High School Dropout Prevention and College Preparatory Programs

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I.   INTRODUCTION

The benefits of education are substantial in terms of both monetary and nonmonetary returns. However, the pathway to obtaining a bachelor's degree involves many milestones, and along the education pipeline, two decision points have proven critical hurdles: obtaining a high school degree and successfully transitioning to a postsecondary institution. In 2007, nearly 7,000 students dropped out of high school each day with 1.2 million students not graduating from high school as scheduled (Editorial Projects in Education EPE Research Center [EPE], 2008). While some may eventually complete a General Educational Development (GED) certificate or other high school equivalent, analysis suggests high school dropouts face a tough labor market and are more likely to need government support and become entangled in the criminal justice system. Meanwhile, of the students who do graduate high school, about two-thirds subsequently enroll in higher education within two years, but there are huge disparities by income, race, ethnicity, and gender (Advisory Committee on Student Financial Assistance, 2001). Once arriving at a college or university, many of these students are not prepared for college-level work, and over one-third are therefore forced to first complete remedial or developmental courses before starting to accumulate credits towards postsecondary degree (Bettinger and Long 2007).

Investments in high school dropout prevention and college preparatory programs could greatly reduce poverty by addressing these major leaks in the educational pipeline. Improving these critical transition points would bolster a student's chances for gaining the skills necessary to thrive in the labor market as well as have numerous nonmonetary benefits on the quality of the student's life. This chapter reviews the literature on high school dropout prevention and college preparatory programs with the goal of summarizing the available research. I review studies on a number of the larger programs geared at improving these transition points and extrapolate on the likelihood that investments in such programs would be an effective anti-poverty effort.

The chapter continues by giving additional background on the problems: the considerable number who drop out of high school, the low college entry rates among some groups, and the insufficient postsecondary preparation of many high school graduates. I then elaborate on the underlying reasons for these problems and outline the approaches that have been taken to address these problems. Following this, I describe the major initiatives and programs that target high school dropout prevention and college

preparation. Section IV discusses the key evidence on the effectiveness of these programs and considers the implications of this research. Section V concludes and offers suggestions about future lines of research.

II.   BACKGROUND

Problem #1: High School Dropout Rates

To understand the prevalence of students dropping out of high school, one must first settle on a definition of the term. High school dropout rates are often not measured uniformly with school districts, states, and researchers using a variety of definitions. Until recently, many definitions were used without discussion about the underlying assumptions of each statistic and the comparability of numbers across sources. Different assumptions are often made about the grade levels or age of student who should be classified as dropouts. For example, some measures include the ninth through twelfth grades while other only count students who dropout within their last (twelfth) year. There is also variation in the length of time that a student is required to miss school before they are considered a dropout (this can range from 15 to 45 days of unexcused absence), which students are included in the calculation (e.g., some may exclude students who receive special education services), and which programs count toward enrollment (some count students enrolled in GED programs or night schools while others only include those enrolled in traditional day schools). Finally, the flow of students who transfer in or out of the school can complicate the process of determining an accurate dropout rate (Lehr, Johnson, et al., 2004).

Noting these issues in measurement, there has been a recent push to establish a consistent set of indicators across time and school district. In terms of the educational pipeline, the most useful measures track a cohort of students over time to determine whether and how they progress through school. Greene and Winters (2005) and the Editorial Projects in Education (EPE) Research Center (2008) attempt to approximate the percentage of ninth graders who earn a regular diploma four years later.[1] Although not a

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[1] According to Greene and Winters (2005), there are several reasons why GED recipients should not be included in the high school graduation rates. They point to research that has found that the returns to a GED are far less than that of a regular diploma (see Cameron and Heckman, 1993; Murnane, Willett, and Boudett 1995). EPE (2008) also notes that the No Child Left Behind Act counts only students receiving standard high school diplomas as graduates.

true longitudinal measure, they both find that about 70 percent of students graduate high school on time.[2] Similarly, in a 2008 study using a slightly different measure but intending to reflect the same type of longitudinal measure, the National Center for Education Statistics (NCES) found the high school graduation rate for the 2005-06 school year to be 73.4 percent (Stillwell and Hoffman, 2008).[3]

All of the studies found high school dropout rates to differ by demographics, background, and region. For instance, EPE's *Diploma Counts 2008* study found that only about 57.8 percent of Hispanic students, 55.3 percent of black students, and 50.6 percent of Native American students graduated on time with a regular diploma compared to 81.3 percent of Asian students and 77.6 percent of white students. Stillwell and Hoffman (2008) found similar differences by racial group although the percentages for each group were slightly higher. There were also differences by gender with women graduating at a much higher rate than men.

While freshmen graduation rates four years later give some sense of the students left behind without a degree, another way to measure the prevalence of dropping out of high school is to use direct estimates. Stillwell and Hoffman (2008) provide an event dropout rate, which is the proportion of students who drop out in a single year.[4] During the 2005-06 school year, they find that there were more than 579,000 dropouts from high school (grades 9 through 12) among 48 reporting states. The overall annual event dropout rate was 4.0 percent but ranged from 3.2 percent in grade 9 to 5.5 percent in grade 12. It also differed greatly by state from 1.6 percent in New Jersey to 8.9 percent in Alabama. As with the above measure, there were differences in dropout rates by race. The high school event dropout rates were highest for Native American (7.4 percent), Black, non-Hispanic (6.1 percent), and Hispanic (6.0 percent) students and lowest for White, non-Hispanic (2.7 percent) and Asian (2.4 percent) students.

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[2] The Greene method estimates the number of students who enter the ninth grade, makes some adjustments for changes in population, and then divides the resulting number into the number of students who actually graduated with a regular diploma. EPE uses the Cumulative Promotion Index (CPI) method, in which they multiply grade-specific promotion ratios (i.e., the ninth-to-tenth grade promotion rate times the tenth-to-eleventh grade rate, etc.). This takes into account the schooling conditions prevailing during a particular school year.

[3] NCES calculates an averaged freshman graduation rate (AFGR), which divides an estimate of an incoming freshman class with the number of diplomas awarded four years later. The incoming freshman class size is estimated as the summation of the enrollment in eighth grade in one year, ninth grade for the next year, and tenth grade for the year after, and then dividing by three.

[4] A dropout is defined as a student who was enrolled at any time during the previous school year but who did not enroll the beginning of the next school year and had not completed school. The following are not considered dropouts: students who have transferred to another school, died, moved to another country, or who are out of school due to illness.

A third (and broader) way to measure high school degree attainment is to examine at one point in time the proportion of students who have not completed a high school degree and are not enrolled in school. The U.S. Department of Education tracks this information over time to produce a status dropout rate, which includes any 16 to 24 year old student without a high school credential (i.e., diploma or equivalent, such as GED) regardless of when they dropped out of school. Table 1 summarizes the trends from 1972 to 2006. Over this time period, the status dropout rate fell from 14.6 percent to 9.3 percent. Most of the decline occurred prior to 1992 and the rate stagnated in the late 1990s and early 2000s. Although the rate has decreased over time, the total number of dropout remains above 3.4 million students due to the growing numbers of individuals age 16 to 24 years old.

Table 2 gives a more detailed snapshot of the status dropout rate for 16 to 24-year-olds in October of 2006. As noted above in other studies, this measure of the dropout rate also highlights differences by race and gender. While only 3.6 and 5.8 percent of Asian and White students age 16 to 24 did not have a high school credential, respectively, the rates were 10.7 percent for Black and 22.1 percent for Hispanic students. Given such differences, even though the White population is much larger than the Hispanic population, there are more Hispanic dropouts than White dropouts. In terms of gender, men are more likely to dropout, and the dropout rate increases with age. The dropout rate was also very high among Hispanic students born outside of the United States (36.2 percent).

