Low SES Students GEAR UP for College:

Evaluating Adolescent Intervention Programs Academically and Socially

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AERA 2010, Division G Social Context of Education
Section 4: Social Context of Educational Policy, Politics, and Praxis
May 3, 2010

Abstract: This research evaluates the social context of adolescent intervention programs through a critical lens to determine the impact on youth postsecondary decisions with respect to both educational attainment and deviant behavior, further examining the role of education from a social and political perspective. The Education Longitudinal Study 2002/06 is employed. Propensity score matching is used to make causal inferences with respect to program participation and the impact of some associated ecological aspects. Policy recommendations for programmatic enhancement and future research are discussed based on the implications of the findings.

<u>Purpose</u>

Education has assumed an encompassing role as the solution to all ills plaguing society (Baker & LeTendre, 2005). Over several decades federal education policy has sought to rectify the racial and economic barriers to educational attainment through adolescent intervention programs implemented under the Higher Education Act of 1965. The purpose of this paper is to address the following objectives:

1.   assess school-based adolescent intervention programs within social contexts;

2.   evaluate the populations benefiting from intervention services;

3.   apply the aforementioned results to social and political contexts of education.

 Essentially, this research aims to determine whether programs are alleviating the burdens of social class as a form of social and cultural differentiation using measures of educational deviance. Through adolescent intervention programs, the federal government is significantly increasing the role of education in social and political contexts in an environment that has socially constructed education to be one of few ways in which personal status growth is possible. With economic inequality in the U.S. exceeding that of any other developed country, federal intervention is necessary to achieve equitable access to higher education, making the assessment of programs focused on such a political priority (Wolff, 2006).

<u>Theoretical Frame</u>

Despite the relative acceptance of the findings of the Coleman Report (1966)—variation with respect to student outcomes is determined by within school variances and not between school variances—more recent research has found that between school variance explains 40% of

student achievement (Borman & Dowling, 2009; Gamoran & Long, 2006). Because postsecondary education is neither compulsory nor free, yet remains a key determinant in economic and social mobility, minimizing between school variance has the ability to reduce the gaps in postsecondary eligibility and access. Maximizing the impact of the between school variance can be achieved through addressing the characteristics identified as predictors of student success at the school level. Due to insufficient resources, between school variances may be attributable to any of the following: inadequate counseling and academic advisement, non-college preparatory trajectories, inability to meet admissions' requirements, unqualified teachers, low aspirations and expectations, lack of peer support, *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).

Because high school completion is no longer sufficient for a sustainable lifestyle in postindustrial society, college attendance is a necessary component to breaking the cyclic nature of poverty, as evident through attendance rates (Marshall & Tucker, 1992; Wortington & Juntunen, 1997). Only 6.9% of low SES students attend some form of postsecondary education—comparable to an 88% attendance rate of their higher SES counterparts—with only 22% completing their program of study (HEA, 2008; IES, 2007; Perna & Swail, 2002). In addition to lower high school completion and college matriculation rates, low SES students are overrepresented in forms of deviant behavior. Deviant behavior taking place in school results in suspension or expulsion, which is a pathway to idleness.

Juvenile delinquency and convictions, whether in school or the criminal justice system, result in the attaching of negative labels, contributing to lower aspirations, expectations, and attainment (DiLe, 1999; Hirschi, 1969). Zero tolerance policies with respect to violence and/or

drugs strip schools of their disciplinary authority forcing suspension or expulsion[1]. When school

is no longer an option, youth are left with employment as a high school dropout, or idleness,

which is defined as a lack of employment, educational enrollment, military service, or primary

caregiver responsibilities (Bowen & Finegan, 1969; Finegan, 1982; Jencks, 1989; Mare,

Winship, & Kubitschek, 1984; Tienda & Stier, 1991; Welch, 1990). Interim forms of idleness—

that is less than six months—have minimal detrimental results; however, exceeding the six

month threshold negatively impacts future success with respect to educational attainment, SES

employment status, and marital status, resulting in low self-esteem and higher levels of stress and

anxiety (Finegan, 1982; Powers, 1994; Taggart, 1982).

Accounting for 40% of variance in student outcomes, the school then becomes a

determinant in future success and a pathway to enhance youth educational outcomes through

increased high school graduation and college matriculation rates, as well as decreased suspension

and expulsion rates that serve as pathways to idleness and the possibility of future criminal

behavior (Maguin & Loeber, 1996; Sampson & Laub, 1993). To accomplish these goals,

between school differences need to be addressed. Currently, school SES, race/ethnic

composition, urbanicity, and mean achievement have been identified as predictors of youth

outcomes with considerable variance.

