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**BREAKING BARRIERS TO EDUCATIONAL OPPORTUNITIES:  
A COMPARATIVE ANALYSIS OF ADOLESCENT INTERVENTION PROGRAMS**

A Dissertation in

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by

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## **ABSTRACT**

While access to education may be increasing, equity still eludes the U.S. education system, specifically for low socioeconomic status students. Using both educational and deviance theoretical frames, this study examines the effectiveness of adolescent intervention programs with respect to educational attainment and deviant behaviors. The Education Longitudinal Study 2002-2006 provides a nationally representative, longitudinal sample from which causal inferences can be drawn using propensity score matching. The three types of programs—individually targeted, spillover, and school-wide—all enhance educational outcomes while decreasing educational deviance. The variance in program effectiveness is discussed, as are implications and policy recommendations based on these findings.

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## **Chapter 1. INTRODUCTION**

Economic inequality in the U.S. is greater than that of any other industrialized nation, resulting in the underrepresentation of low SES students in the collegiate realm (Wolff, 2006). Tuition rates are rising at a rate three to four times greater than inflation and expenses are doubling for students receiving the maximum Pell grant. College tuition at a four-year public institution would require 71% of a low socioeconomic status (SES) family's income, making college an unattainable dream for the majority of these students (Advisory Committee on Student Financial Assistance, 2002; Department of Education, 2003; Padroin, 2004). The inability to attend college ensures the perpetuation of the current state of inequality.

Social justice researchers and advocates argue that in order to break the cycle of poverty and enable these students to improve their situations, economic and education policy must enhance human capabilities instead of continuing to ignore the very real destitution low SES families face (Anderson & Larson, 2009; Brighthouse, 2000; Freire, 1995; Larson & Murtadha, 2002; Nussbaum, 2000; Sen, 1992, 1999; Walker & Unterhalter, 2007). More than 13 million children live in low SES conditions wrought by anxiety, stress, fear, and mental, emotional, and physical health and safety concerns, handicapping their academic potential (Deneulin, Nebel, & Sagovsky, 2006; National Center for Children in Poverty, 2008; Nussbaum, 2000). Low SES families are especially vulnerable to poor health due to their lack of support systems, inflexible work hours, and unaffordable health insurance, making the majority of these families just one medical emergency away from being homeless (National Policy and Advocacy Council on Homelessness, 2007; Sen, 1992).

Not only are low SES students less likely to take college preparatory measures, like applying for financial aid and taking the appropriate high school courses, but they are also more

likely to be labeled as juvenile delinquents, hindering academic achievement, future job stability, and status achievement (Di Le, 1999; Kane, 2002). These negative labels lower expectations and remove conventional means of success (Becker, 1963; Farkas, 1996; Hallin, 1996; Lemert, 1951; Rosenbaum, 2001; Sutherland, 1934). The barriers to legitimate successful pathways—lower expectations, lower academic achievement, poor health, increased stress and anxiety, etc.—remove the freedom to make positive life choices. Unequal circumstances produce unequal freedom in the power to choose (Ricour, 2006), meaning low SES students have blocked opportunity structures that leave them with limited options. If they chose to attend a postsecondary institution, it is most often at the peril of their family, if the financial aid is even available for them to do so. More than likely, college is not the viable option. The remaining options then become entering the job market (either as a high school graduate or drop-out), or resigning themselves to deviant means of helping to financially support their family.

According to Gottfredson and Hirschi (1990), the first six to eight years of life are the most important. Some might argue that the answer to the problems plaguing low SES families would thus be to increase early childhood policy and programs targeting this important stage of development. I, however, am arguing that in order to best combat the problem, we must address the issue prior to conception of a child on the basis of not only the importance of the first six to eight years, but also the importance of prenatal care (for a complete literature review see Murata, McGlynn, Siu, & Brook, 2007). As such, the purpose of this study is to use current theoretical and conceptual frames provided by both education and deviance researchers to assess adolescent intervention programs.

Adolescent intervention programs have been attempting to close the educational attainment gap between low and high SES students since the inception of the Higher Education



Act of 1965 (HEA). Though HEA offers a wide variety of intervention programs, the typical structure and eligibility of programs are relatively similar—students from low SES families who will be first generation college attendees are offered information that is supposed to take the place of the social and cultural resources these students would otherwise possess if living in a higher SES household. While the Department of Education assessments of HEA programs report program effectiveness, when programs like Upward Bound, Talent Search, and Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) are evaluated using experimental or quasi-experimental designs, minimal, if any, effects can be attributed to program participation (ACT, 2007; Constantine, Seftor, Martin, Silva, & Myers, 2006; Domina, 2009; Myers, Olsen, Seftor, Young, & Tuttle, 2004). While individually targeted programs offered under HEA have mixed reviews and minimal effectiveness, school-based programs have been found to produce slightly more significant results (Domina, 2009; Fordham & Ogbu, 1986; Gottfredson, 1986).

The effectiveness of adolescent intervention programs is the main purpose of this study.

I will address the following research questions:

1. Are adolescent intervention programs closing the college attendance gaps between low and high SES students?
2. Are adolescent intervention programs providing other positive outcomes, such as decreasing idleness and other forms of deviance?
3. Are adolescent intervention programs mediating for the lack of parental resources typically seen in low SES families?

These questions are specifically addressing the outcomes for program participants relative to their non-participating, low SES counterparts. Restricted data from the Education Longitudinal Study 2002:06 (ELS) will be used to examine a propensity score matching model, providing a

quasi-experimental design enabling causal inference with respect to adolescent intervention program participation.

Chapter 2 outlines the conceptual framework for this study through a review of current literature, including both theoretical and empirical work. Chapter 3 explains propensity score modeling in detail, including the appropriateness of ELS data. Additionally, the variables used for the analyses are discussed and descriptive statistics are provided. The results are reported in Chapter 4, with a discussion following in Chapter 5 that addresses the implications of my findings. The final chapter, Chapter 6, draws conclusions from the research and provides recommendations for researchers and policymakers for the direction of adolescent intervention program services and funding.

The familiar adage, “College is not for everyone” is particularly salient to educational research, especially when considering the barriers low SES students face with respect to educational attainment. Even if these programs do not get students into college, they may still be beneficial with respect to breaking the cycle of poverty. Minimizing delinquency and increasing high school graduation helps smooth the transition into adulthood and the workforce. Successful intervention programs help shape successful students and gain community support. Hopefully these successful youth will become adults who give back to their communities benefitting everyone, and enhancing the overall quality of life.

## **Chapter 2. THEORETICAL BACKGROUND**

The compulsory nature of education provides a foundation for adolescent intervention programs that have the ability to both increase educational attainment and decrease deviance. The sociology of education helps provide a framework for understanding inequities in student educational outcomes which will be discussed through both family and school characteristics (section 2.1). The social context and effectiveness of adolescent intervention programs will then be discussed (2.2). The sociology of deviance is then used to address the theoretical connection between deviant behavior and the role of education based interventions (2.3). The theoretical frames and practical applications will be combined in the final section through the conceptual framework of this study (2.4).

### 2.1 Sociology of Education

Postsecondary education in the U.S. is neither compulsory nor fully funded by tax dollars. Because low SES students lack the knowledge of financial aid possibilities and other collegiate preparatory information, the college attendance gap between low and high SES students will persist. The continued presence of the social divide can be explained in the sociology of education through the conflict theory perspective, which perceives that school enrollment, funding, resources, and facilities are related to social characteristics that have the ability to eventually impact academic achievement and educational attainment (Dreeben & Gamoran, 1986; Griffin & Alexander, 1978; Kerckhoff, 1975). Higher status groups have the ability to impose cultural norms and values, controlling and determining eligibility for social elevators like postsecondary education (Bourdieu, 1984). Consistent with Weber's theory of status groups, several researchers have found that one's SES is positively correlated with

educational outcomes (Alexander, Cook, & McDill, 1978; Alexander & McDill, 1976; Bowles, 1968; Bowles & Gintis, 1976; Rosenbaum, 1980).

Low SES students are the least informed and most fearful with respect to college attendance. Not only do they attend college at a significantly lower rate—6.9% compared to 81% of their high SES counterparts—but also only 22% of those who do attend will complete a four-year degree (HEA, 2008; IES, 2007; Perna & Swail, 2002). Due to insufficient resources, low SES students suffer from a myriad of things, such as: inadequate counseling and academic advisement, non-college preparatory trajectories, inability to meet admissions' requirements, unqualified teachers, low aspirations and expectations, lack of peer support, racism, *de facto* segregation, high drop-out rates, and a lack of parental and communal resources that produce adequate social and cultural resources (Gandara, 2001; Hayward, Brandes, Kirst, & Mazzeo, 1997; Vargas, 2004). High school completion is no longer adequate for a sustainable lifestyle in postindustrial America, meaning some college attendance is necessary if low SES students are to break the cycle of poverty (Marshall & Tucker, 1992; Wortington & Juntunen, 1997).

The Coleman Report (1966) found that most of the variation in individual student achievement lies within, not between, schools, implying that student and family characteristics are the strongest predictors of student achievement and inequity in such achievement. Family SES positively corresponds to higher student achievement and educational attainment, with parental education being the strongest predictor of educational outcomes though parental wealth remains one of the main contributing factors (Bankston & Zhou, 2002; Beller & Chung, 1992; Caldas & Bankston, 1997; Featherman & Hauser, 1978; Orr, 2003; White, 1982; Wilkins, 2000). The rising cost of tuition prevents half of all eligible low and moderate SES students from attending college, with high SES students attending at a rate of more than 25% points higher, and

being five times as likely to graduate (Padroin, 2004; Pathways to College Network, 2004; Washington State GEAR UP, 2008). Income disparity contributes to the disparity in educational equity resulting in only 28% of low SES students having access to honors classes, compared to 65% of high SES students (Pathways, 2004). The inability to ignore extreme family conditions also prevents low SES students from focusing on their studies (Anderson & Larson, 2009).

In addition to the disparaging impact of SES, individual students can also be negatively impacted by race and/or ethnicity (Coleman, 1987; Delgado-Gaitan, 1991; Farkas, 2004; Hao & Bonstead-Bruns, 1998; Jencks & Phillips, 1998). Despite the near doubling of minority populations in the U.S., *de facto* segregation now is equivalent to that of the early 1960s with per pupil expenditure gaps between black and white students exceeding \$1,000 in 11 states (Frankenberry & Lee, 2003; Jost, 2004). An interactional pattern has emerged in the U.S. with respect to SES, race/ethnicity, and family composition. Single-parent families tend to have lower income, resulting in an overall decreased level of educational attainment, while the inclusion of a step-parent only further complicates college attendance (Astone & McLanahan, 1991; Beller & Chung, 1992; Hill & Duncan, 1987; Krein & Beller, 1988; McLanahan, 1985; Shaw, 1982).

Single parents are going to have lower income and fewer resources than two-parent families. Minority students are more likely to live in single-parent homes, further increasing the racial/ethnic disparity. Additionally, the intertwining effects of family composition, race/ethnicity, and SES contribute to student achievement. Students from low SES and/or single- or step-family homes have lower levels of achievement (Bankston & Zhou, 2002; Beller & Chung, 1992; Caldas & Bankston, 1997; Featherman & Hauser, 1978; Fordham & Ogbu, 1986; Orr, 2003; White, 1982; Wilkins, 2000). The direct relationship between student

achievement and college attendance is intuitive, in that those with higher levels of achievement attend and complete college at higher rates than those with low levels of achievement (Fox, Connolly, & Snyder, 2005).

Essentially, family resources contribute substantially to youth educational outcomes, which are further reflected in aspirations and expectations. Student and parental aspirations and educational attainment expectations can effect student achievement and parental involvement (Cabrera & La Nasa, 2000; Horn, 1998; Hossler, Braxton & Coopersmith, 1989; Natriello & McDill, 1986; Orr, 2003; Perna, 2000). Higher aspirations and expectations may result in self-selection into adolescent intervention programs, and should directly impact the amount of effort expended by the student. Unfortunately, recent research shows the gap between student effort and expectations is widening, meaning a lack of effort and not labeling is preventing students from attending college (Siennick & Staff, 2008).

An additional form of family resources is the capability to be involved. Student and parental involvement, as well as the combined involvement between the two, are considered important aspects of student outcomes. Parental involvement has been found to increase student achievement and college attendance, making it a necessary component to level the playing field (Fox, Connolly, & Snyder, 2005; Kim & Schneider, 2005; McElroy & Armesto, 1998; Natriello & McDill, 1986; Orr, 2003). Ho Sui-Cho and Willms (1996) established and tested a four dimensional model of parental involvement which included home discussions, home supervision, school communication, and school participation. A fifth component should also be considered, intergenerational closure. Intergeneration closure is the closure of family units in which parents are friends with the parents of their children's friends (Coleman, 1988; Epstein, 2001; Heimer, 1997; Perna & Titus, 2005; Pong, Hao, & Gardner, 2005).

Involvement increases both parental and student knowledge with respect to the current educational situation as well as direction for future success. Students with uninformed parents are less likely to enroll in postsecondary institutions and are the least informed, while high SES students are “conditioned” to succeed in the application process (Cabrera & La Nasa, 2000; Orfield & Paul, 1994; Perna & Swail, 2002). Student’s SES, race/ethnicity, family composition, achievement, aspirations, and parental aspirations and involvement, account for the within school variation identified by Coleman et al (1966). Because school characteristics are often the product of family demographics, between school variance provides additional predictors of educational outcomes.

More recent research has found that between school variance explains 40% of student achievement (Borman & Dowling, 2009; Gamoran & Long, 2006). When SES, academic ability, and physical and psychological health are factored in, schooling still has an effect on individual outcomes (Pallas, 2006). Gaps in student achievement between high and low SES students are minimized during the school year, only to be widened during summer vacation (Downey, von Hippel, & Hughes, 2008). With schools having the ability to minimize the gaps created by inequitable family structures, then the equalizing of schools should decrease the parallel college attendance gaps.

As with individual and family characteristics, school SES, race/ethnic composition, mean achievement, and urbanicity all contribute to student outcomes. The school SES has a contextual effect beyond individual student and family characteristics (Becker & Epstein, 1982; Lightfoot, 1978; Willms, 1992). Though each state has its own funding hierarchy formula, schools are still funded by property tax; therefore, if a school is in a low SES neighborhood, it receives less funding. While some scholars argue additional funding does not have a direct relationship with

increased academic achievement (see Hanushek & Lindseth, 2009), this argument disregards the lack of structural changes that need to be made when additional funding is offered. The relationship between funding and achievement is quite complex. However, trends in the U.S. tend to be reflective of decreased funding corresponding with decreased achievement and educational attainment, impacting the choices available to low SES students (Lleras, 2008).

The school SES, like family SES, is intertwined with race/ethnic composition and urbanicity forming interconnected determinants of student outcomes. The most successful schools in the U.S. are found in predominately white, upper-middle class, suburban areas (Downey, von Hippel, & Hughes, 2008; Wilkins, 2000). Schools with a high minority population have lower student achievement and attainment for both the white and minority students, which indicates the previously mentioned *de facto* segregation has severe consequences (Bankston & Caldas, 1996; Carbonaro, 2005; Entwisle & Alexander, 1992; Lleras, 2008; Roscigno, 1998). Additionally, the more urban the school, the more disadvantaged it is relative to its suburban and rural counterparts. The growth of the middle class provided the most successful minorities with the opportunity to escape to suburbia, leaving behind an even greater concentration of poverty in urban schools (Bankston & Caldas, 1996; Farley & Frey, 1994; Lleras, 2008; Reardon & Yun, 2001; Roscigno, 1998). This concentration of urban poverty at the school level further hinders the educational attainment of low SES students.

The family and school demographics lend support to the conflict theoretical frame. The conflict perspective explains the college attendance gap between low and high SES students as a way to perpetuate inequality. The members of the high SES status group control access to higher education which provides better opportunities, and they then limit these opportunities to their status group. As such, members of the low SES status group are denied access to higher



education and the opportunities that accompany it, completing the circle of poverty and the differentiation between status groups. Though this theory seems to provide an explanation for the college attendance gap, there are some policies and practices that refute this theory. For example, the federal, state, and local governments—presumably comprised of members with higher social status—fund programs to increase the representation of minorities and members of lower social classes in the collegiate realm. An example of such programs would be adolescent intervention programs funded under HEA.

## 2.2 Adolescent Intervention Programs

Adolescent intervention programs range in scope and scale, as well as services offered, target populations, duration, intensity, and persistence. For a program to be effective, it must promote social bonding, as well as social, emotional, cognitive, moral, and behavioral competencies (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). The program must additionally foster resilience, self-determination, self-efficacy, clear and positive identity, pro-social norms, and belief in the future. Finally, effective programs provide recognition of positive behaviors, while also providing opportunities for pro-social involvement. When programs attempt to cover as many of these criteria as permissible, and consistently provide the services for a period of nine months or longer, then they are effective (Catalano et al., 2004). Success is a direct result of combining family, community, though long-term benefits are usually difficult to measure due to a lack of longitudinal data.

Difficulty invoking all the aforementioned criteria, fails to provide the in-school systemic reform necessary to level the playing field (SHEEO, 2003). Despite this, there are some

programs that have been striving to meet some of the recommendations of previous research. Perna and Swail (2002), for example, recommend the goal of the program be college attendance, achieved through increased parental involvement that raises expectations. They additionally recommend the use of college tours, visits, or fairs in conjunction with the promotion of more rigorous course taking that begins no later than 8<sup>th</sup> grade. Most, if not all of these recommendations are reflected in the adolescent intervention programs implemented under HEA.

HEA was predominately designed to aid low SES students in achieving equal access to postsecondary educational opportunities. This legislation provided appropriations for adolescent intervention programs like the most well-known TRIO programs. Though it did not receive this nickname until its first reauthorization in 1968, the TRIO programs originally included Upward Bound, Talent Search, and Support Services (which was renamed Student Support Services) but has now grown to include nine programs (Department of Education, 2006). Over the years since its inception, HEA has been amended several times through its eight reauthorizations. One such reauthorization added GEAR UP.

For the purpose of this study, three HEA programs will be highlighted to provide more detailed examples of quantifiable program participation—Upward Bound, Talent Search, and GEAR UP. Table 1 provides program statistics for comparative purposes. Upward Bound and Talent Search are individually targeted programs facilitated by outside institutions. GEAR UP is designed as a spillover program, which means it is based at the school but not all students are required to participate. Under the spillover framework, all students in the school are thought to benefit from improving those in the lower percentiles. Unfortunately, because they are so poorly defined, school-wide programs have yet to be evaluated in detail.

**Table 1-Program Statistics at a Glance.**

<b>Program</b>	<b>Students Served</b>	<b>% Low SES Population Served</b>	<b>Amount per Student</b>	<b>% of Education Budget</b>	<b>College enrollment rates</b>
Upward Bound	65,179	0.49	\$4,800	0.56	78.4
Talent Search	363,300	2.7	\$393	0.25	77.8
GEAR UP	738,968	5.6	\$410	0.54	52.2

\*\*from "Funding Status" page on [www.ed.gov](http://www.ed.gov) for each of the programs (accessed 12/26/08).

% Low SES statistics: 13,247,238 children lived in poor families in 2007, which was defined as family income is below the poverty threshold. The federal poverty level for a family of four with two children was \$20,650 in 2007.

