

COVER PAGE

2006 AIR RESEARCH GRANT PROPOSAL

**Beginning Community College Student Characteristics
that Predict Postsecondary Persistence Trajectories**

Analysis using the Beginning Postsecondary Students Data from 1996-2001
and the National Educational Longitudinal Study from 1988-2000

Grant Amount Requested: \$29,680

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PROJECT SUMMARY

The open door admission policies of most community colleges provide an entry to higher education for many students that may not otherwise be academically qualified for selective-admissions institutions; similarly, lower costs of tuition provide an opportunity for students that may not otherwise be able to afford higher education. Though community colleges are the only viable entry to higher education for many students, elevated dropout rates observed at these institutions suggest that many students are not succeeding at their only entry point to higher education. In fact, attrition among college students that begin their careers at community colleges significantly exceeds that observed at four-year public and private institutions. First-year attrition alone exceeds attrition in the first three years of four-year institutions (Bradburn, 2003).

The proposed study uses the NELS and BPS data sets to examine factors in the first year of community college that predict students' future success in higher education. The first phase of the study will model persistence trajectories for first institution and multi-institution data for individuals in the NELS and BPS data sets. After establishing a set of latent trajectory groups, a wide variety of predictors will be examined using discriminant function analysis to understand the factors that differentiate students that successfully navigate their early years in college from those who do not. There are two primary aims of the study: (1) define persistence trajectories using only data from students' first institution and define persistence trajectories using all available multi-institution data, and (2) identify background experiences, educational experiences, and study habits that are associated with persistence through college beyond established relationships in student demographics and risk factors associated with lower persistence levels.

In addition to addressing important policy and research, the proposed studies are analytically innovative in the exploration of latent trajectory analysis (LTA) in the study of persistence in higher education. The technique is being increasingly used in social science research (Muthén & Muthén, 2000; Nagin, 1999); however, we are not aware of previous implementations of this analytic technique in the study of postsecondary persistence. LTA models characterize progress in postsecondary education by separating students into latent groups defined by persistence trajectories across time.

The first aim of the study, comparing persistence trajectories based on students' first institution data and students' multi-institutional data, will inform the debate regarding the use of retention and

completion rates in community colleges. Comparing postsecondary trajectories from first institutions and multiple institutions will inform the adequacy of single institution data for assessing retention and completion rates used in accountability measures. Critics of the use of community college retention and completion rates note that there are several problems with these measures, including factors beyond the control of the institution, student goals that do not include long-term persistence or completion of a degree or certificate, and a failure to account for part-time enrollment (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2005a; Wild & Ebbers, 2004).

The second aim of the study—identifying background experiences, educational experiences, and study habits that are associated with persistence—will increase the understanding of behavioral, psychological, and environmental data that contribute to persistence. Models from both the NELS and BPS data sets will include demographic variables, known risk factors, and financial data. The NELS data will be used to identify factors during secondary education that predict success in postsecondary education. The BPS analysis will focus on experiences during the first year of college that predict successful educational trajectories. The study of persistence and retention in community colleges has relied heavily on research conducted in four-year institutions and there is little empirical work to justify its applicability to community colleges (Braxton, Hirschy, & McClendon, 2004); despite the dominance of student integration and engagement theoretical perspectives, there is little empirical literature examining these perspectives with community college students (Bailey & Alfonso, 2005).

The results of the proposed research will serve as a basis for development of a survey instrument that will be used to assess the experiences of beginning community college students. The instrument will potentially serve many purposes. Data collected with the instrument can be used to deepen understanding of students' experiences during the critical early days and weeks of their college experience and to design and implement institutional plans to intentionally engage students entering colleges and successfully integrate them into the college environment. It can also be used to meet accountability requirements from governmental and accreditation entities. Staff of the Community College Survey of Student Engagement have previously established procedures that would be implemented for standardized administration and reporting; with this standardization, results from the new survey could be benchmarked across participating colleges.