While the above measures document differences in the propensity to drop out of high school by race/ethnicity, gender, and age, other studies have also found a connection between family income and the likelihood of graduating high school on time. Graduation rates are significantly lower in districts with higher percentages of students who are eligible for free or reduced-price lunches (Swanson, 2004). Moreover, Lehr, Johnson, et al. (2004) found that low-income students as well as non-native English speakers, disabled students, and children of single or unemployed parents are more likely to dropout of high school than other students. For example, high school students living in low-income families drop out of school at six times the rate of their peers from high-income families (NCES, 2004). Achievement in high school is also an important factor as Carnevale (2001) found that the lowest achieving quarter of students were twenty times more likely to drop out of high school than students in the highest achievement quartile.

Problem #2: College Access and Preparation

While obtaining a high school degree is an accomplishment, it is not sufficient enough to grant a student the opportunities necessary for a middle class standard of living. Unfortunately, the likelihood of attending college varies substantially by family income. Among high school graduates in 2004, only 43 percent of students from families who made less than $30,000 immediately entered a postsecondary institution. In contrast, 75 percent of students from families who made more than $50,000 did so.[5] Even after accounting for differences in academic preparation and achievement, substantial gaps in college access still exist by income. Low-income high school graduates in the top academic quartile attended college only at the same rate as high-income high school graduates in the bottom quartile of achievement (Advisory Committee on Student Financial Assistance, 2001).

Even if students are able to access higher education, a high school degree also does not guarantee that they are prepared to undertake postsecondary level courses. Greene and Foster (2005) estimate that only 34 percent of high school graduates in 2002 were academically prepared for college.[6] College-readiness rates were lowest for African-American and Hispanic students (23 and 20 percent, respectively) with 40 percent of White students being found prepared. Although it is debatable whether this is the most accurate method of determining the proportion who are college-ready, most accept that many students finish high school below grade-level competency and certainly below the level expected for college.

Sometimes academic deficiencies are so severe that colleges choose to expel the students. For instance, during the fall of 2001, the California State University system "kicked out more than 2,200 students – nearly 7 percent of the freshman class – for failing to master basic English and math skills" (Trounson, 2002). However, the most common response of institutions has been to test and place ill-prepared students in college remedial or developmental courses.[7] In 2001, colleges required nearly one-third of first-year students to take remedial courses in reading, writing, or mathematics (NCES, 2003). Moreover, there is some evidence that the proportion of students in need of college remediation has been

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[5] Authors' computations using 2004 October Current Population Survey.

[6] They measured college readiness by trying to reproduce the minimum standards of the least selective four-year colleges. To meet the criteria, students must have graduated with a regular high school diploma (i.e., not a GED), have completed a minimum set of course requirements, and been able to read at a basic level.

[7] Most scholars define "remediation" as courses students need to re-take while defining courses that are new material as "developmental." In this paper, I will refer to both types of courses as being remedial.

growing. According to the NCES (1996), 39 percent of colleges surveyed reported that remedial enrollments had increased during the last five years. At some colleges and universities, over two-thirds of the entering class is placed into remedial courses (Bettinger and Long, 2007).

The Consequences of High Dropout Rates and Low College Access and Preparation

The repercussions of these two leaks in the educational pipeline are evident in many ways. High school dropouts earn less; in 2006, the annual income of persons age 18 to 65 who did not have a high school degree was $21,000 compared to over $31,400 for those with a high school degree or GED. (U.S. Bureau of the Census, 2007). Rouse (2005) concludes that "over a lifetime, an 18 year old who does not complete high school earns approximately $260,000 less than an individual with a high school diploma." Combined with contributing less in federal and state taxes, she finds that the total losses to the country for not having a person graduate from high school amount to $192 billion for one cohort of students. High school dropouts are also more likely to rely on government support programs, such as welfare and food stamps, suffer from health ailments, and be incarcerated (College Board, 2004 and 2007). According to1997 and 1998 data from the U.S. Department of Justice (2000, 2002), approximately 30 percent of federal inmates, 40 percent of state prison inmates, and 50 percent of persons on death row are high school dropouts. As Rouse summarizes, having a high school diploma is a "necessary (but not sufficient)" condition for being successful in America.

However, earning a high school degree is also not sufficient to enabling students to reach a middle class standard of living. Higher education plays an increasingly important role in helping individuals attain social and economic success. According to the U.S. Census Bureau, individuals with a college degree made 62 percent more than those with only a high school degree in 2005 (College Board 2007). The monetary rewards to a college degree are so great that many in the field have begun to summarize the college attendance decision as the "Million Dollar Question" – on average, people with a bachelor's degree will earn $1 million more over the course their lifetimes than those with only a high school diploma. Additionally, as noted above, there are many non-monetary benefits associated with attaining more education such as lower rates of government dependency and incarceration and better health.

III.   POSSIBLE SOLUTIONS: AN OVERVIEW

The need to target investments to reduce the number of high school dropouts and better prepare students for college is evident. However, the first key to determining the best way to invest resources is to understand why students drop out of high school or fail to prepare and enter college. This section first reviews the research on why these problems exist and then introduces the general approaches that have been taken to address these issues. The following section focuses on particular programs and evaluations, but first I summarize some of the challenges in conducting convincing and useful evaluations.

Understanding High School Dropout Behavior and Potential Solutions

Certain behaviors are associated with dropping out that could be addressed and altered using interventions. The Northwest Regional Educational Laboratory [NREL] (1995) summarizes these behaviors as fitting them into four main categories. The first is school-related factors such as poor academic performance, repeating a grade, poor attendance (truancy, absenteeism, tardiness, suspension), and other disruptive behaviors and disciplinary infractions. Student-related factors are the second category and include personal problems that are separate from social or family background. Among these factors could be substance abuse, pregnancy, and legal problems. Third are family related factors such as an unstable or stressful home life, socioeconomic status, and the education level of the parents. Lehr, Johnson, *et al.* (2004) also note that the families of dropouts have permissive parenting styles and few educational supports. Finally, community-related factors like poverty are also associated with dropout behavior. Whether these behaviors and factors are the actual causes of dropping out or things that are correlated with the true root cause remains to be determined.

To reduce dropout rates, efforts have typically focused on interventions within schools. High schools have tried to provide adequate financing for programming that meets the needs of dropouts and improve connections with postsecondary education, particularly community colleges (Steinberg and Almeida, 2004). Many have also implemented early warning systems to target interventions for at-risk students (Kennelly and Monrad 2007). Reforms have also focused on altering school structures to improve educational outcomes. For example, some have tried implementing schools within a school,

redefining the role of the homeroom teacher, reducing class size, and creating an alternative school (NREL, 1995).

Other interventions, work outside of the typical school setting. NREL (1995) categorizes several types of interventions. The first is called Personal or Affective and refers to programs that involve individual counseling or target self esteem. The second type of intervention is academic and includes the provision of special academic courses, individualized methods of instruction, and tutoring. Family outreach, or programs that include increased feedback to parents or home visits, is another type of intervention. Finally, interventions that work outside of schools may be work related and consist of vocational training or participation in volunteer or service programs. While the main focus of this chapter is on these "add on" interventions (i.e, programs that work either outside of or in partnership with schools), I also include several important interventions that are school-based.