While the school funding debate is beyond the scope of this research, the complexity of

the relationship between funding and achievement (Hanushek & Lindseth, 2009) does not negate

the contextual effect of school SES that is beyond that of individual and familial SES (Becker &

Epstein, 1982; Lightfoot, 1978; Lleras, 2008; Willms, 1992). The funding hierarchical structure

provides tax dollars on a district-level basis, meaning familial and community SES impacts the

funding available to schools. The most successful schools in the U.S. are found in predominately

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[1] For more information refer to http://www.abanet.org/crimjust/juvjus/zerotolreport.html.

white, upper-middle class, suburban areas, interconnecting SES, race/ethnicity, and urbanicity at

the school level (Wilkins, 2000). White flight to the suburbs has created *de facto* segregation

equivalent to the *de jure* segregation seen prior to the Civil Rights movement (Coleman, 1987;

Delgado-Gaitan, 1991; Farkas, 2004; Frankenberry & Lee, 2003; Hao & Bonstead-Bruns, 1998;

Jenks & Phillips, 1998). The growth of the middle class and desirability of suburbia has resulted

in an even greater concentration of poverty in urban schools and neighborhoods with an

overrepresentation of minorities (Bankston & Caldas, 1996; Farley & Frey, 1994; Lleras, 2008;

Reardon & Yun, 2001; Roscigno, 1998).

Several attempts have been made to rectify the inequity at the school-level, one of which

was the Higher Education Act of 1965 (HEA). In the wake of the War on Poverty and the Civil

Rights movement, the gaps between low and high SES families were brought to the forefront of

social policy. HEA implemented programs aiming to minimizing these gaps by increasing

access to and eligibility for postsecondary matriculation. Adolescent intervention programs

provide low SES youth with information they would have otherwise possessed had their parents

attended some form of higher education. While the majority of these programs take place at the

individual level—the most notable programs being Upward Bound and Talent Search—

additional programs have been implemented at the school level. HEA provides funding for the

spillover program Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR

UP).

Spillover programs target the lower achieving students in schools where the majority of

the students qualify for free/reduced lunch. In targeting lower achieving students, GEAR UP

seeks to enhance the educational environment of the school by implementing early intervention

services, professional development, pre-service teacher education programs, parent programs,

and last dollar scholarships[2] (PA State, 2004). The Department of Education reports GEAR UP

as a success given the high school graduation rates of participants—low SES, first generation

college attendees—in 2006 was 84.4% with 52.2% enrolling in postsecondary institutions (HEA,

2008). The U.S. population graduation rates in 2006 were 74.4%, with the national

postsecondary enrollment rates of 18 to 24-year-olds in degree-granting institutions was 38.9%[3]

(IES, 2007).

Effective adolescent intervention programs increase aspirations and expectations,

understanding and use of the collegiate support resources, applications for financial aid, parental

involvement, core and advanced course taking in high school, ACT scores, and international

baccalaureate program participation, high school graduation, and college attendance rates,

maximizing the academic and socio-cultural strengths for all race-sex groups (Domina, 2009;

Garms, 1971; McElroy & Armesto, 1998; McLure & Child, 1998; Murnane & Levy, 1998; Zulli,

Frierson, & Clayton, 2003). These programs can also reduce the number of remedial math

credits in both high school and postsecondary institutions (Gullatt & Jan, 2003). However,

experimental or quasi-experimental designs have rendered different, mixed results, including a

50% attrition rate due to the mobility of low SES students, low program intensity, minimal

summer participation and parental interactions, minimal or no effect on high school curriculum

and/or college plans, and inconsistency with respect to academic achievement, aspirations, and

expectations (ACT, 2007; Domina, 2009; Westat, Inc. 2003). When positive results are reported,

the effect is more a result of the spillover—at the school level—than individualistic—

participating students only (Domina, 2009).

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[2] 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
[3] The Department of Education statistics fail to specify the qualification for postsecondary enrollment as a "degree-
granting institution".

While these results may be discouraging and reflect programmatic inconsistency and in some cases failure, the only measured outcomes were educationally based. Physical, cognitive, and social development taking place during the age-graded transition of adolescences provide the social institution of schooling to be a salient influence over individual behaviors (Sampson & Laub, 1992). Crime and delinquency rates peak during this stage of development, and many low SES youth rely on social institutions like the school to provide them with the tools necessary to effectively integrate social circles in this stage (Fordham & Ogbu, 1986; Sampson & Laub, 1992). While deviance based programs like Scared Straight have been found to actually cause harm (Petrosino, Turpin-Petrosino, & Buehler, 2003), educationally based programs can promote a sense of belonging and attachment, decreasing welfare dependency, delinquency, and criminal behavior, while simultaneously improving the overall school atmosphere, increasing the students' commitment to education, educational attainment and lifetime earnings (Currie, 2001; Gottfredson, 1986; Maguin & Loeber, 1996).