### 2.2.1 Upward Bound

Upward Bound was the first of the TRIO programs, beginning as a pilot project funded under the *Economic Opportunity Act of 1964* to aid low SES students in high school graduation and college matriculation (Department of Education, 2006). Upward Bound provides instruction in mathematics, laboratory sciences, foreign languages, composition, and literature, as well as social and cultural capital consistent with parental college attendance<sup>1</sup>. In order to participate, students must be between the ages of 13 and 19, completed the eighth grade, demonstrate the need for academic support if they are to attend college, be of a lower SES, and be the child of parents who have not completed postsecondary programs (first generation college attendee). In order for the program to receive federal support, two-thirds of the students enrolled must be low SES and first generation college attendees, while the other third be comprised of students who are at least one or the other.

As of 2005, 78.4% of Upward Bound students enroll in postsecondary institutions immediately following high school graduation, which is comparable to the national average low SES attendance rates of less than 7% (HEA 2008b; IES 2007). Upward Bound has been found to increase aspirations and expectations, understanding and use of the collegiate support resources,

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<sup>1</sup> For a complete listing of services offered by Upward Bound, see the Department of Education webpage: <http://www.ed.gov/programs/trioupbound/index.html>.

applications for financial aid, parental involvement, core course taking in high school, ACT scores, and high school graduation and college attendance rates, maximizing the academic and socio-cultural strengths for all race-sex groups (Garms, 1971; McElroy & Armesto, 1998; McLure & Child, 1998; Zulli, Frierson, & Clayton, 2003). Additionally, the program reduces the number of remedial math credits in both high school and college (Gullatt & Jan, 2003).

Despite the benefits, previous research has also found several flaws with Upward Bound, as well as conflicting results. The program has been found to produce no overall effect on high school outcomes and the length of program participation is highly correlated with postsecondary attendance—a problem given the attrition rates can be as high as 50% (Gandara, 2001; Gullat & Jan, 2002; Myers, Olson, Seftor, Young, & Tuttle, 2004; Westat, Inc., 2003). The economic investment required for Upward Bound is also questionable with respect to having a positive return on the investment. Given the \$4,800 per pupil expenditure, the program has been found to be economically marginal, at best (Garms, 1971; HEA, 2008b). Using findings like this, former President George W. Bush disputed the appropriations for Upward Bound calling the program, “ineffective,” weakening program effectiveness through insufficient federal funding (Fields, 2007; McElroy & Armesto, 1998).

In a more recent study, Anderson and Larson (2009) found the most significant problem with Upward Bound lies with the assumptions upon which the program is structured. The assumptive pillars of the program—the ethic of rugged individualism, a focus on the future, and immersion in intense academic settings—negate attention to the realities of program participants’ lives. Ignoring the prioritization of safety and survival over education, adolescent intervention programs can actually fuel anxiety, and many participants become a product of their environment

because, “intelligence, ambition, and family support these young men enjoyed were not enough to keep them in the program,” (Anderson & Larson, 2009, p. 80; Nussbaum, 2004; Sen, 1999).

### 2.2.2 Talent Search

Talent Search was incorporated in HEA at inception to help low SES students in the application process for the newly formed federal application for financial aid. Attacking the problem from the opposite end of the spectrum than Upward Bound, the overall goal of the program was to identify and assist those low SES students who were the most likely to succeed in postsecondary endeavors (Department of Education, 2006). The program provides academic, career, and financial counseling, plus encouragement to graduate and matriculate, while encouraging drop-outs to reenter<sup>2</sup>. Sponsorship and eligibility are the same as that of Upward Bound, though with a wider age range—participants must have completed the fifth grade and be between the ages of 11 and 27. Because it is typically coordinated in conjunction with other TRIO programs and receives less per pupil appropriations, Talent Search is considered a low-intensity program (Cahalan, Silva, Humphrey, Thomas, & Cunningham, 2004).

As of 2006, 77.8% of Talent Search participants were enrolling in postsecondary institutions and 85% of the participants were applying for federal financial aid (HEA, 2008a). Talent Search participants have been found to be more likely to enroll in postsecondary institutions—specifically four-year programs—than those eligible but not participating, as well as apply for federal financial aid (Brewer & Landers, 2005; Constatine, Seftor, Martin, Silva, & Myers, 2006). Though the program provides low SES students with the cultural capital they would have possessed had their parents attended postsecondary institutions, the type of

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<sup>2</sup> For a complete list of Talent Search services, see <http://www.ed.gov/programs/triotalent/index.html>.

institution attended is highly dependent upon the type of postsecondary institution facilitating the program.

Aside from the mixed results of previous research, the statistical methods have been called into question due to a lack of comparison/control groups, insufficient baseline data, and unaccounted attrition rates (Gandara, 2001; Garms, 1971; Gullat & Jan, 2002). The insufficient data prevents researchers from investigating the inner-workings and elemental effectiveness of programs, as well as the relevance of addressing systemic inequality (Gandara, 2001; Hayward, Brandes, Kirst, & Mazzeo, 1997; Vargas, 2004).

### 2.2.3 GEAR UP

During the 1998 State of the Union Address, President Clinton outlined what he called the *High Hopes for College Initiative*. This initiative addressed the difficulties facing low-income students during the late 90s, particularly focusing on research findings indicating these students do not even aspire to graduate high school let alone attend college. GEAR UP is a federal grant program aimed at increasing the awareness and readiness of low SES students for success in postsecondary institutions. The federal funding provides Institutions of Higher Education (IHEs), Local Education Agencies (LEAs), and State Education Agencies (SEAs) with a six year fund-matching grants enabling these partnerships to aid middle and high school students in low SES areas. The policy guidelines state that the funds can be used for programs as early in life as preschool if they are attached to “priority students” instead of cohorts (Section 404D, B2A). These funds are attached to cohorts prior to seventh grade to ensure these students not only have high hopes for college, but can now see those dreams to fruition.

In order to accomplish this feat, GEAR UP funds are available for adolescent intervention programs and college scholarships. The adolescent intervention component is specifically designed to address the issues surrounding low SES students' low expectations and aspirations, making college less of a dream and more of a reality (Department of Education, 2008). Funding priority is granted to those institutions who, prior to enactment of GEAR UP in 1998, demonstrated early or adolescent intervention initiatives for low SES students. However, to be eligible for the grant, the school can receive no other federal program funds for intervention, and 50% of the student population must be eligible for free/reduced lunch pricing. Though federal guidelines are specific in detailing the categorical use of the funds, the implementation of GEAR UP can be maneuvered within those guidelines, giving each state the ability to structure individual detailed guidelines and program services. GEAR UP seeks to raise academic performance through the following five means: early intervention services, professional development, pre-service teacher education programs, parent programs, and last dollar scholarships<sup>3</sup> (PA State, 2004).

This program had, and continues to have a substantial impact on high school graduation and college matriculation rates for low-income students. The percentage of GEAR UP students who graduated from high school in 2006 was 84.4%, and 52.2% were enrolled in a postsecondary institution (HEA, 2008a.). When compared to the U.S. population, the GEAR UP students are doing very well. The average freshman graduation rate for public schools in 2006 was 74.4%, exactly 10% lower than the GEAR UP students (IES, 2007). The nation-wide enrollment rates of 18 to 24-year-olds in degree-granting institutions was 38.9%, which is 13.3% lower than the GEAR UP statistics (IES, 2007). The preference for evidence that is

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<sup>3</sup> For an example of the specific program attributes under each of the five categories, refer to the Pennsylvania State GEAR UP website: <http://www.pagearup.org/aboutus.html>.

scientifically-based severely limits the amount of information that can be used to support these HEA programs. As causal inference modeling and statistical software packages include these new forms of analyses, educational research is beginning to form literature around experimental and quasi-experimental designs.

#### 2.2.4 Quasi-Experimental Designs

Five recent research endeavors have used either experimental or quasi-experimental designs to infer causality with respect to the effectiveness of intervention programs under HEA. In the Upward Bound evaluation in 2004, eligible program applicants were randomly assigned to treatment and control groups (Myers, Olsen, Seftor, Young, & Tuttle, 2004). A nationally representative sample of 67 Upward Bound programs was randomly chosen, and then students within the schools were randomly selected into treatment and control groups. Overall findings reported program participation had no effect on high school graduation or overall college matriculation rates; however, it did positively impact four-year college enrollment, especially for those with initially lower expectations. Upward Bound did substantially increase the postsecondary attendance rates of Hispanic students, as well an overall increase in postsecondary engagement, collegiate employment, receipt of personal counseling, attendance at learning skills centers, and use of tutoring services.

The 2006 review of Talent Search used propensity score matching to infer causality with a sample of 10 Talent Search programs, encompassing 20 high schools (N = 4,027), though the study was restricted to programs in Texas (Constantine, Seftor, Martin, Silva, & Myers, 2006). The results did not demonstrate a strong support for program continuation, like the findings in the Upward Bound study. The review of Talent search found the program to have a positive



effect on financial aid applications and college enrollment, while the findings for 4-year institution enrollment rates were inconsistent. In addition to the intervention programs that take place with select individuals (Upward Bound and Talent Search), there are also interventions implemented at the school level, those designed to have spillover effects (GEAR UP).

One of two quasi-experimental research endeavors with respect to GEAR UP was contracted to Westat, Inc. in 2003. This evaluation essentially found negative aspects of program participation, including the 50% attrition rate, which they assigned to the mobility of low SES students enrolled in the program. Aspirations and expectations of GEAR UP students were similar to that of their nonparticipant counterparts, and it was found to be a low-intensity program with minimal summer participation and parental interaction. In the second quasi-experimental project, schools were matched on the basis of size, test score average, and urbanicity (ACT, 2007). Nearly 13,000 GEAR UP participants in 250 schools were matched with nearly 12,000 non-participating students from 250 non-participating schools. Findings with respect to high school outcomes were inconsistent, concluding GEAR UP had no effect on high school curriculum or college plans, and inconsistent effects on academic achievement (ACT, 2007).

Using a nationally representative dataset of more than 15,000 students, a quasi-experimental design evaluated the adolescent intervention programs previously discussed, highlighting school-wide programs designed to have spillover effects. Domina (2009) found adolescent intervention programs increase the number of students taking pre-calculus and calculus classes, international baccalaureate students, college enrollment, and math scores through a logistic regression, propensity-score matching analysis. Though these types of improvements should have a substantial impact on student outcomes (Murnane & Levy, 1998),

Domina's findings lacked the statistical strength to demonstrate this. These minimally significant outcomes were found to be more a result of the spillover effect of having a program in the school than programs that specifically target individual students.

Domina (2009) used participation in any adolescent intervention program as the treatment to determine causality. Propensity score methods can be used to infer causality, when done properly. Though this method has been in use for more than 20 years (Rosenbaum & Rubin, 1983), it is just recently appearing in education literature. As such, these studies negate some of the fundamental principles of propensity score matching, like using imputed data or failing to invoke the region of common support, which will be discussed in greater detail in the next chapter. When taken in tandem, the results of both the previous research and the more recent quasi-experimental design studies show program inconsistency and only marginal effectiveness.

Since inception, Upward Bound and Talent Search have been reauthorized eight times, and though they were not altered with each reauthorization, several programmatic changes have been implemented. From changes in appropriations to changes in program eligibility, both programs have been transformed over the decades with the federal government spending substantial sums to research the impact of these changes (Department of Education, 2008; Field, 2007; Garms, 1971; Lederman, 2006; McElroy & Armesto, 1998; Myers, Olsen, Seftor, Young, & Tuttle, 2004). Though changes can be made to the programs during any annual budget, the scheduled 2013 reauthorization of HEA could be used to alter the programs further, thus the importance of additional quasi-experimental research to evaluate adolescent intervention programs through a different lens, that of deviance.

### 2.2.5 Deviance and Educational Intervention

HEA adolescent intervention programs like Upward Bound, Talent Search, and GEAR UP, may be able to play a significant role in the lives of low SES students, especially when considering the fragility of adolescences (Sampson & Laub 1992). As individuals grow and develop both physically and mentally, social institutions become more and more salient. Social institutions have a certain amount of influence over individual behaviors and development, specifically during age-graded transitions in life (Sampson & Laub 1992). This influence can be either positive or negative depending on both the individual and the experience. If crime and delinquency peaks in adolescents, then the role of social institutions, like schools, in the lives' of students can be quite powerful, especially for low SES students who rely on such institutions to provide them with the tools necessary to effectively integrate all of their social circles for emotional, psychological, and educational growth (Fordham & Ogbu, 1986). While deviance interventions like *Scared Straight* have been successfully discredited by researchers for actually causing youth harm (Petrosino, Turpin-Petrosino, & Buehler, 2003), few programs actually use education as the medium for disseminating deviance interventions.

Gottfredson (1986) evaluated school-based delinquency prevention programs for the Office of Juvenile Justice and Delinquency Prevention's (OJJDP). One particular program, Positive Action Through Holistic Education (PATHE), promoted a sense of belonging and attachment, which in turn decreased delinquent behavior, increased the students' commitment to education, and improved the overall school atmosphere. Effective programs can decrease criminal activity and welfare dependency, while increasing educational attainment and lifetime earnings (Currie 2001). While reducing delinquency and risk factors for those students most

negatively impacted by low SES factors, the adverse environmental issues not specifically addressed by the program can negate the positive effects of such programs.

Many adolescent intervention programs fail to address these adverse environmental issues, particularly the social, emotional, and economic disparities between low and high SES students, specifically when the programs are heavily focused on reportable outcomes (Sen, 1992). When parents, schools, and communities are involved in the program, showing support and enthusiasm, students' lives are improved socially and academically (Gottfredson, 1986). If intervention programs are to truly improve the lives and conditions of the impoverished, then they need to combine social, economic, and human service agencies (Anderson & Larson, 2009). Unfortunately, research has found that, "the kind of treatment most likely to be implemented in schools is less efficacious than an organizational-level change," (Gottfredson, 1986, p. 728). Organizational-level change is more permanent and becomes part of the everyday routine as opposed to the types of treatment usually implemented which are additive programs. Additive programs are less likely to have a lasting impact because they do not become part of the school norms and are viewed negatively as additional work to an already over-burdened system (McDonnell & Elmore, 1987).

Adolescent intervention programs can more effectively lower delinquency and raise educational outcomes if they include law-related educational aspects, social skills, parent training, and combine individual, parental, and school-level interventions (Maguin & Loeber, 1996). To help ensure effectiveness, policymakers should be asking who the program is helping, how it is helping, and why, along with the required duration, persistence, and intensity needed for success. Additionally, and maybe most importantly, given we know parents of the most at-risk students are the least likely to participate, how is it possible to ensure those who would

benefit most from the programs are actually participating (Hawkins, Catalano, Morrison, O'Donnell, Abbott, & Day, 1992; Maguin & Loeber, 1996)? The argument surrounding compulsory education has always been that of the benefits of an educated populace, with one of those many attributes including lower levels of deviance. To connect the realms of education and deviance, it is therefore helpful to assess the theories provided through the sociology of deviance.

### 2.3 Sociology of Deviance

Sociologists of deviance have developed several key theories using class, parental practices, and learned behavior to explain deviance. Strain theory explains deviance as man's overall aspiration to conform to societal norms and behaviors, but he is forced to do otherwise by the pressure of unfilled but legitimate desires (Hirschi, 1969). Strain theory is overall a classist theory based on the assumption that human beings are innately good natured, developing in the same broad social structure. Additional deviance theories help to further define social spheres in which development and socialization occur.

Sutherland first proposed differential association theory in 1934, a theory that includes multiple social spheres. Behavior is dependent upon the norms of social organizations present in one's life, consisting of but not limited to family, neighborhoods, peers, and schools. When there is a conflict between the norms of these organizations, deviant behavior occurs because it is impossible to follow conflicting norms (Sutherland, 1934). The individual is then forced to choose which norms to follow and learns which behaviors will produce the individually desired outcome.

When this is combined with the differential association-reinforcement theory of Akers (1985), it explains how deviant behavior is chosen. When one of the conflicting social organizations teaches deviant behavior as an acceptable behavior to achieve the desired means that are otherwise blocked in institutions like schooling, deviant behavior is the outcome (Akers, 1985). Differential association combines social stratification and culture, explaining the relationship between delinquent behavior, parenting styles, and peer effects. Delinquency results from learned behavior associated with peers, parents, and prior delinquency (Heimer, 1997).

Gottfredson and Hirschi (1990) proposed the deviance theory of self-control, which is specifically associated with the role of parents in child development. Under self-control theory, individuals are fully formed through three parental aspects—discipline, supervision, and affection (Gottfredson & Hirschi, 1990). Failure to perform these significant parental tasks results in the development of children who lack the ability to form proper attachments and social involvement. The resulting lack of self-control (and focus on instant gratification) then explains the use of deviant behavior to obtain legitimate goals, as well as the diminished investment in education.

To combine the sociological realms of education and deviance, it is helpful to incorporate the relatively new idea of deformed choices. More commonly referred to as the capabilities approach by researchers like Sen (1992; 1999) and Nussbaum (2000), deformed choices has roots in Aristotelian philosophy, by which well-being is brought about through the universal development of human capability, and for low SES students, “sociability is *deformed* by fear and hierarchy,” (p. 298, emphasis added, Anderson & Larson, 2009; Burczak, 2008). Humans make choices based on material, educational, and cultural capacities. As such, “well-being freedom,” is the capability to make choices that enable one to flourish, and is restricted or

removed when an individual is in a deprived environment, and therefore only offered deformed choices (Sen, 1992, 1999).

An important aspect of deformed choices is what Denzin (2002) referred to as the epiphanic moments, or a life-event that causes you to realize the only available options are deformed choices (Anderson & Larson, 2009). These moments can include things like the emotional trauma of incarceration or unemployment (either of self or loved one), neighborhood violence coupled with a fear of being a social pariah on campus, or the economic distress caused by an ill family member. Despite their best efforts to achieve their dreams and better their situations, low SES students are still faced with restrictions as a result of inequitable social structures (Anderson & Larson, 2009, p. 82). These moments provide further explanation as to why youth make deformed choices, or feel the only choices they have are deformed. Without the lenses of conflict, strain, differential association, and self-control theories, however, deformed choices is just another way of saying poor people have fewer, less desirable choices.

The framework used to explain deviant behavior then becomes a rather all-inclusive statement. Parental levels of discipline, supervision, and affection influence the formation of attachments and involvement, and when coupled with socioeconomic barriers, either hinder or contribute to an individual's choice to partake in deviant behavior often associated with or influenced by differential associations. Delinquency has a negative effect on educational attainment and college attendance independent of social and cultural characteristics, SES, and higher levels of cognitive ability (Moffitt, Caspi, Harrington, & Milne, 2002; Sampson & Laub, 1993; Siennick & Staff, 2008; Tanner, Davies, & O'Grady, 1999). Adolescents can have differing levels of deviant outcomes, one of which is that of idleness.

Though referred to under different technical labels, the definition remains the same: idleness is a state of societal disengagement that is more easily identifiable by what it is not (Bowen & Finegan, 1969; Finegan, 1982; Jencks, 1989; Tienda & Stier, 1991; Welch, 1990). To be considered idle, one is not attending any formal educational institution, in the military, or working as defined by societal norms as legitimate employment (Mare, Winship, and Kubitschek, 1984). While short bouts of idleness are not detrimental, and can even be considered normal, extended periods of idleness—greater than six months—have severe consequences with respect to educational attainment, SES, future employment status, marital status, self-esteem, stress, and anxiety (Finegan, 1982; Powers, 1994; Taggart, 1982).