Understanding Gaps in College Enrollment and Preparation and Potential Solutions

Focusing on the transition to higher education, there are three main barriers to enrollment. The first is cost, and that issue is being addressed by another chapter in this volume. A second major barrier is academic preparation. Numerous studies link the types of courses students take in high school to their entry into and performance in higher education. For example, Adelman (1999) finds that a student's academic background, defined by measures of academic content and performance in secondary school such as high school curriculum intensity, class rank and GPA, are the most critical factors in determining college enrollment and success. In a recent update, Adelman (2006) finds curriculum to be even more compelling in terms of its role in degree completion. Not surprisingly, studies also identify academic preparation as an important determinant of the need for college developmental or remedial courses. A 2002 study by the Ohio Board of Regents (OBR) found that students who had completed an academic core curriculum in high school were half as likely to need remediation in college when compared to students without this core curriculum.

Even students who complete the recommended high school courses often are still placed into postsecondary remediation. In the OBR study, 25 percent of those with a core high school curriculum still required remediation in either math or English. As a result, many officials interpret the increasing

role of remediation as a signal of the ineffectiveness of secondary school systems. While many reforms attempt to improve the quality of teaching and rigor of high school classes, even these efforts may not be sufficient. Several researchers also note the large disconnect between what high schools aspire to achieve and the competencies that colleges require (McCabe, 2001). Venezia, Kirst, and Antonio (2003) detail how the coursework in high schools is designed according to standards that are entirely different in college. Moreover, assessments in high school often emphasize different knowledge and skills than those that are tested in college entrance and placement. This points the possible role of inventions that work outside of regular high schools.

The above point about the disconnect between high schools and colleges also underscores a third major barrier to college enrollment and success: information. Lack of good information about how to access, pay for, and succeed in college is a major concern. In terms of financial aid, the Commission on the Future of Higher Education, assembled by Secretary of Education Spellings, concluded that some students "don't enter college because of inadequate information and rising costs, combined with a confusing financial aid system." The Commission further emphasized that "our financial aid system is confusing, complex, inefficient, [and] duplicative" (2006). Perhaps due to the complexity of the system and the lack of information about the availability of aid, 850,000 students who would have been eligible for federal financial aid in 2000 did not complete the necessary forms to receive such aid (King 2004).

Lack of information also results in students not performing the steps necessary to gain admissions into college or taking the proper courses to adequately prepare for higher education. College attendance is the culmination of a series of steps and benchmarks, and this current landscape is too complex and difficult for many families to decipher and navigate. First, students must aspire to attend college or derive aspirations from their parents, teachers, and/or mentors. Additionally, students must prepare academically for college by taking the proper classes and getting a sufficiently high grade point average, particularly if they wish to attend selective schools. To gain entry into a four-year college, students must also register for a college admissions exam (i.e. the SAT or ACT). Finally, students must fulfill the requirements for high school graduation. Research by Kane and Avery (2004) showed that low-income high school students possess little understanding of how to handle this admissions process or knowledge about actual

college tuition levels. Other work has also found a significant lack of information among prospective college students in general (Ikenberry & Hartle, 1998; Horn, Chen, & Chapman, 2003).

Addressing the Problems: An Overview of Programs and Research Issues

Programs targeting students at risk of dropping out or not continuing to college often have multiple components (Gándara and Bial 2001). The programs usually include some combination of academic enrichment, counseling, mentoring, and personal enrichment along with possible college and/or financial aid advising and scholarship support. However, while most programs choose to target high school students, others begin to target children in elementary or middle school. Some programs work directly with schools or adopt an entire cohort of students, but others instead choose to work with individual students. Figure 1 summarizes the goals of outreach programs while Figure 2 gives a sense of the range of services offered by such programs. The information was collected by the College Board in the National Survey of Outreach Programs.[8]

The following section reviews the evidence on some of these programs to comment on their effectiveness. While there have been a number of evaluations of the programs that aim to reduce the number of high school dropouts and increase college access and success, most have faced a number of difficulties in establishing the causal effect of the interventions. It is first worth noting these problems before reviewing the specific research as the issues complicate interpretation of the results and limit the ability to take away firm lessons.

The first major problem of many of these evaluations is lack of an appropriate comparison group. In order to determine the effects of a program, one must consider what would have happened otherwise, and so a control group is necessary to provide that baseline. However, few programs collect information on such a comparison group. Moreover, a group of students with similar characteristics may not be a sufficient control group. Often participation in the intervention is not assigned randomly (i.e., by lottery) and so there are differences between the students who do and do not choose to participate in the program. Those who choose to take advantage of the opportunity may be more motivated or willing to put effort

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[8] This survey was conducted in association with The Education Resources Institute and the Council for Opportunity in Education during the 1999–2000 school year with the intent of collecting detailed information about all types of early intervention programs. Figures 1 and 2 were reported in Swail (2000).

into succeeding, factors that are unobservable to the researcher. As a result, a simple comparison of students in and out of a program could end of being a comparison of motivated (in the program) and unmotivated (out of the program) students. The ideal way of dealing with this issue is to have random assignment or accept students into the program by lottery. In these situations, participation would not be related to unobserved motivation or level of effort, and so the researcher has a better chance of producing causal estimates of the effect of the program. The lack of an appropriate comparison group caused me to eliminate many studies from this review.

As an alternative to randomized assignment, which must be planned for and implemented long before the first outcome is measured, studies will often create a comparison group by getting a sample of students at schools that did not offer the intervention. Several studies try to identify "peer" schools with similar student body characteristics as the focal school or they use individual student data to match participants with similar nonparticipants. The quality of this research approach depends greatly on the amount of information the researcher has to make the matches with obviously the more detail being better. Still, the local environments and trends of each treatment and control matched pair may differ in ways that could affect the analysis, and so one must be cautious in interpreting the results of such analyses.

Another major problem researchers often have to contend with in evaluating programs is a lack of good data. Without information about high school course-taking and grades, high school attendance and discipline, college application experiences, and postsecondary enrollment and persistence, it is difficult to get a sense of a program's impact on outcomes. Many smaller programs fail to collect much data on their participants in a systematic way, and few programs continue to track their students (and the comparison group) over time to get a sense of the long term impact of the intervention. For this reason, conclusions about programs are often reduced to statistics on the dropout or college entry rate of participants without much additional detail. This chapter focuses on the research that goes beyond these simple indicators.

Many evaluations are also unable to isolate which components of a program are successful or not successful in helping students. As noted above, often interventions include many services. For instance, as part of Upward Bound, students could participate in an intensive instructional program as well as receive counseling. However, when examining the outcomes of students in the program, it may not be

possible to know if the instructional program was the reason for the effect or the counseling was the reason instead (or perhaps both services are needed to produce a result). One also is unable to determine the relative effectiveness of one component versus another. Such information could be extremely valuable in minimizing the costs of investing in an effective intervention. If one knew that only a particular type of support was necessary to reduce the likelihood of dropping out of high school and increase the likelihood of going to college, then this would be less expensive than investing in a program with multiple types of support.

Related to the issue of isolating the effect of a particular component of an intervention is the fact that students often have the opportunity to participate in several support programs at the same time. In other words, a focal intervention does not operate in a vacuum. Therefore, both the students in a particular program and their comparison group may also be receiving services beyond the focal intervention. In terms of the analysis, as long as both the treatment and control groups have the same opportunities for additional support, then this does not disturb the results. However, if time in the focal intervention reduces the other opportunities that the treatment group can access (but not the control group), then it becomes difficult to isolate the effect of the intervention of interest as the circumstance of comparison is no longer no intervention at all. Detailed information on services received, whether they be from the focal intervention or some other program, is needed to properly interpret the results, but these data are not usual available.