The aims of this research are to evaluate educationally based adolescent programs from the educational perspective while including outcome measures of educational deviance using a quasi-experimental design[4]. Additionally, this research will contribute to the current body of knowledge by clarifying the type of adolescent intervention program at the school level as either a true spillover program or a school-wide program. Examining the characteristics of the schools offering these programs will enable this research to determine whether these particular intervention programs are actually aiding the population with the greatest need or merely widening the gap even further by only being offered in schools with the resources to provide them. The social and political context of programmatic efficiency and effectiveness can also be addressed in this research as outlined through a discussion of the methods used.

[4] Refer to Figure 1 in Appendix A for the theoretical framework used in this analysis.

Methods

The complexities of human ecologies require an equally multifaceted analysis to measure the effects of the social context in which adolescent intervention programs are implemented. As such, this paper utilizes propensity score matching to infer causality with respect to program effectiveness, and then gain a better understanding of the relationship between the differing demographic facets of human ecology and successful transitioning decisions. The quasi-experimental design of propensity score matching creates a control group and a treatment group based on school characteristics (Domina, 2009). Nearest neighbor matching with replacement is used, allowing each case in the treatment group to be matched to the closest control case in a one-to-one match. 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. As an additional measure of robustness, and because nearest neighbor matching forces matches regardless of the difference in scores, radius matching is also used to further support the findings[5] (Becker & Ichino, 2002).

Separate assessments of overall school outcomes—one for spillover programs and one for school-wide programs—provides statistical information at the school level enabling this research to further explore the depth of the spillover effect of adolescent intervention programs.

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[5] The radius was restricted to the STATA default of 0.1.

One analytic technique for programmatic assessments is the quasi-experimental design of propensity modeling. 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, is longitudinal, and provides the necessary matching varialbes.

Data Source & Variables

ELS data collection began in 2002 through the National Center for Education Statistics. This multi-level, longitudinal study follows a group of students beginning during their sophomore year of high school[6] with a biannual follow-up. The Research Triangle Institute, a not-for-profit, university based research organization, surveyed the students and their parents, as well as school administrators, teachers, and librarians. Two-tiered sampling was done with 750, nationally representative schools being randomly chosen then the tenth grade sample taken from those schools. All available sample members were retained for the 2004 and 2006 follow-ups, with freshening taking place as needed[7]. With more than 15,000 students in all three waves, this dataset applicably covers the transition into adulthood, though the second follow-up wave of data are not yet available for public use. As such, the restricted data was used, providing access to the social and educational variables necessary to address the aims of this research.

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[6] Though it varies by state, the youngest age at which a student can legally dropout of the public education system is 16-years of age, or approximately their sophomore year of high school.
[7] Asian and non-public schools were purposefully over-sampled.

The baseline data collected in 2002 was used in the matching algorithms. ELS constructed a composite variable to provide researchers with a uniform measure of *School SES*, which was used for these analyses. At the school level, SES is determined by the percent of students receiving free/reduced lunch, and therefore, is easily misinterpreted. To rectify this situation, the sample was broken into inverse quintiles so that *SES Quintiles* is intuitively interpretable. The interaction between SES, race/ethnicity, and urbanicity is incorporated in the matching stage of the analysis through the inclusion of measures of *Race/Ethnic Composition*— the percent of the student body that is non-white—and *Urbanicity*[8]. 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).

Impoverished schools in areas with perceptibly higher levels of crime face difficulties when attempting to adequately staff their schools. As such, this research additionally matched students with respect to the *Student-Teacher-Ratio*, as well as the percent of *Out-of-Field Teachers*, *Certified Teachers*, and access to *College Prep* courses. To ensure high quality matches, not only did the region of common support bind the sample[9], but Wald tests were also done with each matching variable for the matched samples. In order to satisfying the balancing property[10], an interaction term was necessary between *Certified Teachers* and *College Prep*, under the assumption that they are codependent. The inclusion of the interaction satisfied the balancing property and eliminated the significance of the Wald test that was present for those

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[8] 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.

[9] Restricting the sample to the region of common support ensures only those students with the propensity to receive the treatment are included.

