

1. 2007 AIR RESEARCH GRANT PROPOSAL COVER PAGE

**College Readiness to Degree Completion:
Remedial Placement and Patterns of College Persistence Project Description**

Data sets employed:
Institutional Data from the California State University, Sacramento & the University of Houston, Texas

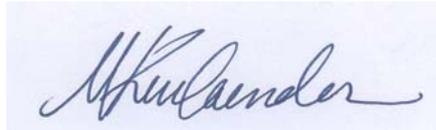
Grant Amount Requested: \$30,000

Principal Investigators:

Michal Kurlaender
Assistant Professor of Education
University of California Davis
School of Education
One Shields Avenue
Davis, CA 95616
Phone: 530.752.3748
Fax: 530.752.5411
E-mail: mkurlaender@ucdavis.edu

Catherine Horn
Assistant Professor of Education
College of Education
Department of Educational
Leadership and Cultural Studies
University of Houston
4800 Calhoun Rd.
Farish Hall 437
Houston, TX 77204-5038
Phone: 713.743.5032
Fax: 713.743.8650
E-mail: clhorn2@uh.edu

Jessica S. Howell
Assistant Professor of Economics
California State University,
Sacramento
6000 J Street
Sacramento, CA 95819-6082
Phone: 916.278.5588
Fax: 916.278.5768
E-mail: jhowell@csus.edu



Michal Kurlaender
Submitting Principal Investigator

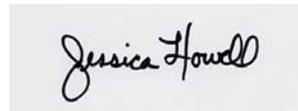
Office of Research, Sponsored Programs
University of California Davis
1850 Research Park Drive, Suite 3000
Davis, CA 95616
Phone: 530-747-3828 Fax: 530-747-3929
Email: ORSPOTeam3@ad3.ucdavis.edu

Authorized Institutional Representative

Other PIs



Catherine Horn
Co-Principal Investigator



Jessica S. Howell
Co-Principal Investigator

2. PROJECT SUMMARY

College participation rates are at an all time high. Yet, despite increases in the share of high school graduates continuing on to college, college completion rates have remained relatively stagnant for the past several decades. Moreover, graduation rates remain significantly lower for minorities and for those who come from poor or modest economic backgrounds than for white and relatively advantaged students.

The goal of the proposed study is to identify how existing policies around remedial education at two less-selective public four-year institutions influence college persistence and completion. Specifically, the research project aims to answer the following research question: *Do college students who are required to take remedial coursework have the same patterns of college persistence and time to degree completion as observationally equivalent college students who are not required to take such courses?* Analyzing detailed individual-level longitudinal data at two institutions, the study applies a quasi-experimental design to tease out the causal impacts of this specific institutional intervention on college persistence.

Academic ability and preparation in high school clearly influence college completion rates. Two influential Department of Education analyses by Clifford Adelman, *Toolbox I* (1999) and *Toolbox Revisited* (2006), find that the intensity of a student's high school curriculum is the single best predictor of college graduation. To address the discrepancy between students' K-12 academic preparation and the demands of postsecondary schooling, many institutions require students to enroll in remedial coursework. In recent years, many states have been questioning the role of remedial courses in their postsecondary institutions. Although some believe that these courses serve as an important bridge between poor K-12 schooling opportunities and college readiness, others argue that remediation falls under the purview of secondary schools or community colleges rather than baccalaureate-granting colleges and universities. However, contrary to the certitude that characterizes much of the rhetoric around remediation, there is little evidence on the effect of taking remedial courses on college persistence and degree completion.

The proposed study relies on unique institutional data from the California State University Sacramento and the University of Houston in Texas. The campuses investigated in this study are broadly representative of the vast middle-range of public colleges and universities that educate most American youth and are sufficiently diverse by socioeconomic origins, race and ethnicity to support subgroup analyses. The population studied consists of college

entrants at California State University, Sacramento and the University of Houston who took remedial tests for course placements; a sample of approximately 5,000 and 6,000 freshmen respectively. A regression discontinuity design is employed to identify the effect of receiving remediation in college on future academic outcomes.

Results from this investigation will establish new information about the impact of remedial coursework on students' baccalaureate trajectories. As many non- and less-selective public institutions of higher education grapple with high rates of remediation, state and institutional policymakers demand new empirical evidence on this costly way of preparing students for baccalaureate work. Findings from two such institutions will shed light on this important public policy issue.

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4. PROJECT DESCRIPTION

Statement of Problem

College participation rates are at an all time high. Among the high school class of 1970, 52 percent of graduates went on to attend college within 12 months of completing high school, compared with 67 percent of the class of 2004 (Snyder, Tan, & Hoffman, 2006). Despite increases in the share of high school graduates continuing on to college, college completion rates have remained relatively stagnant for the past several decades—approximately 66 percent for those who achieve at least 10 credits at a baccalaureate-granting institution and substantially less for the entire population of postsecondary entrants who aspire to a baccalaureate degree or more (Adelman, 2006; Turner, 2005). Moreover, graduation rates remain significantly lower for minorities and for those who come from poor or modest economic backgrounds than for white and relatively advantaged students (U.S. Commission on the Future of Higher Education, 2006).

In its recent review of the state of higher education in America, the Spellings Commission asserts that “[i]n an era when intellectual capital is increasingly prized, both for individuals and for the nation, postsecondary education has never been more important” (U.S. Commission on the Future of Higher Education, 2006). Yet, despite the pressing need to ensure that more students obtain a postsecondary degree, we know surprisingly little about what leads to college completion. The dearth of experimental and quasi-experimental research on strategies for increasing college retention and completion is especially noteworthy given the U.S. Department of Education’s emphasis on such studies at the elementary and secondary education level. In fact, reducing racial/ethnic and socioeconomic disparities in college completion are among the goals included in the U.S. Department of Education’s strategic plan for 2002-2007 (United States General Accounting Office, 2003). The substantial labor market payoff to a college diploma (Dale & Krueger, 2002; Hoxby, 1998; Murphy & Welch, 1992) and the pressing need for a more diverse and more highly educated workforce (Brief of the General Motors Corporation, 2003; Brief of the Retired Military Officers, 2003; Dynarski, 2005) make the need for scientifically-based research on college retention and completion all the more pressing.

Our study will contribute to the knowledge base on programs that improve postsecondary persistence by identifying how existing developmental, or remedial, programs and policies aimed at identifying underprepared

students influence college persistence and completion by these students. Analyzing detailed individual-level longitudinal data, we apply quasi-experimental designs to tease out the causal impacts of remediation on college persistence and time to degree. A critical point in the trajectory to a baccalaureate degree is initial academic placement. Based on a variety of information, colleges and universities determine who among their incoming students must complete remedial coursework. By increasing their academic readiness, stymieing their progress toward a baccalaureate degree, or both, such placement decisions may have important consequences for students' persistence and performance in college. Despite high rates remediation in postsecondary schooling (Parsad & Lewis, 2003), we have little evidence on the effect of taking remedial courses on college persistence and degree completion (Bettinger & Long, 2004). We analyze the effect of assignment to and participation in remedial coursework on academic GPA, persistence, and time to degree at two large public institutions.

Previous Research on Academic Preparedness and Alignment

Academic ability and preparation in high school clearly influence college completion rates. Two influential Department of Education analyses by Clifford Adelman, *Toolbox I* (1999) and *Toolbox Revisited* (2006), find that the intensity of a student's high school curriculum is the single best predictor of college graduation. Using High School and Beyond (HS&B) and National Educational Longitudinal Study (NELS) data to investigate the pathways that affect college completion in more detail than any other researcher to date, Adelman points us to important junctions in the pathway to a college degree that merit closer investigation. Not surprisingly, students with higher levels of measured academic skills are more likely to graduate from college than their less able peers. Our own analysis of the NELS data indicates that, among the highest achieving students in high school, college completion rates by students who begin at a four-year college are 77 percent. Among the lowest achieving students, only 37 percent of those who enter a four-year college graduate by age 26.

Recent reports suggest that 28 percent of all first-time freshmen are enrolled in some remedial course (Parsad & Lewis, 2003). Although the large majority of these students attend two-year institutions, about 26 percent of first-time freshmen attending four-year colleges are required to take remedial courses as well (Adelman, 2004). In fact, remedial course enrollment varies substantially across four-year colleges and universities, with some institutions not offering remedial courses and others enrolling upwards of 50 percent of their incoming students in

remedial classes. In recent years, many states have been questioning the role of remedial courses in their postsecondary institutions. Although some believe that these courses serve an important bridge between poor K-12 schooling opportunities and college readiness, others argue that remediation falls under the purview of secondary schools or community colleges rather than baccalaureate-granting colleges and universities. Several states have embraced this logic and stripped remedial programs from their colleges and universities (Gleason, 2000; Shaw, 1997). In some states, including California, community colleges have resisted increasing the number of remedial courses that they offer, arguing that the provision of remedial classes reduces their capacity to support students who intend to transfer to four-year colleges (Ignash, 1997). Moreover, to address the discrepancy between students' K-12 academic preparation and the demands of postsecondary schooling, many states have implemented or are considering K-16 or Pre-K-20 initiatives, albeit with a wide range of purposes, relationships, and end goals (United States General Accounting Office, 2003; Venezia et al., 2005). These efforts often involve aligning secondary and postsecondary curricula, as well as the curriculum within the elementary and secondary systems themselves (Martinez & Klopott, 2005). However, the success of these efforts (e.g., the California State University's Early Assessment Program) in improving college readiness has not been investigated.

Contrary to the certitude that characterizes much of the rhetoric around remediation, we know of little evidence on the effect of taking remedial courses on college persistence and degree completion. In one study of students attending four-year colleges in Ohio, Bettinger and Long (2004) find that students placed in remedial courses were more likely to drop out or transfer to a lower level college than observationally similar students who were not placed in such classes. However, among those students who completed remedial coursework, the results are mixed, suggesting that these courses may help facilitate degree completion, albeit through a longer route of study. The effects of different remediation strategies on a variety of student outcomes, however, have not been directly tested.