Researchers face another complication when trying to evaluate large programs with many sites. Often there is a great deal of variation across sites in which students are recruited to participate and how, they supports they receive, the leadership, and the information collected from students and the comparison group. These disparities can develop when a small program expands to many sites, and there is little standardization. Sometimes the lack of standardization is advantageous so that programs can adjust to the needs of a local environment, but this makes evaluating multiple programs difficult. For example, the large federal programs require grantees to follow basic principles to accomplish a common goal, but each program can vary in exactly how they choose to offer and implement an intervention. Evaluations of the overall program are then complicated by the fact of this underlying variation by program site.

Keeping all of the above complications in mind, the following review highlights the some of the best research that has been done on the major programs that target reducing high school dropout rates and increasing college access and success. Unfortunately, the above concerns call into question the interpretation of many of the results. Therefore, it is difficult to draw steadfast conclusions about what exactly works. Also, most studies report little on costs, and so one is unable to do a proper cost-benefit analysis to determine the most effective investments.

IV.   SPECIFIC INTERVENTIONS AND EVALUATIONS

This section summarizes and reviews the evaluations of programs that attempt to reduce high school dropout rates and increase college access and success. I discuss the key evidence on the effectiveness of the programs and consider the implications of this research. Special attention is paid to what has been learned about how to best target investments with the goal of reducing poverty. As mounting evidence indicates that a student's decision to finish high school and go to college is the result of a complex web of decisions and influences that begin long before high school, many of the programs profiled provide multiple services over a period of time. Because the key programs combine the multiple goals of high school preparation and graduation and postsecondary enrollment, I do not separate the discussion of the programs into two groups. Table 4 summarizes the characteristics of the major programs while Table 5 highlights the major studies on their effectiveness.

GEAR UP

The October 1998 reauthorization of the Higher Education Act created the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP). The federal program is a comprehensive intervention program and is tasked with equalizing access to higher education for low-income students. GEAR UP grantees are charged with establishing partnerships among school districts, colleges and other organizations to operate the projects, and states and partnerships are awarded six-year grants to provide the services at high-poverty middle and high schools. There is a great deal of variation in how the funds are used, but as mandated by legislation, the programs must promote giving college

information to students and parents and providing individualized academic and social support to students; the funds may also be used to provide college scholarships (Westat, 2003). With 185,602 participants in its first year (2000-01), the program grew quickly to 305,888 participants in its second year. The typical partnership served an average of 1,264 students in 2001-02 (Terenzini, et al. 2005).[9]

Westat (2003) did some initial description analysis on the early implementation of GEAR UP. They followed a group of GEAR UP participants in 20 partnership programs who had entered the program in seventh grade during 2000-01. The services received included tutoring, college-planning activities, summer programs, and professional development activities for teachers. Given that the analysis was only on the first two years of the program, the participants had not reached the age of high school graduation or college entry.

After the initial analysis, the researchers chose 18 middle schools and matched them with 18 similar schools as a comparison group (Westat 2008). The schools chosen were not done so randomly and there were limits to the researchers' ability to find good match schools. The small sample size of schools also limits that analysis of school-level outcomes. However, the researchers also randomly selected 140 seventh graders from each school to survey along with their parents. In their analysis, they concluded that attending a GEAR UP school (measured near the end of eighth grade) was positively associated with the student's and parents' knowledge of the opportunities and benefits of postsecondary education, the likelihood of parents being involved in their children's education, and the academic expectations of the parent. On the other hand, there was no evidence that GEAR UP influenced academic performance, school behavior, nor students' aspirations to attend college. African-American students also seemed to be positively impacted by GEAR UP to take more rigorous courses during middle school (Westat 2008).

Terenzini, *et al.* (2005) also analyzed the effects of GEAR UP using on two data sources on the first two years of the program. The first data source was the GEAR UP Annual Performance Report for Partnerships (APR) database, which contains information at the partnership level of 265 GEAR UP programs. This information includes partnership enrollments, activities, programs, staffing, and selected

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[9] As noted by the authors, these figures may differ somewhat from those of other sources due to the fact that GEAR UP participants tend to be highly mobile, and the count will vary depending on the time taken. The figures here are from the GEAR UP Annual Performance Reports.

outcomes as reported in student and parent surveys. The researchers did not have a separate comparison group and instead examined how the outcomes of cohorts changed over time with more exposure to GEAR UP-based activities. For example, they tracked how the percentages of students performing academically at specified levels or who knew certain kinds of information changed over time.

The second data source of Terenzini, *et al.* (2005) was information on all California public elementary schools from the Policy and Evaluation Division of the California Department of Education. Although this part of the research did not focus on GEAR UP exclusively, the researchers focused on schools offering GEAR UP programs to analyze "the outcomes associated with the structural concepts and kinds of activities and programs that GEAR UP embodies" (p. 11). The researchers compared the outcomes of these schools to similar peer schools also in the state. In total, the study compared 47 GEAR UP schools to 133 peer schools by examining academic performance as measured by the Stanford-9 tests.

The results of Terenzini, *et al.* (2005) are somewhat limited by their use of data aggregated to the partnership or school level (in comparison to the more nuanced analysis possible with individual student data). However, they were still able to draw several conclusions. Terenzini, *et al.* (2005) found that GEAR UP seemed to positively affect students' college plans with the parent-focused activities having a stronger effect than those directed at students. Because the effects were more pronounced in the second year, the researchers suggest that the impact of GEAR UP on college aspirations and plans may be cumulative. Focusing on college-readiness levels, the researchers found that GEAR UP improved mathematics skills even after accounting for students' previous test scores and school characteristics. The analysis, however did not find statistically significant on reading scores.

Upward Bound

One of the largest and longest running federal programs, Upward Bound is "designed to generate skills and motivation necessary for success in education beyond high school among young people from low-income backgrounds and inadequate secondary school preparation" (Public Law 90-222, Dec. 23, 1967). In 2004, about 52,000 students participated in 727 regular Upward Bound projects around the country (Myers, et al. 2004). At least two-thirds of each project's participants must be both low-income and potential first-generation college students. Students typically enter the program while in ninth or

tenth grade and may participate through the summer following twelfth grade (most typically remain in Upward Bound for about 21 months). Projects provide students with a variety of services, including instruction, tutoring and counseling. In addition to regularly scheduled meetings throughout the school year, projects also offer an intensive instructional program that meets daily for about six weeks during the summer. The vast majority of projects are hosted by four-year colleges (Myers, et al. 2004).

Mathematica Policy Research, Inc., (MPR) has been conducting a national evaluation of Upward Bound for the Department of Education since December 1991. The effects of Upward Bound on high school outcomes were presented in Myers and Schirm (1999), and Myers, et al. (2004) presents results based on the national evaluation's third follow-up data collection (completed in 2000). The latter report updates the findings from the former and examines the impact of Upward Bound on students' postsecondary experiences. These are longitudinal evaluations in which eligible applicants from a nationally representative sample of projects were randomly assigned to Upward Bound or to a control group. For the analysis, the researchers used data from surveys (a baseline survey conducted 1992 to 1994 and follow-up surveys conducted 1994-1995, 1996-1997 and 1998-2000), high school and postsecondary transcripts, and reports on participation from Upward Bound project staff. In comparison to many other evaluations, the research design of these studies is quite strong.

The analysis suggests that for the average student, Upward Bound increased the number of high school math credits earned but did not affect other measures of high school academic preparation. Upward Bound may have increased enrollment at four-year institutions, particularly for students with lower educational expectations. However, the program did not affect enrollment more generally when taking into account all kinds of postsecondary institutions (Myers, et al. 2004). Both reports suggest that Upward Bound would have had larger effects if students had remained in the program for longer periods of time as many left after during the first year of participation (Myers and Schirm 1999; Myers, et al. 2004).