[10] The balancing property is satisfied when matched observations have the same distribution of observable characteristics independent of treatment status (Khandker, Koolwal, & Samad, 2010).

variables. The descriptive statistics are displayed in Tables 1 and 2 and the sampling

distributions are depicted in Figures 2 and 3, for the spillover and school-wide programs,

respectively, whose classifications are best explained through a discussion of the applied

treatment variable.

The treatment was taken from the first follow-up wave of data collected in the expected

senior year of high school in 2004. To specify program participation between spillover and

school-wide programs, a survey question was asked of administrators whether or not students

participated in intervention programs aimed at increasing college matriculation or easing the

transition into the workforce. A response of "yes, some students do this" was used to classify a

spillover program (N = 350 schools with 7,550 students)[11], while a response of "yes, *all* students

do this" (emphasis added) was used to classify a school-wide program (N = 90 schools with

2,150 students). The outcomes were then tested separately for spillover program participation

and school-wide program participation to assess program effectiveness.

Because this research is interested in the school level as opposed to the individual level at

which the data was collected, individual data will be aggregated for the outcome variables of

interest[12]. The aggregate data then reports the proportion of the students in each school

responding positively to each dichotomous outcome variable with the means displayed in Table

3. As previously discussed, the goal of many adolescent intervention programs is not the

successful transition into adulthood, but also the successful transition to any postsecondary

institution. As such, *College Attendance* (N = 10,530) is a dichotomously coded outcome

variable. This analysis takes it one step further and additionally dichotomously codes attendance

at *Two-Year* (N = 4,000), *Four-Year* (N = 6,490), *Public* (N = 7,760), and *Private* (N = 2,730)

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[11] In accordance with NCES restricted-use data policy, all sample size values were rounded to the nearest 10.
[12] This was done using the *egen* command in STATA.

institutions. Under normal circumstances, eligibility for postsecondary education is conditional

upon *High School Completion* (N = 14,630), which is also measured as an outcome variable.

Because 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,

measures of *Deviance* are included as outcome variables (Sampson & Laub, 1993; Tanner,

Davies, & O'Grady, 1999). *Deviance* was formed using factor analysis with respect to

administrator provided information on how often deviant behaviors (i.e. fighting, drugs, alcohol,

etc.) were a problem on school grounds (α=0.995, eigen value = 14.10). An additional outcome

variable was added to the school-level analysis, *Tardiness*, which was formed using factor

analysis from administrator responses to questions regarding how often students skip school, are

late, or have unexcused absences (α=0.820, eigen value = 2.254). Because no enrollment status

is one of the definitive components of idle behavior, dropping out—whether self-selected or the

result of suspension/expulsion—in order to not be classified as idle the respondent must then

enter the workforce, military, or be the primary caregiver of a child (Finegan, 1982; Powers,

1994; Taggart, 1982). As such, the enumeration of *Idleness* is not mutually exclusive from that

of *Deviance*. Additionally, the enumeration of *Idleness* poses another difficulty given the current

economic situation in the U.S.

Most states provided a maximum unemployment compensation allotment for 26 weeks.

The *Emergency Unemployment Compensation Extension Act* of 2008 and its extension passed in

February 2009, provide an additional 20 weeks of federal compensation. As such, in times of

economic strife the federal government is willing to allot individuals 46 weeks to find gainful

employment, which can extended to 59 weeks in the 27 states experiencing unemployment rates

in excess of 6%. Though the second follow-up wave of data was collected in 2006, to prevent

the misidentification of respondents as idle when the economy is to blame and not the individual,

an individual will be dichotomously coded as idle if they are unemployed for a period exceeding

15 months, during which time they are not otherwise engaged (N = 1,540).

Results

  The ATT and Rosenbaum bounds for spillover program effectiveness are displayed in

Table 4. Participation in a spillover program increases high school graduation and college

matriculation rates, specifically at four-year, public, and private institutions. The negative

relationship reflected in the two-year ATT values may be the result of more students attending

four-year institutions, but this analysis did not aim to confirm those results. Additionally,

program participation had an overall negative impact on deviant behaviors, especially in the form

of idleness and tardiness. Each of these outcomes were statistically significant in at least one of

the algorithms and demonstrated a significant stability against unobservable bias, with only one

of the models being below the desired 1.5 threshold (public college attendance at 1.4).

  Spillover programs are performing as hypothesized by enhancing the social context of the

educational environment. Referring back to Table 1, the populations these programs are

assisting are in lower SES, higher racial/ethnic minorities with limited English proficiency.