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PROJECT DESCRIPTION

STATEMENT OF PROBLEM

Due to their relatively low cost and open-door admissions policies, American community colleges represent the only viable entry into postsecondary education for many students. The analyses that we propose herein focus on understanding and then improving first-year persistence in community colleges. Persistence in community colleges, particularly first-year retention, is markedly lower than in four-year institutions. There are more students that leave during their first year of community college and do not return to any institution during the next three years than there are students that leave at any point during their first three years in four-year institutions (Bradburn, 2003). Institutional first- to second-year retention rates among community college students are estimated at 52% (ACT, 2005). Students leaving community college in their first year or first term of college offer minimal opportunity for study in a sector that has historically been understudied relative to four-year institutions (Pascarella, 1997; Townsend, Donaldson, & Wilson, 2004). Yet, persistence in community colleges is critically in need of increased study as demands for accountability increase and the importance of postsecondary credentials to lifetime earnings and quality of life becomes ever more obvious.

Performance indicators are increasingly prominent in higher education, and retention is a core measure. There are currently 42 states that have in place or are considering performance-based funding in community colleges (Burke, 2002). Despite this, there is considerable controversy about how retention should be measured in community colleges (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2005a; Bailey et al., 2005b; Wild & Ebbers, 2004). Progress towards a degree is the most common student-assessment measurement by institutions of higher education, exceeding college-readiness skills, satisfaction, and general education competencies (Peterson, Augustine, Einarson, & Vaughan, 1999). However, students at two-year institutions have a variety of objectives in their educational goals, including professional certificates, associate degrees, or credit transferable to a four-year institution. Data from the BPS show that among students beginning their postsecondary education in the two-year sector, 17% indicated that personal enrichment was their primary reason for enrolling, and 23% indicated that obtaining job skills was their primary reason for enrolling. Thus, many community college students have goals that do not include degrees.

Wild and Ebbers (2002) argue that community colleges are in need of a retention definition other than the implicit degree completion definition borrowed from four-year institutions; furthermore, measures of student retention should include student goals, including periodic revisiting of those goals. Arguments against the usefulness of completion rates include the notion that factors such as students' social, economic, and even academic problems are beyond colleges' control; that many students are not seeking degrees, nor do they intend to transfer to four-year colleges; and that completion and transfer rates calculations typically do not account for multi-institution enrollment and part-time enrollment and are thus assessed over too short a period (Bailey et al., 2005a). Factors that negatively impact institutional completion rates include larger enrollments; relatively high shares of minority, part-time, and female students; lower expenditure per full-time equivalent undergraduate; and the state in which the institution is located (Bailey et al., 2005). While student goals are somewhat predictive of student outcomes, it is not the case that limited student goals are an adequate explanation of failures to persist (Bailey et al., 2005b).

Arguments precluding the strict use of completion rates as performance indicators present problems in establishing alternative definitions. While there are certainly many factors beyond institutions' control that impact postsecondary persistence, many of these factors are difficult to measure widely and accurately. Ewell's (1999) distinction between 'hard' statistics and 'second-order' statistics defines 'hard' statistics as being clearly enumerated and based on census-type data, such as numbers of students, graduates, and degrees awarded. 'Second-order' statistics measure phenomena that cannot be directly counted, such as student satisfaction and students' self-assessments of their behavior, and as such contain some statistical instability. Ewell argues that 'hard' statistics are preferable for performance funding because they are more statistically stable than 'second-order' statistics that are less stable and less direct measures of student outcomes.

Modeling persistence patterns in community college students is not constrained by the same factors as performance funding and undoubtedly does require a broader understanding of second-order data. The study of persistence in the two-year sector in general has either relied on models developed in the four-year sector (Tinto, 1993), used single-institution or within-state groups of institutions, or been based on descriptive data. While the factors that influence attrition in the four-year sector can reasonably be expected to be influential factors in the two-year sector, the relative importance of these factors is unlikely

to be equivalent. A recent review of the empirical evidence for Tinto's (1993) theory of student departure, for example, found that there are notable differences in the theory's applicability to the two- and four-year sectors (Braxton, Hirschy, & McClendon, 2004). Examining thirteen testable propositions in Tinto's theory, the authors report that there is robust empirical affirmation in the two-year sector for only one of the propositions – that is, student entry characteristics. There is, however, modest empirical support linking academic integration and departure. This assessment suggests that theoretical perspectives developed in the four-year sector do not apply equally to community colleges. However, there is a paucity of empirical literature examining social and academic integration in the two-year sector. Attempts to quantify the extent to which higher education research literature is biased towards understanding students in four-year institutions indicate that less than 10% of published research focuses on community college students. Of the 2600 studies reviewed in the seminal text, *How College Affects Students*, at most 5% of the studies focused on community college students (Pascarella, 1997), and a systematic examination of five major higher education journals found that only 8% of articles mentioned community colleges (Townsend et al., 2004). While the lack of fit for Tinto's (1993) model reported by Braxton, Hirschy, and McClendon (2004) may be due to either insufficient empirical literature on community college students or to the lack of generalizability of Tinto's model to community college students, both explanations suggest that further research is necessary.