The earlier report also emphasized the fact that Upward Bound appeared to have differential effects for different kinds of students. The found impacts were larger for boys in comparison to girls, for Hispanic and White students in comparison to African-American student, and for students who were low-income only or low-income and potential first-generation college students in comparison to students who

qualified for the program only as potential first-generation students. Poorer performing students were also found to benefit substantially more than their better performing peers (Myers and Schirm 1999).

Because it is a relatively intensive program, Upward Bound is considerably more expensive than most other precollege programs. In FY 2001, the cost per student served was about $4,800 per year (Myers, et al. 2004). While the MPR evaluations establish the relative outcomes of Upward Bound participants and non-participants, the reports do not provide a full cost-benefit analysis.

There is also a math and science initiative within Upward Bound. In 1990, the U.S. Department of Education created this initiative with the goal of addressing the relatively low levels of academic achievement by economically disadvantaged in math and science courses. Upward Bound Math-Science awards grants to institutions to provide instruction to students, including hands-on experience in laboratories, computer facilities, and at field sites. They also offer a six-week summer program providing intensive instruction in laboratory science and mathematics through pre-calculus. An early evaluation found that the program improved high school grades in math and science and overall, increased the likelihood of taking chemistry and physics in high school, and increased the likelihood of enrolling in more selective four-year institutions (Olsen, et al. 2007).

Talent Search

The Talent Search program was created in 1965 as one of the original federal TRIO programs, which also includes Upward Bound (discussed above). The program is designed to help low-income, first-generation college students prepare for and gain access to college by providing information on the types of high school courses students should take to prepare for college and on the financial aid available to pay for college. The program also helps students complete financial aid applications and navigate the college application process. According to Constantine, *et al.* (2006), Talent Search received approximately $144 million to serve 382,500 students in 470 projects nationally in fiscal year 2004. This averaged approximately $375 per participant served.

Constantine, *et al.* (2006) collected administrative records from multiple sources to evaluate the effectiveness of Talent Search in Florida, Indiana, and Texas. They used a quasi-experimental design by comparing the outcomes of participants to similar students at the same schools or other schools who did

not participate. To enable them to study the impact of Talent Search on high school completion and postsecondary enrollment, the analysis focuses on the cohort of students who were in ninth grade in 1995-96. Students may have received services at any point from grades six until the end of high school.

The researchers found that Talent Search participants were more likely to apply for financial aid and enroll in a public institution, especially a two-year college, than the comparison students. In Florida and Texas, for which they had good data about high school completion, they found that there were large differences between the outcomes participants and nonparticipants with those in Talent Search being more likely to graduation. However, they are less confident about this finding due to the possibility that program staff may have chosen to serve students they deemed more likely to complete high school. In summary, although this is not a randomized study, the use of detailed individual student data makes this a strong analysis with certain caveats noted by the researchers.

Brewer and McMahan Landers (2005) conducted another study of Talent Search. This paper focuses on the program at the University of Tennessee-Knoxville and compares the enrollment rates of 758 participants to a control group of 450. However, because the control group is made up of students who were eligible for Talent Search services but elected not to receive them, it is likely that there are unobservable differences between the two groups. If motivation and aspirations affected the likelihood of participating in Talent Search, and these factors are also related to the outcomes of interest (i.e., postsecondary attendance), then the results will be biased upward. There were also observable differences between the groups as the nonparticipants' parents had lower average educational attainment. The researchers indeed find that the participants were significantly more likely to attend college, but it is unclear how large the bias might be, and so the contributions of this study are limited.

Project GRAD

First launched in Houston, TX, Project Graduation Really Achieves Dreams (Project GRAD) is designed to improve academic achievement, high school graduation rates, and rates of college attendance for low-income students. It does this by first trying to help students arrive at high school better prepared academically by implementing a specific reading and math curricula, along with enhanced professional development for teachers, at the elementary and middle school levels. At the high school level, Project

GRAD offers special academic counseling and summer academic enrichment and a college scholarship Partee (2000). The scholarship typically provides a minimum of $1,000 per year for four years, and students must meet eligibility requirements that are formalized in a "contract" designed to motivate students to stay in school and focus on college preparation (Project GRAD n.d.)

MDRC, a nonprofit, nonpartisan research organization, conducted an evaluation of Project GRAD to determine its effects on high school course-taking, academic performance, and graduation rates. The researchers used a quasi-experimental research design by comparing the changes in student outcomes at Project GRAD schools with changes at similar, non-Project GRAD schools in the same districts. Outcomes were tracked from the implementation of the first components of the model at each site (ranging from the mid-1990s to the early 2000s) until the 2002-2003 school year. However, due to the fact that many Project GRAD students did not benefit from exposure to the model in elementary or middle school, many did not enter high school at the appropriate level of preparation as originally intended, and this affected the implementation of the program at the high school level and the overall evaluation of its effects (Snipes, *et al.* 2006)

For the study of the Houston sites, Snipes, *et al.* (2006) focused on three Houston high schools that implemented Project GRAD from 1998 to 2004 and compared their outcomes to 10 high schools in the district that did not implement the program but had similar student body characteristics. The researchers concluded that Project GRAD had a statistically significant positive impact on the proportion of students who completed a core academic curriculum on time and graduated from high school within four years at the initiative's flagship school in Houston. However, at the two other Houston high schools, they did not find positive effects on students' academic preparation. Improvements in graduation rates at the three Project GRAD Houston high schools were generally matched by improvements in graduation rates at the comparison schools suggesting Project GRAD did not have an effect on the likelihood of high school graduation. Project GRAD high schools in Columbus and Atlanta showed improvements in attendance and promotion to tenth grade that appear to have outpaced improvements at the comparison schools. However, the differences are only sometimes statistically significant. Moreover, due to the limited amount of follow-up in the expanded program sites, the researchers suggest that the results for sites other than Houston should be treated as more provisional.

The researchers conclude that Project GRAD had limited effects most likely due to the fact that it does not intervene directly in classroom instruction at the high school level. However, they do point out that the program's "focus on the full span of grades, the connection to postsecondary education, and the need to work above the level of individual schools are now appreciated as important aspects of many district-level reforms" (Snipes *et al.* 2006). Although the Project GRAD materials and web site tout much more positive research results, other studies of Project GRAD only examine changes overtime within the Project GRAD schools (e.g., Opuni 1999; Opuni and Ochoa 2002). They do not utilize comparison groups to establish a counterfactual and determine a more accurate measure of the effects of the program.

AVID

The Advancement Via Individual Determination (AVID) Program targets students in fifth through twelfth grade with the hope of helping students who are capable of completing a rigorous curriculum but currently fall short of their potential. Many of AVID's students are from low-income or minority families. To improve outcomes, AVID attempts to enroll students in more challenging classes, including honors and AP courses. Students also enroll in the AVID elective, in which they learn organizational and study skills, work on critical thinking, and get academic help from peers and college tutors. According to its website, in fall 2007, AVID was in 3,500 schools in 45 states and 15 countries.

Guthrie and Guthrie (2000 and 2001) conducted longitudinal studies of the program designed to examine the impact of AVID on middle school students as they transition to high school. The research tracked an initial cohort of 435 students and added of new cohort of ninth graders during year three of the study for a study sample of about 1100 students. The study then compared the high school outcomes of students who took AVID in middle school to students who did not. The early results suggested that students with two years of AVID in middle school had a significantly higher GPA than those with only one year of AVID or no AVID experience. However, this pattern was not sustained in high school. The researchers did find that AVID appeared to positively influence credit accumulation. While the accumulation of credits put the AVID students on track for acceptance into a public university, their standardized reading test scores were below the national average.

