overwhelmingly low-income, racial/ethnic minority students who come from families and communities with very little history of college-going. Surely, IB has no influence on the current recession, the ever-shrinking purchasing power of the Pell grant, and the increasingly dire cost-

benefit analysis disadvantaged students and their families must do when considering whether or not a college education is truly affordable for them. The IB program also has no influence over the dynamics of the postsecondary marketplace, in which colleges see increased competition for access every year and face a set of incentives that discourage them from accepting “risky” students like those coming from IB high schools.

What IB did have the opportunity to influence was the behavior and abilities of the students and professionals in the program. IB students left high school with extremely strong qualifications for college, making them very competitive for college admissions. The program seems to have influenced students’ ability to capitalize on that access and enroll in college, and it appears to have made students prepared to succeed in college. This is evident in IB students’ college persistence rates, which are higher than a matched comparison group, but also in their own accounts of what college was like for them. Whereas many Chicago students with similar backgrounds struggle to make a successful postsecondary transition, IB students thrived. They described a wide range of core academic skills, academic behaviors, and mindsets that they relied upon to succeed in their college-level coursework. Perhaps more importantly, they described an academic identity that underpinned their efforts in college: they believed they belonged in college, were unintimidated by their more advantaged peers, and knew their IB coursework had given them unique and important tools for learning in college.

Limitations and Complications of IB’s Success in Chicago

There is a great deal of good news in this report, and it would stand to reason that the results presented here will be a call to action to expand the IB program, both within CPS and to large urban districts across the country. There is reason, however, to approach such expansion cautiously and with a careful eye toward addressing the weaknesses identified in this work. There are multiple issues that need to be addressed.

The Social Capital Gap

Though many IB students were armed with the academic tools to succeed in college, many faced other types of challenges that left them adrift when it came first to college admissions and then ultimately to their experiences on campus. As has been documented in previous reports, the IB program has struggled to influence the “social capital gap” among its students. Too often, IB students are missing critical information and support around important questions and tasks of college search, application, and choice. One of the striking findings of the qualitative work in this report is that this lack of information about college generally – what being a college student is like, how the experience is different at different types of colleges, how to effectively navigate a college campus – continued to create challenges for students beyond college choice through their college experiences. In short, the social capital gap followed these students to college.

College Choice

One important way to influence first-generation college students' ability to overcome the social capital gap is to encourage them to attend schools that provide a greater level of support to students. The *Hard Work* report showed that though IB students had much stronger qualifications for college than their peers across the district, they were nonetheless choosing to attend roughly the same set of colleges: mostly large, public universities that were frequently less selective than the colleges these students could have attended. The qualitative work in this report highlights some of the consequences of those decisions. Students who attended large public universities often struggled to successfully manage complex collegiate bureaucracies to secure appropriate resources and supports. By comparison, students who attended smaller, private colleges generally received a much higher level of institutional support. Of course, there is no single correct answer to the question of where IB students should go to college. Indeed, college choice is a complex and personal decision for any individual student. However, this report provides strong evidence that the choice to attend large public institutions is risky for many students.

It is important to recognize that that the IB program in Chicago has recently taken significant steps to address this issue of a lack of social capital or college knowledge within its student population. Beginning in 2009, IB administrators began a week-long summer academy for students participating in the IB program, focused on writing effective college essays and informing students of their options to attend more selective colleges, private colleges, and liberal arts colleges. Though it is too early to evaluate the efficacy of such efforts, it is an extremely positive sign that IB staff in Chicago has taken ownership of this issue.

The Other Thirty-Eight Percent

The number of students who informally enroll in an IB Cohort in ninth grade but withdraw before the curriculum officially begins in eleventh grade is alarmingly high at 38 percent. The high attrition rate among students who enter an IB Cohort in ninth grade represents a missed opportunity: students do not benefit measurably from simply beginning high school in an IB Cohort without completing the program. By contrast, the benefits to students who do complete the IBDP appear considerable. Highly motivated students and families are choosing to attend particular high schools with the expectation that they will receive an IBDP education. The attrition issue must be addressed.

A Two-Year Program in a City of High School Choice

In Chicago, a relatively open system of high school choice makes admittance to an IB Cohort in ninth grade an important factor in students' and families' decisions about what high school to choose. This model is more the norm than an exception for large urban districts, and if the IBO intends to expand IB programming in urban areas, there must be careful consideration paid to

the experience of students who intend to enroll in the IBDP throughout all four years of high school. This may be a new challenge for the IBO, but it is an important one.

