ASSOCIATION FOR INSTITUTIONAL RESEARCH
2009 DISSERTATION GRANT APPLICATION

Application ID: DG 09-288

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Title of Proposal

High School Dual Enrollment programs: Are we fast-tracking students too fast?

Statement of the research problem and national importance

Despite the national focus on increasing the rigor of high school education, about a quarter of high school students do not enroll in postsecondary institutions, and about a third of those that do are unprepared for college level work (U.S. Department of Education, 2003). One approach to address these problems that is becoming

increasingly popular is dual enrollment (DE). DE programs allow high school students to enroll in college courses and earn college credits while they are still in high school. While these programs were initially limited to academically advanced students, they are increasingly serving a wider student population, including middle- and even low-achieving students (Karp et al., 2007).

The central assumption underlying DE programs is that participation would promote access to postsecondary education as well as retention because students would enter college with a stronger academic preparation and more realistic idea of the skills needed to succeed. However, fast-tracking students through the system may also discourage students if they are not ready for college-level academics (e.g. Greenberg, 1988). These arguments provide the major motivation to understand the overall effect of DE programs on high school graduation, subsequent postsecondary enrollment, college persistence, college GPA, and degree completion. Using transcript data from the state of Florida, I will analyze the effect of DE on college access and success using a regression discontinuity design.

DE programs differ from other programs which also allow students to earn college credits, such as Advanced Placement (AP) or International Baccalaureate (IB). One important distinction is that DE students take a course with an actual college syllabus, and receive college credit when passing the course without additional end-of-course exams. Instead, AP and IB courses, while intended to be college-level, are taught using a standardized curriculum developed by a national or international entity, and students are not guaranteed college credit upon course completion.

DE programs are widespread. The NCES estimated that 813,000 high school students nationwide -about 5 % of all high school students- took a college course during the 2002-2003 school year (Kleiner & Lewis, 2003), with 71% of public high schools offering such possibility (Waits et al., 2005). While nationwide numbers are not available on the growth of DE, data from specific states support the perception of a rapid expansion. In Florida, the state concerning this project, DE participation has increased from 28,950 students in 1998 to 34,574 in 2004; a 19% increase in a 7-year period (Florida Department of Education, 2006).

Despite the popularity and growth of DE programs, there is little evidence of its effectiveness (Bailey & Karp, 2003). Assessing the impact is difficult because DE students would likely have better outcomes than non-DE students in the absence of the program. The selection problem is two-fold: not only students choose to take college courses but also colleges are allowed to set their own admission requirements to ensure the integrity of their academic programs. My research proposal addresses this selection problem by exploiting a statutory mandate in Florida that requires high school students to have a 3.0 minimum GPA in order to participate. This policy generates a source of exogenous variation in DE participation that can be used for identifying its impact.

In addition to the general impetus of acceleration mechanisms, there is a particular national interest in examining how DE might expand

access to higher education for historically underrepresented groups. Measuring the impact of DE, and whether it varies systematically with students' characteristics, would therefore provide valuable information to policymakers in their search for ways to improve students flow from high school to college. Findings from this study also have important implications for the IPEDS data collection efforts. First, this study provides an opportunity to assess the consistency between IPEDS survey-based information on DE offerings at each institution with actual enrollment data for Florida. Second, this research can inform decisions regarding future data collection. At present, there is no national source of information on the prevalence and characteristics of DE programs across states. In particular, IPEDS does not currently distinguish DE students from other types of non-degree seeking students. If this study were to find solid evidence that DE effectively increases access and success in college, it would provide a strong case for the collection of more refined DE data. Moreover, to the extent that the impact of DE is found to be heterogeneous both across different populations and program experience, this study would provide guidance as to the relevant DE characteristics (e.g. participants' demographics or course subject area) that warrant further exploration nationwide.

Review the literature and establish a theoretical grounding for the research

The literature on the effect of DE is limited and often qualitative in nature. The lack of research in the topic results from the fact that just a few states have comprehensive K-16/20 data systems where high schools students can be followed into their postsecondary experience. Coupled with data limitations, most quantitative studies suffer from serious methodological problems. Two extensive reviews of the literature (Bailey & Karp, 2003; Lerner & Brand, 2006) conclude that there is no sound evidence showing that DE programs contribute to students' college access and academic success.