A brief review of the literature from single-institution studies and within-state groups of institutions highlights several factors that should be considered in the continued investigation of community college student persistence. Factors include: college orientation (Glass & Garrett, 1995); coordinated studies programs (Tinto, Russo, & Kadel, 1994); academic preparedness (Grimes, 1997; Grimes & Antworth, 1996); remedial educational needs (Feldman, 1993; Hoyt, 1999); students' goals (Cofer & Somers, 2000; Fralick, 1993; Napoli & Wortman, 1998); financial aid, grants, and work study (Cofer & Somers, 2000; Hoyt, 1999; Makuakane-Drechsel & Hagedorn, 2000); financial independence (Cofer & Somers, 2000); and being a single parent (Hoyt, 1999). This review suggests that curricular factors, academic preparedness, clarity of goals, and finances all are related to persistence and should be examined in any general model of student persistence in community colleges.

The proposed study is informed by recent analyses by *CCSSE* staff. *CCSSE* is currently conducting a series of validation studies by examining the relationship of responses on the survey instrument, the Community College Student Report (CCSR) to external data sources containing measures of student outcomes. Three separate data sets of outcome data have been compiled: (1) Hispanic-Serving Institutions and members of Hispanic Association of Colleges and Universities (HSI/HACU), (2) data from the Florida Department of Education (FDE) for students at all Florida community colleges, and (3) data collected by JBL Associates for the Achieving the Dream initiative, involving 27 community colleges in five states (AtD).

Latent trajectory analysis (LGA) is a technique that is increasingly used in social sciences to identify latent groups that are defined by their change across time on a putative outcome measure. While it has been used to model several behavioral and psychological outcomes (Muthén & Muthén, 2000; Nagin, 1999), its use in higher education research is limited to date. Several widely used education outcome measures available from college transcripts could be modeled using this technique, including credit hours attempted, credit hours completed, semesters attended, and time to graduation. In our applications of LCGA, we have focused on credit hours completed to distinguish enrollment patterns.

The HSI/HACU and FDE datasets consist entirely of cases that match an ID provided by a CCSR respondent. The AtD data consists of complete cohorts of first-time college students at 27 community colleges, a small percentage of which were matched to IDs obtained from CCSR respondents. We explored the usefulness of LTA modeling with each of these data sets by modeling credit hours completed. For the HSI/HACU and FDE data sets, we modeled the first three years of college; the AtD data represented only the first two years of college as that was the extent of the available data. Figures 1 and 2 illustrate latent trajectory groups in the HSI/HACU and AtD data sets. In both figures, dashed lines represent the regression line representing that group and solid lines represent observed data.

Examining the trajectories of the different latent groups in Figure 1 reveals some striking differences between respondents in the AtD and the HSI/HACU. The graphical representation of the FDE model is not shown here due to space limitations and because the pattern observed in the FDE data set was nearly identical to those in the HSI/HACU data set. The similarity we observed between the HSI/HACU and FDE- in contrast to the AtD data-indicates that this contrast is likely due to the differences by which

the samples were obtained. All of the respondents in both the HSI/HACU and FDE data sets were students that completed the *CCSSE* in a spring semester in contrast to the AtD sample that consists entirely of beginning community college students. This difference indicates to us that latent trajectory groups represented in the AtD data are nearly nonexistent among *CCSR* respondents. Specifically, students that leave during or after their first semester are not represented among *CCSR* respondents. The difference between the AtD sample and the sample consisting entirely of *CCSSE* respondents reveals that students enrolled in the spring semester are fundamentally different from the population of students beginning postsecondary education at community colleges. There were far higher rates of students that dropped out in the first semester in the AtD cohort than were observed in the HSI/HACU and FDE datasets. Of the factors that distinguish between the AtD dataset from the HSI/HACU and FDE datasets, the sampling is undoubtedly a factor. The high numbers of dropouts prior to the second semester illustrates the need for obtaining data on students as early as possible in their college careers. The lack of representation among students that leave college early also presents the possibility of a ceiling effect whereby the students that we are able to reach in the spring semester are more engaged than those not reached. To a large extent, these students have exhibited some persistence. To understand the extent to which the activities, experiences, and study habits of students predict their persistence, it is necessary to understand how they differ from the students that do not succeed.