Idleness is merely one aspect of deviant behavior; delinquency has many forms, ranging from minor acts of defiance like truancy, to more severe forms like acts of violence. Delinquency becomes an increasingly disparaging problem when the behavior is exhibited at a young age. Juvenile delinquency and convictions result in negative labels, which can decrease aspirations and expectations. Lower expectations of those assigning the labels in the school system contribute to lower educational attainment of youth (Di Le, 1999; Hirschi, 1969). The relationship between juvenile delinquency and parental effectiveness lends support to the placement of intervention programs prior to conception of a child. Not only does ineffective parenting significantly determine delinquent behavior, parenting has also been found to determine friend selection in childhood (Simmons, Chao, Conger, & Elder, 2001). Given the importance of early development, family demographics are particularly salient to youth outcomes.



### 2.3.1 Students, Families, & Social Bonds

Unlike the distinct relationship between educational attainment and family SES, the relationship between SES and delinquency sparked a heated debate. One side claims SES is one of the only predicting factors of delinquency while the other charges this to be a form of discrimination. The latter argument has tested several theories finding no empirical existence of the negative association between SES and delinquency, but that the theory itself is based on preconceived notions and prejudice of lower SES immorality, criminality, and inferiority (Tittle, 1983; Tittle & Meier, 1990; Tittle, Villemez, & Smith, 1982). In defense of the relationship between SES and delinquency, Braithwaite (1981) said, “Perhaps Tittle et al. take their own findings seriously and adopt no extra precautions when moving about in the slums of the world’s greatest cities than they do when walking in the middle class areas of such cities,” (p. 37).

Researchers continue the debate, questioning the reliability of self-reported deviant behavior, as well as the resource bias reflected in the criminal justice system (Sampson & Laub, 1992). Regardless of the causality, the prison boom that has taken place in the last 30 years disproportionately impacts low SES communities and less than 7% of low SES students attend college regardless of race (Braman 2004; Edin, Nelson, & Paranal 2004; Garland 2001; Hagan & Dinovitzer 1999; Johnson & Waldfogel 2004; Mauer 2001; Nurse, 2004; Western 2006). Low SES neighborhoods are disproportionately minority neighborhoods and have more illegitimate employment opportunities and delinquent peers available and visible than higher SES neighborhoods (Peeples & Loeber, 1994). Though black and white children from equivalent neighborhoods have equivalent delinquency rates, black men are still 6.4 times more likely to be incarcerated than white men (Peeples & Loeber, 1994; Wagner, 2005). The relationship between delinquency, SES, and race/ethnicity is only further complicated by student achievement.

Student achievement has been found to predict deviant behavior regardless of SES, with lower achieving students offending more frequently, committing more severe offenses, and persisting in delinquent behavior (Maguin & Loeber, 1996). Family relationships and the role they play in individual deviant behavior can be further understood through examining social bonds.

The social bond, or obligatory nature of one's place in society, creates norms, values, and behaviors that shape identity and social conformity (Hirschi, 1969). Deviance results when social bonds are weak or broken and society has failed to properly socialize an individual (Hirschi, 1969). A strong social bond can mediate for the effects of previously discussed background characteristics, more so for whites than blacks, the latter of whom tend to be more inclined to submit to community context than the overall societal context (Di Le, 1999; Gardner & Shoemaker, 1989). Social bond is better explained through the categorical nature of its composure in discussing attachment, commitment, involvement, and conventionality.

The level of attachment—values or norms one holds—to parents, peers, and teachers partially determine the strength of a student's social bond, as well as student outcomes. Students who have conventional values are less likely to be deviant (Felson, Liska, South, & McNulty, 1994). Attachment to parents, particularly the rewards/punishment system established by parents, contributes to deviant behavior (DeLi, 1999; Hirschi, 1969; Huebner & Betts, 2002; Small & Rogers, 1992). The amount of deviant behavior participation has been found to depend on the attachment to peers, given group level values predict individual behavior demonstrating social control processes (Gardner & Shoemaker, 1989; Huebner & Betts, 2002; Small & Rogers, 1992). Like parents and peers, student attachment to and respect for teachers can increase self-perception and sense of belonging (Gottfredson, 1986; Hirschi, 1969).

The importance of following rules and regulations, or commitment, established during and prior to adolescences plays a significant role in participating in deviant behaviors. Effort, expectations, and aspirations coalesce to form one's level of commitment. Greater commitment gives student's more reason to focus on school work and pathways to educational attainment as opposed to looking for deviant alternatives (Farkas, Grobe, Sheehan, & Shuan, 1990; Reynolds et al, 2004; Schneider & Stevenson, 1999; Siennick & Staff, 2008). Involvement is not just that of the student in question, but more importantly the involvement of the student's parent/s in both the personal and social life of their child. Conventionality, or the student's participation in social activities and subscription to socially constructed norms and values is determined through the amount of time the student spends on homework, volunteering, working, and helping out at home (Gardner & Shoemaker, 1989; Hirschi, 1969; Huebner & Betts, 2002; Small & Rogers, 1992).

Social bond is determined through family relationships and values, as well as the impact of other social institutions on development, like that of neighborhood and school. Given these interrelationships, individual development of low SES students is going to characteristically differ from that of high SES students. Low SES students attend low SES schools in low SES neighborhoods. These low SES neighborhoods have increased rates of crime, which is reflected in the schools found in these areas (Gottfredson, 1986), impacting the environment in which low SES parents are raising children who are making life-altering choices.

When the environment consists of higher levels of poverty, race/ethnic minority populations, and perceived crime, legitimate means of success are severely restricted, causing youth to make deformed choices (Burczak, 2008). HEA was implemented under the guise that intervening through the social institution of the school would minimize the gaps resulting from

the resource differences that provide higher SES students with an advantage, and essentially level the educational playing field. If that is the case, theoretically speaking, then not only should these programs provide educational equality, but they should also decrease deviant behavior<sup>4</sup>.

## 2.4 Conceptual Framework

Education is an intervening social institution conforming individuals to societal norms and values, teaching self-control, and providing viable alternatives to differentially associated behaviors and deformed choices. The characteristics that create levels of inequity—negligent or inconsistent parenting resulting in limited self-control and attachments, differential associations, and deformed choices—can be mediated (or at least minimized) through educational means and interventions to enhance student outcomes. The gaps between low and high SES students are so extreme, remaining in school and out of the criminal justice system should be considered successes (Anderson & Larson, 2009; Brighthouse, 2000; Deneulin, Nebel, & Sagovsky, 2006; Freire, 1995; Larson & Murtadha, 2002; Nussbaum, 2000; Sen, 1992, 1999; Walker & Unterhalter, 2007). Because they are educationally based, HEA and other adolescent intervention programs have only been evaluated with respect to educational outcomes. In addition to lacking other potential positive outcomes of intervention programs—decreasing idleness and deviance—previous research has been isolated to specific programs.

Whether the evaluation is of just one program that targets individual students, or a spillover program, experimentally-based evidence supporting the further funding of these

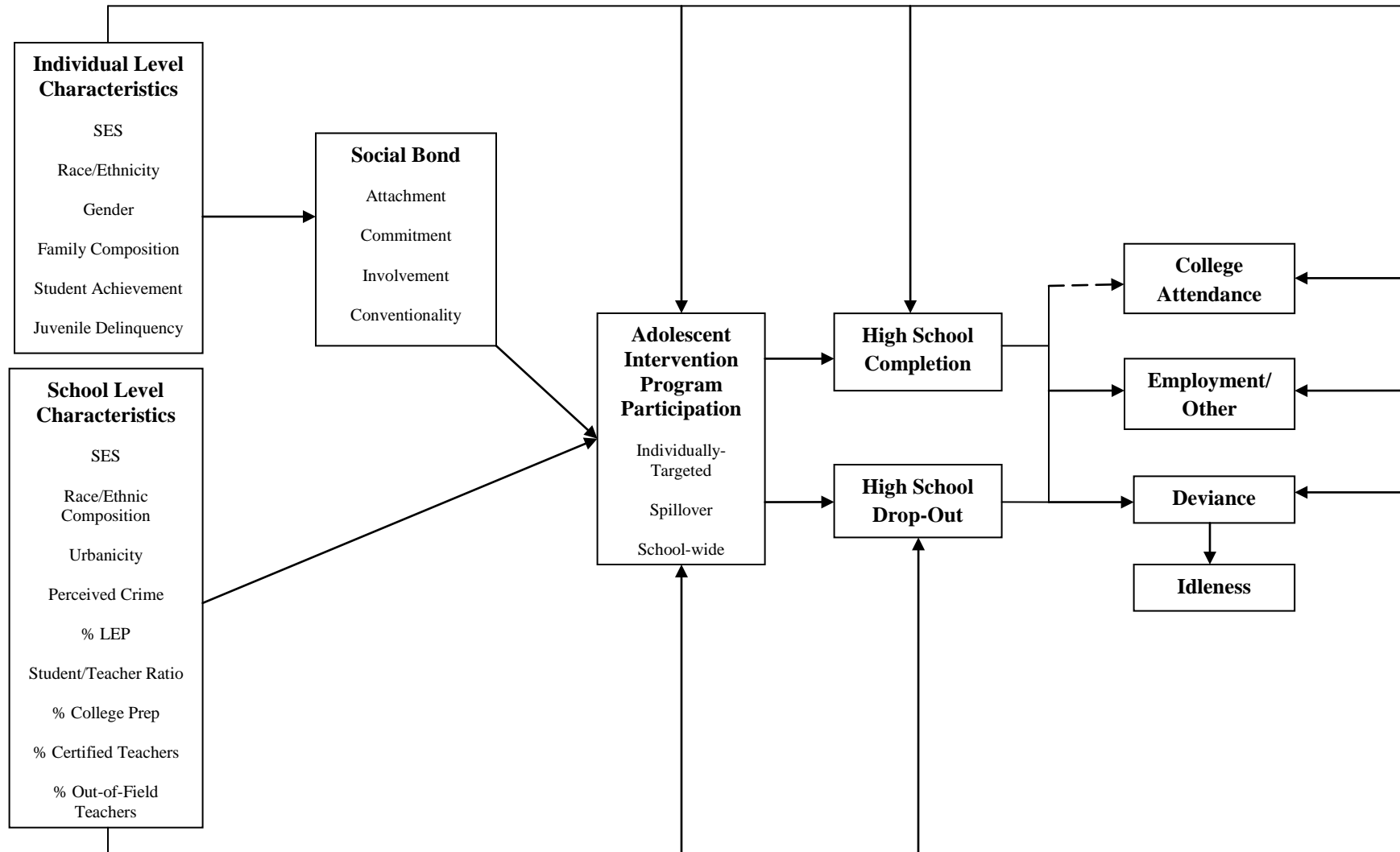
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<sup>4</sup> While many people think of “crime” as more serious offenses, it is important to note that research indicates minor offending like truancy and idleness serve as points of entry into the broad spectrum of deviant behaviors (Maguin & Loeber, 1996; Sampson & Laub, 1993).

programs is insufficient. While quasi-experimental designs have compensated for the shortcomings of previous research, the new designs are still limited in scope. In addition to including non-education related outcomes of idleness and deviance, this research will add to the current body of knowledge by evaluating the three types of intervention programs—individually targeted, spillover, and school-wide. While spillover programs have been looked at by Domina (2009), ACT (2007), and Westat, Inc. (2003), school-wide programs have not been evaluated. As such, the purpose of this research is to provide scientifically-based evidence that can be used to make policy recommendations with respect to the most effective types of adolescent intervention program, using the framework outlined in Figure 1.

Because both family and school demographics determine program availability, receptivity, and participation, it is necessary to include these key elements. Demographics influence levels of social bond which contribute to program participation. In the proposed framework I will assess the impact of adolescent intervention programs on educational and deviance outcomes of the transition to adulthood, though there are other possible outcomes. These relationships as well as the variable compositions will be discussed in detail in the next chapter.

**Figure 1. Conceptual Framework**



## Chapter 3. DATA & METHODS

To determine the effect of an adolescent intervention program on student outcomes, when experimental research is too costly or time consuming, propensity score matching can be used to infer causality (Becker & Ichino, 2002). In choosing data for a propensity model, the timing of data collection must be taken into consideration. The matching variables must be collected prior to the treatment, and the outcome variables after the treatment. Additionally, the dataset must have a sufficient sample size to provide both a treatment and a control group. Given these stipulations, the Education Longitudinal Study (ELS) 2002 is an applicable dataset in that it is nationally-representative, has more than 15,000 respondents, and is longitudinal. ELS provides several variables necessary to employ propensity score matching as the analytical technique for this research.

### 3.1 Data

The National Center for Education Statistics (NCES) began data collection for ELS in 2002. ELS is a multi-level, longitudinal study established to follow a group of students from 10<sup>th</sup> grade into either postsecondary education or the workforce to gain an understanding of this transition of American youth. The students, their families, schools, teachers, and librarians were surveyed every two years by the Research Triangle Institute, a not-for-profit university research organization. Participants for this study were selected to build a nationally representative sample of 15,000 students and their corresponding parent, teacher, and school personnel. First, 750 schools were randomly selected. Then the tenth grade student sample was randomly selected within each school.

All available sample members were retained in the two follow-up waves of data collection. A freshening sample was also recruited during the follow-up data collection to maintain national representation. Non-public schools and Asian students were purposefully oversampled, and the dataset is appropriately weighted. Because the overall purpose of this study was to document the transition from high school to adult life and the choices impacting that transition, as well as the environmental, family, and other social factors involved, this dataset will help answer the proposed research questions. The second follow-up data—taking place two years after projected high school graduation—was taken in 2006, and has not yet been released for public use. As such the restricted data will be used for this research.

### 3.2 Variables

The individual-level analyses include eight outcome variables<sup>5</sup>. Because the goal of both TRIO and GEAR UP is postsecondary education of any kind, any postsecondary attendance will be coded as a dichotomous variable, *College Attendance* (N = 10,530)<sup>6</sup>. However, in this analysis, college attendance is divided into further dichotomous variables of attendance at *Two-year* (N = 4,000) or *Four-year* (N = 6,490) institutions, and whether or not this postsecondary institution is *Public* (N = 7,760) or *Private* (N = 2,730). Because one typically cannot attend college without first completing high school, or receiving an equivalent GED, this will also need to be included in the analyses as another dichotomous outcome variable, *High School Completion* (N = 14,630).

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<sup>5</sup> Refer to Appendix A for a list of the ELS variables used in the analysis.

<sup>6</sup> Note that all sample sizes are rounded to the nearest ten to protect respondent confidentiality in accordance with IES restricted data regulations.



*Idleness* is typically measured through a combination of lack of school enrollment and duration of employment, with one being considered idle if they are not in school, the military, or working (Finegan, 1982; Powers, 1994; Taggart, 1982). The ELS data have separate questionnaires for actively enrolled students and what they deem “nonenrollees”. As such, this can be measured using one variable from the “nonenrollee” questionnaire in which participants were asked to report the number of months since high school they were unemployed. Most states provide unemployment compensation for a maximum of 26 weeks. The Emergency Unemployment Compensation Extension Act of 2008 and its extension in February 2009, provided an additional 20 weeks of federal compensation. In other words, the federal government, in times of financial strife is willing to allot individuals 46 weeks to find gainful employment—or 59 weeks for the 27 states in which the unemployment rate is greater than 6%. As such, for the purposes of this study, an individual will be dichotomously coded as idle if they are unemployed for more than 15 months and not otherwise engaged (N = 1,540)<sup>7</sup>.

Those who drop-out of high school are less likely to find gainful employment and more likely to become idle and/or participate in deviant behavior. Pathways to deviance often begin with minor indiscretions and are either deterred early in life (as with intervention programs) or escalate into more serious offending (Sampson & Laub, 1993; Tanner, Davies, & O’Grady, 1999). As such, the enumeration of *Deviance* includes measures of dropping out and/or suspension/expulsion (N = 2,120)<sup>8</sup>. Because *Idleness* is a form of *Deviance*, and given the complexity of the relationship, these two outcomes were not forced into mutually exclusive outcomes. For example, a respondent could be idle from more than 15 months as a result of

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<sup>7</sup> This sample size reflects the exclusion of respondents who indicated nonattendance as a result of being the primary caregiver for a child to avoid mislabeling stay-at-home parents as idle.

<sup>8</sup> It is important to note that ELS did not interview those initial respondents who were actually institutionalized or incarcerated at the time of the follow-up, which excluded 50 initial respondents.

being expelled and would then be coded positively for both idleness and deviance. The lack of exclusivity is not necessarily a problem as long as they are not possible outcomes in the same analysis<sup>9</sup>. The defining specificity and accompanying set of complications provided by *Idleness* warrant this particular portion of *Deviance* its own analytical outcome, which will be advantageous when interpreting the results (Bowen & Finegan, 1969; Finegan, 1982; Jencks, 1989; Tienda & Stier, 1991; Welch, 1990).

The sample means for the demographic characteristics and measures of social bond are displayed in Table 2, showing the means of the full sample and the matched sample. An *SES* composite variable was generated by ELS, comprised of five components—family income, mother’s education and occupational prestige, and father’s education and occupational prestige. The students were matched on gender and race/ethnicity, forming dummy variables for *Males*, as well as *Black*, *Hispanic*, and *Asian* students, as they were the only ample sample sizes. Family composition at the time of the baseline interview for ELS will be used, again forming dummy variables for *Single-* and *Step-parent* families. ELS administered baseline achievement tests, for which a composite is provided combining the Math and Reading scores that will be used as a measure of *Student Achievement*. The students were asked if English was their first language, which was recoded as an English-as-a-second-language (*ESL*) variable. The final demographic characteristic included in the model is that of *Perceived Crime*, which is a categorical variable formed from both parental and school administrator perceptions of crime in the surrounding neighborhood.

As discussed in the previous chapter, there are four dimensions of social bond—attachment, commitment, involvement, and conventionality. *Parental attachment* is formed from 14 different survey questions indicating the amount of time students spend with one or both

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<sup>9</sup> This will be discussed further in section 3.3 Analytic Techniques.

of their parents (De Li, 1999; Hirschi, 1969; Huebner & Betts, 2002; Small & Rogers, 1992).

*Peer attachment* is measured using time spent with and importance of strong friendships (Felson,

**Table 2. Means for Overall Samples and the Propensity Score Matched Samples by Individually Targeted Adolescent Intervention Programs.**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
<i>Demographic Characteristics</i>				
SES	1.864	2.191	1.853	2.225*
Male	0.422	0.472	0.380	0.482*
Black	0.307	0.115	0.288	0.109*
Hispanic	0.175	0.132	0.161	0.130
Asian	0.145	0.087	0.158	0.095
Single-parent	0.272	0.190	0.259	0.156
Step-parent	0.161	0.139	0.171	0.144
Student Achievement	48.253	51.109	49.366	51.956*
ESL	0.280	0.164	0.275	0.155*
Perceived Crime	2.577	2.262	2.590	2.766
<i>Social Bond</i>				
<i>Attachment</i>				
Parental Attachment	3.072	3.073	3.114	3.303
Peer Attachment	2.546	2.523	2.767	2.793
Teacher Attachment	2.089	1.952	2.187	2.181
<i>Commitment</i>				
Student Effort	0.691	0.699	0.701	0.742
Parental Aspirations	5.472	5.396	5.539	5.442
Student Aspirations	4.755	4.423	4.894	4.840
<i>Involvement</i>				
Home Supervision	3.692	3.617	3.709	3.693
Home Discussion	2.069	2.115	2.481	2.550
Intergenerational Closure	0.709	0.705	0.725	0.763
PTO	0.516	0.511	0.516	0.553
Importance of Grades	3.430	3.304	3.518	3.576
Going to class unprepared	1.647	1.533	1.738	1.689
<i>Conventionality</i>				
Work for pay	0.462	0.473	0.539	0.567
Community Service	0.304	0.281	0.341	0.328
Homework	2.882	2.903	2.912	2.924
Extracurricular activities	0.717	0.614	0.722	0.663
<i>Juvenile Delinquency</i>				
Drop-out prevention	0.054	0.022	0.042	0.022
Delinquency	2.419	2.454	2.423	2.471
Fighting	1.193	1.147	1.179	1.141
N	500	14,590	380 (76%)	11,100

\*indicates statistically significant difference between treatment and control using Wald test.