DE programs are grounded on the underlying assumption that participation will be beneficial to students (e.g. Morest & Karp, 2006; Karp et al., 2007). There are several strands to the argument. First, DE might build human capital by providing a more rigorous curriculum than traditional high school courses. Second, the broader scope of curricular options available through DE provides a learning environment that challenges and motivates students with a wide variety of interests. Moreover, DE can foster postsecondary access for minorities or disadvantaged students by establishing a bond with the institution and familiarizing students with the application and enrollment processes. Finally, DE also provides the opportunity to 'test the waters' in college and get a realistic view of what are the skills needed to succeed and get an early call to strengthen their skills in particular areas. Advocates of DE also remark collateral benefits such as the ability to shorten the time to get a college degree, saving the students and the state money, the enhancement of high school and college articulation, and the use of high school and college building space more efficiently according to the needs.

While DE can be viewed as a potential tool to increase access and success in college, it is not without controversy. A common concern of DE programs is that it might lower students' self-esteem and educational aspirations. It is not clear that students that are marginally successful in high school can do college-level work. A course failure might discourage postsecondary education altogether or it might set students on a non-academic path too early in their lives. Critics of DE also question the ability of broadly targeted DE programs to actually provide college level curriculum (e.g. Johnstone & Del Genio, 2001). Allowing high school students into the class could dilute the quality of education at the college campus, and many are skeptical about the quality of DE courses taught by high school teachers in the high school campus. Last but not least, one could also be concerned about the possible general equilibrium effects of DE programs. DE programs might reduce the incentives to improve the level of high school courses available to those that do not participate, thus exacerbating the already existing inequities in postsecondary opportunity (Museus et al., 2007).

Despite the fact that DE programs are widespread, with about 98% of public two-year institutions participating (Kleiner & Lewis, 2003), little is know about its effect. Most of the empirical evidence available is merely descriptive, simply comparing DE students with non-participants in terms of their educational outcomes. A recurrent finding in this literature is that students who earn college credits while in high school are able to enter college and complete degrees at higher rates than their peers without such credits and perform better once in college (e.g. Florida DOE, 2004b, 2006; WICHE, 2006). As DE students are very different in many observable and unobservable ways than their non-DE counterparts, some studies attempt to control for these differences by restricting the sample to students that share some commonality. For example, Windham & Perkins (2001) restrict the sample to students who subsequently enroll at a state university, while a study by the Florida Department of Education (2004a) analyses students with a 3.0 GPA or higher who subsequently enroll in a community college and pass the college placement exam.

Given that students are not randomly assigned to the program but rather choose to participate based on their academic ability, motivation, and expected gains from participation, a simple comparison of DE and non-DE students is likely to provide a biased estimate of the DE effect. The first serious attempt to measure the effect of DE is that of Karp's et al. (2007). The authors control for a rich set of individual and school level characteristics that are likely correlated with DE participation and students' outcomes such as race, gender, SES, academic background, and school demographics. The study finds that DE in Florida and New York City is positively associated with the likelihood of obtaining a high school diploma, initially enrolling in a four-year institution, enrolling full-time, and continuing college enrollment through the second semester. DE students have significantly higher cumulative college GPA three years after high school graduation and earn more college credits than their non-participants peers. While this report is the first comprehensive

study that attempts to control for relevant pre-existing student differences, it is still possible that students' or schools' unmeasured characteristics may be confounding these findings.

Some of these positive findings where echoed in a recent study by Swanson (2008) that provides evidence on DE nationwide using NELS:88/00 data. The problem with using this data is that the NELS only collects information about DE through the Post-secondary Education Transcript Study which samples students that enroll in college after high school. Therefore, this data cannot be used to evaluate the effect of DE on college enrollment; an important outcome for educators and policymakers.

While there is suggestive evidence that DE is an effective strategy to circumvent some of the problems of high school education by increasing access and success in college, research in the field is still in its infancy. Questions about the causal effect of DE participation, how the effect varies across different populations, or types of courses, remain largely unknown. The goal of this proposal is to fill this gap in the knowledge base among policymakers by overcoming some of the methodological shortcomings in the previous literature.

Describe the research method that will be used

This research will present causal evidence on the effect of DE using a large longitudinal dataset from 2 cohorts of public high school students in Florida. Florida has been at the forefront of many innovations in educational policy, and DE is not an exception. Florida is one of the only 6 states who pay for DE courses, while most other states require the school district or the students themselves to pay for them (WICHE, 2006). This funding provision not only promotes program participation but also enables access for students from low-income households. In addition, schools are encouraged to support student participation, as Florida is among the 11 states that fund both high schools and postsecondary institutions for DE courses (Florida Legislature, 2006).