Schools offering spillover programs do have a higher percentage of certified teachers, more of

whom are able to teach in their specified fields. Because the propensity models were able to find

schools with comparable quality teachers, it is safe to say that the positive outcomes are a result

of program participation and not having a higher caliber teacher in each classroom. The

propensity models also account for the likelihood that these schools may be able to offer

intervention programs because they are more adequately staffed. However, based on the

descriptive statistics, while these programs are being implemented in schools with populations characteristic of requiring interventions, the enhanced teaching staff needs to be explored further.

Referring now to the first column in Table 6, several matching variables significantly determine the schools propensity to offer spillover programs. As seen with the descriptive statistics, the relationship between the propensities to offer an intervention program is negatively associated with school SES, limited English proficiency, and the number of out-of-field teachers. The percentage of racial/ethnic minorities, student-teacher ratios, levels of perceived crime, and the number of certified teachers have a significant positive relationship with respect to the propensity to offer spillover programs. While the sample size was smaller for school-wide intervention programs, the results are similar.

Table 5 displays the ATT and Rosenbaum bounds for school-wide adolescent intervention programs. As seen with spillover programs, school-wide programs increase high school graduation and college matriculation rates, specifically at four-year, public, and private institutions, though private institution attendance can be easily confounded by unobserved variables. Additionally, school-wide programs experienced the benefits of decreasing deviant behaviors, specifically those of idleness and tardiness. The propensity models are more resistant to outside influence with respect to deviant outcomes than were the spillover models.

Again, as hypothesized, in the social context, school-wide programs enhance educational outcomes while decreasing deviant behavior at the school level. When referring to Table 2, the school-wide program participation descriptive statistics, schools offering intervention services are lower SES, have a higher percentage of racial/ethnic minorities, and perceptibly higher levels of crime, though only marginally so for each. On the other hand, these schools also have lower levels of limited English proficient students, substantially more students enrolled in college

preparatory curriculums[13], and more certified teachers practicing in their field. The availability

of a higher quality staff provides students with access to information necessary to attend

postsecondary education.

Referring to the second column in Table 6, the significance of the matching

characteristics in determining propensity to offer a school-wide program is listed. As seen with

spillover programs, SES is inversely associated with the propensity to offer a program, though to

a much lesser extent. Urbanicity is a significant contributor, though it's nominal coding makes

the direction difficult to interpret. Offering a college preparatory curriculum with certified

teachers teaching within their subject matter expertise increases the propensity to offer a

program. These results will be summarized and further clarified through a discussion of the

significance of this research.

Research Significance

Both spillover and school-wide programs are effectively enhancing educational outcome

while decreasing deviant behavior at the school level. The use of propensity score matching

provides certainty that these results are attributable to program participation and not some other

social context. The social context in which these programs are being offered, however, do

substantiate an argument that while these programs are for the most part helping those who

require the most help in terms of limited familial resources, they are still being offered in schools

whose staffing status is reflective of already enhanced educational environments.

One key difference between the populations being served by spillover versus school-wide

programs is the percent of LEP students. While spillover programs are offered in schools with

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[13] This significant difference seen in the percent of students taking college preparatory courses may actually be one
of the intervention elements used by the administrator to classify the school as offering programmatic services.

significantly higher proportions of the student body being classified as LEP, the school-wide

programs are not. In fact, school-wide programs are actually implemented in schools where

there are lower percentages of LEP students. Given both programs are effectively enhancing the

educational outcomes of youth while simultaneously decreasing school deviance, the social and

political contexts of these findings render further discussion.

Socially speaking, these programs can be used to level the educational playing field and

further enhance the educational environment through the production of increased stability, while

decreasing the fear and anxiety that accompany perceptions of a dangerous environment (Pallas,

2006). Economic segregation impacts individuals, families, and communities altering school

environments and contextual effects. The process of educating low SES students can be a

sufficient means of enhancing human capabilities in a manner conducive to adaptation

throughout life, alleviating the burdens of complex ecologies. As such, while education policy

may not have the capacity to overcome disadvantages directly resulting from a lack of familial

resources, the political context of education should focus on the impact such policies can make

through the enhancement of human capabilities and enrichment of choices (Anderson & Larson,

2009).

The convergence of social spheres of influence in public education provide a context in

which adolescent intervention services benefit youth during the transition to adulthood by both

enhancing education and decreasing deviance. As this research demonstrates programmatic

effectiveness, specifically in more adequately staffed low SES schools, one policy

recommendation involves the implementation of adolescent intervention programs in the lowest

SES quintile schools that are the most difficult to staff. To further enhance these programs, the

element of teacher training, as well as benefits to attract and retain higher quality teachers need to be incorporated in all intervention programs[14].