Liska, South, & McNulty, 1994; Gardner & Shoemaker, 1989). *Teacher attachment* focuses on respecting teachers' advice, time spent with teachers, and ability to get along with teachers (Gottfredson, 1986; Hirschi, 1986). Commitment is measured through *Student Effort* and *Parental and Student Aspirations* (De Li, 1999; Farkas, Grobe, Sheehan, & Shuan, 1990; Reynolds et al, 2004; Schneider & Stevenson, 1999; Siennick & Staff, 2008).

Involvement includes student involvement with the school, as well as parental involvement with both the student and the school. School involvement is measured via student responses to the *Importance of Grades* and *Going to Class Unprepared*. Each of the five aspects of parental involvement are composites of several questionnaire responses covering *Home Discussion*, *Home Supervision*, *Intergenerational Closure*, and school communication and participation, measured through parent-teacher organization (*PTO*) participation (Coleman, 1988; Ho Sui-Cho & Willms, 1996). Conventionalness, the final measure of social bond, will be determined using composites as well through the following measures: *Work for pay*, *Community Service*, *Homework*, and *Extracurricular activities*. The final matching characteristic is that of juvenile delinquency, which will be measured through self-reported measures of *Drop-out preventions*, a composite of *Delinquency*, and *Fighting* (Gottfredson, 1986; Huebner & Betts, 2002; Siennick & Staff, 2008; Small & Rogers, 1992; Tanner, Davies, & O'Grady, 1999).

For the individually targeted programs, two treatments will be used. The first uses any participation in a program for at-risk students (N = 500), while the second is restricted to Upward Bound and Talent Search participation only (N = 280). Upward Bound and Talent search are the only individually targeted programs specifically inquired about in the ELS questionnaire. Table 3 includes the sample means for the analysis that is restricted to these specific programs.

**Table 3. Means for Overall Samples and the Propensity Score Matched Samples by Individually Targeted Adolescent Intervention Programs (Upward Bound and Talent Search Participants only).**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
<i>Demographic Characteristics</i>				
SES	1.761	2.172	1.740	2.207*
Male	0.389	0.441	0.343	0.480*
Black	0.342	0.112	0.314	0.113*
Hispanic	0.171	0.126	0.150	0.132
Asian	0.112	0.083	0.107	0.096
Single-parent	0.258	0.182	0.253	0.200
Step-parent	0.174	0.136	0.178	0.150
Student Achievement	47.993	50.695	49.095	51.550*
ESL	0.266	0.167	0.253	0.158*
Perceived Crime	2.596	2.467	2.592	2.749
<i>Social Bond</i>				
<i>Attachment</i>				
Parental Attachment	3.142	2.806	3.136	3.227
Peer Attachment	2.531	2.352	2.728	2.778
Teacher Attachment	2.091	1.835	2.202	2.191
<i>Commitment</i>				
Student Effort	0.709	0.647	0.723	0.735
Parental Aspirations	5.456	5.380	5.573	5.425
Student Aspirations	4.742	4.097	4.906	4.786
<i>Involvement</i>				
Home Supervision	3.692	3.622	3.708	3.691
Home Discussion	2.109	1.906	2.460	2.542
Intergenerational Closure	0.727	0.642	0.737	0.744
PTO	0.538	0.463	0.530	0.537
Importance of Grades	3.430	3.304	3.517	3.577
Going to class unprepared	1.574	1.443	1.685	1.702
<i>Conventionality</i>				
Work for pay	0.443	0.511	0.516	0.567
Community Service	0.290	0.329	0.319	0.324
Homework	2.952	2.892	2.962	2.914
<i>Juvenile Delinquency</i>				
Drop-out prevention	0.025	0.023	0.018	0.023
Delinquency	2.293	2.493	2.268	2.508
Fighting	1.153	1.155	1.140	1.149
N	280	14,810	210 (75%)	12,230

\*indicates statistically significant difference between treatment and control using Wald test.

Because this research is evaluating three types of adolescent intervention programs, school-level variables will also be used. To determine which schools were participating in spillover programs, the administrator questionnaires were used, specifically a question indicating whether or not the school offered a program that prepared students for college. The categorical response of “some but not all students participate” was recoded as a dummy variable and used as

the treatment. In the ELS data, 350 schools were offering spillover programs (N = 7,550). The same question was used to determine if a school-wide program was in effect. A dummy variable was created for a response of “all students participate” to serve as the treatment for school-wide program participation, which included 90 schools (N = 2,150).

Because this is a school-level analysis, the outcome variables used—*High School Completion*, *College Attendance*, *Two-Year*, *Four-Year*, *Public*, *Private*, and *Idleness*—were all formed using the same variables from the survey; however, to keep the analysis at the school-level, the school mean of each of these variables was used instead of the individual values<sup>10</sup>. *School Deviance* was formed using factor analysis with respect to administrator provided information on how often deviant behavior (i.e. fighting, drugs, alcohol, etc.) were a problem on school grounds ( $\alpha=0.995$ , eigen value = 14.10). An additional outcome variable was added to the school-level analysis, *Tardiness*. This variable was also formed using factor analysis from administrator responses to questions regarding how often students skip school, are late, or have unexcused absences ( $\alpha=0.820$ , eigen value = 2.254). Table 4 provides the school means for the full sample, spillover and school-wide programs.

**Table 4. Mean Distribution for School-level outcome variables by program participation.**

<b>Variable</b>	<b>Full Sample</b>	<b>Spillover</b>	<b>School-wide</b>
High School Graduation	0.903	0.893	0.928
College Attendance	0.599	0.610	0.695
Two-Year	0.227	0.251	0.224
Four-Year	0.369	0.357	0.467
Public	0.441	0.470	0.498
Private	0.155	0.137	0.193
Idleness	0.087	0.022	0.019
Deviance	NC	3.449	3.584
Tardiness	NC	1.047	0.932

NC indicates not comparable at individual level

<sup>10</sup> The school mean was constructed in STATA using the sorting command and egen.

Again, with this analysis taking place at the school-level, matching characteristics differ from those used in the individual analysis. The descriptive statistics for the spillover and school-wide program participants are displayed in Tables 5 and 6, respectively. As with individual SES, ELS has a composite available determining the *School SES* that is used in the analysis. However, the variable used by ELS is the percent of students receiving free/reduced lunch; as such, the higher the value, the lower the SES of the school. Low SES schools in low SES neighborhoods have increased rates of crime, which is reflected in the schools found in these areas (Gottfredson, 1986). Increased crime and decreased funding typically correspond with decreased achievement and educational attainment. As such, *Perceived Crime* is included as a matching element, whereby a composite is formed using the perceptions of levels of crime from the parental and administrator perspectives.

The *Racial/Ethnic Composition* of a school and its *Urbanicity* are interconnected determinants of student outcomes, both of which are composites provided in the ELS data<sup>11</sup>. ELS measured the race/ethnic composition as the percent of non-white students, so higher values reflect higher numbers of minority students. Given the racial disparity and the rising immigrant population, the schools percent of limited English proficient students, or *LEP*, is also included in the analysis (Bankston & Caldas, 1996; Carbonaro, 2005; Entwisle & Alexander, 1992; Lleras, 2008; Roscigno, 1998). Additionally, the more urban the school, the more disadvantaged it is relative to its suburban and rural counterparts. The resulting lower quality schools suffer from several problems, like the inability to attract high quality teachers, as well as the inability to pay to supply an appropriate number of teachers. Given these difficulties, this research will also include the *Student-Teacher Ratio* and the percent of *Out-of-Field Teachers*. The analysis also

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<sup>11</sup> Urbanicity is coded numerically for Urban, Suburban, and Rural. Because the mean value has no statistical importance, urbanicity is not displayed in the table but is included in the analyses.

includes matching variables regarding the percent of students who have access to college preparatory classes, *College Prep*.

### 3.3 Analytic Technique

Propensity score matching simulates an experiment by matching students who received the treatment with a “control” group based on the theory and research driven characteristics. Two groups are generated—a control group and a treatment group—enabling researchers to create a quasi-experimental design with existing data, minimizing bias (Becker & Ichino, 2002). The actual propensity score is the conditional probability of one receiving the treatment based on the assigned characteristics. Once the propensity score has been assigned, and the matched sample generated, logistic regression is then used to calculate the ATT—or average effect of treatment on the treated. Because logistic regression is used, micro-level outcomes—in this case the individual life trajectories—are measured. The ATT enables causality to be inferred using existing data, assuming the treated sample is large enough to support the propensity score matching process.

ELS can be used in propensity score models given it meets the prerequisites—longitudinal collection with a large, nationally-representative sample. Additionally, ELS provides the necessary variables outlined by previous research for inclusion in the propensity model to avoid complications incurred through limited degrees of freedom (Dehejia & Wahba, 2002). For this study, the treatment in question will be participation in adolescent intervention programs and the students will be matched using the previously discussed individual and school level characteristics, as well as social bond (Domina, 2009). To produce robust findings and



enhance the analyses, three matching algorithms will be used—nearest neighbor, radius, and kernel.

Nearest neighbor matching with replacement will be one algorithm used to determine the ATT. This method will enable each treated case to be matched to the untreated case with the closest propensity score, whereby the replacement allows untreated cases to be matched to multiple treated cases (Becker & Ichino, 2002). The ATT is then computed through the average difference between the treated and untreated outcomes. Using nearest neighbor matching enables the application of Rosenbaum Bounds to test the robustness of the models (Rosenbaum, 2002). Rosenbaum bounds indicate the sensitivity of the model to possible bias attributed to unobserved confounding variables (DiPrete & Gangl, 2004). As per design, these bounds can only be used in one-to-one matches, thus restricting the application to the nearest neighbor matching algorithm. For this research, the assigned scale ranges from 1 to 2 and the higher the value the better the model, with the desired minimum being 1.5.

Because nearest neighbor matching forces all treated cases to be matched, regardless of the difference in propensity scores, this method will be compared with the radius matching algorithm. The radius matching method enables the researcher to predetermine the acceptable range of propensity score matches which may eliminate some treated cases from the analysis (Becker & Ichino, 2002). A third matching algorithm will be used, kernel matching. Kernel matching acts as an intermediate between nearest neighbor and radius techniques in that it uses the difference between the matched treatment and control propensity scores as a weight which is applied to the ATT calculation.

Because STATA will be used for the evaluation, *pscore* and *psmatch2* will both be used for robustness. A separate logistic regression is run for each outcome variable listed in the code.

As such, the analysis will be done for each of the eight or nine outcome variables, thus foregoing the need for mutual exclusivity and solving the quandary discussed in the previous section with respect to *Deviance* and *Idleness*. In other words, both outcomes can be included in the analyses despite overlapping cases.

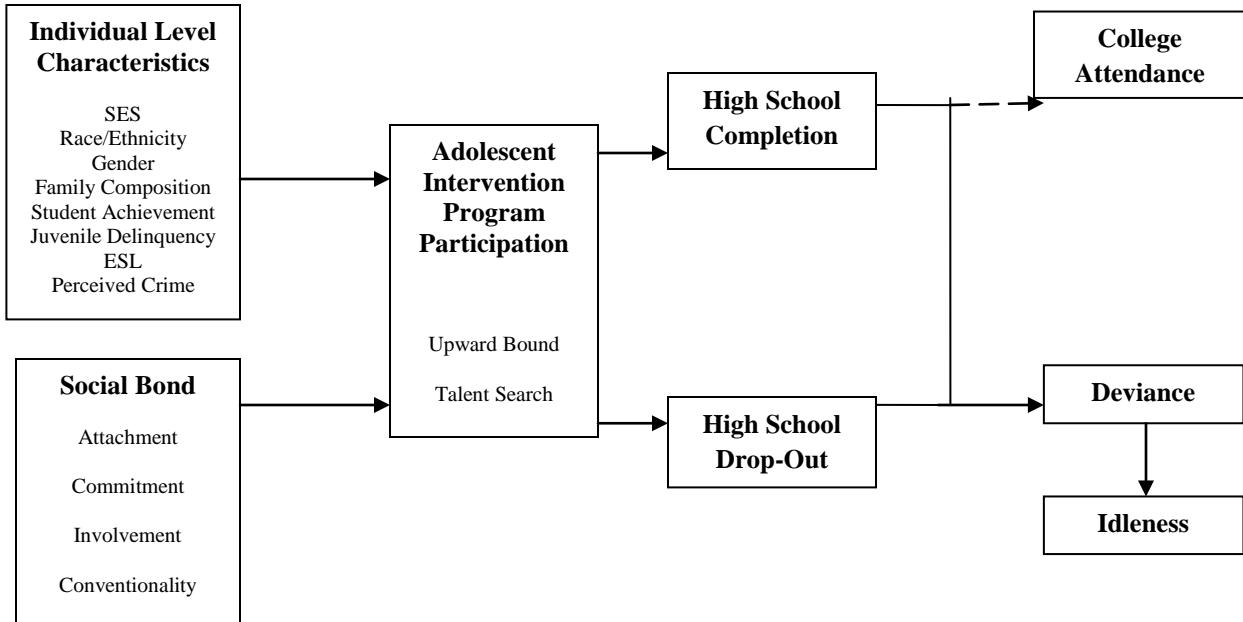
For the purposes of this study, two different propensity models will be required, as there are two different levels of analysis—the individual student and the school. Because there are three different types of programs to be assessed—individually targeted, spillover, and school-wide—there are several different treatments that will be applied during the analyses. Individually targeted programs are adolescent intervention programs that are specific to individual students and are often held at locations other than the school the student attends. The propensity models used for the individually targeted programs include the demographic characteristics as well as the social bond characteristics as the basis for the matching. In this case, because the data provided by ELS is not specific, two treatments will need to be applied, and the tested outcomes include measures of college attendance and deviance, including idleness, as depicted in Figure 2.

When using propensity score matching methods, the sample distribution included in the region of common support plays an important role in determining the validity of the matches. Invoking the region of common support means only those cases with the propensity to be treated will be included in the matched sample for the analysis. Given the low number of program participants in the sample<sup>12</sup>, specifically those who only participated in Upward Bound and Talent Search, the sample distribution is far from ideal. Figure 3 depicts the sample distribution for any individually targeted program participation, and Figure 4 is restricted to Upward Bound

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<sup>12</sup> N = 380 matched pairs for all individually targeted participants and 210 for the Upward Bound and Talent Search restriction.

**Figure 2. Propensity Score Model for Individually Targeted Programs**  
Matching                      Treatment                      Possible Outcomes<sup>13</sup>

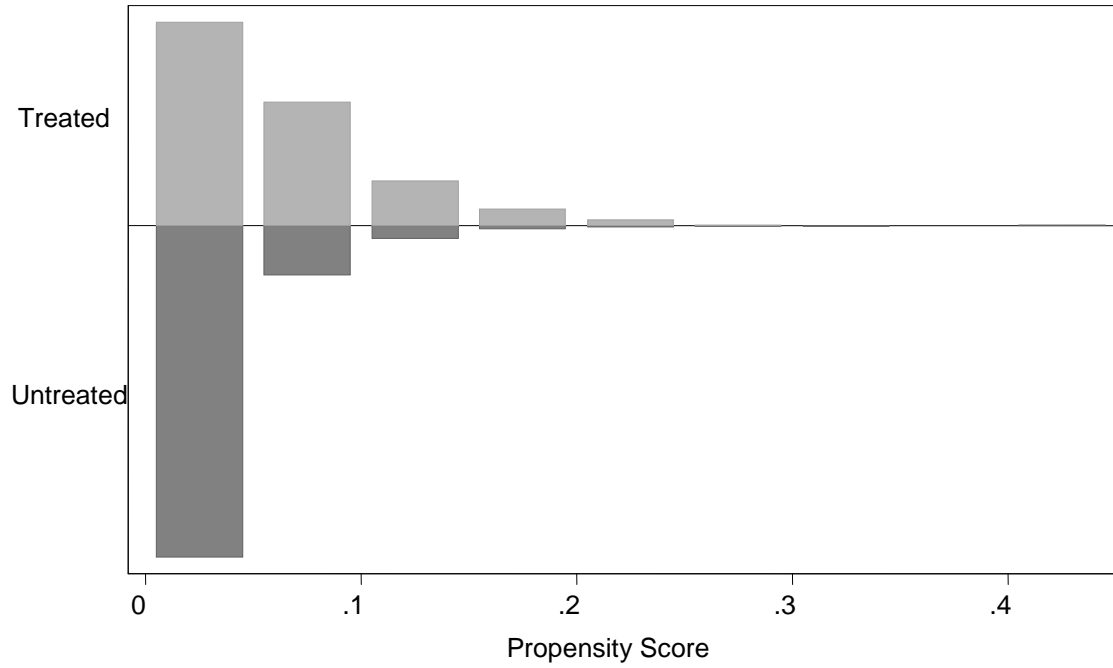


and Talent Search only. As you can see from the figures, the majority of the sample in the region of common support has little propensity for being in the treatments.

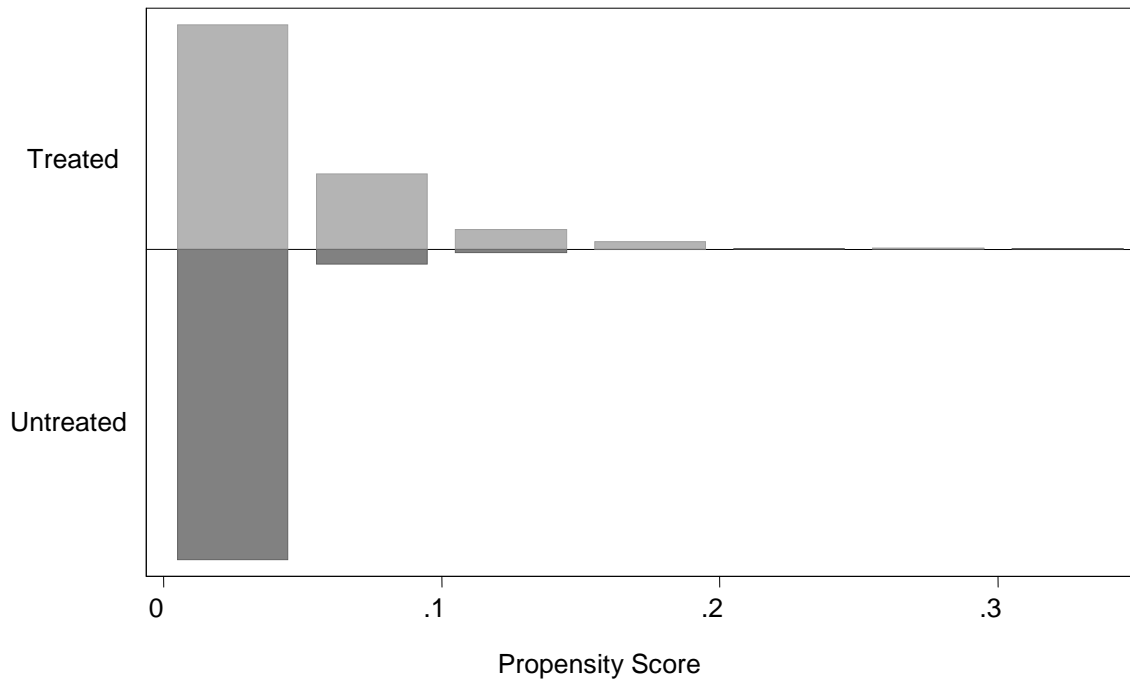
With the overall goal of propensity score modeling being that of inferring causality, in order for the sample to do so, it is necessary that the treatment and control groups do not differ with respect to matching variables. Tables 2 and 3 indicate there is a statistically significant difference between the treatment and control groups with respect to SES, gender, student achievement, ESL, and one racial category. While this may be due to a large sample size—increasing the N and decreasing the standard error—it is still beneficial to find some compensatory measures, without which balancing would not be achieved. To compensate for these differences, one higher order term, *Male*<sup>2</sup> (the proportion of the student body who are male), and two interaction terms were introduced to the propensity model.