Determinants of IB Success

These challenges aside, the achievements of the IB program are cause for optimism. More importantly, these results demand that further attention be paid to the question of how exactly the IB program in Chicago produced such tremendously capable graduates. It would be a mistake to assume that the answer to this question is obvious, and it is outside the scope of the analysis in this report to effectively answer such a question. Our analysis presented here and throughout the *From High School to the Future* series of reports does, however, help us to generate some important hypotheses about how exactly the IB program impacted the students it served in such a positive way.

Comprehensive, Intentional Programming

IB is by no means the only program being implemented in CPS high schools with the goal of increasing college readiness via advanced coursework. Schools are also turning to AP coursework, advanced math and science offerings, and increased core courses over the course of high school with the same goal. Our recent investigation into the impact of coursework on college outcomes has shown extremely limited effects, with no effect on persistence (Roderick et al, forthcoming). What separates the IB program from these other coursework-based strategies is that IB is not simply a class or even a series of classes in a student's school day: it is the entirety of a student's high school experience. With few exceptions, the IB program has created intentional programming for students that dictates their educational experiences from the beginning to the end of the school day, from the first day of ninth grade until graduation day – and often beyond. The extent and intentionality of this educational experience could very well be a critical component of its success.

Quality Curriculum and Assessments

In addition to being a comprehensive, intentional structure for a student's education, the IB program also provided students and teachers with a curriculum, as well as an extremely challenging and detailed set of assessments. Though it is difficult to decipher what exactly the IB curriculum entailed from students' accounts, the curriculum itself certainly cannot be ignored as a possible contributor to the strong results of the program. It might be particularly important to consider whether or not a curriculum focused on developing students' world view and sense of intercultural understanding might have been a particularly good fit for the students served by IB in Chicago, many of whom are the children of immigrants or immigrants themselves and nearly all of whom are racial/ethnic minority students. Furthermore, the assessments completed as a part of the IBDP could also have contributed to the success of the program. Rather than being asked to complete a one-day standardized test, students seeking to

earn an IB Diploma were required to demonstrate ability across a broad range of subjects using a wide array of assessments, submitting science lab work, extended essays, written products for every class, and in some cases, audio recorded oral defenses of their work. When comparing IBDP students to a matched comparison group, we found no significant difference in ACT scores, but it is possible that this deeper examination of students' skills and abilities could identify and reinforce skills not picked up by more commonly used exams.

A Community of Peers

One of the results of starting small IB programs in larger urban high schools is that students ended up experiencing high school as a community apart from the rest of their school. They took all of the same classes, and consistently took their classes with the same 20 or so students, all day long. Though this isolation from the rest of the school was certainly seen as a mixed blessing by students, it had the important effect of creating a cohort of high-achieving, hard-working, intellectually curious students who grew very comfortable with each other over time. They built and subscribed to group norms centered on discussion of ideas, team problem-solving, and support for each other's learning that served them well in college.

It is important to note that these intellectual communities were created in racially segregated high schools, and the students within these cohorts were nearly as racially segregated. The sad reality of pervasive racial/ethnic segregation within urban schools is a hotly contested issue in Chicago, and much of this debate focuses on Chicago's elite selective enrollment high schools, which serve a much higher proportion of white, economically advantaged students than does the rest of the system. How to maintain some amount of racial/ethnic diversity in these schools and how to create more integration of students in schools across the city remains a loud debate in Chicago. The fact that the IB program achieved such significant results without changing the racial/ethnic or income composition of schools is a notable component of the achievements documented in this report.

Talented and Dedicated Teachers

Critics of IB expansion in Chicago were highly concerned about how CPS high schools would attract and train the necessary talent to teach to the standards of the program. Given the success of the program, we can infer that schools managed to overcome this obstacle; but how schools hired and trained these teachers remains an open and important question. Did the opportunity to teach IB draw a different kind of teacher to these high schools? If this were true, we might speculate that the impact of opening an IB program in a neighborhood school could extend well beyond the students served by the program itself. Was the extensive training that IB teachers undergo in order to be certified particularly effective? There is some evidence from a study of IB in Title I schools to suggest that there is indeed something special about the training of IB teachers, who describe the experience as extremely valuable (Siskin, 2011).