In addition to free tuition, Florida students have clear incentives to participate in DE. The state is one of only 15 states that allow students to simultaneously earn both high school and college credit, and guarantees that the credits count towards high school graduation (WICHE, 2006). Students may apply successfully completed courses towards the requirements necessary to earn a certificate or AA/BA degree, thereby shortening the time to earn a postsecondary award. Florida has also developed a statewide course numbering system that eases the transfer of credit among the state's public colleges and universities.

The strong state support for DE has been crystallized in a widespread program with all school districts participating and a large increase of students involved. Overall, about 12% of the students in the cohorts that will be analyzed in this research took at least one DE course, and all 28 community colleges had an articulation agreement with its corresponding district to offer such possibility. Given the lack of national studies on the effectiveness of DE, findings from a large and

well-developed program would therefore provide valuable information that is also relevant nationwide.

To avoid the selection bias that arises because more able students are more likely to participate in DE, I will exploit a statutory mandate in the state of Florida that requires high school students to have a minimum of 3.0 un-weighted GPA in order to enroll in academic courses (Florida Statute 1007.271) . This policy creates an ideal setting to estimate the program effect using a Regression Discontinuity (RD) design. The RD methodology, which meets the IES rigorous standards for the review of causal research (What Works Clearinghouse, 2008), is increasingly being used by researchers to obtain unbiased impact estimates of education-related interventions. A few examples are the evaluation of the effect of merit scholarships (Thistlethwaite & Campbell, 1960; Goodman, 2008), need-based scholarships (Kane, 2003), title I money (van der Klaauw, 2008a), elementary school remedial education (Jacob & Lefgren, 2004), and college remedial education (Long & Calcagno, 2008; Martorell& McFarlin, 2008).

The basic implementation of the RD design identifies the impact of the program by comparing outcomes of students who barely pass the requirements with those that barely miss the required GPA cutoff. Arguably, students with a GPA just under the 3.0 cutoff are on average very similar in many relevant respects to students with a score just over the cutoff, but these small differences leads to an immediate and big difference in DE eligibility and participation. However, not every student above the 3.0 cutoff takes a course in DE, and not every student below the cutoff is disallowed enrollment. This situation is often referred to as a "Fuzzy" RD design (Campbell, 1969), and requires a modification of the estimator: that the difference in average outcomes be scaled by the difference in the probability of enrolling in DE. More formally, the program effect under the Fuzzy RD is typically estimated in two steps:

First,

$$DEi = \alpha + \lambda\{GPAi \geq 3.0) + \gamma g(GPAi) + xi'\delta + ui$$

Second,

$$Outcomei = \alpha + \beta DEhati + \gamma g(GPAi) + xi'\delta + \varepsilon i$$

where i is the student, DEi is an indicator that takes the value one if the student i took a DE course in her first term of junior or senior year and zero otherwise; GPAi is the un-weighted cumulative high school GPA prior to the first term of junior or senior year; DEhati is the estimated DEi probability from the first regression, and xi is a vector of student characteristics. If the function g is a linear function, then this estimator is algebraically equivalent to the two-stage least square instrumental variable estimator (van der Klaauw, 2008b). This basic framework can be extended to estimate the effect by different student populations or DE content area. Threats to the internal validity to the RD method are misspecification of the functional form g (which can be assessed by checking the robustness of the results to different model specifications), and violation to the assumption that students above and below the cutoff are similar in both observables and unobservable ways. Technically, this assumption states that students'

potential outcomes would be similar in the absence of the program. While this assumption is fundamentally untestable, a number of validity tests have been developed to bolster the credibility of the design (e.g. McCrary, 2008; McEwan & Urquiola, 2005; van der Klaauw, 2002).
The study will answer the following research questions:
(i) What are the background characteristics of students taking DE courses in Florida? How do those characteristics compare across students taking other forms of acceleration mechanisms such as AP or IB?
(ii) What are the characteristics of schools providing DE programs?
(iii) What is the effect of DE participation on short and long term outcomes? Are DE students more likely to graduate from high school, transition to college, enroll in 4-year college, and enroll full-time? Do DE students have higher GPA during the first years in college? Are they more likely to persist through the second semester or the second year of college? Does the program increase the likelihood of obtaining a BA degree?
(iv) Does the program effect vary by ethnicity, gender, or subject area taken?
(v) How do RD quasi-experimental estimates compare with those obtained using traditional OLS regression methods?