<sup>13</sup> The “Employment/Other” category was omitted from this figure because it is not a tested outcome.

**Figure 3. Sampling Distribution for Individually Targeted Programs**



**Figure 4. Sampling Distribution for Individually Targeted Programs (Upward Bound & Talent Search)**



The interactions formed combine SES, Black, and ESL, with an additional interaction included between ESL, Student Achievement, and SES. As such, the variables that produced a statistically significant Wald test were all included through these terms<sup>14</sup>. When the new terms were included in the models, balancing was achieved, and the Wald test no longer recognized a statistically significant difference between the treatment and control groups. While it could be argued that interactions limit the implications and interpretation of statistical finding, these particular interactions reflect the complexity of the relationship that exists in the U.S. between race/ethnicity, SES, and achievement (refer to section 2.1.1). The applicable variables are included in Table 2.A. and 3.A.

**Table 2.A. Adjusted Means for Overall Samples and the Propensity Score Matched Samples by Individually Targeted Adolescent Intervention Programs.**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
SES	1.864	2.191	1.935	2.052
Male	0.422	0.472	0.480	0.482
Black	0.307	0.115	0.288	0.207
Student Achievement	48.253	51.109	49.660	50.695
ESL	0.280	0.164	0.256	0.194
Perceived Crime	2.577	2.262	2.590	2.766
Male <sup>2</sup>	0.422	0.472	0.381	0.482
SES*Black*ESL	0.039	0.013	0.028	0.011
ESL*Achieve*SES	22.163	18.981	22.758	18.796

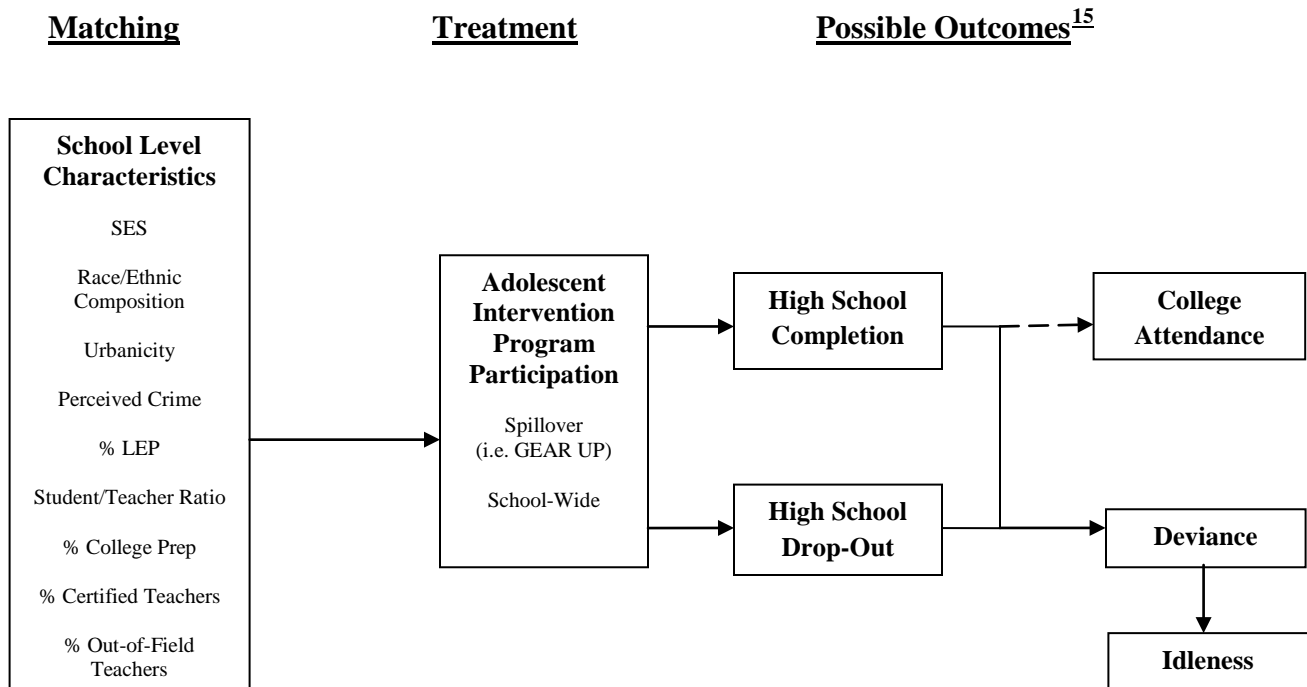
**Table 3.A. Adjusted Means for Overall Samples and the Propensity Score Matched Samples by Individually Targeted Adolescent Intervention Programs (Upward Bound and Talent Search Participants only).**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
SES	1.761	2.172	1.800	2.144
Male	0.389	0.441	0.372	0.435
Black	0.342	0.112	0.296	0.174
Student Achievement	47.993	50.695	49.905	51.505
ESL	0.266	0.167	0.246	0.168
Male <sup>2</sup>	0.389	0.441	0.343	0.479
SES*Black*ESL	0.012	0.043	0.030	0.013
ESL*Achieve*SES	17.748	15.118	17.596	14.960

<sup>14</sup> In each of the models, the Wald test was only done for the matched sample given programs specifically target participants based on demographics.

Because the spillover programs are implemented at the school-level, they will be assessed at the school-level. As previously mentioned, spillover programs are held at the school, though only a fraction of the student body participate. The theoretical basis asserts that aiding the lower achieving students will in turn increase the learning environment of all students. As such, the outcomes in this portion of the analysis will be measured at the school-level and not the individual level. Though using the same theoretical framework, the conceptual framework for this model is altered to reflect only those variables that take place at the school-level. The school-level framework used for both the spillover and the school-wide analyses is depicted in Figure 5.

**Figure 5. Propensity Score Model for School-Wide and Spillover Programs**



<sup>15</sup> The "Employment/Other" category was omitted from this figure because it is not a tested outcome.

In the spillover sample, three of the matching variables registered a statistically significant difference through a Wald test—SES, the percent of students taking college prep courses, and the percent of certified teachers—which is indicated in Table 5. As with the individual level analyses, an interaction term was introduced to compensate for the differences, combining the latter two, all of which are seen in Table 5.A. Recoding the SES variable into aggregate quintiles based on individually reported SES, reduced the difference between the treatment and control groups. As seen with the modifications used for the individual level analyses, when the new variables were introduced, the balancing property was satisfied and there was no longer a statistically significant difference between the treatment and control groups.

**Table 5. Means for Overall Samples and the Propensity Score Matched Samples by Spillover Adolescent Intervention Program Participation.**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
School SES <sup>1</sup>	29.186	18.028	15.551	23.093*
School Race/Ethnic Comp. <sup>2</sup>	33.804	25.526	23.981	25.429
Perceived Crime	2.756	2.252	2.761	2.780
School LEP <sup>3</sup>	5.172	2.890	2.656	2.611
School College Prep	57.202	56.599	71.576	60.465*
Certified Teachers	94.251	89.985	93.042	90.796*
Out-of-Field Teachers	3.143	5.324	3.846	4.247
Student-Teacher Ratio	17.113	16.370	16.256	16.281
N	7,550	6,210	5,033 (66.7%)	4,550

<sup>1</sup>School SES is reported as the percentage of 10<sup>th</sup> graders eligible for free/reduced lunch.

<sup>2</sup>School Race/Ethnic Comp. is the percentage of non-white students.

<sup>3</sup>School LEP is reported as the percentage of 10<sup>th</sup> graders who are LEP or non-English proficient.

\*indicates t-test detected difference in means between treated and control.

**Table 5.A. Adjusted Means for Overall Samples and the Propensity Score Matched Samples by Spillover Adolescent Intervention Program Participation.**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
SES quintiles	2.145	2.203	1.802	1.447
School College Prep	57.202	56.599	66.994	57.824
Certified Teachers	94.251	89.985	91.046	90.998
CollPrep*Certified Teachers	5,332.526	5,781.562	5,281.526	5,758.126

Table 6 reflects the problematic variables in the school-wide program analysis. In addition to the compensations made for the spillover program analysis with respect to the interaction term and the SES quintiles, the school-wide analysis also required the inclusion of a higher order term for perceived crime. The adjusted variables are displayed in Table 6.A. Once again, with the modifications, the balancing property was achieved and there was no longer a statistically significant difference between the treatment and control groups. The necessary modifications reflect the complicated relationship between school SES and staffing capabilities.

**Table 6. Means for Overall Samples and the Propensity Score Matched Samples by School-wide Adolescent Intervention Program Participation.**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
School SES <sup>1</sup>	15.224	24.480	15.551	22.827*
School Race/Ethnic Comp. <sup>2</sup>	34.467	33.808	23.981	25.178
Perceived Crime	2.762	2.428	2.844	4.347*
School LEP <sup>3</sup>	2.917	4.007	3.050	3.067
School College Prep	73.293	59.625	71.576	60.616*
Certified Teachers	93.695	91.824	90.793	93.042*
Out-of-Field Teachers	3.846	4.247	3.846	4.247
Student-Teacher Ratio	16.068	16.536	16.253	16.256
N	2,150	11,610	1,420 (66%)	8,200

<sup>1</sup>School SES is reported as the percentage of 10<sup>th</sup> graders eligible for free/reduced lunch.

<sup>2</sup>School Race/Ethnic Comp. is the percentage of non-white students.

<sup>3</sup>School LEP is reported as the percentage of 10<sup>th</sup> graders who are LEP or non-English proficient.

\*indicates t-test detected difference in means between treated and control.

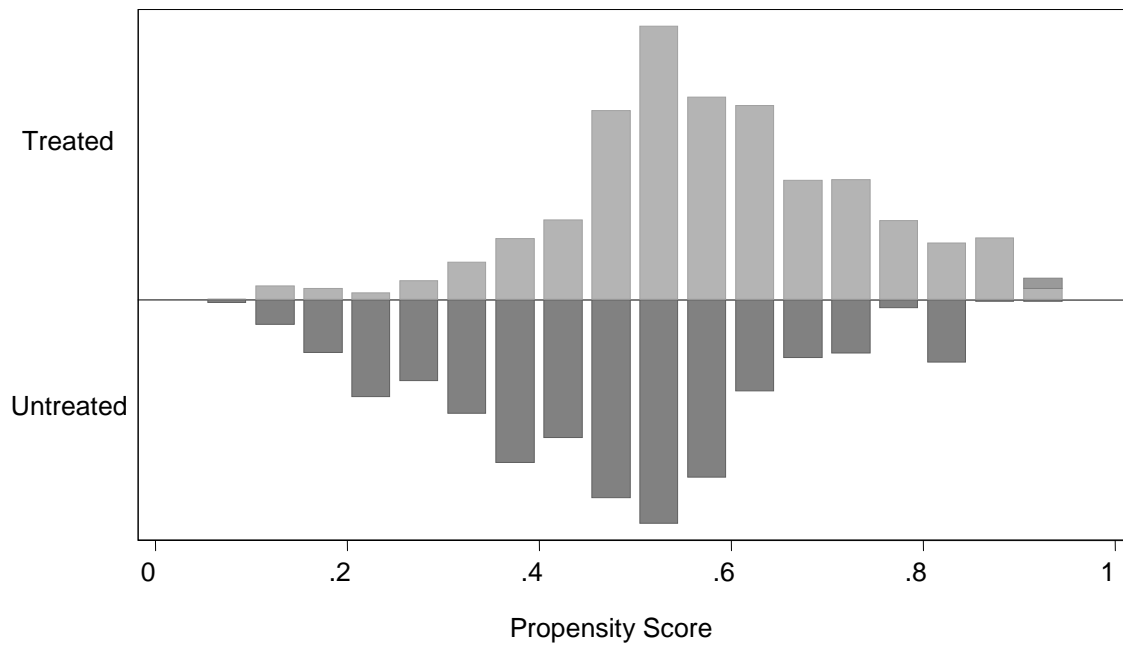
**Table 6.A. Adjusted Means for Overall Samples and the Propensity Score Matched Samples by School-wide Adolescent Intervention Program Participation.**

Variable	FULL SAMPLE		MATCHED SAMPLE	
	Participants	Non-Participants	Participants	Non-Participants
SES Quintiles	2.060	2.699	2.045	2.307
Perceived Crime	2.762	2.428	2.897	3.785
School College Prep	73.293	59.625	69.434	62.311
Certified Teachers	93.695	91.824	91.974	92.307
Crime-squared	8.133	7.103	8.150	8.180
CollPrep*Certified Teachers	6627.4	8945.53	6197.65	5804.54



As with the individual-level analysis, the region of common support was invoked for both the spillover and the school-wide analyses. Given the analysis still included individuals within the schools in order to determine the school means, the overall sample sizes were much larger ( $N = 5,030$  and  $1,420$  matched pairs for spillover and school-wide, respectively). Figures 6 and 7 depict the sampling distribution for the spillover and school-wide program participants, respectively. The results from the individual, spillover, and school-wide analyses will be discussed in the next chapter.

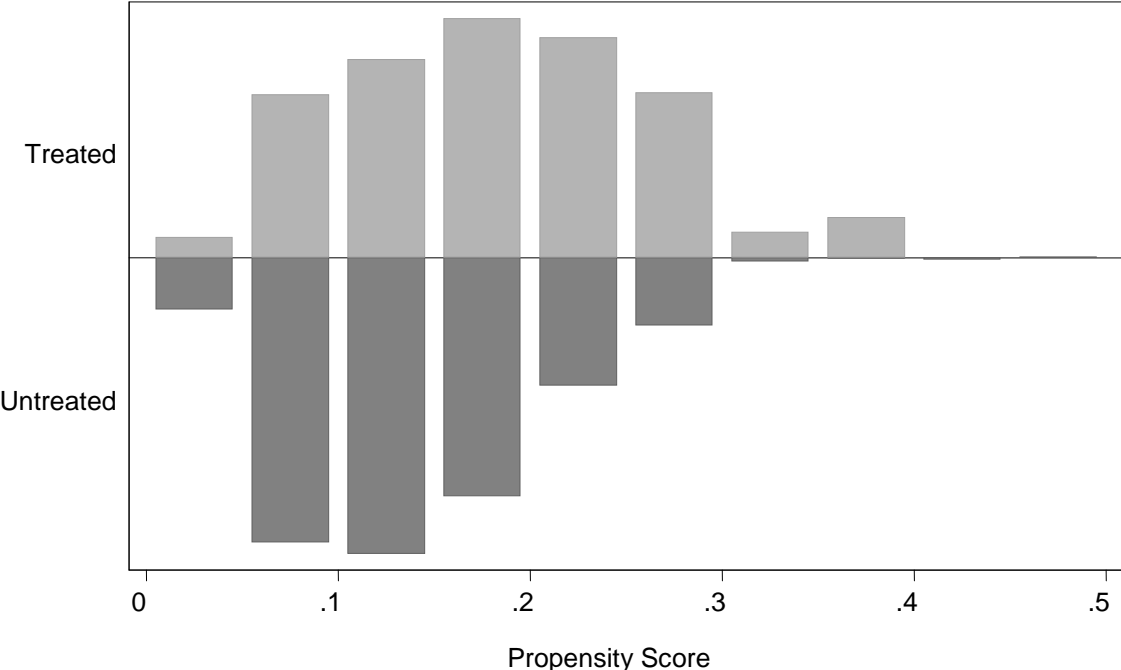
**Figure 6. Sampling Distribution for Spillover Programs**



In addition to the propensity models, the following chapter will also include the regression coefficients as a means of comparison, as this was the previously referred to standard measure of assessment. The data collection for ELS violates the regression assumption of independent sampling. Regression fails to address the causal relationship between adolescent program participation and any measurable outcome in that regression can only provide combined

measures and relationships. Given program participation may be the results of self-selection bias, specifically when analyzing individually targeted programs, OLS or logistic regression lacks the ability to compensate for this bias. These limitations will be addressed through the propensity models in the next chapter.

**Figure 7. Sampling Distribution for School-wide Programs**



## Chapter 4. RESULTS

The use of propensity score matching enables the results of this research to be attributable to program participation, clarifying the ambiguity of regression outcomes. Because the purpose of this research is testing program effectiveness—and the programs are implemented at either the individual or the school level—each of the three research questions are addressed by program type. While propensity score matching does not specifically assess the programs as mediating mechanisms for a lack of parental resources, previous research indicates the educational attainment gap between low and high SES students is a result of the complex interaction between family and school characteristics that are inseparable from parental resources, or lack thereof. Program effectiveness, therefore, can be used to infer that program participation mediates for a lack of parental resources specified in the matching process. The programs were in fact found to be effective, as shown in the following reported results.

### 4.1 Individually Targeted Program Results

Table 7 reports the ATT values and the associated Rosenbaum bounds for the individually targeted program assessment<sup>16</sup>. The results are relatively consistent from one matching algorithm to the next. Unfortunately, the model has some discrepancies with respect to model sensitivity. In this model, individually targeted programs have a strong positive relationship with high school graduation, as well as attending public institutions, and a strong negative relationship with deviance. While these programs positively impact college attendance—and attendance at four-year institutions—the possible impact of unobservable bias

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<sup>16</sup> The logistic regression outputs for each propensity model are included in tables found in Appendix B.

is only acceptable when using the nearest neighbor algorithm. Individually targeted programs have no effect on attendance at two-year or private institutions, and do not reduce idleness as hypothesized.