Intervention programs effectively enhancing the educational environment and simultaneously decreasing deviance can impact ecological factors. Decreasing the actual as well as perceived levels of crime in the school and surrounding neighborhood has the ability to substantially improve the school environment, decreasing levels of fear and anxiety which have been shown to reduce student achievement as well as well-being freedom (Anderson & Larson, 2009). Schools contribute to the ecologies of students, and as such have the ability to compensate for the otherwise restraining context in which low SES students are developing and making choices. As demonstrated in this research, the implementation of adolescent intervention programs—whether spillover or school-wide—can help to reduce both the college attendance gap and the deviance participation gap between low and high SES students. Minimizing the overrepresentation of low SES students with respect to deviant behavior, as well as minimizing the underrepresentation of these same students in the collegiate realm has the potential to break the cyclic nature of poverty, but only when educational policy is properly formed and implemented.

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[14] As teacher quality and retention are not the focus of this paper, refer to that body of research (i.e. Darling-Hammond; Haunshek, Kain, & O'Brien; Buckley & Schneider; etc.).

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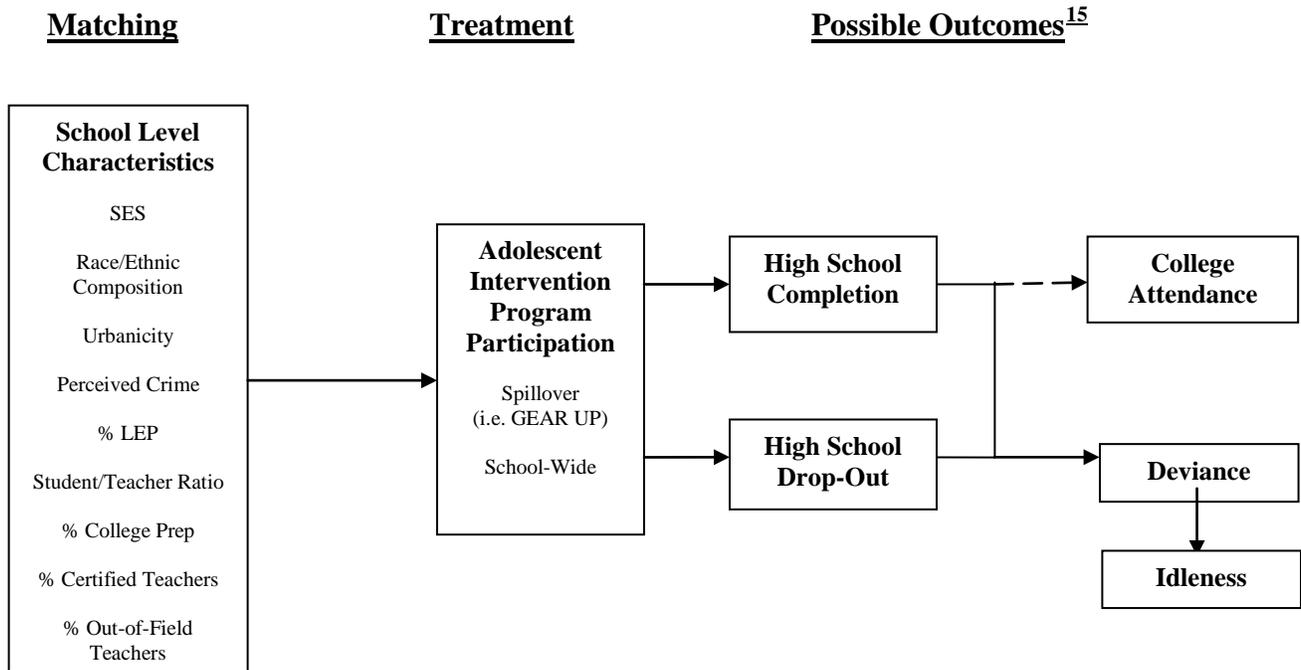
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APPENDIX A: FIGURES