These examples illustrate the value of LTA modeling. Respondents are characterized not simply by the number of credit hours they accumulate, but also by the patterns by which they accumulate them. For example, in Figure 1, there are multiple trajectories that represent persistence, but each represents a distinct pattern of persistence. Classes 3 and 4 are nearly identical for the first two years, but at the third year, Class 4 members depart the institution. In contrast to the vast majority of modeling in social science research that models variation around a measure of central tendency, such as a grand mean or intercept parameter, LTA models account for the possibility that data is better modeled with multiple intercepts that represent the multiple components of complex distributions.

There are two important limitations to our existing data. The first limitation is that there is virtually no behavioral data from students that depart early. The behavioral data that we obtain from the *CCSSE* administrations is collected in the spring semester and therefore, nearly all students have at least

Figure 1: Latent Postsecondary Persistence Trajectories for Hispanic Serving Institutions and Hispanic Association of Colleges and Universities

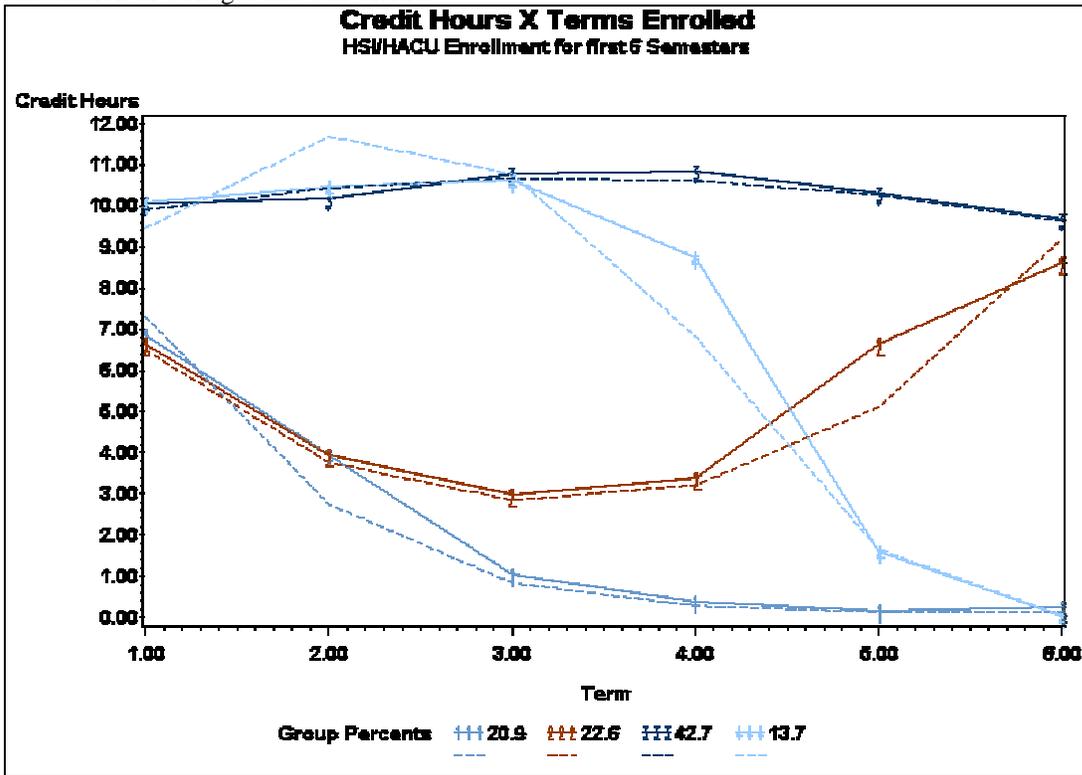
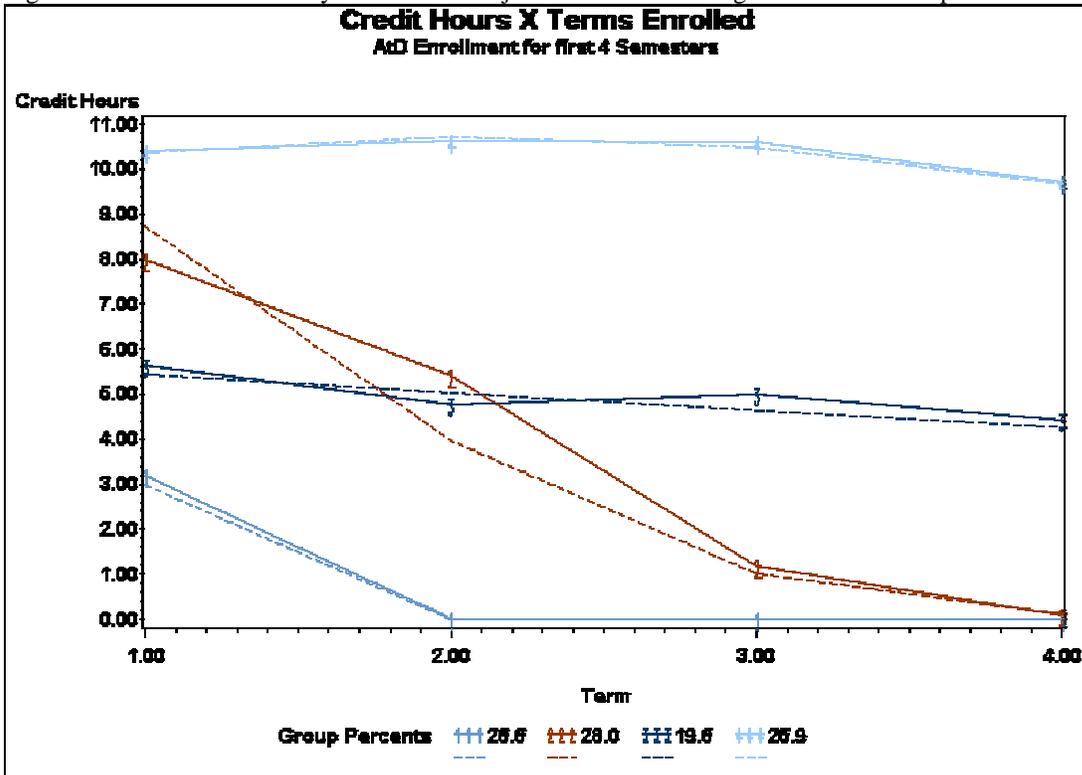