**Table 7. ATT and Rosenbaum Bound Outcomes for Individually Targeted Programs.**

Outcome	Average effect of Treatment on Treated			
	Nearest Neighbor	Kernel	Radius	Rosenbaum Bounds
High School Graduation	0.971***	0.971***	0.971***	1.8
College Attendance	0.743**	0.743**	0.743*	1.6
Two-Year	0.275	0.275	0.275	1.1
Four-Year	0.466*	0.466*	0.466	1.5
Public	0.569*	0.569**	0.569*	1.6
Private	-0.172	-0.172	-0.172	1.1
Idleness	0.008	-0.008	0.008	1.2
Deviance	-0.045***	-0.045***	-0.045***	1.7
N treated	380	380	380	

\*p-value < 0.05, \*\*p-value < 0.01, \*\*\*p-value < 0.001

As discussed in the previous chapter, this model was also tested using logistic regression, the results of which are displayed in Table 8. This comparison yields several interesting points. First, in a logistic regression, it would not be necessary to include the higher order terms or the interactions that were necessary to satisfy the balancing property, specifically when considering SES and student achievement. As with the propensity model, program participation has a strong positive relationship with high school graduation in that program participants would be more likely to graduate than non-participants. The similarity between the two methods was also seen in the strong negative relationship between program participation and deviance with program participants being less deviant than non-participants. There is no relationship between program

**Table 8. Logistic Regression Coefficients for Individually Targeted Programs by Propensity Model Outcomes.**

Variable	HS Grad	College Att.	Public	Private	Two-Year	Four-Year	Idleness	Deviance
SES	0.519***	0.499***	0.061	0.242***	-0.146**	0.473***	-0.830**	-0.574***
Black	-0.112	0.265***	0.024	0.259**	-0.0289***	0.637***	0.055	0.153
Hispanic	-0.136	0.041	-0.105	0.128	0.039	-0.087	-0.211	0.106
Asian	0.255	0.598***	0.340***	-0.014	0.092	0.411***	-1.059*	-0.226
Single-parent	-0.240**	-0.053	-0.115*	0.107	-0.052	-0.004	-0.000	0.212**
Step-parent	-0.405***	-0.328***	-0.085	-0.252**	0.027	-0.304***	0.146	0.412***
Student Achievement	0.065***	0.063***	0.017***	0.042***	-0.038***	0.099***	-0.044***	-0.043***
ESL	0.249	0.807***	0.377**	-0.072	-0.060	-0.773***	-0.192	-0.018
Perceived Crime	0.022	-0.004	0.077**	-0.151***	-0.001	-0.004	-0.124	-0.061
Male <sup>2</sup>	-0.156*	-0.389***	-0.167***	-0.119*	-0.146**	-0.160***	0.213	-0.022
SES*Black*ESL	0.995	0.069	-0.133	0.295*	0.106	-0.075	-0.580	-0.007
ESL*Achieve*SES	-0.007**	-0.009***	-0.002*	-0.002	0.000	-0.007***	0.002	0.000
<i>Attachment</i>								
Parental Attachment	0.029	0.040	0.032	0.004	0.025	0.019	0.013	0.022
Peer Attachment	0.144**	0.081*	0.103***	-0.057	0.045	0.071	0.285	-0.071
Teacher Attachment	-0.035	-0.071*	0.044	-0.126**	0.100*	-0.131**	0.228*	0.126**
<i>Commitment</i>								
Student Effort	0.128	0.082	0.043	0.060	-0.124*	0.180**	0.082	-0.086
Parental Aspirations	-0.021	0.089***	0.070***	0.031	0.003	0.136***	0.073	-0.048*
Student Aspirations	0.101***	0.115***	0.084***	0.051**	0.033**	0.119***	-0.007	-0.086***
<i>Involvement</i>								
Home Supervision	-0.047	-0.052	0.038	-0.077	0.083**	-0.095*	-0.013	-0.024
Home Discussion	10.136**	0.034	-0.004	0.080*	-0.051	0.128***	-0.081	0.034
Intergenerational Closure	0.200	0.213*	0.135	0.211	0.212	0.339**	-0.163	0.058
PTO	0.117	0.219***	0.003	0.252***	-0.007	0.192***	-0.284	-0.173*
Importance of Grades	0.206***	0.211***	0.069**	0.116**	-0.102**	0.305***	-0.289**	-0.280***
Going to class unprepared	0.009	0.044	0.013	0.007	-0.079**	0.068*	-0.219*	0.011
<i>Conventionality</i>								
Work for pay	-0.168*	-0.121**	-0.141***	0.123**	-0.036	-0.050	-0.286	0.281***
Community Service	0.157	0.107*	-0.098*	0.161**	-0.149**	0.146**	0.193	-0.161*
Homework	0.051	0.129***	0.037	0.067*	-0.002	0.107***	-0.115	-0.068
Extracurricular activities	0.359***	0.278***	0.111**	0.198**	-0.179***	0.478***	-0.142	-0.451***
<i>Juvenile Delinquency</i>								
Drop-out prevention	-0.161	-0.182	-0.305*	0.134	-0.167	-0.202	-1.100	0.534**
Delinquency	-0.159	-0.118***	-0.056**	-0.065**	-0.015	-0.113***	0.004	0.254***
Fighting	-0.232	-0.148**	-0.173***	-0.042	-0.106*	-0.186**	0.111	0.297***
Program Participation	1.18***	0.366**	0.245*	0.080	0.037	0.320**	-0.095	-1.216***
R <sup>2</sup>	0.185	0.213	0.049	0.090	0.036	0.292	0.068	0.197

\*p≤0.05, \*\* p≤0.01, \*\*\* p≤0.001

N = 11,540

participation and idleness, nor is there a relationship between participation and either two-year or private institution attendance, as was seen in the propensity model.

While the relationship was significant with respect to college attendance, specifically at public and four-year institutions, there is a confounding relationship here that could be clarified through propensity models. Comparable to the Rosenbaum bounds, the  $R^2$  value is often used in regression models to justify the significance of the findings. Most of these models would be considered significant, explaining up to 30% of the variance in determining four-year postsecondary institution attendance. Given the propensity model outcomes, this success cannot be solely contributed to program participation as it may be in a regression analysis.

The ATT and Rosenbaum bounds for the analysis restricted to Upward Bound and Talent Search participants are displayed in Table 9, and are very similar to those of all individual programs. Upward Bound and Talent Search have a significant positive relationship with high school graduation and attendance at four-year institutions (at least in two out of three algorithms), and a significant negative relationship with deviance. These programs have no effect on two-year institution attendance or idleness, and this is a relatively sound model for determining no relationship between program participation and private institution attendance, given the Rosenbaum bounds values. While there is a positive effect seen with respect to college attendance, particularly at four-year institutions, the inconsistency with respect to model sensitivity and relationship strength suggest further research is necessary to enhance the model and clarify the findings.

**Table 9. ATT and Rosenbaum Bound Outcomes for Upward Bound and Talent Search.**

Outcome	Average effect of Treatment on Treated			
	Nearest Neighbor	Kernel	Radius	Rosenbaum Bounds
High School Graduation	0.977***	0.977***	0.977***	1.9
College Attendance	0.737**	0.737**	0.737*	1.5
Two-Year	0.267	0.268	0.268	1.9
Four-Year	0.465*	0.465*	0.465	1.8
Public	0.577*	0.577**	0.577**	1.6
Private	0.145	-0.155	-0.155	1.5
Idleness	0.014	0.014	0.014	1.2
Deviance	-0.047***	-0.047***	-0.047***	1.7
N treated	210	210	210	

\*p-value < 0.05, \*\*p-value < 0.01, \*\*\*p-value < 0.001

Table 10 contains the results from the logistic regression analyses. As seen with the larger sample including all individually targeted program participants, when using logistic regression, the higher order term and the interactions were unnecessary, specifically with respect to SES and student achievement. When controlling for the other factors included in the model, Upward Bound and Talent Search participants would appear to have higher high school graduation rates than non-participating peers, but they would be more deviant, both of which are significant relationships. The relationship between participation and two-year or private attendance are not significant, nor is the relationship with idleness.

Again, the relationship between program participation and college attendance, specifically at four-year and/or public institutions, is positive and significant, indicating Upward Bound and Talent Search participants are actually more likely to attend than non-participating counterparts. As seen with the unrestricted sample, the  $R^2$  values are indicative of relatively sound models which are not actually the case. Essentially, the propensity models demonstrate a causal relationship between individually targeted programs and increased high school completion and college attendance, specifically at four-year, public institutions (though to a less significant degree), while decreasing deviance.

**Table 10. Logistic Regression Coefficients for Upward Bound & Talent Search Participants by Propensity Model Outcomes.**

Variable	HS Grad	College Att.	Public	Private	Two-Year	Four-Year	Idleness	Deviance
SES	0.423***	0.483***	0.066	0.261***	-0.128*	0.473***	-0.290	-0.541***
Black	0.065	0.300***	0.048	0.300***	-0.223**	0.625***	0.063	0.063
Hispanic	-0.092	0.0240	-0.109	0.129	0.026	-0.96	-0.029	0.077
Asian	0.170	0.546***	0.339***	-0.034	0.095	0.388***	-0.830*	-0.181
Single-parent	-0.204*	-0.071	-0.119**	0.105	-0.070	0.006	0.054	0.240**
Step-parent	-0.437***	-0.401***	-0.153**	-0.264***	-0.032	-0.343***	0.261	0.435***
Student Achievement	0.066***	0.062***	0.019***	0.042***	-0.034***	0.098***	-0.032***	-0.043***
ESL	0.219	0.794***	0.389***	-0.047	0.006	0.741***	-0.145	-0.130
Perceived Crime	0.005	0.002	0.076**	-0.144***	0.004	-0.002	-0.096	-0.056
Male <sup>2</sup>	-0.178**	0.377***	-0.179***	-0.113*	-0.159***	-0.154***	0.207	0.018
SES*Black*ESL	0.083	0.138	0.067	0.280	0.115	-0.022	-0.556	0.046
ESL*Achieve*SES	-0.006**	-0.008***	-0.002**	-0.002	-0.001	-0.007***	-0.001	0.002
<i>Attachment</i>								
Parental Attachment	0.078*	0.067**	0.052*	0.016	0.044	0.034	-0.062	0.017
Peer Attachment	0.126*	0.088*	0.117***	-0.067	0.079*	0.046	0.245	-0.103
Teacher Attachment	-0.034	-0.081*	0.064	-0.146**	0.093*	-0.155***	0.242*	-0.208**
<i>Commitment</i>								
Student Effort	0.174*	0.094*	0.049	0.042	-0.127**	0.201***	-0.093	-0.094
Parental Aspirations	-0.000	0.084***	0.068***	0.027	0.002	0.133***	0.055	-0.054*
Student Aspirations	0.106***	0.111***	0.085***	0.049**	0.035*	0.119***	-0.008	-0.077***
<i>Involvement</i>								
Home Supervision	-0.048	-0.063	0.034	-0.096*	0.075*	-0.104**	-0.022	-0.022
Home Discussion	0.115**	0.026	-0.008	0.084*	-0.047	0.126***	0.114	0.030
Intergenerational Closure	0.100	0.196	0.089	0.182	0.196	0.375***	0.051	0.096
PTO	0.170*	0.220***	0.009	0.252***	-0.013	0.202***	-0.345*	-0.194**
Importance of Grades	0.183***	0.193***	0.070**	0.112**	-0.096**	0.298***	-0.200*	-0.267***
Going to class unprepared	0.037	0.033	-0.009	0.136	-0.072*	0.074*	-0.114	-0.035
<i>Conventionality</i>								
Work for pay	-0.203**	-0.123**	-0.143***	0.121**	-0.057	-0.035	-0.253	0.280***
Community Service	0.098	0.072	-0.106**	0.151**	-0.162***	0.134***	0.257	-0.101
Homework	0.046	0.120***	0.027	0.080*	-0.007	0.105***	-0.132	-0.093**
Extracurricular activities	0.309***	0.275***	0.114**	0.211***	-0.159***	0.472***	-0.206	-0.450***
<i>Juvenile Delinquency</i>								
Drop-out prevention	0.05	-0.145	-0.269*	0.118	-0.129	-0.229	-0.328	0.394**
Delinquency	-0.182***	-0.128***	-0.061***	-0.080***	-0.017	-0.129***	0.022	0.253***
Fighting	-0.154*	-0.112*	-0.133**	-0.053	-0.081	-0.166**	0.145	0.250***
Program Participation	1.457**	0.377*	0.331*	-0.004	0.036	0.402**	-0.050	-1.017**
R <sup>2</sup>	0.189	0.212	0.055	0.094	0.030	0.295	0.055	0.190

\*p≤0.05, \*\* p≤0.01, \*\*\* p≤0.001

N = 12,540



## 4.2 Spillover Program Results

The results at the school level are not quite as distinct as those at the individual level. Table 11 displays the results for the spillover program analyses. It is important to note that in none of the analyses did all three algorithms completely coincide; therefore, for this portion of the results two out of three coinciding algorithms will be considered sufficient. Spillover programs have a significant positive relationship with high school graduation, college attendance—specifically at four-year and private institutions—and a significant negative relationship with two-year institution attendance, idleness, deviance, and tardiness. Given the increased college attendance, specifically at four-year institutions, I am suggesting the negative relationship with two-year institutions is a result of these students opting out of the two-year track and into four-year programs. The only relationship that is subject to unobservable confounding variables is that of public institution attendance, though the relationship is still positive and significant.

**Table 11. ATT and Rosenbaum Bound Outcomes for Spillover Programs.**

Outcome	Average effect of Treatment on Treated			Rosenbaum Bounds
	Nearest Neighbor	Kernel	Radius	
High School Graduation	0.895	0.895**	0.895**	1.5
College Attendance	0.614	0.614**	0.614**	1.5
Two-Year	-0.257*	-0.257**	-0.257**	1.5
Four-Year	0.353*	0.353	0.353**	1.5
Public	0.473	0.473**	0.473**	1.4
Private	0.138*	0.138*	0.138**	1.6
Idleness	-0.024	-0.024**	-0.024**	1.5
Deviance	-3.443	-3.443*	-3.443**	1.5
Tardiness	-0.986*	-0.986*	-0.986**	1.5
N treated	5,030	5,030	5,030	

\*p-value < 0.05, \*\*p-value < 0.001 (Note: No p-values in this analysis fell in the 0.05 < p-value < 0.01.)

Because the outcomes of interest at the school level were calculated using the school means instead of individual dichotomous responses, logistic regression could not be used as a

comparative measure. Instead, OLS regression outcomes are displayed in Table 12. Unlike the individually targeted analyses, the spillover program regression coefficients provide a specific case of confounding variables. For example, the relationship between program participation and college attendance—at two-year, four-year, and private institutions—is negative and significant. However, is this relationship present because these students are less likely to go to college anyway due to their circumstances, hence the program implementation? Or, are the programs detrimentally impacting the students?

The  $R^2$  values would suggest that this is an excellent regression model for the education-based outcomes, with some models explaining half the variance. The interpretation would be at the discretion of the researcher. In this case, as was seen with the propensity score models, the programs are benefitting not hindering educational attainment, as well as minimizing deviant outcomes. The regression analyses with respect to deviant outcomes were insignificant models explaining at most 7.6% of the variance. Overall, spillover programs significantly increased high school completion and college attendance at both public and private institutions, specifically four-year institutions, while decreasing idleness, deviance, and tardiness.

**Table 12. OLS Regression Coefficients for Spillover Programs by Propensity Model Outcomes.**

Variable	H.S. Grad	Coll. Attend	Public	Private	Two-Year	Four-Year	Idleness	Deviance	Tardiness
School SES <sup>1</sup>	-0.001	-0.004***	-0.002***	-0.001***	0.001**	-0.004***	0.001***	-0.008***	-0.002
School Urbanicity	-0.012***	-0.043***	-0.015***	-0.00***	0.029***	-0.073***	0.001	-0.088***	0.021
School Race/Ethnic Comp. <sup>2</sup>	-0.001***	-0.001***	0.000	-0.001***	0.002***	-0.001***	0.001***	-0.001**	0.001
Perceived Crime	0.007***	0.030***	0.025***	0.006***	0.007***	0.024***	-0.002***	0.008	-0.014
School LEP <sup>3</sup>	-0.003***	-0.003***	-0.004***	0.001***	-0.002***	-0.001***	-0.001***	-0.002	-0.003
School College Prep	-0.004***	0.000	0.001**	0.001	-0.002***	0.002***	-0.001*	-0.001	-0.003*
Certified Teachers	-0.001***	-0.002***	0.001*	-0.002***	-0.001***	-0.001**	0.000	-0.004**	-0.001
Out-of-Field Teachers	0.000	-0.000***	-0.000	-0.001	0.001	-0.001***	-0.000	-0.002**	-0.003***
Student-Teacher Ratio	-0.002***	-0.002***	0.003***	-0.005***	0.003***	-0.005***	0.001***	-0.019***	0.022***
CollPrep*Certified*LEP	-0.000***	0.000***	0.000***	0.001***	0.001***	-0.000***	0.000***	0.000***	0.00**
SES Quintiles	-0.012***	0.040***	0.028***	0.012***	0.005	0.035***	-0.001	0.165***	0.089**
Spillover Program	-0.010	-0.023***	-0.001	-0.020***	-0.011***	-0.010**	0.001*	-0.033	-0.005
R <sup>2</sup>	0.318	0.429	0.130	0.307	0.112	0.500	0.076	0.030	0.025

<sup>1</sup>School SES is reported as the percentage of 10<sup>th</sup> graders eligible for free/reduced lunch.

<sup>2</sup>School Race/Ethnic Comp. is the percentage of non-white students.

\*p≤0.05, \*\* p≤0.01, \*\*\* p≤0.001

N = 11,540

### 4.3 School-wide Program Results

The ATT and Rosenbaum bounds for the school-wide programs are listed in Table 13. As with the spillover programs, not all three algorithms are in accord, thus a majority agreement will be used. School-wide program participation has a significant positive relationship with high school graduation, college attendance—at both public and private institutions—and a significant negative relationship with two-year institution attendance, idleness, deviance, and tardiness. Unlike the spillover programs, where it is believed that the negative relationship with two-year institutions is based on the increase in four-year institutions, that same relationship was not substantial enough in this analysis to make that claim. Only one of the three algorithms returned a significant result, yet the Rosenbaum bounds would indicate that this was a sound model.

**Table 13. ATT and Rosenbaum Bound Outcomes for School-Wide Programs.**

Outcome	Average effect of Treatment on Treated			
	Nearest Neighbor	Kernel	Radius	Rosenbaum Bounds
High School Graduation	0.934*	0.934***	0.934***	1.5
College Attendance	0.695*	0.695**	0.695***	1.5
Two-Year	-0.237*	-0.237*	-0.237***	1.4
Four-Year	0.453	0.453	0.453***	1.9
Public	0.511*	0.511***	0.511***	1.7
Private	0.179	0.179***	0.179***	1.2
Idleness	-0.024	-0.024***	-0.024***	1.6
Deviance	-3.539	-3.539*	-3.539***	1.8
Tardiness	-0.893	-0.893***	-0.893***	1.9
N treated	1,420	1,420	1,420	

\*p-value < 0.05, \*\*p-value < 0.01, \*\*\*p-value < 0.001

As with the spillover programs, the level of analysis and the coding of the outcome variables prevented logistic regression comparisons from being used. The OLS regression outcomes are displayed in Table 14. In this particular portion of the analyses, the regression and propensity models are in agreement with respect to the significant positive relationship seen between program participation and high school graduation and college attendance, specifically

attendance to public institutions. However, the relationship between program participation and private institution attendance was negative, again posing another confounding finding. Are students in these low SES schools less likely to attend private institutions due to the inability to afford the increased tuition, or are the programs themselves discouraging attendance to private institutions?

A significant positive relationship appears when using the propensity method, suggesting neither case is accurate. The  $R^2$  values were similar to those seen in the spillover regressions. The only significant negative relationship with program participation that corresponds to that found in the propensity model is that of tardiness. Overall, then, school-wide programs significantly increased high school completion and college attendance at both public and private institutions, as well as four-year institutions, while decreasing idleness, deviance, and tardiness. The individually targeted, spillover, and school-wide program analyses results will be discussed in greater detail in the next chapter.