Figure 1. Propensity Score Model

Matching   **Treatment**   **Possible Outcomes**[15]

```
┌────────────────────┐
│  School Level      │
│  Characteristics   │
│                    │
│       SES          │
│                    │
│   Race/Ethnic      │
│   Composition      │
│                    │
│    Urbanicity      │
│                    │
│  Perceived Crime   │
│                    │
│      % LEP         │
│                    │
│ Student/Teacher Ratio │
│                    │
│   % College Prep   │
│                    │
│  % Certified Teachers │
│                    │
│   % Out-of-Field   │
│     Teachers       │
└────────────────────┘
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Adolescent Intervention Program Participation

Spillover (i.e. GEAR UP)

School-Wide

High School Completion

High School Drop-Out

College Attendance

Deviance
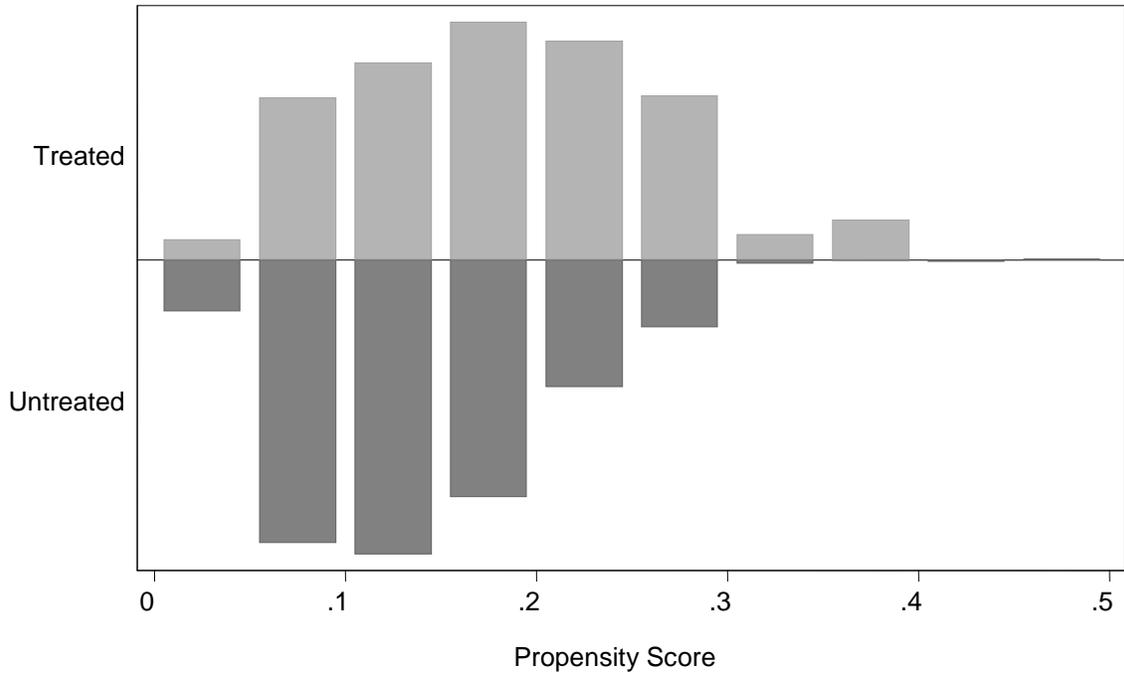
Idleness

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[15] This figure only includes the tested outcomes, noting there are several additional outcomes with respect to the transition to adulthood.

Figure 2. Sampling Distribution for Spillover Programs
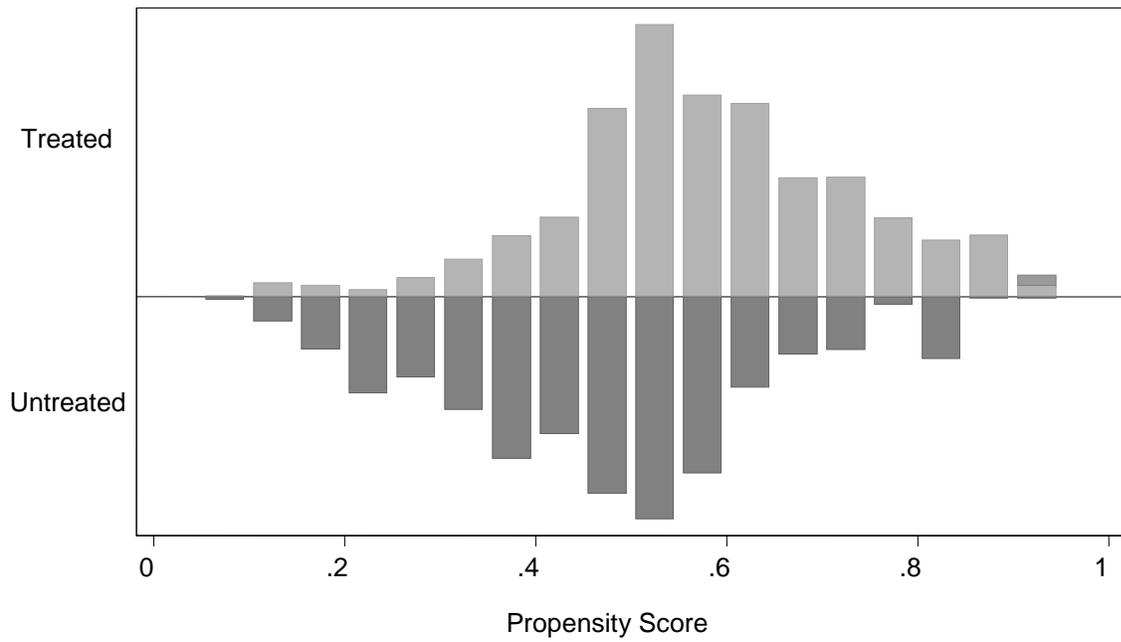
Figure 3. Sampling Distribution for School-wide Programs

APPENDIX B. TABLES

Table 1. Spillover Program Descriptive Statistics

	FULL SAMPLE		MATCHED SAMPLE	
Variable	Participants	Non-Participants	Participants	Non-Participants
SES quintiles	2.145	2.203	1.802	1.447
School Race/Ethnic Comp.[1]	33.804	25.526	23.981	25.429
Perceived Crime	2.756	2.252	2.761	2.780
School LEP[2]	5.172	2.890	2.656	2.611
School College Prep	57.202	56.599	66.994	57.824
Certified Teachers	94.251	89.985	91.046	90.998
Out-of-Field Teachers	3.143	5.324	3.846	4.247
Student-Teacher Ratio	17.113	16.370	16.256	16.281
CollPrep*Certified Teachers	5,332.526	5,781.562	5,281.526	5,758.126
N	7,550	6,210	5,030 (67%)	4,550

[1]School Race/Ethnic Comp. is the percentage of non-white students.
[2]School LEP is reported as the percentage of 10[th] graders who are LEP or non-English proficient.

Table 2. School-Wide Program Descriptive Statistics

	FULL SAMPLE		MATCHED SAMPLE	
Variable	Participants	Non-Participants	Participants	Non-Participants