Another study of AVID focused on 10 high school in Texas (Watt, Powell, and Mendiola 2004). The researchers collected data on nearly 1300 participants and found that all of the AVID schools improved their accountability ratings during the first three years of AVID implementation. In comparison to their classmates, AVID students did better on standardized tests and attended school more often. Finally, the study concludes that enrollment in Advanced Placement courses at AVID schools is increasing suggesting that more underrepresented students are being prepared for college. However, little in known about the exact research design to comment on the strengths versus weaknesses of this study.

Puente Project

The Puente Project is a outreach program with the goal of increasing the number of educationally disadvantaged students who enroll in four-year institutions, earn degrees, and return to the community as mentors. Although it services all kinds of students, Puente targets non-immigrant Latino students in particular as an original goal was to increase the number of Latino students attending University of California. (Gándara 1998). In 2004, it served nearly 3800 students (Gándara 2005). The program includes a rigorous counseling component in which participants meet with trained community members. Student must also meet at least monthly with teachers and advisors to discuss challenges and life choices. Their parents must also sign a statement agreeing to support the student and attend necessary meetings.

Gándara (1998) and Moreno (2002) are two studies of Puente, and they estimate the effects by comparing participants with a comparison group. Gándara (1998) focused on college going rates, admissions test trends, and high school course-taking and performance. She matched participants with students in the control group that had similar characteristics (e.g., by achievement level and grades). Gándara found that Puente had positive effects on the outcomes of students participating in the program, including increasing the likelihood of applying to a University of California campus and taking a pre-college admissions exam. Slightly more Puente students took honors courses and participated in the SAT II subject exams. The study by Moreno (2002) of long-term outcomes further support claims about the positive effects of Puente. In the long-term, Puente students were more likely to have both gone and persisted in college. However, both studies are based on a very small sample of students; the Gándara

(1998) study has a population of 144 students in both the treatment and control groups. Also, many of the outcomes are self-reported.

Other Programs and Evaluations

The profiles and discussion of research on the above programs gives a basic sense of the types of programs implemented to address the dropout and college access problems.   There have been other studies that have reviewed additional programs. For example, Dynarski, et al. (1998) is an evaluation of 16 dropout-prevention programs that were supported by grants from the U.S. Department of Education from 1991 to 1995. The programs of the study ranged from those located middle versus high schools but all were designed to help students perform better and stay in school.   The services of the programs included intensive instruction, attendance monitoring, counseling, small-school settings, mentoring, and links with social-service providers.   To determine the effectiveness of the programs, the researchers randomly assigned students to treatment or control groups and tracked their outcomes with surveys and school records. Students assigned to treatment groups could participate in one of the programs while those in the control group could attend school as they normally would and could participate in other available education programs.

The analysis resulted in two sets of conclusions. Of the middle school program, the authors concluded that intensive programs can improve grade promotion and reduce the rate of dropping out while low-intensity middle school programs did not improve outcomes. At the high school level, the research suggests that the GED programs were successful helping students obtain GED certificates. However, alternative high school programs did not reduce dropping out or improve other outcomes. The high school programs also did not affect personal and social outcomes (Dynarski, *et al.* 1998).

Gándara and Bial (2001) also try to identify the most effective practices of programs "capable of at least doubling the college-going rate of participants." They conclude that the best programs provided mentors who would guide a student over a long period of time, high-quality instruction through access to the most challenging courses offered by the school, and financial assistance and incentives. The most effective programs also focused on long-term investments (rather than shorter term investments), paid attention to the cultural background of students, and provided a peer group that supported a student's

academic aspirations as well as social and emotional support. However, the authors underscore the limitations of much of the underlying research on which they base their conclusions. Supplementing my list above, they point to program attrition, incomplete records on program contact, little information on long-term outcomes as problems of the research and note that there was limited evidence that the programs raised academic achievement.

V.   SUMMARY AND CONCLUSIONS

The objective of this chapter was to review the literature on high school dropout prevention and college preparatory programs with the goal of determining the likelihood that investment in such programs would be an effective anti-poverty effort. As documented by many sources, substantial numbers of students do not graduate from high school. Among high school graduates, many do not enroll in college or find themselves underprepared for college-level coursework. These are significant problems that cost society dearly in terms of the reliance on expensive government programs and lost tax revenue, but more importantly, individuals suffer in multiple ways as a result of low educational attainment.

While there are many programs that attempt to address these problems, as my review demonstrates, it is difficult to draw strong conclusions about what are the most effective approaches. The research literature is plagued by poor data, inadequate comparison groups, and complications when trying to determine the relative impact of multiple services. Additionally, there is little information about cost to extrapolate a cost-benefit analysis. However, several points can be taken away from the research.

Several of the evaluations concluded that more systemic, longitudinal interventions were more successful with the effects increasing with prolonged involvement in a program. Interventions providing a variety of services, including instruction, counseling, and intensive summer activities also were found to have more positive effects. However, starting early (i.e., in middle school) and continuing to work with students until the end of high school can be quite expensive. Also, while some results suggest the effects of early investments are sustaining, other studies did not find that early positive effects still remained as the students got older and farther away from the intervention.

Looking forward, future analyses should follow the example of some of the more in depth studies and implement random assignment to determine who gets the intervention (e.g., Dynarski, et al. 1998). This would create the best possible comparison group for causal analysis, but a great deal of planning is necessary to accomplish this. However, with limited resources and the great need for such programs, oversubscribed programs could use a lottery to determine who gets the benefits, and as long as the researchers continue to track the applicants who did not get into the program, they should be able to establish a rigorous study.

The availability of new data sources should also greatly help future analyses. Similar to Constantine, *et al.* (2006), researchers should tap into the state and district administrative databases that now include K-12 and postsecondary data on students. Supplemented by surveys and program information, one might be able to do more comprehensive research on the effects of programs. Special attention should also be paid to collecting information on program costs to enable full cost-benefit analyses in the future.

There is also a great need to distinguish the effects of one particular service versus another or how different combinations of services impact student outcomes. To address this, researchers should carefully consider research designs that will allow them to estimate separately the effects of different parts of an intervention. This may involve larger sample sizes and more complex randomization plans, but the result would be more specific information about exactly what types of services to include in the most effective program. Finally, with careful research design and larger sample sizes, future evaluations should attempt to estimate how the effects of an intervention differ by type of student as research suggests that "one size fits all" is not the best way to try to address these problems.

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Figure 1: The Goals of Outreach Programs
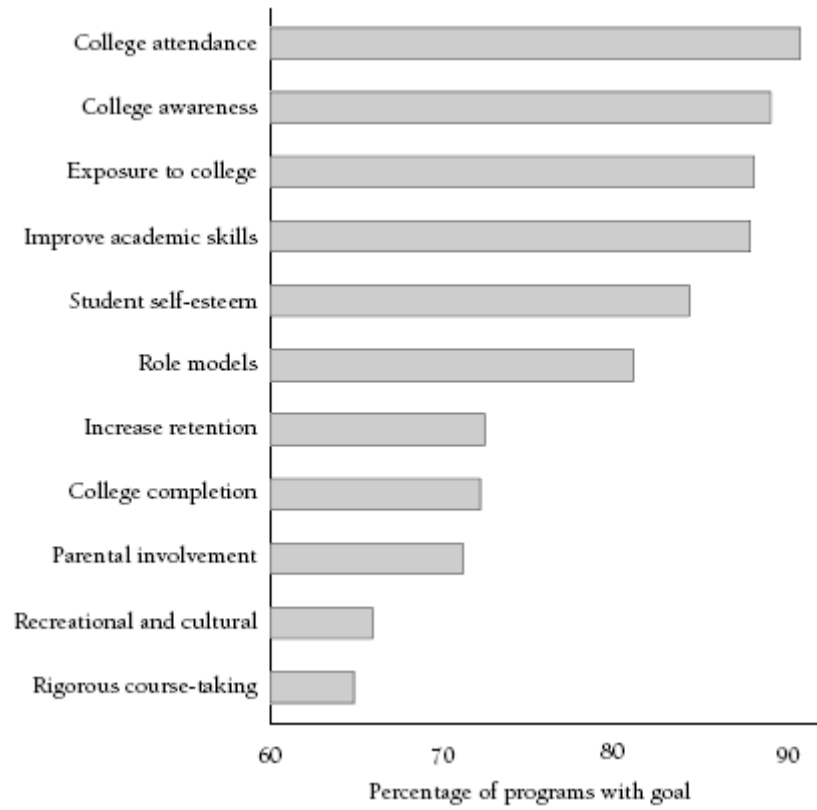
Source: The National Survey of Outreach Programs, The College Board, 2000. Reported in Swail (2000).