Figure 2: Latent Postsecondary Persistence Trajectories for Achieving the Dream Participants



one semester of college and thus have exhibited some persistence. The LTA model for the AtD data illustrates that there is a large portion of students that leave college in the first semester. Despite being a rich data set, the AtD data is primarily actuarial data; intriguing patterns, such as those exhibited in Figure 2, are difficult to interpret without soft data that describes students' behaviors, attitudes, and goals.

The second limitation to our existing data is that there is virtually no information about transfer between institutions. Multi-institutional data is critical for understanding if a student's departure from an institution represents a successful or unsuccessful outcome. For example, a student that completes a single course at a community college while simultaneously enrolled at another college and who continues to be enrolled represents a successful educational trajectory in contrast to a fulltime student that passes only one course and drops out after the first semester. By defining educational trajectories as credit hour accumulation from a single institution, we are not able to capture multi-institutional persistence and artificially categorize trajectories based on data from single institutions. Using NCES datasets such as the BPS and NELS will serve to improve our understanding of these growth trajectories because the data track individual students across postsecondary institutions and contain rich behavioral data for their secondary and early postsecondary education.

The proposed analysis plan will serve to guide the development of a community college beginning student survey. There are several possibilities for when the survey could be administered. Those include prior to first semester enrollment; at the point of first semester enrollment; and early in the first semester of enrollment. Surveying students prior to their first semester has the advantage of understanding how their background and attitudes predict how they engage early in college. Surveying students at first semester registration captures their background experiences and their concrete plans for college coursework. Surveying students early in their college experience will add the ability to understand their initial behaviors as students and their earliest experiences with their college.

PROPOSAL OF WORK

The proposed research will use the BPS data set to assess the adequacy of existing models of attrition and develop models with applications for assessment in the two-year sector in three steps:

- Step 1. Establish LTA models with the NELS and BPS data sets for first institution and multi-institutions trajectories

- Step 2. Develop a model that examines the impact of students' prior academic preparation, experiences, and characteristics using the NELS data.
- Step 3. Develop a model that examine the impact of students' experiences in the first year of college using the BPS data.