SES quintiles	2.060	2.699	2.045	2.307
School Race/Ethnic Comp.[1]	34.467	33.808	23.981	25.178
Perceived Crime	2.762	2.428	2.897	3.785
School LEP[2]	2.917	4.007	3.050	3.067
School College Prep	73.293	59.625	69.434	62.311
Certified Teachers	93.695	91.824	91.974	92.307
Out-of-Field Teachers	3.846	4.247	3.846	4.247
Student-Teacher Ratio	16.068	16.536	16.253	16.256
CollPrep*Certified Teachers	6627.4	8945.53	6197.65	5804.54
N	2,150	11,610	1,420 (66%)	8,200

[1]School Race/Ethnic Comp. is the percentage of non-white students.
[2]School LEP is reported as the percentage of 10[th] graders who are LEP or non-English proficient.

Table 3. Mean Distribution for School-level outcome variables by program participation.

Variable	Full Sample	Spillover	School-wide
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
Deviance	NC	3.449	3.584
Idleness	0.087	0.022	0.019
Tardiness	NC	1.047	0.932

NC indicates not comparable at individual level

Table 4. ATT and Rosenbaum Bound Outcomes for Spillover Programs.

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

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

Table 5. ATT and Rosenbaum Bound Outcomes for School-Wide Programs.

Outcome	Average effect of Treatment on Treated		
	Nearest Neighbor	Radius	Rosenbaum Bounds
High School Graduation	0.934*	0.934***	1.5
College Attendance	0.695*	0.695***	1.5
Two-Year	-0.237*	-0.237***	1.4
Four-Year	0.453	0.453***	1.9
Public	0.511*	0.511***	1.7
Private	0.179	0.179***	1.2
Deviance	-3.539	-3.539***	1.8
Idleness	-.024	-0.024***	1.6
Tardiness	-0.893	-0.893***	1.9
N treated	1,420	1,420	

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

Table 6. Propensity Score Model Logistic Regression Coefficients.

Variable	Spillover	School-Wide
SES Quintiles	-0.736***	-0.091***
School Urbanicity	0.051	-0.285***
School Race/Ethnic Comp.[1]	0.005***	0.001
Perceived Crime	0.106**	0.211
School LEP[2]	-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
CollPrep*Certified Teachers	0.000***	0.000
N	9,580	9,610

*p-value < 0.05, **p-value < 0.01, ***p-value < 0.001
[1]School Race/Ethnic Comp. is the percentage of non-white students.
[2]School LEP is reported as the percentage of 10th graders who are LEP or non-English proficient.