Why do so many college students appear to require remediation? Part of the explanation for the large share of remedial students in American colleges and universities may be a combination of limited information students possess regarding what they need to do to succeed in college and the (arguably) mistaken perception that everyone must at least attend if not complete college in order to succeed in the labor market. A majority of high school students, regardless of their academic performance, report that they will attend college. In fact, academic

performance accounts for little of the variance in students' *expected* levels of educational attainment. Reynolds et al. (2006) find that between 1976 and 2000 the percentage of high school seniors indicating that they probably or definitely would complete *at least* a baccalaureate degree increased from 50 percent to 78 percent. At the same time, not surprisingly, the explanatory power of self-reported grades and participation in a college preparatory program have declined appreciably (Reynolds, Stewart, MacDonald, & Sischo, 2006). These findings are consistent with those of Rosenbaum and his colleagues who report that high school seniors have little understanding of what it takes to succeed in higher education (Rosenbaum, 2001).

Institutional Practices

Colleges vary widely in the share of entering freshman they graduate within four, five or six years. While the average four-year completion rate at four-year degree-granting institutions is a modest 34.5 percent, many schools graduate fewer than 15 percent of their students in four years while others graduate as many as 85 percent (Knapp, Kelly-Reid, & Whitmore, 2006).¹ Recent reports by the American Association of State Colleges and Universities (2005) and The Education Trust (Carey, 2005) speculate about why some public four-year colleges and universities are more successful than others at retaining students. Although both of these reports suggest that campus leadership on issues of retention may influence graduation outcomes, even when holding constant the typical set of institutional characteristics (e.g., size, sector, prestige, and average SAT/ACT scores), they do not provide direct evidence of how specific institutional policies affect college completion.

What practices might account for institutional variation in rates of freshman degree completion and time to degree? Reviewing graduation rates of students who entered 27 elite colleges in 1989, Small and Winship (in press) find that college selectivity accounts for an appreciable share of the institutional variation in college graduation, while other institutional characteristics, such as institutional endowment, contribute little to the variation in rates of degree attainment. Other research suggests that student interaction with faculty, student peers and sense of community, active engagement with the institution, and mentoring all contribute to higher rates of persistence (Astin, 1993; Tinto, 1993). Although they provide promising directions for future research, many of these studies fail to adequately control for observable and unobservable differences between students who select different kinds of

¹ The average six-year graduation rate at four-year degree-granting institutions rises to 56.4 percent (Knapp, Kelly-Reid, & Whitmore, 2006).

colleges or collegiate experiences (Astin 1993; Braxton, 2000; Tinto 1993) and thus risk conflating the contributions of student characteristics to institutional rates of postsecondary persistence with those of institutional practices.

Researchers have only very recently begun to conduct experimental research on institutional practices. The Opening Doors evaluation currently undertaken by the Manpower Demonstration Research Corporation (MDRC) is the first random assignment study of retention interventions in community colleges. The study investigates the direct impact of several intervention strategies at community colleges, including improvement in collegiate instruction, student services, and direct financial assistance, on a range of outcomes, including total credits earned, retention, degree attainment, four-year college transfer and labor market success.² Results from this experiment are not yet available, however, and will be limited to students entering postsecondary study via community colleges. These students are among those least likely to earn a bachelor's degree *a priori* based on their academic skills and occupational goals.

Project Research Question & Methodology

Students at sites in both California and Texas must complete course placement exams upon matriculating at their four-year postsecondary institutions unless exempted for reasons discussed below. Students who score below a threshold are compelled to take remedial courses in college. *Do college students who are required to take remedial coursework have the same patterns of college persistence and time to degree completion as observationally equivalent college students who are not required to take such courses?* We will address this research question with evidence from two different institutions. The data available at the two institutions are quite similar, making it possible to employ essentially the same research design. A brief description of the two sites is provided below and other specific differences between the two institutions with regard to remediation are relegated to Table 1 in the Appendix.

² The Opening Doors project is testing the following interventions: blocking a group of freshmen to take classes together and providing them a voucher for the cost of their books and access to a tutor; enhancing advising services; providing scholarships; and providing basic academic instruction and college survival skills for students on probation. For additional information, see: http://www.mdrc.org/project_31_2.html.

Site and Program Description

California State University, Sacramento

Incoming California State University (CSU) freshmen are classified as remedial according to the guidelines in *Executive Order No. 665*, issued by the CSU Chancellor's office in the spring of 1997 and effective for the fall of 1998. Entering undergraduates who either fail to take the EAP or fail to achieve an adequate score on the EAP and fail to successfully complete recommended high school coursework must demonstrate competence in English and mathematics by passing, respectively, the English Placement Test (EPT) and the Entry Level Mathematics (ELM) exams. Students may receive an exemption from these exams if they can demonstrate competence through their performance on the SAT, the ACT, or on relevant Advanced Placement (AP) exams. The standards on the placement exams, as well as the means by which a student can gain an exemption, are consistent across all campuses in the CSU system. Students who are not exempt and who fail either the ELM or EPT are required to complete prescribed remedial courses with a grade of "C" or better within one year in order to continue their studies at CSU. As evidenced in Figure 1 (Appendix), remediation is required for and undertaken by a substantial proportion of first-time freshmen at most CSU campuses. CSU, Sacramento (CSUS) falls near the median remediation rate in the CSU system of 64 percent.

Of those required to take remedial coursework, the proportion of first-time freshmen who successfully complete those remedial courses within a year is quite high on most CSU campuses, including CSUS where it was 87 percent in 2003 (see Figure 2, Appendix). Students who successfully complete their remedial courses are deemed "proficient" but are not required to demonstrate their proficiency by passing the placement examination that categorized them as remedial in the first place.

University of Houston

Like CSUS, the University of Houston compels students to complete remedial coursework if they fail to exceed a threshold on a mandatory placement test. Beginning in 1989, the state of Texas mandated college readiness tests for all students entering public postsecondary education. In 1995, the state implemented a minimum passing score on the mathematics and reading Texas Academic Skills Program (TASP) placement exams in order for

students to be exempt from or remedial coursework in college. Students with scores above specified thresholds on the SAT, ACT, or Texas Assessment of Academic Skills (TAAS) were exempt from the TASP placement exams. Until 2003, students required to complete remedial courses could not enroll in upper-level courses (anything beyond 60 hours) until they had either successfully completed their remedial coursework with a “C” or better or had retaken and passed the TASP college readiness exams. Because of changes to the state’s college readiness policy in 2003, we focus on the period between 1995 and 2002 when the guidelines surrounding remediation and the data available were most consistent.³

The University of Houston (UH) currently enrolls approximately 34,000 undergraduates (or 27,000 full-time-equivalent students). As in the California State University system, the proportion of first-time Texas freshman who are under-prepared for college-level work is considerable. Figure 3 (Appendix) indicates that the fraction of first-time University of Houston freshmen requiring remediation exceeds remediation need at other Texas four-year postsecondary institutions across all race/ethnicity categories. Remediation rates for white, Hispanic, and black UH freshmen are 25, 39, and 48 percent, respectively.

Among those who participate in remedial courses at the University of Houston, 36 percent are declared “college ready” by the end of their first year. Students are considered remediated if they pass remedial courses with a grade of “C” or better or retake and pass the remedial placement exam. The proportion of remedial students who are successfully remediated at the University of Houston, 36 percent, is substantially higher than at other four-year postsecondary institutions in the state of Texas (see Figure 4, Appendix).

Data Description

Although the data for this project come from two distinct postsecondary institutions in different states, the institutions are actually quite similar in important ways, namely, admissions selectivity, student body diversity, and graduation rates. At both sites we observe individual-level data for all first-time freshmen who took college placement examinations to determine college remediation need. We observe students’ scores on these placement

³ In 2003, the state reconceived of its college readiness policy, dissolved the previous program, renamed the new policy the Texas Success Initiative and changed the name of the exam to the Texas Higher Education Assessment (THEA) (approved by the Texas Higher Education Coordinating Board under Senate Bill 286, Section 51.3062 Texas Success Initiative). While the spirit of the entire process remained the same, the decision-making authority shifted from a largely centralized to decentralized format.

tests, as well as whether their scores indicate required remedial coursework. The estimated CSUS and UH sample sizes are 5000 and 6000 students, respectively.

A variety of individual demographic characteristics are available, including gender, race/ethnicity, age, and pre-collegiate academic achievement measures (e.g., high school GPA, mandatory state-specific standards exam score, SAT/ACT score). Because we also observe the high school attended by each student, we are able to include school-specific attributes that might influence students' postsecondary outcomes (e.g., high school size, constant dollar expenditure per pupil, attributes of the teachers and student body).

For those students who were placed into remedial classes in college, we observe whether they successfully completed their coursework within one academic year. For both remedial and non-remedial students, we observe their enrollment patterns in subsequent semesters, their course-taking patterns, and additional important academic outcomes including college GPA by semester, choice of major, and time to degree completion. Perhaps the biggest limitation of the data is that we are not able to easily distinguish between students who transfer out of the institutions under study and those who drop out of higher education altogether. We treat all students who disappear from the sample as dropouts and recognize that this will potentially overstate our conclusions regarding the determinants of persistence in college.

