Title: The College Ambition Program: Improving Opportunities for High School Students Transitioning to College

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Abstract Body

Background/Context: The overwhelming majority of ninth graders expect to attend college, yet the rate at which U.S. public high school seniors successfully matriculate to postsecondary institutions is problematically low, especially among students with limited economic and social resources. While many middle class students rely on family and counselors for assistance in making academic, educational, and career decisions, students with limited family resources, including those in households where parents did not attend college, often attend high schools with inadequate guidance resources (McDonough, 1997; McClafferty, McDonough, & Nunez, 2002). These students often lack access to role models and experiences that can help promote the transition to postsecondary education (Rosenbaum, 2001). The model for this intervention, The College Ambition Program (CAP), is a whole-school design that provides resources and support to all students and is intended to fill this gap between resources and students. CAP is based on fifteen years of empirical work that followed over 1,000 adolescents from middle school into adulthood (Schneider & Stevenson, 1999, Csikszentmihalyi & Schneider, 2000; Schneider, 2007), a four-year random clinical trial (Arora, Schneider, Thal, & Meltzer, 2011), and reviews of the extant literature on determinants of college enrollment (Roderick, Coca, & Nagaoka, 2011; McDonough, 1997).

Research Questions: This study will examine students’ postsecondary education choices. Although students often have very high educational expectations and occupational aspirations, they often lack information and strategies for navigating the college-going process and knowledge needed to prepare for their chosen occupations. This intervention and study expects to contribute to existing theoretical and empirical evidence bases research on the misalignment between adolescents’ college ambitions and enrollment trends. Specifically, what are the effects of CAP on students’ (1) likelihood of attaining their postsecondary goals and (2) pursuit of a STEM major in college?†

Setting: CAP is a whole-school intervention that is being implemented in phases. For the 2010-2011 school year, it was implemented in two public secondary schools (one urban and one rural) in Central Michigan. In addition to the intervention schools, there were two matched comparison schools. For the 2011-2012 year, there are four treatment schools (two urban and two rural) with four new matched comparison schools. All schools also have lower than average college enrollment rates when compared with the state average and with other schools with similar student populations on measures of race and ethnicity, socioeconomic status, and in similar geographic regions.

Population: This study draws upon two sources of data, data from the first year of the CAP intervention and the Educational Longitudinal Study (ELS: 2002). The CAP data include a sample of 2,318 students from four high schools in grades 9th-12th. The data from ELS: 2002 is a nationally-representative sample and began with a sophomore cohort in 2002, and includes two follow-ups in 2004 and 2006. The urban high school that participated in the CAP intervention serves a racially diverse student population (39 percent white, 34 percent black, 20 percent Hispanic, 5 percent Asian, and 2 percent Native American) of approximately 1,200 students. The

† Analysis of the second research question is still being conducted, but would be ready to present at the conference in the spring.
rural treatment school serves a little over 400 students, nearly all of whom are white. The urban school serves a large percentage of economically disadvantaged students, with 90 percent of their students eligible for free and reduced lunch. At the rural school, around 30 percent of the students are eligible for free and reduced lunch. Both treatment schools have a substantial number of students who would be the first in their family to go to college.

Intervention: CAP is comprised of four components and is designed to supplement existing school resources to enhance the college-going culture of the school. Briefly, the four components include:

1. Tutoring and Mentoring: CAP offers tutorial help using undergraduate honors students (with a particular emphasis on recruiting from STEM majors) for subjects in which students often have demonstrated difficulty in—algebra I and II, statistics, biology, chemistry, physics, and English, which are also important for college admissions and entrance exams.

2. Course Counseling and Advising: Beginning when students first enter high school, CAP has developed an extensive set of activities that help students make more informed choices about their courses and the steps needed to apply to different types of colleges.

3. Financial Aid Assistance: CAP works with all students to understand and search for financial aid. The CAP staff has a specific focus on graduating seniors in May to identify how much money the family and student actually need to begin college in the fall, what forms must be completed, how to plan for living arrangements, how to register for classes, and how to seek employment—especially work-study opportunities.

4. College Visits: Research shows that college visits are one way that adolescents can form concrete visualizations of going to college. Participating in college visits has been shown to have a significant association with college-going (Hill, 2008). CAP provides students with the opportunity to visit college campuses and has designed a special training program for students to assist them in evaluating how the college fits their expectations.

Research Design: The CAP study is best described as a pretest, posttest, quasi-experimental, comparison-group design. The CAP intervention formally began in 2009-2010. In the first year, instruments and data collection procedures were developed and piloted, and baseline data were collected. In the 2010-2011 school year, implementation began in two public high schools with two comparison schools. For the 2011-2012 year, there are four treatment schools with four new matched comparison schools that will be followed for three years.

To measure the impact of participating in CAP on each of the outcome variables, we plan to estimate a two-level logistic regression (a two-level hierarchical generalized linear model using the logit link function). At level 1 the probability of each outcome of interest is a function of student characteristics and college going interest variables, in addition to CAP treatment variables. Level 2 will include school level factors, such as the proportion of students receiving free and reduced price lunch; availability of advanced and college preparatory courses; geographic availability of postsecondary institutions; and prior years’ rates for college matriculation. Because CAP currently has only data spanning four schools in the 2010-2011 school year, the above model cannot be estimated until the sample of schools expands in upcoming years. With such a small number of schools, detecting an effect size is impossible at the school level. However, estimating preliminary effect sizes of CAP treatment is possible at the
student level, and estimates can be strengthened by increasing our sample of students and schools using data from ELS: 2002.