LTA models will be developed using data from the NELS and BPS data sets. The trajectories will measure progress across postsecondary education by modeling persistence as a function of enrollment. The BPS has several possible outcomes that are measured at each year of the study that could be used for LTA modeling. The outcome that will be investigated first is the number of months per year that students are enrolled at any institution full-time (ENFTYX0- ENFTYX6) or part-time (ENPTYX0- ENPTYX6). Enrollment will be modeled as number of full time equivalent month. Number of months enrolled does not have the level of detail that can be obtained from transcript data, but is a reasonable approximation of persistence to degree. Latent trajectories for NELS participants will be constructed from course-level data obtained from the NELS: 88/2000 Postsecondary Education Transcript Study (PETS). Trajectory models will be constructed by modeling the number of credits completed for each semester enrolled in college. Secondary models will also be constructed to assess the adequacy of the BPS models that are based on annual months enrolled. Similar patterns should emerge for the credit hours earned and months enrolled if months enrolled is a reasonable proxy for credit hour accumulation.

Variables that have been demonstrated to predict persistence in prior research will be considered for all analyses. These include the following risk factors: delayed entry to postsecondary education, part-time attendance, full-time employment, financial independence, dependents, single parenthood, and absence of high school diploma (Horn, 1996). Other variables examined in previous research include academic preparedness as assessed by standardized test scores, race, sex, and remedial coursework. The variables that are of primary interest for developing a new survey instrument include questions assessing frequency of behaviors related to social and academic integration, and educational satisfaction.

All factors demonstrated to predict persistence in prior research that are examined in the BPS data set will also be considered in the NELS data set. Where proxy or derived measures are required, an attempt will be made to approximate measures between the BPS and NELS data as closely as possible to ensure model comparability. NELS data will also include a number of variables that describe students'

experiences and goals prior to postsecondary education. These include hours of homework in English, math, science, and social; enrollment in vocational, remedial, and honors courses; experiences with crime, fights, Alcohol, tobacco, drug, and premarital sex; religious, sports, reading, or hobby activities; advanced placement and college admissions; and future expectations.

The first phase of developmental trajectory model building is to determine the optimal number of developmental trajectory groups in the sample. We will use PROC TRAJ, a user-written SAS procedure (Jones, Nagin, & Roeder, 2001) to identify between group differences in developmental trajectories. PROC TRAJ is a semi-parametric, group-based model of a mixture of probability distributions in which groups are derived from underlying component probability distributions. Developmental trajectories are defined as clusters of individuals that shared similar intercepts and slopes where slopes were defined by time in college. Bayesian Information Criterion (BIC) will be used to assess model adequacy across a range of models that differed in the number of developmental trajectory groups and the polynomial slope parameters in the growth trajectory. We will use a SAS macro written by *CCSSE* staff to examine models with a range of groups and a range of complexity in the shapes of trajectory parameters. The number of polynomial slope parameters for time determines the shape of the developmental trajectory. We will consider zero to three slope terms, where zero represents an intercept-only model with no change across time, one slope represents linear change, two slopes represent quadratic change, and three slopes represent cubic change. A series of models will examine model fit for one through eight latent trajectory groups to determine the optimal number of groups.

After LTA models are established, exploratory factor analyses will be conducted on groups of similar survey items. Means will be derived from groups of items within factors. The purpose of this factor analysis is not to establish a model of latent constructs, but rather, its primary use is to eliminate the high degree of multicollinearity that is typically observed among similar items, such as satisfaction items.

The final phase of model development for both the NELS and BPS LTA models will be conducted with discriminant function analysis. Discriminant function analysis is used to identify variables that distinguish between predefined groups. The latent trajectory groups are the predefined groups in this analysis. Because of the large number of variables in the planned analysis, a stepwise selection will be

used to measure demographic and risk factor variables. After pruning non-predictive variables in this phase, we will enter variables measuring behaviors, experiences, and other subjective measures.