Data Analysis

The strategy we employ to identify the effect of receiving remediation in college on future academic outcomes is often referred to as a regression discontinuity design (RDD).⁴ In its simplest form, the regression discontinuity methodology involves comparing students who are very close to, but on opposite sides of the pass/fail threshold of the remediation placement test. Any differences in the academic outcomes between students who received remediation (the treatment group) and students who did not (the control group) can be attributed to the effect of receiving remediation (the treatment). The university's decision to use a strict placement test rule for determining remediation need provides exogenous variation in the treatment. The intuitive benefit of examining only

⁴ The sharp regression discontinuity design produces unbiased estimates of treatment effects so long as assignment to treatment is based solely on a completely observed covariate and that covariate is included as a control in the estimation equation (Berk & Rauma 1983; Rubin 1977). In contrast to the "sharp" design, the "fuzzy" RDD allows the treatment assignment to depend on the selection variable in a stochastic way, but such that there is still a discontinuity at a known threshold. See Jacob and Lefgren (2004) and van der Klaauw (2002) for recent applications of the fuzzy RDD method to education research.

those test-takers who score near the pass/fail threshold is that it is more plausible that these students are similar to one another even on *unobservable* attributes that might influence their academic success (e.g., motivation, family attitudes toward education, work ethic, etc.). This continuity of unobservable student attributes is sufficient to identify the average treatment effect (Jacob & Lefgren, 2004). In addition to its simplicity, one of the primary advantages of RDD is that it addresses selection into treatment on both observable and unobservable characteristics of the subjects (Rubin, 1977).

Another approach to RDD, which utilizes more observations than only those near the pass/fail threshold, is to regress the outcome variable Y_i on the scale used to assign treatment (in our case, the remediation placement exam score, $SCORE_i$) and a dummy variable equal to 1 for the treated and 0 for the untreated. This assumes that the relationship between $SCORE_i$ and Y_i is strictly linear. Although one could include higher order transformation of $SCORE_i$ to correct for nonlinearity in the relationship between $SCORE_i$ and Y_i , the effectiveness of this solution hinges on the variability of $SCORE_i$ for the treatment and control groups.

Remedial course-taking may influence a variety of important student outcomes, including later course-taking patterns, choice of college major, academic success, college persistence, and time to degree completion. Assume for the sake of exposition that the outcome of interest, Y_i , is whether student i persists into their second year of college. Define $TREAT_i$ to equal one if individual i was placed into remediation in their first year of college by scoring below the relevant threshold on the placement exam and zero otherwise. As discussed above, treatment assignment at both CSUS and UH depends in a deterministic way on the score that student i earns on the placement exam, $SCORE_i$. Thus, the model of college persistence we will estimate is written as

$$Y_i = \alpha_0 + \alpha_1 TREAT_i + \alpha_2 SCORE_i + \varepsilon_i,$$

where ε_{it} represents unobservable determinants of college persistence, Y_i . The estimated effect of receiving remediation in college on college persistence will be given by the estimated value of α_1 . If receiving remediation improves persistence in college, the estimated value of α_1 will be positive. The model above can be used to examine many student outcomes of interest by simply redefining Y_i . Under the assumption that ε is normally distributed, the model will be estimated as a Probit for binary student outcomes like persistence and degree completion and with Ordinary Least Squares (OLS) for continuous outcomes (e.g., academic success as proxied by college GPA).

Finally, we will check the robustness of our estimates by also estimating the above equation with the inclusion of student-level covariates as in Jacob and Lefgren (2004).

Results from this investigation will establish new information about the impact of remedial coursework on students' baccalaureate trajectories. As many non- and less-selective public institutions of higher education grapple with high rates of remediation, state and institutional policymakers demand new empirical evidence on this costly way of preparing students for baccalaureate work. We anticipate that our findings from two such institutions will shed light on this important public policy issue.

Dissemination

The personnel team on this project represents a diverse set of disciplines whose research addresses the market for postsecondary education, postsecondary institutional practices, and students' postsecondary behavior. Distinctively, the researchers are faculty in Education and Economics who have done extensive work in the study of higher education, worked with large-scale survey data, and utilized a variety of complex approaches to analyzing quantitative data. For each of the senior personnel, the proposed study will extend her broader research agenda in complementary ways. In particular, the collective research of these personnel cuts across the study of access to and persistence in higher education, the influence of assessment practices on student outcomes at the secondary and postsecondary level, and racial/ethnic and socioeconomic differences in the determinants of individuals' choices and academic outcomes at various stages of the education pipeline.

Given the multidisciplinary nature of the research team, several products will be generated to adequately disseminate project findings to a diverse set of scholarly and policy-oriented venues (*e.g.*, the annual meetings of the American Educational Research Association, Association of Public Policy Analysis and Management, and others). Study findings will be submitted to a variety of disciplinary and cross-disciplinary peer-reviewed journals for publication (*e.g.*, *Sociology of Education*, *Educational Evaluation and Policy Analysis*, *Journal of Labor Economics* and *Economics of Education Review*). Additionally, policy relevant papers will be made available on-line through the researchers' web pages, as well as through dissemination to institutional stakeholders. Supplementary briefings of findings will be made available through the involved university public relations offices and researchers' individual affiliations.

Senior Personnel for this proposed study have achieved substantial success in disseminating research. They have presented at national conferences and published in articles in peer-reviewed scholarly journals. Previous studies have received coverage national newspapers and magazines (*The New York Times*, *Washington Post*, *Time* and *Newsweek*, *Boston Globe*, *Chicago Tribune*, and *L.A. Times*). These researchers also already collaborate with many organizations, making presentations to national and regional meetings of leading education groups and institutions and working to shape the effective engagement of those organizations on these issues.

Institutional Resources

The project will be housed at the School of Education at the University of California, Davis. The University has a substantial public affairs and media office to assist in dissemination of findings. In addition, the School of Education has its own public relations office committed to disseminating policy relevant research to education outlets. The proximity of the University of California Davis and the California State University Sacramento to the state's capital also affords these institutions special access to a variety of legislative outlets and policy discussions surrounding critical higher education issues. As such, both institutions have built relationships with legislative staff working on education, and with a variety of California policy groups such as the California Postsecondary Commission, PACE-Policy Analysis for California Education, and others.

The University of Houston's Office of Public affairs advances the goals of the university by strengthening awareness, engagement and support among constituents vital to the university's success and is comprised of three departments. In particular, University Communication seeks to maximize significant positive media coverage of the university, its people and programs by cultivating relationships with reporters and editors to improve acceptance of story ideas, facilitating media's ability to access information and by communicating effectively about the achievements of the institution, its faculty and students, externally and internally.

Schedule of Tasks

The tentative schedule of tasks and deliverables is as follows:

| | |
|------------------------------|--------------------------|
| June 2007 – September 2007 | Assemble and clean data. |
| October 2007 – February 2008 | Conduct data analyses. |

| | |
|-------------------------|---|
| March 2008 – April 2008 | Write and produce final AIR report, policy brief, and several scholarly manuscripts for conference and journal submission. |
| May 2008 | Disseminate products to a variety of audiences, including institutional researchers in respective campuses, key local and state policy makers, and advocacy organizations focused on relevant issues. |

Policy Relevance and Conclusion

Recent reports by the Government Accounting Office and the Spellings Commission call for more systematic research on the determinants of college attrition and time to degree. This proposal responds directly to their calls. We will provide a rigorous analysis of institutional practice that may improve college persistence and completion rates. Absent careful experimental or quasi-experimental evidence, policy makers have made programmatic decisions guided largely by anecdotes of their own intuitions. While descriptive data show that persistence rates and times to degree vary across colleges and universities (American Association of State Colleges and Universities, 2005; Carey, 2005), we can only speculate as to the institutional practices that cause this variation. Remediation is both controversial and costly. Colleges appear to be scaling back their remedial offerings as high schools and community colleges look to one another to provide students with the skills they need to succeed in college (Ignash, 1997). While we believe critics raise important questions about the appropriateness of colleges taking on the task of remediation, we are struck by the lack of valid evidence on which to assess the effectiveness of remediation in improving students' postsecondary educational outcomes. Our work will shed much needed light on how remediation actually impacts students' likelihood of baccalaureate degree completion and time to degree.

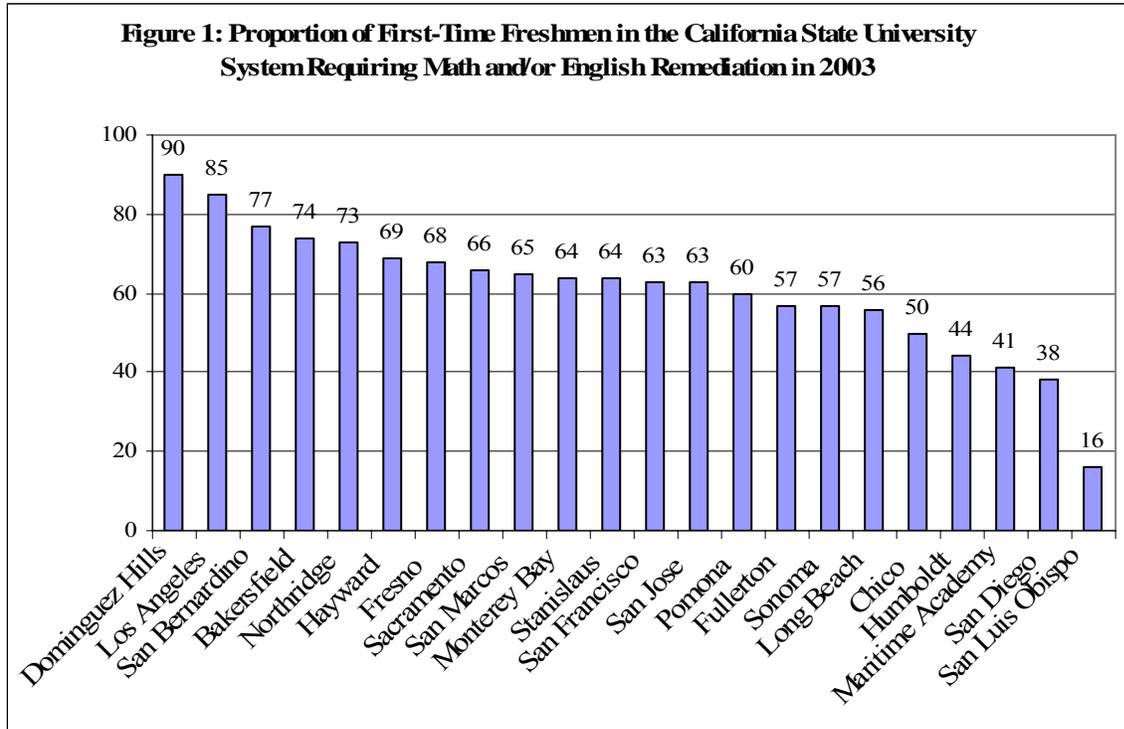
Undergraduate education is expensive for both individuals and the state, but the foregone talents of those who, with modest interventions, could successfully complete a degree are even more costly. The proposed research will help us move toward a postsecondary system in which inadequately prepared students get the assistance they need to achieve their goals. Through these mechanisms, we will contribute to our collective understanding of the kinds of interventions that can increase college persistence and reduce time to degree for many public four-year institutions.