**Data Collection and Analysis:** Data used in this study come from the 2010-2011 CAP data and from ELS: 2002. The two primary sources of CAP data are an initial baseline survey administered to students in all grades and a senior exit survey administered at the end of the school year to 12th grade students. Items on CAP student questionnaires were drawn from national student surveys, which facilitates direct comparison of CAP survey data with nationally representative samples. The CAP data is also augmented with additional data from school administrative records and CAP contact/participation logs.

Until CAP can scale up the intervention to its target number of schools, analysis is focused on measuring effects on college matriculation at the student level. Evidence of the CAP treatment effect comes from multivariate regression analyses conducted with the 2010-2011 CAP data alone, and then with an expanded sample of characteristic-matched controls from ELS: 2002. The binary outcome variable considered in these analyses is a student’s success in achieving or surpassing their pre-treatment postsecondary educational goals, generated by comparing student responses regarding their postsecondary goals (e.g., 2-year or 4-year college) at the beginning of their senior year and their concrete plans at the time of their graduation for the fall. If a student’s concrete plans for fall equaled or exceeded their baseline goal, it is counted as “successful”.

The first analysis, conducted strictly with data from the two CAP treatment schools, estimates a single-equation probit model against the binary outcome variable:

$$y^*_i = \delta + z_i'y + (CAP_i)u + \varepsilon_i \quad i = 1, \ldots, N$$

- $y^*_i$ is the latent variable
- $y_{ij}$ is the binary student outcome (4-year college matriculation) as related to the latent variable
- $z_i$ is a vector of student characteristics for student $i$ – we include:
  - ACT math, science, reading, and English scores
  - Cumulative GPA at end of senior year
  - Change in GPA from junior to senior year
  - Free and Reduced Price Lunch eligibility
  - Race/Ethnicity
  - Gender
  - Mother’s education
  - Dummy for school (Leslie or Eastern High School)
- $CAP_i$ is the treatment variable for student $i$ – whether they visited the CAP center 5 times or more.

The second analysis estimates a similar probit model across both the CAP and ELS samples, but uses a technique in a similar vein to propensity score matching by restricting the ELS sample to a
representative comparison group. First, the ELS sample is restricted to students from public high schools in the Midwest. Next, a student’s likelihood of participating in the CAP treatment is estimated as a function of gender, race, parental education, and socioeconomic status, and predicted propensities are generated for the CAP and ELS samples. Lastly, the sample is restricted to a common support with the treatment group (observations outside of the predicted propensity range of the treatment group are dropped). The resulting sample is then used to estimate a probit model of our outcome variable, which is the same as in the first analysis, but with a different set of student characteristics. Specifically, \( z_i \) now includes: ACT mathematics and composite scores; Cumulative GPA in senior year; change in GPA from 11th to 12th grade and its interaction with pre-treatment ambition for 2-year and 4-year college (as a means of controlling for student effort level); the urbanicity of the student’s school; percentage of students receiving free and reduced price lunch; pupil-teacher ratio; total school enrollment; and 2-year and 4-year college matriculation rates of seniors in the previous year.

**Preliminary Findings:** In the first analysis, using only CAP data from 2010-2011, estimation \((N = 78)\) yields a positive coefficient on the CAP treatment variable of approximately 1.75 \((p = .068)\), which translates to a difference in expected matriculation of approximately 31 percent between treated and untreated groups (82 percent and 51 percent, respectively). While we do not anticipate that the true effect of the intervention is this large in reality, the size, significance, and persistence of the effect across alternate specifications provides preliminary evidence that a student’s participation in the CAP program increases their likelihood of matriculating in a postsecondary institution at the level of their choice or higher. In the second analysis, using CAP data plus relevant ELS data, estimation \((N = 415)\) with clustered standard errors (with 100 schools defining the clusters) finds a coefficient on the CAP treatment of approximately .92 \((p = .025)\), which is tied to a significantly more conservative 5 percent difference between expected matriculation rates between treated and untreated groups. When the common support assumption is relaxed for the lower bound of propensities (which may be reasonable, as the lowest, non-outlier propensity of the treated group is approximately .07), this difference grows to 11 percent.

Interpretation of effect sizes from both analyses should be tempered by the fact that they are, at best, preliminary suggestions of the available treatment data. Nonetheless, despite the small treatment group, the persistence of the effect—even following the addition of a larger control group through ELS—shows promising evidence of the intervention’s positive effects on students’ postsecondary attainment.

**Conclusion:** As the demand for a college-educated population increases, so have the numbers of interventions, many of which include components such as training for counselors to improve their college counseling expertise; offering schools tutoring and mentoring staff; providing information and assisting students with filling out financial aid forms; and taking students on college visits. While helpful, these interventions typically focus on one aspect of the college-going process, and few deliver training for accessing and using the information that many parents and students need to understand the material they receive. In contrast to these one-dimensional reforms, CAP is specifically designed to be an intervention that comprehensively connects several important aspects of the college-going process. Preliminary evidence from CAP suggests that a whole-school approach improves misalignment between adolescents’ college ambitions and postsecondary enrollment.
Appendix A. References

References are to be in APA version 6 format.


Schneider, B. (2008). Inspiring youth to careers in science and medicine: Lessons from the Sloan Study of Youth and Social Development. *Presented on August 7 at the Social Science Perspectives on Workforce Policy Conference, Center for Disease Control*. Atlanta, GA.


Appendix B. Tables and Figures

Further analysis and results will be completed by the time of the conference.