Will you use a NCES target dataset?

No

Will you use a NSF target dataset?

No

Please select the datasets that you intend to use:

Explain why each dataset best serves this research.
Include a variable list for each dataset used.

This study will measure the effect of DE using a unique dataset obtained from the Florida Department of Education through the Community College Research Center, Teachers College, Columbia University. I currently have access to student-level transcript records which provide information on all the courses taken in high school and college, standardized test scores, GPA, as well as demographic characteristics such as age, gender, ethnicity, English language proficiency, and free lunch eligibility. This dataset includes public school students in the 2000-01 and 2001-02 high school graduating cohort, and tracks their postsecondary outcomes in the state's public system through fall 2005.
In addition, this study will complement state's records with the

National Student Clearinghouse data (already under my possession). This data identifies students that enroll in private institutions or in out-of-state colleges. Despite the importance of college access in any analysis of DE, the proposed study will be the first to employ this data to properly track students as they move back and forth across postsecondary institutions in the nation.
One drawback of Florida data is that it only identifies DE courses sponsored by the community college system. However, the number of students that would be incorrectly assigned as non-DE students given that they only participated in a state university or private institution DE program is likely to be small. According to state documentation, only 6% of students who took a course in the public postsecondary sector in 2007-08 took it in any of the 11 public universities (Florida Legislature, 2008).

Will you address the NPEC focus topic?

Yes

If yes, please briefly describe:

This proposal is particularly suitable for this year's NPEC focus topic of "student flow". It intends to provide empirical evidence on the effectiveness of DE programs to improve students' likelihood of transitioning from high school to college, as well as students' persistence and success once in college.

Provide a timeline of key project activities:

The work plan for the academic year under the AIR grant starts in May 1, 2009 and culminates in April 31, 2010. This time period will provide me adequate time to complete the proposed study since I have already received all the necessary data from Florida K-20 Warehouse and I am currently cleaning and formatting the data for the analysis. The plan for the successful completion of the proposed study is as follows:

Summer 2009: run descriptive statistics; in-depth literature review
Fall 2010: data analysis; presentation of preliminary results in the Economics and Education seminar at Teacher College; oral defense of research proposal to dissertation committee; submission of research proposal for the 2009 AIR Annual Forum
Spring 2010: data analysis continues; prepare a research document with main results; share document with Florida Department of Education.
May 29, 2010 – June 2, 2010: present research findings at the AIR forum in Chicago, Illinois
June 2010: submission of the final paper to the NCES and AIR

List deliverables such as research reports, books, and presentations that will

be developed from this research initiative:

I will disseminate the findings of this study by submitting a copy of the final paper to the NCES and AIR. In addition, the research paper will be publically available through the Community College Research Center website; initially as a working paper and later as a final report and policy brief.
I expect my work on this topic will lead to a submission of a research article for publication in a leading journal such as Economics of Education Review, Review of Higher Education, Journal of Higher Education, or Journal of Human Resources.

Describe how you will disseminate the results of this research:

Before the final paper is finalized, I will disseminate my preliminary findings with my colleagues and Professors at Teachers College, as well as with members of the Florida Department of Education and local dual enrollment experts. As I mentioned before, I will also disseminate my work by making it publicly available at the Community College Research Center website. I have allocated part of the budget to present the results of my research at the 2010 AIR forum in Chicago. In addition, I will take the opportunity to present my research at the Equity Symposium in November 2010, organized by the Campaign for Educational Equity and held at my home institution.

Provide a reference list of sources cited:

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Statement of Institutional Review Board approval or exemption

The research proposed will employ student-level records of public school students in the State of Florida. To ensure confidentiality, the data has been provided by the PK-20 Education Data Warehouse using unique fake identifiers which allow linking between high school and college transcript files as well as with the data provided by the National Student Clearinghouse. No institutional IRB is necessary given that the data will be used for the sole purpose of generating aggregate statistics to evaluate the effectiveness of DE programs in Florida.

Statement of Use of Restricted Datasets

As mentioned before, the proposed research requires the use of restricted-use data from the Florida PK-20 Warehouse. The data-sharing and agreement has already been finalized, and the researcher has full access to the necessary data to conduct the study.