Appendix

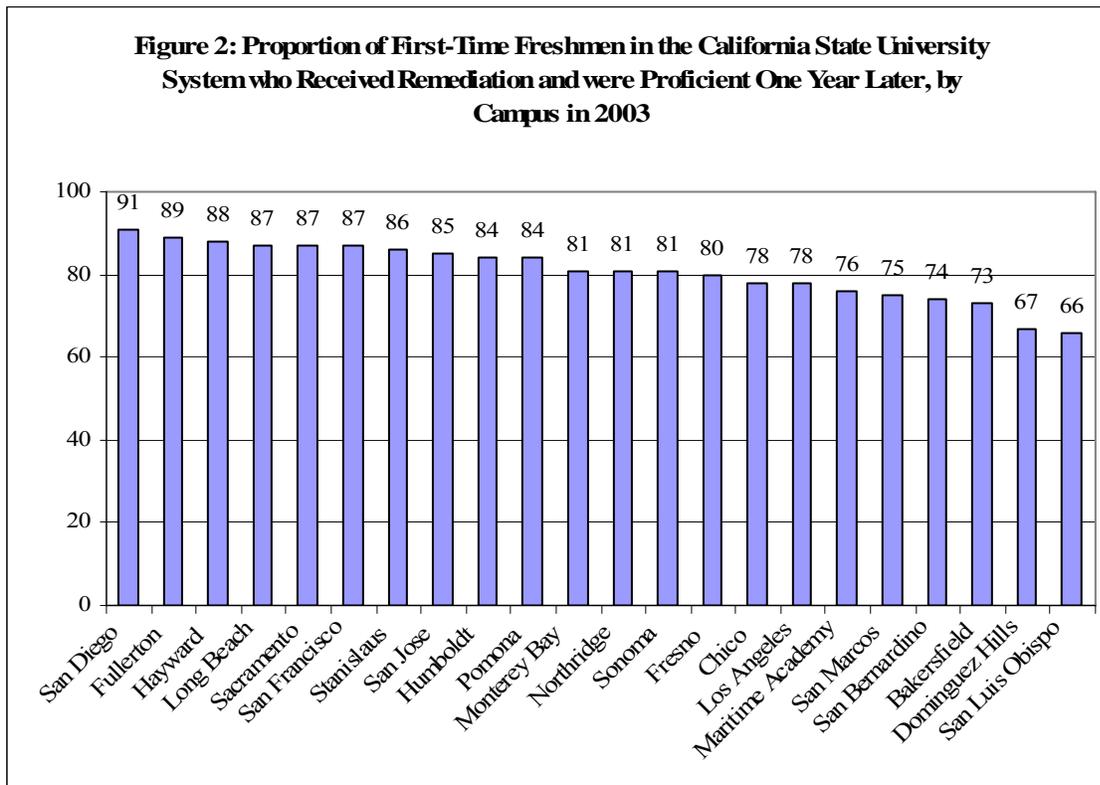
Table 1: Site-Specific Information

| | California State University, Sacramento | University of Houston |
|---|---|---|
| Remedial Placement Exam | Entry Level Mathematics (ELM) and English Placement Test (EPT) ELM/EPT score of 25 | Texas Academic Skills Program (TASP) exam TASP score of 230 |
| Lowest Passing Score | | |
| Means of Exemption | High enough scores on SAT, ACT, or Advanced Placement (AP) exams | High enough scores on SAT, ACT, or Texas Assessment of Academic Skills (TAAS) exams |
| Proportion of first-time freshmen taking exam | 61 percent | 39 percent |
| Proportion requiring remediation | 66 percent | 38 percent |
| Proportion of remedial students successfully remediated within one year | 87 percent | 36 percent |

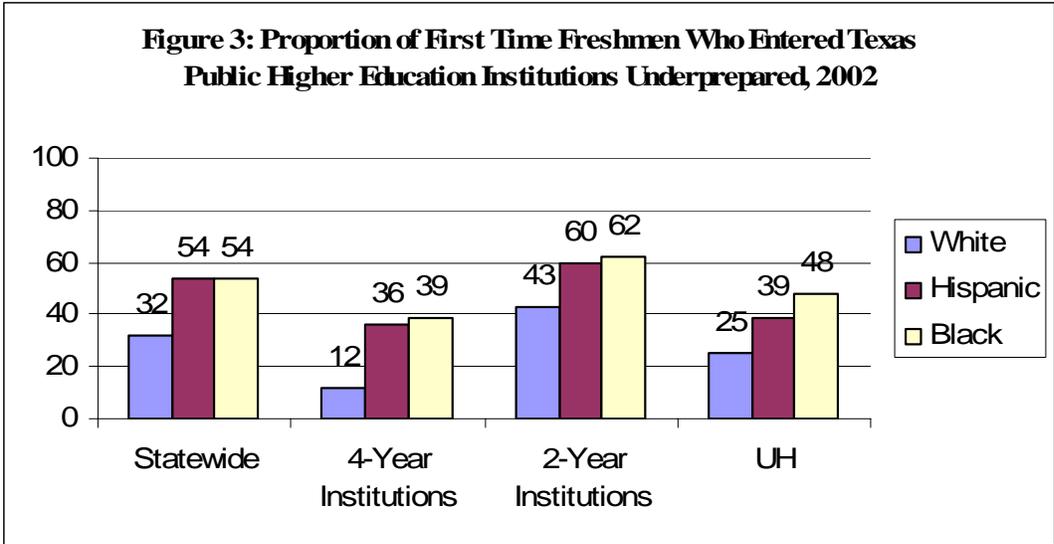
Source: Information from the Division of Analytic Studies of the California State University Chancellor's Office and the Texas Higher Education Coordinating Board (2003 & 2004).



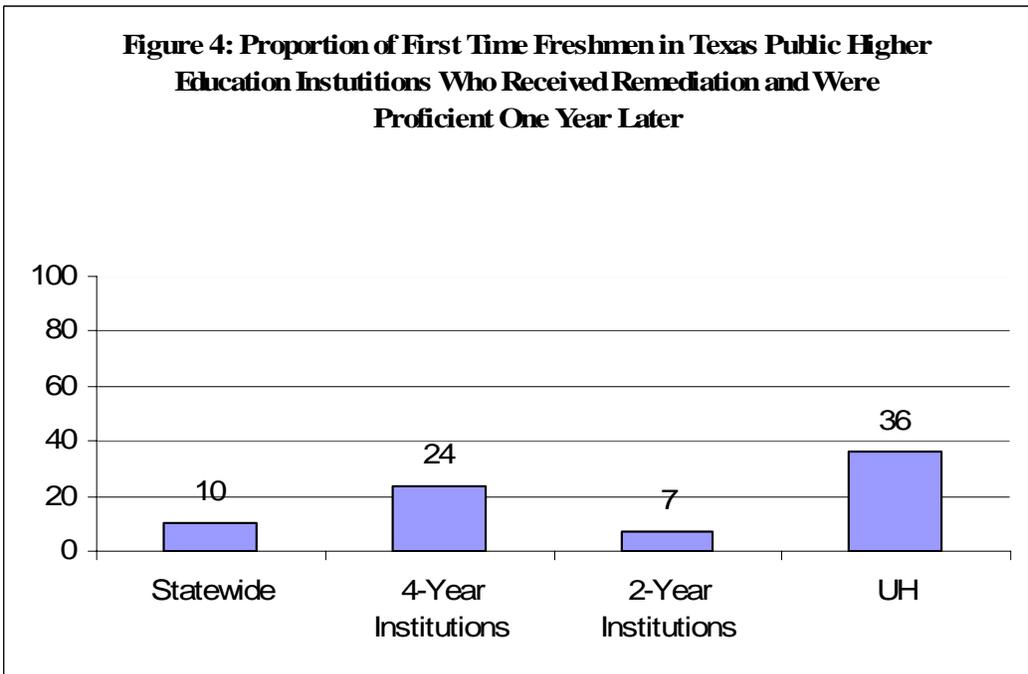
Source: CSU Division of Analytic Studies (<http://www.asd.calstate.edu/performance/proficiency.shtml>).



Source: CSU Division of Analytic Studies (<http://www.asd.calstate.edu/performance/proficiency.shtml>).



Source: Texas Higher Education Coordinating Board, 2003.



Source: Texas Higher Education Coordinating Board, 2004.

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6. BIOGRAPHICAL SKETCHES

Michal Kurlaender – Biographical Sketch

I am currently an Assistant Professor of Education at the University of California Davis. As a faculty member, I teach courses in research design, economics of education, education and social policy, and applied statistics. In particular, I am responsible for teaching quantitative research methods (at a variety of levels) to a diverse group of education researchers and practitioners. This group includes teachers and practitioners who strive to be better consumers of quantitative evidence on a variety of education topics, and to more effectively use data and quantitative inquiry in decision-making. It also includes advising doctoral students working to contribute solid research on tough empirical questions about topics such as achievement disparities, education finance, school-family relationships, occupational attainment, and many other important education and social policy topics.