Perhaps most importantly, how were these teachers different from other teachers? Were there specific instructional practices they used that were effective in teaching this population? Though there are many questions we cannot answer about IB teachers in this analysis, what is clear is that IB students whom we interviewed saw their teachers as allies who were highly supportive, always available, and earnestly dedicated to their educational success. The importance of such dedication cannot be overestimated.

Each hypothesis put forth in the Interpretive Summary requires further analysis and exploration. Understanding what drove the positive post-secondary outcomes for IB students in Chicago is a critical next step, and not simply for successfully expanding and replicating IB in urban districts. Indeed, understanding why IB worked for Chicago students in neighborhood high schools could provide critical direction for one of the central priorities in education today: equipping low- income, racial/ethnic minorities with the academic skills, strategies, and confidence to thrive at four-year colleges and universities.

Appendices

Appendix A: Quantitative Data Used in this Report

This paper draws on data from the Chicago Postsecondary Transition Project, a joint project of the Consortium on Chicago School Research (CCSR), the School of Social Service Administration (SSA) at the University of Chicago, and Chicago Public Schools (CPS). The CCSR database contains complete administrative records for all students since 1992, including birth date; race/ethnicity; special education and bilingual education status; high school course transcripts; and high school achievement test scores. Transcript data allow us to track course taking, identify course level (regular, honors, AP) and determine course grades. Because all juniors in Illinois are required to take the ACT, we have ACT scores for all CPS students, not just those who plan to go to college. Prior to 2002, all CPS students took the Iowa Tests of Basic Skills in the spring of eighth grade. And by 2002, all incoming freshmen in CPS took the Explore exam as part of ACT's Educational and Planning Assessment System. This data is particularly important for controlling for students achievement prior to the ninth grade. Also, students' home addresses have been linked to 2000 census data at the block group level. All CPS data are linked by student- and school-specific identification numbers.

The Consortium on Chicago School Research (CCSR) Student and Teacher Surveys

In 1991, the CCSR began to regularly survey all Chicago public school principals, teachers, and students to learn their views on and experiences in our public schools. In this study, we primarily use data from the 2005, 2007, and 2009 high school student surveys and high school teacher surveys. In the Introduction section Setting the Context of IBDP in CPS we use data from 1999, 2001, 2003, 2005, 2007 and 2009 elementary (grades six to eight) and high school student surveys. Using multiple years of student surveys allows us to obtain the most information possible for our longitudinal sample. However, not all variables are consistently available on each year of the CCSR survey. The item "Were you born in the U.S.?" was available in all years except 2003 (1,692 IBDP students, 12,895 students in selective enrollment schools, and 11,434 CPS Stanine 6 students reported on this item); the item "What is the highest level of schooling your mother/female guardian has completed?" was available in all years except 2009 (1,807 IBDP students, 13,712 students in selective enrollment schools, and 12,378 CPS Stanine 6 students reported on this item); and the item "Was your mother/female guardian born in the U.S.?" was only available in the 2005, 2007 and 2009 surveys (1,197 IBDP students, 8,305 students in selective enrollment schools, and 7,197 CPS Stanine 6 students reported on this item).

National Student Clearinghouse (NSC) Data

As part of the collaboration with the Chicago Postsecondary Transition Project, CCSR also receives college enrollment data from the National Student Clearinghouse (NSC). The NSC is a nonprofit corporation that began in 1993 to assist higher education institutions in verifying enrollment and degree completion. In 2004, NSC expanded its services to high school districts through its new program, “Success Outcomes.” In 2005, more than 2,800 colleges participated in the NSC and it covered 91 percent of postsecondary enrollment in the United States. At present, most Illinois colleges participate in NSC’s enrollment verification program. CPS is the first major urban school district to participate in this program and produce reports on its graduates. Beginning with the class of 2004, the CPS Department of Postsecondary Education and Student Development (now the Office of College and Career Preparation) used this data to publicly report the college enrollment rates of CPS graduates.

We use NSC data to identify whether former CPS students enroll in college in the fall after graduation and whether they were enrolled in college two years after high school graduation. These data are then linked to the National Center for Education Statistics’ (NCES) Integrated Postsecondary Education Data System (IPEDS) and Barron’s selectivity ratings so that we can further describe the characteristics of the colleges to which students have enrolled. Colleges are categorized by their selectivity using Barron’s Profile of American colleges rating given in 2005, (1) nonselective four-year colleges, which combines Barron’s “less competitive” and “non-competitive” categories, (2) somewhat selective four-year colleges, (3) selective four-year colleges, and (4) very selective four-year colleges, which combines Barron’s two top categories (“most competitive” and “highly competitive.”)