**Table 14. OLS Regression Coefficients for School-wide Programs by Propensity Model Outcomes.**

Variable	H.S. Grad	Coll. Attend	Public	Private	Two-Year	Four-Year	Idleness	Deviance	Tardiness
School Urbanicity	-0.013***	-0.046***	-0.017***	-0.030***	0.030***	-0.077***	0.001**	-0.088***	0.019
School Race/Ethnic Comp. <sup>1</sup>	-0.001***	-0.001***	-0.002**	-0.001***	0.001***	-0.001***	0.002***	-0.001**	0.001**
Perceived Crime	-0.015**	0.004	-0.038***	0.044***	0.014	-0.008	0.003	0.013	0.287***
School LEP <sup>3</sup>	-0.004***	-0.003***	-0.004***	0.001***	-0.001***	-0.002***	-0.001***	-0.003	-0.003
School College Prep	0.001***	0.002***	0.001***	0.001***	-0.001***	0.002***	-0.001***	0.002	0.001
Certified Teachers	-0.001	-0.001***	0.002***	-0.001***	-0.001***	-0.001***	0.000***	-0.003***	0.002***
Out-of-Field Teachers	0.000	-0.001***	-0.000	-0.001**	0.001**	-0.004***	0.000**	-0.001*	-0.003***
Student-Teacher Ratio	-0.001***	-0.002***	0.004***	-0.005***	0.003***	-0.005***	0.003***	-0.019***	0.021***
CollPrep*Certified*LEP	0.000***	0.000***	0.000***	-0.000***	-0.001***	-0.000***	0.000***	0.000***	0.000**
SES Quintiles	-0.006***	-0.029***	-0.011***	-0.017***	0.007***	-0.036***	-0.002	-0.044***	0.023**
Crime-squared	0.007***	0.007**	0.018***	-0.012***	-0.002	0.008**	-0.002*	-0.007	-0.094***
School-wide Program	0.011***	0.011**	0.021***	-0.011***	0.003	0.007	0.002	0.033	-0.080**
R <sup>2</sup>	0.077	0.387	0.115	0.298	0.105	0.461	0.074	0.026	0.025

<sup>1</sup>School Race/Ethnic Comp. is the percentage of non-white students.

\*p≤0.05, \*\* p≤0.01, \*\*\* p≤0.001

N = 12,060

## Chapter 5. DISCUSSION & IMPLICATIONS

Each of the adolescent intervention programs—individually targeted, spillover, and school-wide—enhanced educational outcomes while simultaneously reducing educational deviance. This research provides support for the role of education as a social institution conforming individuals to societal norms and values, teaching self-control, and providing viable alternatives to differentially associated behaviors and deformed choices, it does show that in the realm of education, it is possible to use adolescent intervention programs to enhance educational experiences and decrease deviant behavior. The results from each analysis will be discussed in detail, as well as how these results relate to the current body of literature, and the implications of such results.

### 5.1 Individually Targeted Programs

Individually targeted programs significantly increase high school completion and college attendance, specifically at four-year, public institutions, while decreasing deviance, as hypothesized. Propensity score modeling provides confidence in attributing successful student outcomes to program participation and not individual or school demographics. The matching tells us who these programs are helping<sup>17</sup>. Low SES, racial/ethnic minorities tend to be overrepresented in individually targeted programs, as do females. Students who come from non-nuclear families in areas with perceptibly higher levels of crime are also overrepresented. Lower levels of student achievement and higher percentages of ESL students were also seen in the sample of program participants. Generally speaking, the success of individually targeted

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<sup>17</sup> Refer to the unmatched sample in Table 2 for the basis of the comparison.

intervention programs are then able to compensate for the impact of certain individual characteristics known to hinder educational attainment. Participation in any program can aid students in overcoming blocked opportunity structures resulting from the following: low SES, race/ethnicity, family composition, achievement, ESL, and perceptions of dangerous surroundings.

The students' aspirations are slightly higher, but otherwise they appear to have equivalent levels of social bond and juvenile delinquency. When the sample is restricted to Upward Bound and Talent Search participants only, program participating students also report higher levels of attachment. These increased aspirations and attachments may account for the necessary persistence of participants to attend programs outside of school, a problematic element that is not present in school-based programs in that students must find the time and means of transportation to attend these programs.

Upward Bound and Talent Search specifically, were also found to have the same results as any individually targeted adolescent intervention program—increased high school completion and college attendance rates at four-year, public institutions with decreased levels of individual deviance. Initially these two programs were combined into one analysis in order to have a large enough treated sample size to satisfy the balancing property. While serving the same populations (low SES, first generation college attendees), Upward Bound specifically targets those students who appear would fail without intervention, while Talent Search seeks out those students who appear to be the best suited for academic success. As such, pairing the two extremes may have provided balance, but what happens to the students in the middle?



Recent research has shown that the U.S. is currently experiencing a decline in high school graduation rates (Heckman & LaFontaine, 2007). Given we also know that students who qualify for adolescent intervention programs are those particularly at-risk for dropping out of high school, the significant positive relationship between program participation and high school completion is particularly salient (Gandara, 2001; Hayward, Brandes, Kirst, & Mazzeo, 1997; Perna & Swail, 2002; Rothstein, 2004; Vargas, 2004). With these programs also increasing college attendance, specifically at four-year, public institutions, individually targeted programs have the ability to reduce the college attendance gap between low and high SES students. As hypothesized, these programs additionally decrease deviance, showing support for the combined theoretical approach.

The three assumptive pillars upon which individually targeted programs are formed—rugged individualism, a focus on the future, and academic immersion—aid in the explanation of these findings, specifically the small sample size (Anderson & Larson, 2009). The rugged individualism required of a participant is negated by several key environmental factors low SES students face—transportation to an outside facility, time, access, etc.—and would require students to already possess many of the socialization elements program participation is meant to provide. With low SES students having deformed choices, participation may not even be a viable option. The individually targeted programs then have an essential participation element of self-selection and some form of transportation that makes matching difficult, participation limited, and results less significant. When differentially associated behaviors are demonstrating minimal effort may provide similar results, participation is less desirable. Consistent with the conflict perspective, offering such a program would be a means of providing a service, while exercising the power of status, severely restricting access and availability.

In this particular case it may be beneficial to identify the implications of these research findings with respect to each level of the education system. Though these programs all take place at the earliest in middle school, the possible implications impact primary education as well. Given the overall effectiveness of these programs when implemented in adolescences, it may be possible to see enhanced results if implemented earlier in the education system. Combining early intervention programs with adolescent intervention programs should not be outside the realm of possibility, though it is outside the scope of this study. At the secondary level, of course, these findings imply an enhanced educational experience and a reduction of individual deviant behaviors for those who participate. Of course if fewer youth are entering the penal system and more are graduating high school with the necessary skills and knowledge to attend postsecondary institutions, the implications at the postsecondary level are not only educational, but also political, mainly from the appropriations aspect.

Providing students with an alternative pathway removes the limitations to a life of deviant behavior and opens up the realm of educational possibility and the associated elevation in SES for participating students. If additional low SES adolescents are in the position to attend postsecondary education, then it would stand that educational facilities need enhanced capacity for accommodation. As the demand for higher education continues to swell, postsecondary institutions have thus far been accommodating of such demand. However, if greater numbers of low SES students are eligible for postsecondary education, affordability then becomes an issue. It would certainly be a disappointment and potentially problematic situation if programs were to be implemented that provided low SES students with a chance at postsecondary attendance only for that chance to be hindered by a lack of financial means. As such, these research findings

seem to imply that there will or at least should be an increased need for financial aid in all forms—loans, grants, scholarships, work-study positions, and so on.

The significance of deviance and insignificance of idleness in this portion of the analysis would suggest that the impact of program participation applies to dropping-out and suspension/expulsion. The significance of the relationship with high school completion would provide additional support for this idea, a result that may have more magnitude. Given the relatively low number of students enrolled in individually targeted programs (a little over 3%), the reduction in drop-out, suspension, and expulsion rates would have a limited, if not inconsequential impact; however, if the programs were increased in size and actually reaching all the students in need, this could become quite a different implication.

While disciplinary policies vary dramatically, in most cases expulsion follows a serious offense. These findings suggest this type of deviance is decreasing through program participation. If the programs were to be expanded to include a larger portion of the low SES student population these implications would be more applicable. At the very least one would expect to see the need for police officers in schools to decrease, as well as the need for truancy officers (which in some schools is the same position).

The actual number of individually targeted program participants in the sample limits this research. While there were 500 respondents who considered themselves to be in adolescent intervention programs of any kind, there were only 280 in Upward Bound and/or Talent Search. While these would appear to be sufficient sample sizes, you can see from Figure 3 and 4 that it was difficult to find a comparative control group, and the distribution was far from ideal. The compensatory measures for satisfying the balancing property, while sufficient, were also not

ideal. In an ideal propensity model, these adjustments would not be necessary and the sample would provide adequate matches for all program participants regardless of the variables used for comparison. The increased sample size in the school-level analyses produced more significant results.

## 5.2 Spillover Programs

As with the individually targeted programs, spillover programs are associated with several benefits. High school completion and college attendance were both increased through program participation. Increases were seen with respect to both public and private institutions, with an additional emphasis on four-year programs. Because these programs have a more substantial amount of participation (N = 7,550, or more than half of all participants), the implications for primary, secondary, and tertiary schooling, as well as the penal system, remain the same, and are greater in magnitude. If anything, there would be an even greater impact to the penal system given all three tested aspects were decreased—idleness, deviance, and tardiness—at the school level, which again, has a more substantial impact on the community as a whole.

These effective spillover programs are achieving the desired outcomes. The learning environment is enhanced through the reduction of deviant behaviors that cause fear, stress, and anxiety (Deneulin et al., 2006; National Center for Children in Poverty, 2008; Nussbaum, 2000). When these things are removed from the learning environment, students are able to thrive in the classroom, which is seen in the increased high school graduation and college matriculation rates (Nussbaum, 2000). Providing the students with access to financial aid and other collegiate benefits and possibilities, these students are not only taking advantage of the opportunity by

taking college preparatory measures, but the increased matriculation rates are indicative of application as well (Kane, 2002).

These findings provide further support for the proposed theoretical approach. Spillover programs are conforming individuals to the norms and values of the school and teaching self-control as evident through the increased high school completion rates and decreased educational deviance overall. Additionally, educational success is provided and in fact stressed as not only a viable option, but also as the desired option. The funding hierarchy established for spillover programs is again consistent with the conflict perspective in that access is financially restricted. Using the GEAR UP funding guidelines, federal funds are only contributed to the program if no other federal funds are currently in use for intervention services of any kind, and more than 50% of the student population must qualify for free/reduced lunch, again restricting access and availability, though not to the same extent seen with individually targeted programs.

Given the initial means of schools offering spillover adolescent intervention programs, it appears the schools that actually need the help are offering it to at least some of their students<sup>18</sup>. The schools in this sample offering intervention services to some of their students tend to have a higher percentage of students receiving free/reduced lunch, have a higher percentage of minority students, higher levels of perceived crime, more students classified as “limited English proficiency,” and a higher student-teacher ratio. As seen in the individual level analyses, while this was not tested directly, generally speaking spillover programs can compensate for those between school differences included in the model. However, these schools also seem to be better staffed, with fewer out-of-field teachers and more certified teachers. The additional staffing may make it easier for these schools to offer the programs initially. These shortcomings do not seem

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<sup>18</sup> Refer to Table 5 for statistical comparison.

quite so substantial given the sampling distribution depicted in Figure 6, which is very close to ideal.

In addition to the differences between the schools, there is also the issue of how these programs are being defined. Using previous research (Domina, 2009), the following question was used to dichotomously code spillover programs:

15. Do students in your school engage in each of the following activities during their high school years?

c. Special program that helps students plan or prepare for college (e.g., Upward Bound)<sup>19</sup>

with administrators having the option of choosing “No, students do not do this,” or “Yes, some students do this,” or “Yes, all students do this.” As such, there may have been some confusion as to what exactly classified as a “special program”, as opposed to just a college prep curriculum. In other words, were all of the spillover program elements outlined in Chapter 2 taking place in all of these schools, or just a select few? Again, this raises questions as to the reliability of the measure and therefore the outcomes.

If administrators were not given the outlined requirements provided by programs like GEAR UP, then it is likely more administrators would qualify a program that does not include each of the five aspects of effective spillover programs (early intervention services, professional development, pre-service teacher education programs, parent programs, and last dollar scholarships). If administrators were classifying untested programs with only a few of these aspects, then the results for the spillover programs would be conservative estimates. Given 54.8% of the sample were classified as attending schools that offer spillover programs while

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<sup>19</sup> Questions a and b were not used in the analysis.

GEAR UP only provides funding for 5.6% of the low SES student population, it is highly likely this is inflated and producing conservative estimates of program effectiveness.

The inclusion of Upward Bound as a question clarifier does help to minimize the over-classification effect, especially given its wide recognition to administrators and education professionals. However, the associated desirability and lack of program-specific knowledge may negate the clarity this identifier was meant to offer. The only way to overcome this limitation would be to find a more accurate and specific measure. If program consistency was provided to schools through guidelines or governmental regulations, then these estimates would be more accurate and reflective of the actual relationship between spillover programs and tested outcomes.

Despite these limitations, spillover programs seem to have the ability to substantially impact the community in which the school is located. Decreasing idleness, deviance, and overall tardiness in the school indicates there are more students in school instead of in the community being deviant. Obviously the learning environment is enhanced given these schools have better outcomes like higher high school graduation and college matriculation rates. Again, as with the individual level programs, in communities where these programs are implemented, the implications include the need for outlets for these high school graduates and college attendees—i.e. higher enrollment at local postsecondary institutions with more financial incentives for students.

### 5.3 School-wide Programs

Similar to the spillover programs, school-wide programs have several benefits, including increased high school graduation and college attendance. Students who participated in school-

wide adolescent intervention programs attend both public and private institutions, specifically those offering four-year programs. These schools also benefit from decreased levels of idleness, deviance, and tardiness. When the entire school is participating in a program, access to illegitimate pathways is significantly reduced, which would be reflected in the reduced visibility in the surrounding communities (Peeples & Loeber, 1994). The affinity of racial/ethnic minorities to the cultural norm of community context is then reflected through the increased school-wide high school graduation and college matriculation rates, as well as the decreased deviance, idleness, and tardiness (Di Le, 1999; Gardner & Shoemaker, 1989).

As previously discussed, the implications of these results reach all levels of the education system. While it is substantially more difficult to present these implications in the same light as those found with spillover programs, the research results were similar. If, however, the schools offering these programs are in higher income areas and have access to more resources, previous research would support the conclusion that these would be the students more likely to succeed anyway (Wilkins, 2000). Unlike the individual level analysis, when looking at a school level analysis, the types of participants are quite different<sup>20</sup>. The schools administering programs to the entire student body tend to have fewer students receiving free/reduced lunch, more students taking college prep courses, more certified teachers, less out-of-field teachers, and perceptibly lower crime. This would suggest that the schools who can afford to do so, and have comparatively more time, are the ones taking advantage of school-wide programs.

Propensity score models are designed to provide evidence against this quandary of offering intervention program services. Even though the descriptive statistics reveal this to be the case, when matched with equivalent schools, the students attending schools with

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<sup>20</sup> Refer to Table 6 for statistical comparison.



interventions built into the curriculum still exceed their peers with respect to high school graduation, college attendance, and have lower rates of deviance, idleness, and tardiness. Despite satisfying the balancing property, the need for higher order terms and interactions provide limitations. However, when taking into consideration the sampling distribution in Figure 7, there is a relatively normal distribution, indicating the matching was better than that of the individual level analysis, but it is not quite as ideal as that of spillover programs depicted in Figure 6.

A further limitation to this portion of the research, is again, the definition of the measurement used. Using the same question as that used to identify the spillover programs, the response had to include something in which all students are participating; however, the duration of the program is missing from the definition, as is exactly what is classified as a “special program”. This could range from one mandatory meeting with a guidance counselor to something much more intensive that is part of every classroom and every teacher’s curriculum. The entire school system could be based around future success, making it difficult to measure. As such, it is possible that schools with minimal programs are being included here and others in which the program is so engrained into the everyday activities that it is not considered a “special program.” Both the spillover and school-wide programs are organization-level changes, which may explain the additional significant findings that were not seen in the individual-level programs (McDonnell & Elmore, 1987). The vague wording and identification of programs hinders the strength of these results with respect to policy implications, while providing support for additional implementation.

## 5.4 Policy Implications

As a result of social, economic, and federal educational policies, in conjunction with an unequal societal structure, low SES families are unable to escape their impoverished conditions and will remain unable to do so until the U.S. undergoes substantial policy reform (Deneulin, Nebel, & Sagovsky, 2006; Rothstein, 2004). The vague language and lack of definitive programmatic attributes hinders the implications of this research with respect to educational policy. The sample distribution for both the spillover and school-wide programs was indicative of a normal distribution, with high quality matches. As such, this research is generalizable and therefore has policy implications regardless of the questionability of the measurement. To aid policymakers who may not be fluent in the language of propensity modeling, it is helpful to summarize the methods used and applications of these methods to policy agendas.

Adolescent intervention programs implemented at the school level can overcome the barriers to educational success faced by low SES students. When comparing students with similar backgrounds, attending similar schools in similar areas, intervention services both enhanced the educational environment and decreased deviant behavior. The students attending schools offering intervention programs are more likely to graduate from high school and attend postsecondary institutions. Additionally, schools that offer intervention services experience lower levels of educational deviance, specifically behaviors that result in suspension, expulsion, or dropping out, and the idleness that typically ensues. These findings are statistically significant and it is highly likely that the intervention programs caused the resulting positive outcomes and not some other source.

These research findings imply that adolescent intervention programs are one way in which the postsecondary attendance gap between low and high SES students can be reduced. Based on the vague identification process, over-identification is likely resulting in conservative estimates. This implies intervention programs should receive specific attention when appropriations are taken under advisement during the annual budgetary review process. Any argument based on the vague language used to determine program effectiveness could be refuted on the basis of over-identification, indicating the previously mentioned outcomes would only be stronger if the programs were more specifically defined.

### 5.5 Research Contributions

In addition to the policy implications that can be inferred from this research, several other contributions have been made through the use of additional propensity modeling techniques and algorithms, as well as measures of model stability and deviance outcome. This study additionally clarifies the three types of adolescent intervention programs. The most recent research endeavors using quasi-experimental designs had important findings lacking statistical significance (Domina, 2009). This research builds on that model and addresses a few issues furthering our understanding of adolescent intervention program effectiveness. In order to keep the sample size large enough to maintain a sufficient treatment and control sample, Domina (2009) used mean imputation. While this method prevents list-wise deletion, it minimizes the statistical strength of the outcome in a quasi-experimental design by forcing clustering around the means. This clustering creates clumps of matched pairs and prevents the statistical program from detecting the measurable differences necessary for statistically significant outcome

measures. Instead of using mean imputation to maximize the number of cases remaining in the model, this research design generated matching variables that suffered from list-wise deletion, yet each of the analyses retained more than 66% of the original sample.

While the individual level analyses sample distribution left something to be desired, the statistical significance of the outcomes were still present. While list-wise deletion may be a concern for other methods, as long as the balancing property is satisfied in propensity models, these concerns are irrelevant (D'Agostina & Rubin, 2000). Not only did this research ensure the balancing property was satisfied, but it also bounded the sample to the region of common support. Additionally, these models were tested more robustly than that of previous research through the use of three matching algorithms, an additional treatment, and separate modeling levels.

In addition to the nearest neighbor matching used in previous research, radius and kernel matching were also applied. Previous research restricted the distance of the nearest neighbor matching, which is similar to radius matching, yet the use of all three algorithms strengthens the argument and provides additional statistical significance that was lacking in previous models. Using the same survey question as Domina (2009), the sample was differentiated by spillover and school-wide programs, instead of limiting it to school-wide programs with spillover effects. Additionally, this study assessed school-based programs at the school-level where previous research used individual level analysis. Aggregating data using a group function provides more accurate estimates, better quality matches, and statistically significant outcomes.