I have three interrelated strands of professional interest—access to and persistence in postsecondary schooling for underrepresented populations, K-12 school segregation and desegregation, and quantitative research design in education research. Each of these areas addresses critical policy issues of educational equity. Moreover, in each of these areas I approach my research objectives in a very multidisciplinary way. As a graduate student at Harvard University I participated in the Multidisciplinary Program in Inequality and Social Policy, which explored issues of stratification and social policy from various disciplinary approaches (e.g. economics, sociology, psychology, and political science). At UC Davis, I also serve on the Program Committee of the Institute of Governmental Affairs' Economy, Justice and Society program, which brings together faculty and students from a range of social science disciplines. Finally, all of my research collaborations (including the one proposed here) are interdisciplinary by design to allow me to work closely with economists, legal researchers, sociologists, and psychometricians interested in similar questions. All of these experiences have influenced the ways in which I tackle tough educational issues in my teaching, and how I research and evaluate the effectiveness of specific policies and contexts within which education reform occurs.

My first major area of professional interest focuses on access to and persistence in postsecondary schooling for underrepresented populations. In my dissertation research, I examined the role of alternative or “second chance” frameworks in the educational attainment process. Specifically, I explored the impact of the GED certificate on subsequent postsecondary participation for groups from different racial/ethnic and social strata, and the impact of

the community college route to baccalaureate attainment for different socioeconomic and racial/ethnic groups. In this work I also focused on the way in which educational attainment can be measured, testing alternative specifications of educational paths and employing strategies to address problems of selection bias, which have long plagued educational research. In the context of educational stratification research, my work goes beyond documenting the evidence of persisting disparities in educational attainment. By investigating alternative mechanisms for educational attainment and mobility, I explored questions about who takes advantage of the expansion opportunities afforded by the GED certificate and community colleges. A portion of this work is currently under review at the journal, *Sociology of Education*.

A second area of professional interest is K-12 school desegregation and integration. Over the past ten years, I have investigated the impact of desegregated learning environments on a variety of academic, social and democratic outcomes of public schooling. This work largely began through my tenure as a researcher at The Civil Rights Project at Harvard University (CRP), where I worked as a researcher since its founding in 1996. With CRP, I have investigated issues at the intersection of law, policy, and research on educational equity. During my time at CRP, I engaged in several research projects related to school desegregation (many with my colleagues at the time, John T. Yun, and Sean Reardon), quite a few of which led to publications and presentations.

Finally, a third area of professional interest is in bringing innovative quantitative methods to bear on issues of education policy. I developed my interest in quantitative methodologies by working with several faculty members as a doctoral student at the Harvard Graduate School of Education. Through my funding from a Spencer Foundation Research Training Grant, which was developed around an apprenticeship model, I was able to work on a wide range of research topics that employed various multivariate methods (e.g. survival analysis, multilevel modeling, and structure equation modeling) with top notch researchers. In addition, as a teaching fellow throughout my time as a graduate student, I helped develop and teach numerous courses on research design, applied statistics, microeconomics, and educational assessment. Finally, my participation in several trainings and forums on quantitative methods, such as the Program in Quantitative Methods for Social Research, Inter-university Consortium for Political and Social Research (ICPSR) at the University of Michigan, the National Center for Education Statistics data set trainings, and, most recently, Thomas Cook and William Shadish's workshop on Quasi-Experimental

Design and Analysis in Education at Northwestern University. All of these experiences have contributed to my skills and interests in advancing the state of education research on important policy questions.

As I shape my future research agenda, I see extension across these three strands of professional research. In examining issues of access to higher education, I am interested in looking at the role of a variety of institutional policies aimed at improving college completion rates. I remain engaged in the role of the courts and in policy formation around school desegregation across racial/ethnic and socioeconomic lines, including the current controversies surrounding voluntary school desegregation plans. And, in the area of quantitative methods, I am particularly interested in the role of experimental and quasi-experimental research design. In my commitment to advancing the quality of research in the field of education, I hope to continue to seek different methodological and disciplinary perspectives for understanding how social policy aimed at improving educational attainment works, for whom, and under what conditions.

ABBREVIATED CURRICULUM VITA
MICHAL KURLAENDER

EMPLOYMENT

University of California, Davis 2005–Present

Assistant Professor

Courses: *Advanced Research Design, Foundations of Education Research, Economics of Education, Education & Social Policy, Applied Regression & Data Analysis*

EDUCATION

Ed.D., 2005 Harvard University Graduate School of Education, Cambridge, MA

Dissertation Committee: John B. Willett (Chair), Richard J. Murnane, Christopher Jencks

Ed.M., 1997 Harvard University Graduate School of Education, Cambridge, MA

Administration, Planning & Social Policy

B.A., 1995 University of California at Santa Cruz, Santa Cruz, CA

Majors: Political Science and Fine Art

ACADEMIC AWARDS/HONORS

Faculty Development Grant, University of California, Davis (2007)

Faculty Grant in Aid of Research, University of California, Davis (2005)

Spencer Dissertation Fellowship, Spencer Foundation (2004-2005)

Dissertation Grant, American Educational Research Association (2003-2004)

Spencer Research Training Grant, Harvard University Graduate School of Education (2001-2004)

Spencer Research Fellowship, Harvard University Graduate School of Education (2000-2001)

Roy Larsen Research Fellowship, Harvard University Graduate School of Education (1999-2000)

PUBLICATIONS

Journal Articles

Kurlaender, M. and Yun, J. (2007). Measuring School Racial Composition and Student Outcomes in a Multiracial Society. *American Journal of Education*, 113: 213-242.

Reardon, S., Yun, J. and Kurlaender, M. (2006). The Limits of Income Desegregation Policies for Achieving Racial Desegregation. *Educational Evaluation and Policy Analysis*, 28 (1): 49-75.

Kurlaender, M. (2006). Choosing Community College: Factors Affecting Latino College Choice. *New Directions for Community Colleges*, 133: 7-19.

Kurlaender, M. and J. T. Yun. (2005). Fifty Years after Brown: New Evidence of the Impact of School Racial Composition on Student Outcomes. *International Journal of Educational Policy, Research and Practice*, 6(1): 51-78.

Yun, J. and Kurlaender, M. (2004). School Racial Composition and Student Educational Aspirations: A Question of Equity in a Multiracial Society. *Journal of Education for Students Placed at Risk* 9(2):143-168.

Wald, J. and Kurlaender, M. (2003). Connected in Seattle? An Exploratory Study of Student Perceptions of Discipline and Attachments to Teachers. *New Directions for Youth Development: Theory, Practice and Research* (99):35-54. (Formerly, *New Directions for Mental Health Services*).

Shavit, Y., Ayalon, H. and Kurlaender, M. (2002). Schooling Alternatives, Inequality, and Mobility in Israel. *Schooling and Social Capital in Diverse Cultures, Research in Sociology of Education*, 13:105-124.

Kurlaender, M. with Orfield, G. (1999). In Defense of Diversity: New Research and Evidence from the University of Michigan. *Equity and Excellence in Education*, 32(2):31-35.

Edited Books & Book Chapters

Kurlaender, M. & Flores, S. (2005). The Racial Transformation of Higher Education. In G. Orfield, P. Marin, & C. Horn (Eds.), *Higher Education and The Color Line*, Harvard Educational Publishing Group: Cambridge, MA.

Ma, J. and Kurlaender, M. (2005). The Future of Race-Conscious Policies in K-12 Public Schools: Support from Recent Legal Opinions and Social Science Research. In *Resegregation of the American South*. Orfield, G., Boger, J., Edley, C. and High, R. (Eds.), Chapel Hill, NC: University of North Carolina Press.

Orfield, G. with Kurlaender, M. (Eds.), (2001). *Diversity Challenged: Evidence on the Impact of Affirmative Action*. Cambridge, MA: Harvard Education Publishing Group.

Kurlaender, M. and Yun, J. (2001). Is Diversity a Compelling Educational Interest: Evidence from Metropolitan Louisville. In *Diversity Challenged: Evidence on the Impact of Affirmative Action*. Orfield, G. with Kurlaender, M. (Eds.), Cambridge, MA: Harvard Education Publishing Group.

Kurlaender, M. (1999). Vignettes from the Field: Portraits of Religious Activists. In *Religion Race and Justice in a Changing America*. Orfield, G. and Lebowitz, H. (Eds.), New York, NY: Century Foundation Press.

Work in Progress

The Demography of Higher Education in the Wake of Affirmative Action (with Eric S. Grodsky).

Do GED Holders Go To College? Differential Postsecondary Participation Among GED and Diploma Holders By Race and Family Background (with John B. Willett and Richard J. Murnane), Revise & Resubmit, *Sociology of Education*.

Do Community Colleges provide a Viable Pathway to a Baccalaureate Degree? (with Bridget Terry Long).

PROFESSIONAL SERVICE

- Reviewer, *Annual Review of Sociology of Education; Review of Educational Research, Sociology of Education, Journal of Comparative Policy Analysis, Educational Researcher, American Educational Research Association*
- Member, American Educational Research Association (2002—Present)
- Member, American Sociological Association (2002—Present)
- Faculty Affiliate, The Civil Rights Project, Harvard University (2004—Present)
- Faculty Policy Research Panel, Policy Analysis for California Education—PACE (2005—Present)
- Advisory Board, Chief Justice Warren Institute on Race, Ethnicity and Diversity, UC Berkeley School of Law (2006—Present)
- Faculty Affiliate, New Vision-Higher Education Working Group (2005—Present)
- Consultant, Board of Education, San Francisco Unified School District (2005—Present)

PROFESSIONAL ACTIVITIES

Workshop on Quasi-Experimental Design and Analysis in Education. Thomas Cook and William Shadish, Jr., Instructors. Participation sponsored by the Spencer Foundation. Evanston, IL, June 5-9, 2006.