International Baccalaureate Data

We also use exam and diploma data collected by the International Baccalaureate (IB). The IB data included in exam scores and diploma information for all students who participated in the International Baccalaureate Diploma Programme (IBDP) in Chicago Public Schools from 2002 to 2009.

Appendix B: Steps in Finding Students Who Were in the Pre-IBDP Cohort in the Ninth Grade

- 1) The first assumption is that students who are taking at least six semesters of (core subject) IBDP courses in their junior year were students in the International Baccalaureate Diploma Program (IBDP).
- 2) Second, we assume that of these IBDP juniors were most likely taking preparatory-IBDP courses in the ninth grade and thus attempt to create a cohort of ninth graders that were in the same freshman classrooms as the students who were eventually IBDP students in the eleventh grade.
- 3) In order to establish this early IBDP Cohort, we analyze the freshman classrooms (fall only and in IBDP schools only) of the IBDP juniors.
 - a. Of these classrooms, we count the number of non-IBDP students and IBDP students.
 - b. We only keep classrooms that are entirely made up of IBDP eleventh graders or have a mix of IBDP and non-IBDP students.
 - c. We also only keep classrooms that have fewer than 20 non-IBDP students.
- 4) We calculate the total student count for each freshman classroom and find the percent of junior IBDP students in each classroom.
- 5) As an additional check, we analyze the titles of these freshman classrooms and flag the classes that have a title that refers to the class as an “IBDP” or a “Pre-IBDP” class.
- 6) A classroom is considered to be a ninth-grade pre-IBDP classroom if:
 - a. The class is explicitly labeled as an IBDP/Pre-IBDP class
 - b. **OR** the class is made up of at least **33 percent** of future junior IBDP students, is a core class, and is not a mixed titled class (e.g. some students in a class have the title of their class as “English” and some have the title “English IB”).
- 7) After all freshman classes are coded, a student is considered to be a ninth grade pre-IBDP student if he/she is taking at least three classes identified as a ninth grade pre-IBDP classroom **OR** if student took than six or more semester courses labeled at IBDP/Pre-IBD in an IBDP school in the ninth grade.

Appendix C: Propensity Models and Full Lists of Variables Used in Chapter 1

9th grade IBDP status

$$\begin{aligned}
 &= \beta_0 \text{Intercept} + \beta_1(\text{Demographics}) + \beta_2(\text{SES Variables}) \\
 &+ \beta_3 \text{Distance student travels to school} + \beta_4 \text{8th grade test score} \\
 &+ \beta_5 \text{Dummy for student choosing school outside their attendance area} \\
 &+ \beta_6 \text{elementary school fixed effect}
 \end{aligned}$$

11th grade IBDP status

$$\begin{aligned}
 &= \beta_0 \text{Intercept} + \beta_1(\text{Demographic characteristics} + \beta_2(\text{SES Variables})) \\
 &+ \beta_3 \text{student ITBS percentile centered within elementary school} \\
 &+ \beta_4 \text{Elementary school average test score grand mean centered}
 \end{aligned}$$

Variables used in this report:

- Demographic characteristics includes: Dummy for Male; dummies for student's race/ethnicity: white, African-American (omitted), Latino, Asian; Student's neighborhood concentration of poverty in student's census block based on 2000 U.S. census information on the block group in which students live on two reverse-coded indicators: (1) the log of the percentage of male residents over age 18 employed one or more weeks during the year, and (2) the log of the percentage of families above the poverty line; Student's neighborhood socioeconomic status of adults in student's census block Based on 2000 U.S. census information on two indicators: (1) the log of the percentage of employed persons 16 years old or older who are managers or executives, and (2) the mean level of education among people over 18.
- ITBS Percentile: Student's percentile on Illinois Test of Basic Skills taken in the eighth grade
- Distance traveled to School: Distance from student's census block group to attending high school
- High School Chooser: Dummy variable coded 1 if student attends a high school outside his or her attendance area, 0 otherwise
- High School College-Going Culture: the percentage of seniors who went to a four-year school from the students high school the year prior

Note about Samples

Because we look at outcomes sequentially, our sample changes slightly depending on our outcome. Hence, for four-year college enrollment, we use all CPS graduates, while for our other outcomes of enrolling in a more selective college and college persistence, we use only those graduates who enroll in a four-year college. Moreover we can only use students from the graduating cohorts of 2003-2007 to measure two-year persistence so our sample is further reduced for those models. Additionally, because of our multiple propensity score and matching technique, our analytic sample is much smaller than our base sample.