Biographical Sketch

Cecilia Speroni is a third year doctoral student of Economics and Education at Teachers College, Columbia University. She holds a B.A. in Political Science from Universidad de San Andres, Argentina. Her research interests include quantitative methods in program evaluation and issues of access and educational attainment for minority students. She is currently a Research Assistant at the Community College Research Center where she is primarily involved in programming and analyzing Florida state K-20 student level data. Ms. Speroni also works closely with Prof. Jonah Rockoff at the Columbia Business School, with whom she has co-authored a paper on the Reliability, Consistency, and Validity of the New York City Department of Education Surveys. The recently implemented NYC accountability system uses the data from these teacher, parent, and student surveys as inputs in the evaluation of schools' performance. Under the supervision of Prof. Rockoff, she is currently conducting research on the design of teacher evaluation systems. The goal is to identify effective teachers by assessing the relative predictive power of objective performance data (test scores) and subjective evaluations (by principals or mentors). This research uses teacher evaluations data from three programs – the Teaching Fellows program (TF), Teach for America (TFA), and the NYC DOE mentoring program. Objective data on teacher effectiveness in improving student performance is being derived from matching students' characteristics and test scores

to the teachers.
Prior to her doctoral studies, Ms. Speroni worked at the American Institutes for Research (AIR) for three years, where she was involved in various projects related to bilingual education, school reform, and policy evaluation; notably, the Evaluation of Proposition 227 in California. This proposition, passed in 1998, significantly altered the ways in which nearly one-third of the nation's 5 million English Learner students are taught, by requiring students to be taught "overwhelmingly in English" during a transition period and then transferred to English language mainstream classrooms. Ms. Speroni was responsible for performing the majority of the statistical analyses for the final report of the five-year study conducted by Dr. Thomas Parrish, including both descriptive and cross-sectional regression analyses. Using student-level achievement and demographic data for all students in California over a seven-year period, she studied the relationships between academic performance, instructional services, language fluency, and socioeconomic status. She presented her work at the 2005 meeting of the American Education Research Association.
At AIR, she has also worked intensively on two studies that were part of "Getting Down to Facts", a project involving more than 20 studies designed to provide comprehensive information about the status of California's school finance and governance systems. This project, coordinated by the Institute for Research on Education Policy and Practice at Stanford University, was requested by the Governor's Committee on Educational Excellence, the California Superintendent of Public Instruction Jack O'Connell, and members of the California Legislature. The first study, Successful California Schools in the Context of Educational Adequacy, explores the resource allocation practices in "Beating-the-odds" schools – those that consistently perform better than predicted given the population of students that they serve, and compares them with that of low performing schools. The second study, Charter Schools in California: A Review of their Autonomy and Resource Allocation Practices, looks at the extent to which Charter Schools' freedom from regulation affects resource allocation decisions and student performance.
Ms. Speroni is an advanced SAS and STATA programmer and has extensive experience working with large restricted-use datasets from several State Departments of Education. Having completed advanced courses in applied econometrics, analysis of panel data, multilevel models, and labor economics, among others, she has built strong quantitative skills to successfully complete the proposed research. Furthermore, her current level of access to data from Florida, one of the largest and most diverse states in the country, puts her in an advantaged position to answer a number of important outstanding questions related to dual enrollment policies in the U.S.

Budget	
Salary/Stipend: 12,096	**Tuition & fees**: 7,226
Travel: 628	**Other travel related expenses**: 0

Other research expenses:	**Total Request**:
50	20,000

Statement of Prior, Current, and Pending Funding

I have been recipient of Teachers College Scholarship, covering the tuition costs of a year of full-time enrollment. Through my work at the Community College Research Center (CCRC), housed at Teachers College, I have received tuition waiver for 3 additional courses. The rest of the tuition costs have been covered through my salary at CCRC, my research-assistantship with Prof. Jonah Rockoff, and personal savings.

I will continue to hold both jobs during the academic year 2009-2010, adjusting work hours depending upon this grant decision. My work at CCRC will provide me with tuition exemption for 2 additional courses, and I am budgeting tuition expenses for the 2 remaining courses (6 credits) that I will have left to fulfill the requirements of the PhD program. This research proposal has not been submitted to any other source of external funding, other than this AIR dissertation grant application.