Program in Quantitative Methods for Social Research, Inter-university Consortium for Political and Social Research (ICPSR) at the University of Michigan, (Summer 2003)

National Center for Education Statistics Training Seminar (May 2002)

Catherine Horn – Biographical Sketch

I am an Assistant Professor at the University of Houston, and my primary line of research focuses on systemic barriers to college access and completion – in particular high stakes testing – for traditionally underrepresented students. I am responsible for teaching many of the College of Education’s doctoral level quantitative methods courses as well as higher education policy courses. I advise doctoral dissertations and contribute to the overall development of the College by serving on several key committees, including the quantitative development task force and the faculty’s executive committee.

I completed my PhD in Educational Research, Measurement and Evaluation in 2001 from Boston College under the mentorship of Dr. George Madaus. Below I detail my relevant research on testing policies across the K-16 pipeline, which serves as a basis for the current proposed project and my future research interests. My professional tenure as a psychometrician, to date, has provided abundant opportunity to integrate my technical expertise in classical test theory, item response theory, complex regression, and other analytical tools with my policy research experience to explore the nature, impact, and trade-offs of local and state educational policies on school-level decision making and ultimately on student learning. In particular, I have applied these methodologies to study the impacts of high-stakes assessment policies on students in both K-12 schools and selective colleges and universities.

As the Boisi Fellow in Education and Public Policy under the auspices of the National Board on Educational Testing and Public Policy (NBETPP), I led a study of the methods used and impacts of cut-score or performance standard setting on students in Massachusetts sitting for the Massachusetts Comprehensive Assessment System (MCAS) exams. The results of that study found that in many cases, students who were scoring well above average on other commercially developed standardized tests such as the Stanford 9 or the Iowa Test of Basic Skills were labeled “failing” or in “need of improvement” by the MCAS. While the public places great faith in the infallibility of performance levels as a measure of student performance, the procedures used to create cut scores are judgmental – and therefore fallible – by nature. Thus, my research confirmed the critical need for policy makers to use multiple sources of evidence, including normative information about student achievement when making important decisions about individual students and schools.

My work as a Research Associate with The Civil Rights Project at Harvard University focused on the trade-offs of college admission policies on the racial composition of college campuses. In two studies, I used simplified models to explore how various approaches to admission affect the racial diversity of the admitted student population. Looking at public schools in California and Texas – states restricted in their ability to consider race in the college admission process – I fit logistic regression models to simulate race/ethnicity neutral admissions policies that considered only SAT scores and high school GPA. These models were then applied to College Board data to predict whether SAT takers in this data set would be admitted under a race/ethnicity neutral admissions setting. The results found that such “race neutral” policies clearly reduced the percentage of admitted minority students. The studies also assessed the potential impacts of automatic admission policies (i.e., “percent plans”) on campus racial diversity and found that their ability to increase minority representation, particularly on the most selective campuses, was negligible. Finally, the studies tested the hypothesis that giving preference to other alternative diversity characteristics (e.g., parental education, socio-economic status) could effectively create a racially/ethnically diverse campus. Taken as a whole, the empirical results indicated that, although attention to alternative diversity criteria can result in some practical boost in minority representation, the fact remains that such policies do not bring minority representation close to those achieved with the use of affirmative action. The results from these studies were cited in numerous briefs submitted to the Supreme Court in the *Gratz* and *Grutter* cases and cited in Justice Ginsburg’s dissenting opinion.

At the Civil Rights Project, I also led efforts to develop research and policy agendas on the impacts of testing policies on the pipeline of students moving from kindergarten through college and into the workforce. The United States is increasingly becoming a society where all students are required to take numerous tests in order to determine whether they can move on in their education. Important decisions like grade promotion, educational placements, high school graduation, college entrance, college continuation, and professional licensure are increasingly being made based solely or substantially on test scores. In the context of the impressive existing body of scholarly research that looks at particularly “at-risk” students, there is little that bridges the additive influence of multiple levels of high stakes testing on these already vulnerable students.

Currently, I have a collaborative research project that arises out of a quasi-experimental framework. With my colleague, Michal Kurlaender at U.C. Davis, we are analyzing data from the National Education Longitudinal

Study of 1988 (NELS:88) and the Integrated Post-Secondary Data System (IPEDS) to explore two research questions. What are the timing decisions of college leavers? What are the institutional determinants of college departure? Specifically, we utilize the NELS:88 postsecondary transcript files, which contains information on the types of degree programs, periods of enrollment, specific courses taken, grades and attained credits, and obtained credentials by NELS:88 respondents who enrolled in college. These data are relevant here because they offer the level of detail by academic term that we need in order to investigate questions surrounding the timing of decisions to remain in college or exit. Because our findings must be interpreted as providing evidence of the extent to which there are timing differences in college exit among observationally similar individuals, we utilize approaches such as a propensity score blocking technique to stratify the sample into groups of respondents with similar estimated chances of college exit, and then through a set of interactions between the propensity score blocks and the time variables test whether those at higher risk for dropping out do so earlier than those of lower risk (Morgan, 2001). For this study in particular, we participated in the Spencer Foundation's 2006 invited professional development on the analyses of quasi-experiments.

I am especially excited about the opportunity to work with this interdisciplinary team of scholars to explore a critical assessment juncture in the K-16 pipeline. Given the *Gratz* and *Grutter* decisions as well as the test-based accountability implications of the "No Child Left Behind" act, the extent to which test scores ought to and will continue to serve as both a formative and summative means of decision-making remains up for debate. The state of Texas's decision to decentralize and yet maintain oversight of the developmental placement policies in the state provide a shining example of the complexities that continue to lie in both the political and technical realities of tests. This project is a wonderful complement to my continuing research and policy work around the issues of the cumulative effects of elementary, secondary, and post-secondary testing policies. A better understanding of the collective impacts of such policies is crucial in minimizing social and economic costs (e.g., higher dropouts, retentions) and maximizing the educational benefits (e.g., improved learning and teaching in the classroom) for students as they progress through the K-16 system.

ABBREVIATED CURRICULUM VITA
CATHERINE HORN

EXPERIENCE

ASSISTANT PROFESSOR, Educational Leadership and Cultural Studies, The University of Houston
Houston, Texas. *January, 2005 - present*

ASSOCIATE EDITOR, *The Review of Higher Education*, Journal of the Association of the Study of Higher
Education
September, 2005 - present

RESEARCH ASSOCIATE, The Civil Rights Project, Harvard University
Cambridge, Massachusetts. *November, 2001 – January, 2005*

SENIOR RESEARCH ASSOCIATE, Center for the Study of Testing, Evaluation and Educational Policy, National
Board on Educational Testing and Public Policy, Boston College
Boston, Massachusetts. *July, 2000 – November, 2001*

BOISI FELLOW IN EDUCATION AND PUBLIC POLICY, Boston College School of Education
Boston, Massachusetts. *1998 to June, 2000*

HIGH SCHOOL TEACHER, Houston Independent School District, Jefferson Davis High School Houston, Texas.
1995-1997

SELECTED REFEREED JOURNAL PUBLICATIONS

Flores, S., Horn, C., & Crisp, G. (2006). Community colleges, public policy, and Latino educational opportunity. *New Directions for Community Colleges* 133 (2).

Horn, C., Flores, S., & Orfield, G. (Eds.) (2006). *Community colleges and Latino educational opportunity*. *New Directions for Community Colleges* 133 (2).

Gandara, P., Horn, C., & Orfield, G. (Eds.). (2005). *The access crisis in American higher education*. *Educational Policy* 19 (2).

Horn, C. (2005). Standardized assessments and the flow of students into the college admission pool. *Educational Policy* 19 (2), pp. 331-348.

Horn, C. (Winter 2003). High-stakes testing and students: Stopping or perpetuating a cycle of failure? *Theory Into Practice*, 42(1), pp. 30-41.

Koretz, D., Russell, M., Shin, D., Horn, C., & Shasby, K. (2002). Testing and diversity in post-secondary education: The case of California. *Education Policy Analysis Archives* 10 (1).

Clarke, M., Madaus, G., Horn, C., & Ramos, M. (2000). A retrospective on testing and assessment in the twentieth century. *Journal of Curriculum Studies* 32 (2), 159-181.

SELECTED REFEREED BOOKS AND CHAPTERS

Horn, C., & Marin, P. (2006). Reaping the benefits of *Grutter*: College admissions and racial/ethnic diversity. In P. Gandara, G. Orfield, & C. Horn (Eds.), Expanding opportunity in higher education: Leveraging promise, (pp. 167-192). New York: State University of New York Press.

Gandara, P., Orfield, G., & Horn, C. (Eds.). (2006). Expanding opportunity in higher education: Leveraging promise. New York: State University of New York Press.

Orfield, G., Marin, P., & Horn, C. (Eds.) (2005). Higher education and the color line: College access, racial equity, and social change. Cambridge: Harvard Educational Press Group.

Horn, C. (2005). Potential or Peril: The Evolving Relationship of Large-Scale Standardized Assessment, Accountability and Higher Education. In C. Horn, S. Flores, & G. Orfield (Eds.), Higher education and the color line: College access, racial equity, and social change, (pp. 153-174). Cambridge: Harvard Educational Press Group.

SELECTED COMMISSIONED PUBLICATIONS

Horn, C. & Kurlaender, M. (2006). The end of *Keyes*—A cautionary tale of resegregation trends and the achievement gap in Denver Public Schools. A paper commissioned by The Civil Rights Project at Harvard University.