Appendix D: Description of Selectivity Ratings Used in this Report

Throughout this report we categorize colleges by their selectivity using categories that are based on *Barron's Profile of American Colleges* in 2005. This college ranking system rates four-year colleges on the academic qualifications of the students that attend the college (e.g., ACT or SAT scores, GPA, and class rank), as well as the percentage of applicants who are accepted. In our analysis, we grouped four-year colleges into four separate groups based on 2005 Barron's ratings: nonselective four-year colleges, somewhat selective four-year colleges, selective four-year colleges, and very selective four-year colleges. This top category, very selective, combines Barron's two top categories ("most competitive" and "highly competitive"). The nonselective category combines Barron's "less competitive" and "non-competitive" categories.

Ratings grouping used in this report	Barron's ratings	Barron's definition
Very selective	Most competitive	Admit fewer than 1/3 of applicants Average freshman: top 10-20% of high school class; GPA of A or B+; median ACT of 29 or higher.
	Highly competitive	Admit 1/3 to 1/2 of applicants Average freshman: top 20-35% of high school class; GPA of B+ or B; median ACT of 27 or 28.
Selective	Very competitive	Admit 1/2 to 3/4 of applicants Average freshman: top 35-50% of high school class; GPA of no less than a B-; median ACT between 24 and 26.
Somewhat selective	Competitive	Admit 75-85% of applicants Average freshman: top 50-65% of high school class; GPA mostly B-, with some C or C+; median ACT between 21 and 23.
Nonselective	Less competitive	Admit 85% or more of applicants Average freshman: top 65% of high school class; GPA below a C; median ACT below 21.
	Non-Competitive	Students must have graduated from an accredited high school with minimum high school requirements. Colleges with higher than a 98% admittance rate are automatically in

this category. Some colleges have no requirements for state residents, but some requirements for out-of-state residents. Some colleges require students to take placement examinations to place into college-level courses.

	Special	These colleges have specialized programs of study and/or are professional schools of art, music, nursing, and other disciplines. Admission usually requires evidence of the talent or special interest. Colleges that serve working adults are also assigned to this level.
	Not rated by Barron's	Some four-year colleges, often proprietary schools, were not rated by Barron's.
Two-year college	Not rated by Barron's	All have open enrollment. Students usually must take placement examination to place into credit-bearing courses. Most offer associate's degrees and certificate programs.

Nonselective colleges in Illinois include Northeastern Illinois University, DeVry University, Columbia College, and Roosevelt University. Somewhat selective colleges include several large public universities such as the University of Illinois at Chicago, Chicago State University, Northern Illinois University, and Southern Illinois University at Carbondale. Selective colleges in Illinois include DePaul University and Loyola University. Finally, very selective colleges in Illinois include the University of Illinois at Urbana-Champaign, the University of Chicago, and Northwestern University. To provide a broader national context, the table below presents examples of colleges from our selectivity categories for various regions of the U.S.

	Illinois	Midwest, outside Illinois	Northeast	South	West
Nonselective	Northeastern Illinois University	University of Akron	City University of New York (Staten Island)	University of Texas (San Antonio)	California State University (Northridge)
Somewhat Selective	Chicago State University	University of Nebraska (Lincoln)	University of Massachusetts (Amherst)	Spelman College	California State University (Long Beach)
Selective	DePaul University	Valparaiso University	Hofstra University	University of Georgia	Pepperdine University
Very Selective	Northwestern University	Notre Dame University	Boston University	Duke University	Scripps College

Appendix E: How We Calculate Two-Year Retention Rates in Four-Year Colleges

We count students as enrolled in a college if the NSC shows an enrollment in a four-year college by the fall after their high school graduation. We only count continuous enrollment if the student has more than 5.5 months between the last day of one enrollment in a four-year college and the first day of the next. After the initial enrollment we do not track whether the student transfers to a four-year college. That is, students can transfer between four-year colleges freely and still be counted as continuously enrolled. At no time do we make restrictions about fulltime or halftime enrollments in any institution. If a student has been continuously enrolled through the end of the spring semester two years after high school graduation, he or she is counted as having persisted for two years at a four year college.