Figure 2: The Services Offered by Outreach Programs (by percentage)
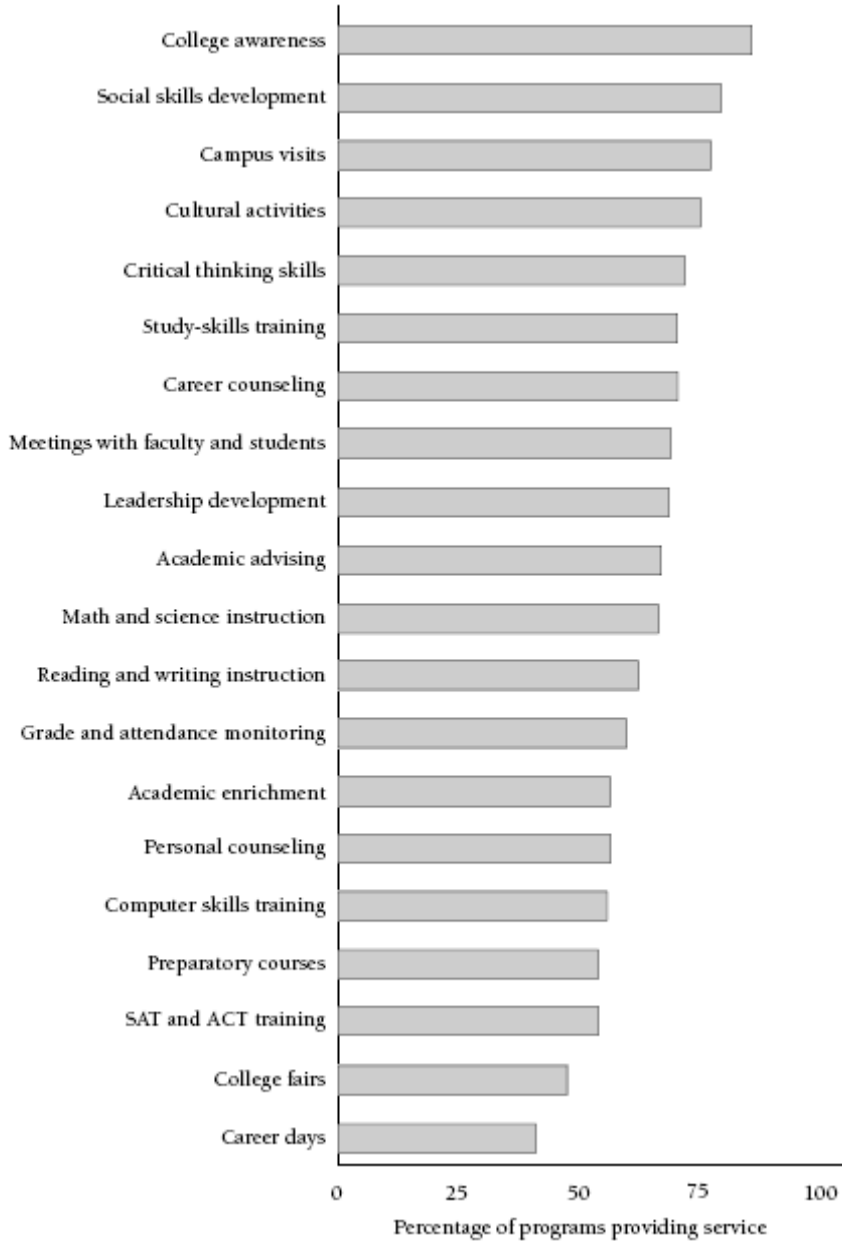
Source: The National Survey of Outreach Programs, The College Board, 2000. Reported in Swail (2000).

Table 1: Status High School Dropout Rates for 16 to 24-year-olds, 1972-2006

Year	Status Dropout Rate (percent)	Number of Dropouts (thousands)	Population (thousands)
1972	14.6%	4,769	32,643
1977	14.1	5,031	35,658
1982	13.9	5,056	36,452
1987	12.7	4,252	33,452
1992	11.0	3,410	30,944
1997	11.0	3,624	32,960
1998	11.8	3,942	33,445
1999	11.2	3,829	34,173
2000	10.9	3,776	34,568
2001	10.7	3,774	35,195
2002	10.5	3,721	35,495
2003	9.9	3,552	36,017
2004	10.3	3,766	36,504
2005	9.4	3,458	36,761
2006	9.3	3,462	37,047

Source: Laird, Cataldi, Kewal Ramani, and Chapman. (2008). *Dropout and Completion Rates in the United States: 2006* (NCES 2008-053), Table 7. U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October (1972–2006).

Notes: The status dropout rate indicates the percentage of 16- through 24-year-olds who are not enrolled in high school and who lack a high school credential. High school credentials include high school diplomas and equivalent credentials, such as a General Educational Development (GED) certificate. Estimates beginning in 1987 reflect new editing procedures for cases with missing data on school enrollment items. Estimates beginning in 1992 reflect new wording of the educational attainment item. Estimates beginning in 1994 reflect changes due to newly instituted computer-assisted interviewing.

Table 2: Status Dropout Rates for 16 to 24-year-olds, October 2006

Characteristic	Status Dropout Rate (percent)	Number of Dropouts (thousands)	Population (thousands)
Total	9.3	3,462	37,047
Race/Ethnicity			
White, non-Hispanic	5.8	1,337	22,863
Black, non-Hispanic	10.7	565	5,260
Hispanic	22.1	1,421	6,439
Asian, non-Hispanic	3.6	56	1,549
More than one Race	7.0	49	703
Gender			
Male	10.3	1,935	18,707
Female	8.3	1,527	18,340
Age			
16	2.8	124	4,462
17	5.0	210	4,212
18	8.6	356	4,120
19	9.7	386	3,982
20–24	11.8	2,385	20,270
Born outside the U.S.			
Hispanic	36.2	959	2,648
Non-Hispanic	6.6	126	1,898

Source: Laird, Cataldi, Kewal Ramani, and Chapman. (2008). *Dropout and Completion Rates in the United States: 2006* (NCES 2008-053), Table 6. U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2006.

Notes: The status dropout rate indicates the percentage of 16- through 24-year-olds who are not enrolled in high school and who lack a high school credential. High school credentials include high school diplomas and equivalent credentials, such as a General Educational Development (GED) certificate. Due to small sample size, American Indians/ Alaska Natives are included in the total but are not shown separately. Detail may not sum to totals because of rounding.