Horn, C. (2006). Affirmative action plus: A case study of UT Austin. A paper commissioned by The Civil Rights Project at Harvard University.

Horn, C. (Fall, 2002). The intersection of race, class, and English learner status. A paper commissioned by the National Academy of Sciences.

SELECTED REFEREED PRESENTATIONS

C. Horn and J. Yun. The Impact of Test-Based Retention Policies on the Learning Trajectories of Elementary School Students and the Implications for Schools. American Educational Research Association in San Francisco. April, 2006.

C. Horn. Affirmative Action Plus – A Case Study of UT Austin. American Educational Research Association in San Francisco. April, 2006.

C. Horn. Potential or Peril: The Evolving Relationship of Large-Scale Standardized Assessment, Accountability and Higher Education. The American Council on Education's Educating All of One Nation Conference in Phoenix. October, 2005.

C. Horn. Looking Beyond Affirmative Action: Addressing Structural Barriers to Higher Education Opportunity for Minority and Low-Income Students. American Educational Research Association in Montreal. April, 2005.

C. Horn. The Technical Realities of Measuring History. American Educational Research Association in Montreal. April, 2005.

C. Horn. Community Colleges and Latino Educational Opportunity: A Civil Rights and Policy Conversation. American Educational Research Association in Montreal. April, 2005.

Jessica S. Howell – Biographical Sketch

I am an assistant professor of economics at California State University, Sacramento, specializing in research that seeks to understand the forces shaping the choices of secondary and postsecondary students and institutions. I teach undergraduate courses in Quantitative Economic Analysis, Economic Research Methods, Labor Economics, the Economics of Education, and Introductory and Intermediate Microeconomics. I also advise students working on Master's theses on a variety of education topics, including the relationship between school finance reforms and private school enrollment, the enrollment effects of the HOPE and Lifetime learning educational tax credits, and the determinants and impact of secondary school teacher attrition.

I received my Ph.D. in economics from the University of Virginia in 2004. At the University of Virginia, my graduate training was highly quantitative and emphasized specialization in two primary fields of study, labor economics and econometrics. The econometrics specialization involved the following four-course sequence: (1) probability theory and statistical inference, (2) econometric theory (linear and non-linear regression models, hypothesis testing, simultaneous equation models), (3) econometric methods for cross-section and panel data (binary and discrete choice models, survival analysis, simulation methods, structural estimation methods, maximum likelihood estimation), and (4) econometric methods for time series data (autoregressive moving average models, vector autoregression, cointegration, forecasting). My graduate education in economics also included two semesters of mathematical economics, which incorporated univariate and multivariate calculus, linear algebra, differential equations, and dynamic optimization. The quantitative knowledge and tools that I gained in these courses were honed through data analysis in a variety of computing environments, ranging from Microsoft Excel to Stata, SAS, SPSS, and Fortran. To supplement my training during the dissertation-writing stage of my graduate program, I also participated in an AERA Institute on Statistical Analysis for Education Policy in April of 2003. Through this multi-day program that focused on the National Longitudinal Educational Study (NELS), I gained invaluable knowledge and hands-on experience with causal inference, hierarchical linear modeling, and the proper use of sampling weights in large-scale data sets.

My research, broadly described, examines racial/ethnic and socioeconomic differences in the determinants of individuals' choices and academic outcomes at various stages of the education pipeline, including academic

preparation, college application, matriculation, and career choice. My dissertation research examined the multi-step process by which students are matched with colleges, including students' application choices, colleges' admissions decisions, and students' ultimate enrollment choice. I estimated the parameters of a structural equation model of these intertwined decisions using data from NELS and IPEDS, and then used the parameter estimates to simulate the effect of a widespread ban on affirmative action in college admissions as well as various affirmative action replacement policies designed to increase racial diversity at U.S. colleges. This research was recently revised for publication in the *Journal of Labor Economics*.

The education research that I have undertaken as a junior faculty member extends my dissertation research both forward and backward in the education pipeline, maintaining a focus on differential educational choices and outcomes by race/ethnicity and socioeconomic factors. In one paper that looks *forward* in the pipeline, I examine the effect of race-neutral college policies on professional degree attainment and future wages of traditionally under-represented minorities. I hypothesize that declining minority enrollments at selective undergraduate institutions diminish the pool of qualified minority applicants that professional schools face. Because many of the highest paid jobs in the U.S. are filled from the ranks of selective law, business, and medical schools – where affirmative action is most likely to be employed – the elimination of affirmative action in undergraduate admissions may have a dramatic impact on racial wage gaps. Using institutional-level data, I find evidence that professional schools in California and Texas, following the elimination of affirmative action in those states, experienced disproportionate decreases in minority enrollments relative to declines in undergraduate minority enrollments, and that these shifts are likely to increase existing racial wage disparities in the future. In another paper that looks forward in the educational pipeline, my co-authors and I examine the chain of educational and career choices that underlie the current dearth of African-Americans in the health professions. Using data from National Longitudinal Study of the Class of 1972 (NLS-72), NELS, and the Current Population Survey (CPS), we estimate a structural equation model of individuals' decisions to enroll in a baccalaureate institution of a particular quality, complete a college degree, and choose a health care profession that requires an advanced degree. Our results indicate that the under-representation of racial/ethnic minorities among health care professionals is due primarily to factors in place very early in the educational pipeline, such as parental educational attainment and academic preparation.

Based on findings in the research described above that point to racial/ethnic differences in choices and opportunities early in the educational pipeline, the newest additions to my research agenda extend my dissertation

research *backward* to examine students' academic preparation for postsecondary study. In the first paper, I examine California high school students' need for remedial coursework in college, focusing on the connection between attributes of students' high schools and secondary teachers and their academic preparation to do college-level work. In this paper I examine how one of the main tenets of the No Child Left Behind Act of 2001, the requirement that all teachers are "highly qualified," is related to students' need for remediation in college. Specifically, I utilize institutional- and high school-specific data from the California State University, the California Department of Education (CDE), and the Common Core of Data (CCD) to examine the relationship between high school teachers' experience, educational attainment, and credential status and the need for remedial math and/or English by their college-bound students. The multivariate regression results imply that more experienced and fully-credentialed teachers are associated with reduced college remediation need by their students, but that additional coursework and masters degree attainment by secondary teachers is unrelated to the remediation rates of their college-bound students. Examining the potentially different response of minority students to these sorts of teacher inputs, I find evidence that all of these teacher qualification measures are associated with reductions in college remediation need, particularly in English, by black and Hispanic students.

After examining the role of secondary schools and teachers in college remediation, my second line of inquiry involves investigating post-secondary institutions' programs and practices that may reduce college remediation need. One such effort in California is the Early Assessment Program (EAP), employed since 2004 by all California State University campuses. This early intervention program targets high school juniors and provides participants with explicit information about their college readiness or guidelines for achieving readiness. This project is new quantitative analysis of the Early Assessment Program that utilizes student-level data from California State University and the California Department of Education. This research is still in the early stages of data collection. Upon completion of the data construction, I will employ a difference-in-differences methodology to identify the causal effect of the program on students' college application and matriculation decisions, as well as their academic preparedness and participation in remedial college courses. I will also examine whether the program has differential effects on the choices and opportunities of students of differing race/ethnicity and socioeconomic background.

These last two projects described above leave many interesting questions unanswered; primary among them is how remedial college students fare later in their college careers relative to their peers with regard to academic performance, persistence in college, and degree completions. These are precisely the questions we seek to address in the current project proposal.

There are multiple ways in which I believe I will benefit from participating in the proposed project. First, this is precisely the type of scholarly activity that is valued by my department and university. Remediation rates among first-time freshmen at California State University, Sacramento have hovered around 50 percent in both mathematics and English in recent years. The results of this research will be of particular interest to university administrators and those faculty members who are closely associated with remediation programs. Second, this project will foster relationships with CSUS Institutional Research, CSU Division of Analytic Studies, California Department of Education, and the public policy community in the California state capital. Ideally, these relationships will pave the way for a broader research agenda on important educational challenges facing California students and institutions. Finally, this project will also cultivate a budding interdisciplinary relationship with my co-Principle Investigators, who are educational researchers, and lead to future collaborative research endeavors.

ABBREVIATED CURRICULUM VITA

PROFESSIONAL EXPERIENCE

- 2003 – Present Assistant Professor, California State University, Sacramento
Courses: Principles of Microeconomics, Intermediate Microeconomic Theory, Labor Economics, Economic Research Methods
- 2005 – 2006 Visiting Assistant Professor, University of Virginia
Courses: Labor Economics, Economics of Education
- 1997 – 2001 Head Teaching Assistant & Teaching Assistant, University of Virginia
Courses: Principles of Microeconomics, Principles of Macroeconomics, Intermediate Microeconomic Theory
- 1995 – 1997 Research Assistant, Board of Governors of the Federal Reserve System
Division of Research & Statistics, Macroeconomic Analysis Section

RESEARCH PAPERS AND PROFESSIONAL PRESENTATIONS

“Assessing the Impact of Eliminating Affirmative Action.” (*Revised for the Journal of Labor Economics*)

- Stanford School of Education (May 2005)
- American Educational Research Association, Washington DC, (October 2004)
- Western Economic Association Conference, Vancouver BC (June 2004)
- Southern Economic Association Conference, San Antonio TX (November 2003)
- Mathematica Policy Research, Inc., Princeton NJ (February 2003)

“Affirmative Action, Law School Admissions, and the Wage Distribution.”

- Association of Public Policy Analysis and Management Conference, Washington DC (Nov. 2003)

“Homeschooling in the United States: Revelation or Revolution?” with Michelle Sylvester.

- Western Economic Association Conference, San Francisco CA (July 2005)
- Southern Economic Association Conference, New Orleans LA (November 2004)

“The Relationship Between High School Characteristics and the Need for Remediation in College: Evidence from California.”