Appendix F: Full Results of Chapter 2 Outcome Models

(All numbers are in logits, p-values in italics)

Table A: Models for All Students in the 9th Grade Regardless of 11th Grade IBDP Status

Outcome:	<i>Attending a Four- Year College</i>	<i>Attending a More Selective College</i>	<i>Persisting for Two Years in a Four-year College</i>
Intercept	-0.0162	-0.8039	0.8364
	<i>0.7402</i>	<i><.0001</i>	<i><.0001</i>
IB Status 9th Grade	0.7329	0.5828	0.3978
	<i><.0001</i>	<i><.0001</i>	<i>0.0611</i>
White	-0.00465	1.1985	0.6498
	<i>0.9678</i>	<i><.0001</i>	<i>0.0477</i>
Asian	0.7738	0.9535	0.8077
	<i><.0001</i>	<i><.0001</i>	<i>0.0191</i>
Latino	-0.4353	0.5911	0.8342
	<i><.0001</i>	<i>0.0003</i>	<i>0.0049</i>
Concentration of Poverty	-0.0865	0.0935	-0.00504
	<i>0.1397</i>	<i>0.3269</i>	<i>0.9763</i>
Concentration of Social Capital	0.0211	-0.0177	0.0962
	<i>0.6712</i>	<i>0.8353</i>	<i>0.538</i>
Male	-0.4443	-0.0605	-0.0837
	<i><.0001</i>	<i>0.6128</i>	<i>0.6794</i>
College-Going Culture	2.9521	2.4518	2.3541
	<i><.0001</i>	<i><.0001</i>	<i><.0001</i>

Table B: Models for All Students in the 9th Grade IB Diploma Programme Who Withdraw from the Program before 11th grade

Outcome:	<i>Attending a Four-Year College</i>	<i>Attending a More Selective College</i>	<i>Persisting for Two Years in a Four-year College</i>
Intercept	0.0133 <i>0.8727</i>	-0.895 <i><.0001</i>	0.935 <i><.0001</i>
IB Status 9th Grade	0.0761 <i>0.5094</i>	-0.2836 <i>0.228</i>	-0.0207 <i>0.926</i>
White	-0.3863 <i>0.0538</i>	0.204 <i>0.5343</i>	1.2551 <i>0.0017</i>
Asian	0.4105 <i>0.2622</i>	0.6831 <i>0.2555</i>	0.6105 <i>0.3602</i>
Latino	-0.6637 <i><.0001</i>	0.6355 <i>0.0241</i>	0.6668 <i>0.0296</i>
Concentration of Poverty	-0.1339 <i>0.1838</i>	-0.2994 <i>0.0915</i>	0.4857 <i>0.0122</i>
Concentration of Social Capital	0.0185 <i>0.8185</i>	0.1586 <i>0.3085</i>	0.1638 <i>0.3334</i>
Male	-0.4466 <i><.0001</i>	-0.0555 <i>0.7827</i>	0.0222 <i>0.9179</i>
College-Going Culture	2.7969 <i><.0001</i>	2.984 <i><.0001</i>	1.9655 <i>0.0016</i>

Table C: Models for all Students Who Persist in the IB Diploma Programme through 11th Grade

Outcome:	<i>Attending a Four-Year College</i>	<i>Attending a More Selective College</i>	<i>Persisting for Two Years in a Four-year College</i>
Intercept	0.1312 <i>0.0455</i>	-0.4865 <i><.0001</i>	0.8957 <i><.0001</i>
IB Status 9th Grade	1.09 <i><.0001</i>	0.7698 <i><.0001</i>	0.5105 <i>0.0025</i>
White	-0.0386 <i>0.8078</i>	0.9422 <i><.0001</i>	0.5742 <i>0.0415</i>
Asian	0.8437 <i>0.0001</i>	0.9384 <i><.0001</i>	0.3574 <i>0.2352</i>
Latino	-0.4326 <i>0.0008</i>	0.5978 <i>0.0001</i>	-0.011 <i>0.9597</i>
Concentration of Poverty	-0.1541 <i>0.0627</i>	0.1665 <i>0.0735</i>	-0.2509 <i>0.0665</i>
Concentration of Social Capital	-0.1 <i>0.1548</i>	0.012 <i>0.8815</i>	0.0324 <i>0.7791</i>
Male	-0.1495 <i>0.1147</i>	0.0185 <i>0.8653</i>	-0.1392 <i>0.3726</i>
College-Going Culture	3.0951 <i><.0001</i>	2.1539 <i><.0001</i>	2.3376 <i><.0001</i>

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