Table 3: Overview of Major Interventions

Program Name	Location(s)	Participant Characteristics	Approach and Program Components
GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs)	242 Partnerships nationwide in 2001-02	Low-income students	Comprehensive intervention program tasked with equalizing access to higher education for low-income students Program promotes giving college information to students and parents, providing individualized academic and social support to students, and college scholarships Grantees are also charged with establishing partnerships among school districts, colleges and other organizations
Upward Bound	In 2004, about 52,000 students in 727 projects nationally	Economically disadvantaged students At least two-thirds participants must be both low-income and potential first-generation college students	Provides a variety of services, including instruction, tutoring and counseling throughout the school year. Also offers an intensive instructional program that meets daily for about six weeks during the summer Majority of projects are hosted by four-year colleges. Students typically enter the program while in ninth or tenth grade and may participate through the summer following twelfth grade (most typically remain in Upward Bound for about 21 months)
Talent Search	382,500 students in 470 projects nationally (FY2004)	Low-income, potentially first-generation college students	Designed to help students prepare for and gain access to college Provides information on the types of high school courses students should take to prepare for college and on the financial aid available to pay for college Helps students complete financial aid applications and navigate the college application process
Project GRAD (Graduation Really Achieves Dreams)	Houston, TX Atlanta, GA Columbus, OH (nationally, serves more than 121,900 youth in 205 public schools)	Low-income students in economically disadvantaged communities	Goal is to see at least 80 percent of students graduate from high school and 50 percent of these graduates enter and graduate from college Aims to reduce dropping out and increase rates of college enrollment and graduation by increasing reading and math skills and improving behavior in school Provides services in those elementary and middle schools that feed in to the participating high schools At the high school level, students are required to take an academic program, attend college campus-based summer academic institutes, participate in career exploration activities, and they can earn scholarships for college. The scholarship program is available to all graduates with 2.5 GPA.

Table 3: Overview of Interventions (*continued*)

Program Name	Location(s)	Participant Characteristics	Approach and Program Components
AVID (Advancement Via Individual Determination Program)	3,500 schools in 45 states and 15 countries (2007)	Students capable of completing a rigorous curriculum	Attempts to enroll students in more challenging classes, including honors and AP courses Students also enroll in the AVID elective, in which they learn organizational and study skills, work on critical thinking, and get academic help from peers and college tutors
Puente Project	California	Services all kinds of students but targets non-immigrant Latino students	Goal of increasing the number of educationally disadvantaged students who enroll in four-year institutions, earn degrees, and return to the community as mentors Program includes a rigorous counseling component in which participants meet with trained community members. Student must also meet at least monthly with teachers and advisors to discuss challenges and life choices. Parents must also sign a statement agreeing to support the student and attend meetings

Table 4: Overview of Major Evaluations

Intervention and Study	Data and Sample	Research Design	Outcome	Effect Size	Cost
GEAR UP Terenzini, *et al.* (2005)	Annual Performance Reports and school-level data on 47 GEAR UP schools to 133 peer schools	Examined how the outcomes of cohorts changed over time Compared schools with GEAR UP to their similar peers	Students' college plans Students' math scaled scores on the Stanford-9 test (accounting for students' previous test scores and school characteristics)	Positively affected (strongest effects with parent-focused activities) By the end of the 7th grade (one year later), growth favored CIP schools by 2.05 mean scaled math score By the end of the 8th grade, CIP schools outperformed their counterparts by 1.2 mean scaled math score (marginally insignificant)	DOE awarded $75 million to 164 partnership grantees and $42 million to 21 state grantees in 1999 No information on specific programs or services within partnerships
GEAR UP Westat (2008)	18 middle schools and matched them with 18 similar schools Randomly selected 140 seventh graders from each school to survey along with their parents	Comparisons between matched schools Analysis of the student and parent surveys	Positively associated with the student's and parents' college knowledge Positively associated with the likelihood of parents being involved in their children's education African-American students positively impacted to take more rigorous courses during middle school	Used various measures. Ranged from 6 to 19 percent point differences. Parents reported attending meetings about college preparatory curricula: 17 percent versus 9 percent (GEAR UP program versus not) Students from GEAR UP schools averaged 1.0 rigorous course as compared to 0.5 of a course among those from non-GEAR UP school	
Upward Bound Myers and Schirm (1999) Myers, et al. (2004) Both as part of Mathematica Policy Research, Inc	Nationally representative sample of eligible applicants Data from surveys, transcripts, and staff reports	Longitudinal evaluation applicants were randomly assigned to Upward Bound or a control group	For the average student, program was found to increase the number of high school math credits earned but did not affect other measures of high school academic preparation. Course-taking: Honors and Advanced Placement courses	Raised the average number of high school credits earned from 19 credits to 21 credits. Much of the increase from additional credits in core academic subjects); however, the effects were statistically significant only for math (0.2 credits) Increased the number of honors and AP courses completed by lower-expectation students by 0.7 credits (70 percent of the treatment group completed one more course than they would have otherwise)	Upward Bound is an intensive program and so considered expensive On average, cost per student served was about $4,800 per year, and these expenditures provided a variety of services (FY2001)

Intervention	Data and Sample	Research Design	Outcome	Effect Size	Cost
Upward Bound (cont.)			Enrollment at four-year institutions	Increased likelihood of four-year college enrollment by 6 percentage points; larger for students with lower educational expectations	
Talent Search Constantine, *et al.* (2006)	Florida, Indiana, and Texas	State administrative records Compared the outcomes of participants to similar students	Apply for financial aid	17, 14, and 28 percentage points more likely to apply, respectively, for Florida, Indiana, and Texas	Received $144 million to serve 382,500 students in 470 projects nationally in fiscal year 2004 (averaged $375 per participant served)
			Enroll in a public institution	Enrollment was higher by 14, 6, and 18 percentage points, respectively, for Florida, Indiana, and Texas	
			Graduate from high school (Florida and Texas only)	Increased graduation 9 and 14 percentage points, respectively, for Florida and Texas, but these results may be biased upward	
Project GRAD Snipes, J.C., Holton, G.I., Doolittle, F., & Sztejnberg, L. (2006).	Houston, TX Ninth-grade students from 13 high schools (3 Project GRAD schools and 10 comparison schools) Atlanta and Columbus (in each city, one Project GRAD school and one comparison school)	Interrupted time series analysis and comparisons with similar schools Outcomes were tracked from the implementation at each site (ranging from the mid-1990s to the early 2000s) until the 2002-2003	Proportion of students who completed a core academic curriculum on time	At the initiative's flagship school, program had a statistically significant positive effect of nearly 7 percentage points (no effects found at the two other Houston high schools)	Difficult to price the individual components as much is done within schools (implementing a specific curricula, academic counseling summer academic enrichment, and a scholarship)
			Attendance and promotion to tenth grade (Atlanta and Columbus sites where it is too soon to examine the impact on high school graduation)	Consistently finds positive effects but they are only sometimes statistically significant	
AVID Guthrie and Guthrie (2000 and 2001)	Initial cohort of 435 students; Increased sample to 1100 later	Compared the high school outcomes of students who took AVID in middle school to students who did not	High School GPA	Higher GPAs the longer the exposure to AVID in middle school (effects not sustained in high school)	No information.
			High School credit accumulation	Positively influenced credit accumulation but the difference appears small (around 2 credits)	

Intervention	Data and Sample	Research Design	Outcome	Effect Size	Cost
Puente Gándara (1998) Moreno (2002)	Small sample of 144 students	Matched participants with students in the control group that had similar characteristics	Admission Test Completion SAT by 12th grade	36 percent points higher among Puente students	Budget of $1,501,000 in 2004 serving 3,799 students (average around $395/person)
			Attend a four-year college	7 percentage points higher among Puente students	
			Attend a two-year college	13 percentage points higher among Puente students	
			College Persistence after 3 years	19 percentage points higher among Puente students	