- Association of Public Policy Analysis and Management Conference, Washington DC (Nov. 2005)

“The Educational Pipeline for Health Care Professionals: Understanding the Source of Racial Differences,” with Ivora Hinton, Elizabeth Merwin, Steven Stern, Sarah Turner, Ishan Williams, and Melvin Wilson.

“An Evaluation of California State University’s Early Assessment Program and its Effect on Students’ College Application, Matriculation, and Remediation Need”

RESEARCH AWARDS AND HONORS

- Scholarly Activity Research Grant, California State University, Sacramento, 2005
Dissertation Fellowship, American Educational Research Association, 2002
Dissertation Fellowship, College of Arts & Sciences, University of Virginia, 2001
Predoctoral Fellowship, Bankard Fund for Political Economy, 2001
Academic Enhancement Research Fellowship, University of Virginia, 2000

PROFESSIONAL ACTIVITIES

- Referee: Journal of Econometrics, Journal of Human Resources, Economics of Education Review, Urban Education
Member: American Economic Association, Association for Public Policy Analysis and Management, Southern Economic Association, Western Economic Association

7. BUDGET

GRANT PROJECT TITLE: College Readiness to Degree Completion: Remedial Placement and Patterns of College Persistence

Personnel:

| | | | |
|---|-----------------------------------|----|------------------|
| | 1 FTE summer month@ | | |
| Principal Investigator - Michal Kurlaender | \$6,573/month | \$ | 6,573 |
| Graduate Student Researcher (GSR) | .25 FTE, 3 summer months@\$769/mo | \$ | 2,307 |
| | Total Salaries and Wages | | \$ 8,880 |
| PI Fringe Benefits @12.27% | | \$ | 807 |
| GSR Fringe Benefits @3% | | \$ | 69 |
| Travel (AIR Forum, AERA for presentation of findings) | | \$ | 1,500 |
| | Total Benefits and Travel | | \$ 2,376 |
| Other Direct Costs | | | |
| Materials and Supplies | | \$ | 296 |
| Subaward - CSU Sacramento - PI Jessica Howell | | \$ | 9,047 |
| Subaward - University of Houston - PI Catherine Horn | | \$ | 9,401 |
| | Total Other Direct Costs | | \$ 18,744 |
| TOTAL AMOUNT OF AWARD | | | \$ 30,000 |

University of Houston Sub-Contract Budget
6/1/07-5/31/08

| | |
|---|-----------------------|
| Personnel | |
| Salary | \$ 53,000 |
| PI Name: Catherine Horn | |
| 1 month summer salary | \$ 5,889 |
| Total Salary | \$ 5,889 |
| Fringe benefits** | \$ 862 |
| Total Salary & Fringes | \$ 6,751 |
| Materials & Supplies | \$ 150 |
| Travel (trip to AIR forum and to AERA for presentation of findings) | \$ 2,500 |
| Total Modified Direct Costs | \$ 9,401 |
| Total Direct Costs | \$ 9,401 |
| IDC 49% MTDC | not applicable |
| Total Costs | \$ 9,401 |

**Must have fringe benefits calculator for each person included in salary

8. CURRENT AND PENDING SUPPORT

The research proposed in this application is currently under review at the Institute of Educational Sciences, the National Center for Education Research FY2007 grant competition. The work proposed here is one part of a larger project, titled: *The Effects of Institutional Practices on Postsecondary Trajectories—Matriculation, Persistence and Time to Degree*, which aims to identify how existing programs and policies influence college persistence and completion. The IES proposal was submitted on November 16, 2006, and PIs are awaiting notification at this time.

In addition, Michal Kurlaender has 20% committed effort on an internal University of California-Davis research project in the 2007-2008 academic year. Jessica Howell has a pending application for internal funding from the California State University—Sacramento for 25% time in the 2007-2008 academic year. Catherine Horn has no other current or pending support at this time.

9. FACILITIES, EQUIPMENT, & OTHER RESOURCES

University of California – Davis

The project will be housed at the School of Education at the University of California, Davis. The PI at UC Davis has a secure data room where confidential data are stored.⁵ In addition, the School of Education houses several computer labs and full-time IT staff to provide technical support to faculty research. In addition, Kurlaender will have full access to the resources of the Institute of Governmental Affairs (IGA) at the University of California, Davis. The IGA offers a broad range of services in support of faculty and graduate student research in the social sciences. IGA's Research Services unit consists of the Library & Data Archive and the Social Science Data Service (SSDS). SSDS provides three types of services in support of quantitative social science research on the UC Davis campus: (1) consulting (2) support of extramurally funded research projects and (3) computing. SSDS exploits economies of scale to provide human and computing resources to UC Davis social scientists at levels that would be too costly to provide to individual faculty. SSDS staff consults on a wide range of software used in social science research. They can assist with questions regarding the use of SSDS computers, as well as statistical and related programming. Limited statistical consulting is also available on both basic and intermediate methods including regression analysis (GLM, Logit/Probit, IV, etc.), crosstabs, t-tests, and other procedures. In addition, staff is knowledgeable about social science data sources, data management and special programming. SSDS staff can assist principal investigators with data management techniques and documentation for their research projects. As appropriate, staff also can write specialized programs to execute computational procedures. Provision of these services is limited by budget constraints and may be provided on a cost-reimbursable basis.

California State University, Sacramento

Jessica Howell will have access to full-time IT staff designated to support faculty in the College of Social Sciences and Interdisciplinary Studies at California State University, Sacramento (CSUS). IT staff provide extensive computing support on hardware and software utilized for research. In addition, Howell has a secure data room where confidential data are stored. Moreover, additional resources for the analysis of CSUS data will be in the form of staff time and expertise on EAP and remediation data from the CSUS Office of Academic Affairs (see attached letter in Section 10 of this proposal: Special Information and Supplementary Documentation).

University of Houston

Catherine Horn will have access to full-time IT staff designated to support faculty in the School of Education at the University of Houston. IT staff provide extensive computing support for research. Horn has a secure data room where confidential data are stored. In addition, resources for the analysis of University of Houston data will be in the form of staff time and expertise on remediation data from the University of Houston Institutional Research Office (see attached letter in Section 10 of this proposal: Special Information and Supplementary Documentation).

⁵All senior personnel on the project maintain a license for restricted-use data through the National Center for Education Statistics, and as such meet all of the requirements for storing and utilizing confidential data.

10. SPECIAL INFORMATION & SUPPLEMENTARY DOCUMENTATION

Human Subjects

All data for this project are collected and assembled by the sponsoring institutions, and will be stripped of identifiers. As such, the project is pending exempt status from human subjects review at the two respective institutions. For all analyses, confidentiality of participants will be assured through several procedures: 1) all identifying information of respondents (name, SS#, exact date of birth, exact address, etc.) will be removed by sponsoring institutional offices prior to researchers' receipt of the data; 2) researchers will make no effort to identify an individual in the data set, institutional data offices will generate the random student identifier and researchers will not possess the individual identification codes; 3) if any individual is inadvertently identified, institutional administrators will be notified; 4) original copies of data will be kept in locked cabinets, accessible only by researchers, and only approved researchers and their research teams will have access to data files. (All researchers on the project maintain a license for restricted-use data through the National Center for Education Statistics, and as such meet all of the requirements for storing and utilizing confidential data.)

U N I V E R S I T Y o f H O U S T O N

Office of Institutional Research

5000 Gulf Fwy Bldg 2
Rm 101
Houston, TX 77204-0903

713/743-0639
Fax: 713/743-0646



October 23, 2006

Cathy Horn
Assistant Professor
College of Education
University of Houston
4800 Calhoun Rd.
Farish Hall 437
Houston, TX 77204-5038

Dear Cathy:

I write to lend my support to your project on the impact of institutional practices on college persistence and completion. The UH Institutional Research office is interested in the goals of the proposed research, which are, among other things, to learn about the potential impacts of developmental placement on students' persistence in college and time-to-degree.

My staff are prepared to work with you to retrieve the necessary individual level data tracking students' developmental and subsequent course taking records. We are happy to be participating in this study and look forward to the ongoing collaboration.

Sincerely,

A handwritten signature in cursive script that reads "Libby Barlow".

Dr. Libby Barlow
Executive Director, Institutional Research and Institutional Effectiveness
Interim Registrar

Learning. Leading.™



California State University, Sacramento
Office of Academic Affairs
6000 J Street • Sacramento, CA 95819-6016
T (916) 278-6331 • F (916) 278-7648 • www.csus.edu/acad

November 8, 2006

Jessica S. Howell
Assistant Professor
Department of Economics
California State University, Sacramento
6000 J Street
Sacramento, CA 95819-6082

Dear Jessica:

I write to lend my support to your project regarding the impact of institutional practices on college persistence and completion. The California State University, Sacramento (CSUS) Early Assessment Program (EAP) is enthusiastic about the goals of the proposed research, which are, among other things, to learn about the effect of early-diagnosis of students' under-preparation for college-level coursework and their persistence and/or success in college.

In conjunction with my colleagues at the California Department of Education (CDE), I am prepared to work with you to retrieve the necessary individual level data on high school students in the ten California counties under the jurisdiction of CSUS and a variety of their eventual academic outcomes, such as mathematics and English placement status, remedial course-taking patterns and success, and persistence toward a four-year degree. This information will be most useful, and necessary, in that 51.6% of our 2006 freshmen are from these same ten regions.

In closing, we are very interested in learning how the EAP may be enhanced to support better student outcomes and look forward to our ongoing collaboration.

Please feel free to contact me with any questions at (916) 278-3643 or salvettiwolfe@csus.edu.

Sincerely,

A handwritten signature in cursive script that reads "Joy Salvetti Wolfe".

Joy Salvetti Wolfe, Ph.D.
Early Assessment Program Coordinator
Guardian Scholars Program Director
California State University, Sacramento