In addition to the modeling techniques that enhanced statistical significance, model strength was tested using Rosenbaum bounds. The reported outcomes of reported magnitude are

not only statistically significant, but are also less likely to be effected by unobserved (or unmeasured) confounding variables. In each of the outcomes that were reported as being statistically significant, an unmeasured confounding variable must affect selection into the treatment by more than 50% before it changes the results (DiPrete & Gangl, 2004).

The final contribution of this research is the additional outcome variables used to assess adolescent intervention program effectiveness—deviance, idleness, and tardiness. While many people think of “crime” as more serious offenses, it is important to note that research indicates minor offending like truancy and idleness serve as points of entry into the broad spectrum of deviant behaviors (Maguin & Loeber, 1996; Sampson & Laub, 1993). Because these programs are implemented mainly through educationally based sources of funding and in the public education system, intervention programs are often thought to only enhance education through measurable education outcomes. When viewing intervention services through a combined theoretical lens, additional outcomes can not only be tested, but also used to demonstrate program effectiveness. Though these are measures of educationally based deviance and not true criminal activity, the inclusion of prior levels of juvenile delinquency as a matching characteristic significantly enhances the criminological attribute (DeLi, 1999; Gottfredson & Hirschi, 1989; Siennick & Staff, 2008; Simmons, Chao, Conger, & Elder, 2001; Tanner, Davies, & O’Grady, 1999). As predicted through the use of sociological theories of education and deviance, this research shows that education can serve as a conforming social institution, teaching self-control, and providing youth with viable alternatives to differentially associated behaviors and deformed choices.

Individually targeted programs significantly increase high school completion and college attendance, specifically at four-year, public institutions, while decreasing deviance. Upward

Bound and Talent Search significantly increased high school completion and college attendance in four-year, public institutions, while decreasing deviance. Spillover programs significantly increased high school completion and college attendance at both public and private institutions, specifically four-year institutions, while decreasing idleness, deviance, and tardiness. School-wide programs significantly increased high school completion and college attendance at both public and private institutions, as well as four-year institutions, while decreasing idleness, deviance, and tardiness. Overall, the spillover programs appear to be the most beneficial type of program, especially considering these are conservative estimates. While these programs may not be the solution to breaking the cycle of poverty for all students, they can certainly be beneficial, especially if the recommendations discussed in the next chapter are implemented.

## **Chapter 6. CONCLUSIONS & RECOMMENDATIONS**

Enhancing educational experiences of adolescents, specifically low SES youth with limited life prospects, can not only increase educational outcomes like high school graduation and college matriculation, but also minimize deviant behavior including things like idleness and tardiness. While the results from this research indicate that adolescent intervention programs are beneficial, this research has revealed several limitations. A combination of the findings and shortcomings of this research provide the foundational support for the following recommendations to be discussed in greater detail:

1. Additional research, both qualitative and quantitative;
2. Streamline and expand program services;
3. Increased support for all types of adolescent intervention programs;
4. Transition Department of Corrections funding to forms of postsecondary funding.

### 6.1 Additional Research

The previous chapter outlined several shortcomings of this research, highlighting the availability of data. Additional research is necessary with respect to individual adolescent intervention programs like Upward Bound and Talent Search, specifically if methods that infer causality are to be used. In this instance, a sample size of 280 was barely sufficient. Several specifications had to be added in order to achieve balance between the treatment and control groups. Additionally, the insufficient definitions used to identify spillover and school-wide programs call outcomes into question even when a relatively good sample distribution is achieved.

One way to aid quantitative researchers could be an oversampling of program participants in each type of intervention program. The Department of Education could be used as a sampling resource to do so. Additionally, questionnaire design could also be improved through the incorporation of a question which asks school administrators,

Which of the following do you offer:

- a. early intervention services,
- b. professional development,
- c. pre-service teacher education programs,
- d. parent programs,
- e. last dollar scholarships
- f. all of the above.

This would aid researchers in identifying which characteristics schools are participating in and help aid with clarification of spillover programs. Modifying that question to ask if these things are incorporated into the core curriculum would aid substantially in the proper identification of school-wide programs. These minimal changes would significantly improve the type of research done here, removing the limitations. However, no matter how thorough the questionnaire, there are some things quantitative studies just cannot address.

It is necessary to additionally highlight the need for qualitative research, specifically formative research that enables the researchers to provide feedback to the school officials administering the programs. This would be an extensive research project that would require several different research sites to ensure all types of adolescent intervention programs are incorporated. As seen in the previous chapter's discussion, under each of the three types of programs there exists a range of implementation levels, as well as programmatic scale and scope. While it may be difficult, if not impossible to properly examine all adolescent intervention programs in place today, further research is necessary if researchers are to properly assess these programs on a larger scale.



The evaluation of these programs, specifically the spillover and school-wide programs, should make note of the different attributes of each program and the elements incorporated by each program. A collaborative effort on the part of the researchers should be able to complete a list of the program specifications, as well as the attributes that work for specific populations. While it is clear that the programs will require some implementation variability in order to make the programs more effective, a basic guideline is necessary not only for evaluation, but also for the equal distribution of services. The additional research can provide better measures and information that can be used to streamline these programs and expand both scope and scale<sup>21</sup>.

## 6.2 Streamline & Expand Program Services

In order to streamline and expand program services, we first need to agree upon the definition of such programs and exactly what services are necessary. The compilation of qualitative researcher reports would provide a better understanding of exactly which services work for whom, as well as why the spillover programs appear to be the most effective. Special attention should also be paid to the recommendations of previous research like that of Currie (2001), which recommends extending program participation to ESL and children of high school dropouts, claiming universal preschool is not the answer; in order for the programs to remain effective, they need to focus on low SES students only. Clearly the established definitions require specificity, while the implementation process needs to provide loose guidelines with room for individualization.

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<sup>21</sup> Without the satisfaction of this first recommendation, the sequential recommendations are not applicable based solely on the results of this research due to the vague language used for program identification.

For example, the five categorical intervention services outline for GEAR UP could be used as the definition for a spillover program, and that model could be emulated for the individualized and school-wide programs, applying reformation as needed for the program specifications. With the application of the recommended research, the broad spectrum of adolescent intervention programs could effectively be streamlined into one of the three styles outlined in this research, consolidating and clarifying adolescent intervention programs and expanding the program services. Again drawing on the spillover program discussion, the lack of explanation and definition of a “special program that helps students plan or prepare for college,” may result in the misidentification of something far insufficient as a spillover program. As such, creating a clear definition and outline of services provided under such a program would also expand program services. Of course none of this would be possible without first meeting the next recommendation of increasing support for intervention services.

### 6.3 Increased Intervention Support

One of the most beneficial ways to gain support for adolescent intervention programs is to show governmental support through increased attention and funding. Without increased appropriations, the recommended additional research cannot take place, and without the additional research, the programs cannot be better defined and streamlined to enhance effectiveness and reach full potential and economic efficiency. One manner of gaining additional support would include the use of multimedia campaigns that convey the importance of education as a means to gain social stability and equity (Maguin & Loeber, 1996). This type of support can be enhanced through the use of what McDonnell and Elmore (1987) refer to as the

“bully pulpit”. In this case the “bully” does not need to be a politician necessarily; some extremely successful multimedia campaigns use popular actors/actresses, artists, or any other well recognized figure to attract the necessary audience for enhanced support.

For adolescent intervention programs to go to scale, one of the foremost forms of support would be financial. As discussed in the beginning chapters, the current levels of funding are reaching less than 10% of low SES children (Center for Children in Poverty, 2008). In order to meet the needs of all children in low SES families, the campaign would need to find representatives able to reach a wide audience ranging from the children who are the target population of the programs to the politicians representing areas in need of such programs, and everyone in between. An increase of funding would mean significant levels of collaboration, forming support networks that would include the needs of the whole child at all developmental stages. Contextualizing the difficulties low SES children face, requires additionally including counseling psychology in the reformation of adolescent intervention programs (Anderson & Larson, 2009; Solberg, Howard, Blustein, & Close, 2002).

An additional collaboration that would enhance the effectiveness of adolescent intervention programs would be that of a K-16 system. The linking of the education system from kindergarten through postsecondary education would ensure the programs themselves are taking the necessary steps to meet the admissions requirements of postsecondary institutions. Previous research has stressed the importance of such collaboration as a necessity for low SES students to succeed in such institutions, going so far as to include the business sector in the entire process ensuring the education system as a whole is preparing these students for entry into the workforce (Kirst, 2004; McElroy & Armesto, 1998). This recommendation increases the involvement of

the community in the education system, providing an encouraging environment both in and out of school.

From the sociology of deviance perspective, one additional recommendation has been made by Gottfredson and Hirsch (1990). They recommend enhancing family institutions, as well as any other social institution possessing the ability to influence social development, in such a way that the ability to help children develop into prospering adults, living lives free from criminal activity are the only realistic long-term crime reduction policies (p. 272-273). This recommendation supports the multi-dimensional approach, of which adolescent intervention programs are merely one developmental tool. This research takes that recommendation from a different perspective in that providing institutions like the family with the ability to aid children in their development—both cognitive and social—could be incorporated into the intervention programs themselves. Use the intervention programs as the tool to form a collaboration of social institutions, engaging not just the family, but also the community, with the school as the focal point for service distribution and communication between the key players.

The compulsory nature of the education systems enables the school to take a lead role in revolutionizing the developmental path of low SES children. Adolescent intervention programs are just the beginning of this process. Encouraging and educating adolescents prior to the childbearing years may not only break that individual's cycle of poverty, but also prevent them from continuing that cycle by bringing another generation into it. Hopefully the generation that benefits from these programs would form the next wave of support for expanding the programs to earlier stages of development. Gaining support for these programs in conjunction with the role education can play with respect to reducing deviant behavior would be easier with governmental recognition through the next recommendation of redirecting funding.

## 6.4 Transitional Funding

We live in a nation that annually pays \$24,000 to incarcerate someone, but only \$8,700 to educate someone (U.S. Bureau of Justice Statistics, 2009). Even using the most expensive program discussed here—Upward Bound with its per pupil expenditure of \$4,800—the cost of incarcerating one person could provide programmatic funding for five students. A temporary initial fund may be necessary to expand the programs and fund the recommended research to properly identify and outline the intervention programs. The eventual reduction in deviant behavior will lead to a reduction in the number of incarcerated persons, providing a funding overflow that can then be transitioned into funding for intervention programs.

The failure of the prison system to rehabilitate inmates is evident in the recidivism rates, which can be as high as 78.8%, with a national average of 67.5% of 1994 released prisoners being rearrested within 3 years, up 5% from 62.5% in 1982 (Langan & Levin, 2002). The increase and sheer number of recidivism is indicative of a failure of the corrections system. Why not redirect funding into prevention instead of correction? One of the principle arguments in favor of using tax dollars to pay for compulsory education was the financial benefit of reduced crime. This argument should hold no less relevance today in the educational funding debate than it was in previous debates.

Once clearly defined and outlined, individually targeted adolescent intervention programs should be offered on-site in schools with a very small proportion of low SES students. Spillover programs should be incorporated in schools with 15-49% of student body being low SES<sup>22</sup>. School-wide programs may be necessary for schools in which the majority of the student body is

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<sup>22</sup> Percentage may vary based on results of further analysis

classified as low SES. The classification for low SES can be a measure already defined, such as qualifying for free/reduced lunch, or the recommended research may produce different classifications.

In times of economic strife, funding for essential programs that lack sufficient evidentiary support may be cut to provide funding for other things, like the controversial banking bailout that took place in 2009. While this research shows adolescent intervention programs are beneficial, there are several unfortunate shortcomings that could be used to argue against continuation of the programs because of all the work necessary to bring about the recommended changes. Change takes time and investment. Without the proper support, these programs will continue to struggle and fail to reach their full potential.

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## Appendix A. LIST OF ELS VARIABLES

	Variable	Label
<b>OUTCOME</b>		
<b>VARIABLES:</b>		
High School Completion	F2HSSTAT	High School Completion Status in 2006
College Attendance	F2EVRATT	Whether has ever attended postsecondary institution-composite
	F2PS1SEC	Sector of first postsecondary institution
Idleness	F2NUNEMP	Number of months nonenrollee unemployed since high school exit
	F2WYLV4	Left school because became pregnant/parent
Deviance	F2EVERDO	Ever dropped out
	F2WYLV6	Left school because was suspended/expelled
Tardiness	F239A-C	How often students are tardy, skip, or have no excuse
School Deviance	F2A40A-O	How often deviant behavior is a problem
<b>STUDENT LEVEL</b>		
<b>CHARACTERISTICS</b>		
SES	BYSES2	Socio-economic status Composite
Race/Ethnicity	BYRACE	Student's race/ethnicity composite
Gender	BYSEX	Sex composite
Family Composition	BYFCOMP	Family composition
Student Achievement	BYXCSTD	Standardized test composite score-math/reading
English is 2 <sup>nd</sup> Lang.	BYSTLANG	Whether English is student's native language
Parent's Education	BYPARED	Parents' highest level of education
<b>SCHOOL LEVEL</b>		
<b>CHARACTERISTICS</b>		
School SES	BYA21	Grade 10 percent free lunch (% receiving free/reduced lunch)
School Urbanicity	BYURBAN	School Urbanicity
School Race/Ethnicity	CP01PMIN	Percent Minority 2000/01 CCD
School/Neighborhood	BYP67	Level of crime in neighborhood
Crime	BYA05	Crime in students' neighborhood
School LEP	BYA20	% 10 <sup>th</sup> graders are LEP or non-English proficient
School College Prep	BYA14B	% 10 <sup>th</sup> graders in college prep program
Certified Teachers	BYA24A	% teachers certified
Out-of-Field Teachers	BYA25A	% teachers teach out of field
Student-Teacher Ratio	CP02STRO	Student/teacher ratio 2002/03
<b>SOCIAL BOND</b>		
<i>Attachment-Parent</i>	BYP57A-L	Student time spent with parents
Peers1	BYS54D	Importance of having strong friendships
Peers2	BYS94	Has close friends who were friends in 8 <sup>th</sup> grade
Teacher1	BYS20A	Student gets along well with teachers
Teacher 2	BYS59B	Has gone to teacher for college entrance information
<i>Commitment</i>	BYTE12D	Student behind due to lack of effort (English teacher)
	BYTM12D	Student behind due to lack of effort (Math teacher)
	BYS38C	How often goes to class without homework
Parent Aspirations	BYPARASP	How far in school parent expects 10 <sup>th</sup> grader to go
Student Aspirations	BYSTEXP	How far in school 10 <sup>th</sup> grader expects to go

<i>Involvement</i>	BYS37	Importance of good grades
	BYS38A/B	How often goes to class without supplies
	Home Discussion BYS86A-I	How often discussed... with parents <sup>23</sup>
	Home Supervision BYS85A-G	Parents establish limitations/privileges, help with homework
	School Participation BYP54A-E	PTA (or other organization) and volunteer involvement
	Intergenerational Closure BYP59CA-C BYP59DA-C BYP59EA-C	Parent knows 1 <sup>st</sup> , 2 <sup>nd</sup> , and 3 <sup>rd</sup> friend Parent knows mother of 1 <sup>st</sup> , 2 <sup>nd</sup> , and 3 <sup>rd</sup> friend Parent knows father of 1 <sup>st</sup> , 2 <sup>nd</sup> , and 3 <sup>rd</sup> friend
<i>Conventionality</i>	BYS72	Ever worked for pay outside the house
	BYS44C	How often performed unpaid volunteer/community service work
	BYS42	Hours/week spent on extracurricular activities
Juvenile Delinquency	BYS24A	How many times late for school
	BYS24B	How many times cut/skip classes
	BYS24D	How many times got in trouble
	BYS24E	How many times put on in-school suspension
	BYS24F	How many times suspended/put on probation
	BYS24G	How many times transferred for disciplinary reasons
	BYS22D	Got into fight at school
	BYS33H	Ever in drop-out prevention program
Program Participation	F1S23	Participated in college preparation program for disadvantaged
	F1S24AC/D	Participated in Talent Search in 11 <sup>th</sup> /12 <sup>th</sup> grade
	F1S24BC/D	Participated in Upward Bound in 11 <sup>th</sup> /12 <sup>th</sup> grade
Spillover Program	BYA15C	(some) Student is program to prepare for college
School-wide Program	BYA15C	(all) Students in program to prepare for college

<sup>23</sup> For spatial reasons, “...” indicates several different discussion topics between students and their parents.

## APPENDIX B. PROPENSITY MODEL REGRESSIONS

**Table B.1. Logistic Regression Coefficients for Individual Level Propensity Score Models.**

Variable	Individually Targeted	Upward Bound/ Talent Search
<i>Demographic Characteristics</i>		
Hispanic	0.216	0.110
Asian	0.399*	0.087
Single-parent	0.409***	0.346*
Step-parent	0.367**	0.344*
Perceived Crime	-0.222**	-0.252**
Male <sup>2</sup>	-0.468***	-0.571***
SES*Black*ESL	0.273	0.394
ESL*Achieve*SES	0.002	0.002
<i>Social Bond</i>		
<i>Attachment</i>		
Parental Attachment	-0.029	-0.041
Peer Attachment	-0.041	-0.343**
Teacher Attachment	0.176	0.060
<i>Commitment</i>		
Student Effort	-0.099	0.009
Parental Aspirations	0.031	0.061
Student Aspirations	-0.020	-0.014
<i>Involvement</i>		
Home Supervision	0.115	0.095
Home Discussion	-0.147*	-0.169*
Intergenerational Closure	0.413	0.595
PTO	0.006	0.073
Importance of Grades	0.208**	0.376**
Going to class unprepared	0.139*	0.237*
<i>Conventionality</i>		
Work for pay	0.005	-0.058
Community Service	-0.068	-0.107
Homework	0.012	0.050
Extracurricular activities	0.311*	
<i>Juvenile Delinquency</i>		
Drop-out prevention	0.480*	-0.363
Delinquency	-0.069	-0.198**
Fighting	0.342**	0.191
N	11,470	12,440

\*p-value ≤0.05

\*\*p-value ≤0.01

\*\*\*p-value ≤0.001

**Table B.2. Logistic Regression Coefficients for School Level Propensity Score Models.**

<b>Variable</b>	<b>Spillover</b>	<b>School-Wide</b>
School SES <sup>1</sup>	0.050***	0.063*
School Urbanicity	0.051	-0.285***
School Race/Ethnic Comp. <sup>2</sup>	0.005***	0.001
Perceived Crime	0.106**	0.211
School LEP <sup>3</sup>	-0.016**	-0.001
School College Prep	-0.005	0.012***
Certified Teachers	0.008***	0.014***
Out-of-Field Teachers	-0.004**	-0.009***
Student-Teacher Ratio	0.039***	-0.006
Crime-squared	N/A	-0.076
CollPrep*Certified*LEP	0.000***	0.000
SES Quintiles	-0.736***	-0.091***
N	9,580	9,610

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**PEER-REVIEWED PUBLICATIONS**

Walsh, R. (2009). *GEAR UP: Creating Opportunities or Conflict* from In From the Margins Web site: <https://sites.google.com/a/temple.edu/infromthemargins/Home/featured-articles>.

Walsh, R. (forthcoming) *Helping or Hurting: Are Adolescent Intervention Programs Minimizing Racial Inequality?* *Education and Urban Society*.

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