DISSEMINATION PLAN

The results will be shared to a variety of audiences through conference presentations, journal articles, and the *CCSSE* Web site (www.ccsse.org). Conference proposals will be submitted for the 2007 AIR Forum in Kansas City, the 2007 Council for the Study of Community Colleges in Tampa Bay, and the 2007 American Association of Community Colleges Annual Convention in Tampa Bay. The analyses will also be the basis for at least three scholarly papers. The first paper will compare LTA models for first institution with multi-institutional data to examine the misclassification of trajectory classes that potentially arises from only examining data from a single institution. The second paper will use NELS data to examine the extent to which high school academic and non-academic activities; academic preparation; and academic goals predict latent trajectory groups beyond that explained by student entry characteristics. The third paper will examine the extent to which academic goals, engagement in social and academic activities at postsecondary institutions, and curricular features predict latent trajectory groups beyond that explained by student entry characteristics.

POLICY RELEVANCE

The results of the proposed analyses will be of interest to state and federal policy makers who are developing accountability measures relevant to postsecondary persistence. The comparison of first institution LTA models and multi-institution LTA models directly examines the extent to which single institution data is a viable assessment of student persistence. If there are substantial numbers of students that appear to leave college early in the single institution model, but persist in the multi-institution model, this will indicate that single institution data is insufficient for accountability measures. A need for multi-institutional data to track persistence would support the need for a national database of student enrollment data.

Although we agree with Ewell's (1999) statement that hard indicators are better suited for performance funding due to their statistical properties, we believe that that the available hard indicators alone are inadequate for assessing student outcomes in community colleges. A fundamental problem with any 'hard' statistic measuring student outcomes is that identical data can represent a success for one student

and a failure for another (e.g., a single semester of attendance with no subsequent enrollment can represent successful goal completion for one student and represent dropping out for another). While acknowledging the statistical instability of second-order statistics, we believe that understanding ‘hard’ statistics can only be accomplished with accompanying second-order statistics that clarify why students are in college. In particular, student’s goals should be considered in measures of persistence; moreover, if the models demonstrate that students’ goals significantly increase our understanding of persistence pathways, Wild and Ebber’s (2002) suggestion of including goals in a definition of community college retention should be seriously considered. Additionally, we believe that survey data measuring academic and social engagement should be used to inform investments in programs and activities that stimulate and increase such behaviors.

INNOVATIONS

The proposed studies provide two substantial innovations to higher education literature: (1) an exploration of LTA models for characterizing persistence pathways, and (2) a thorough examination of factors predicting persistence in community colleges. Pathway is a term frequently used in higher education literature to describe multi-institution enrollment and transfer patterns that are common among students in higher education. While there is little controversy that there is a variety of enrollment patterns among college students, pathways have rarely been explicitly characterized. LTA is an organic perspective on student persistence that provides a view of how students transition through postsecondary education. The research and policy practice of defining educational progress or pathways by transition points imposes a definition that may not account for the various ways that students utilize institutions of higher education. As has been noted previously, the variety of goals and background characteristics represented within community college students defies a homogenous definition of success. LTA modeling allows researchers and policy makers to examine how students are making use of postsecondary institutions and thus better understand the students’ perspectives. The modeling approach has the potential to be widely used in higher education to better understand pathways that characterize student enrollment.

Understanding persistence in community college has relied heavily on empirical work done almost entirely on students at four-year institutions. This is at least in part due to a paucity of research focusing on community college students (Pascarella, 1997; Townsend et al., 2004). A review of the empirical support for applying models developed with four-year institution students to students in community colleges

reveals that there is inadequate support to make this assumption (Braxton, Hirschy, & McClendon, 2004). Whether the lack of support is due to fundamental differences between students at four-year institutions and community colleges or is due to insufficient research on community college students, there is a need to better understand how academic and social integration in institutional environments predicts persistence in community college students.

AUDIENCES

The intended research findings are of particular relevance to institutional researchers, community college faculty and staff, and institutional planners. For institutional researchers, the results will provide a guide for understanding the factors that matter most in early retention efforts and therefore establish performance indicators that are most important to collect. Results will inform staff and faculty about the experiences and environment that foster success and can guide the ways in which they advise and interact with beginning students. For institutional planners, the results will inform efforts to integrate beginning students into the college environment. By understanding the experiences of high risk students that succeed, planners can intentionally structure the experience and environment of beginning students so that they engage with an institutional environment that fosters success. Researchers in higher education will also find the models relevant. In particular, the introduction of LTA models to the analysis of transcript data is a cutting edge exploration of understanding differences in enrollment patterns from nearly universally available transcript data. In addition to potential audiences, the results will be internally useful to *CCSSE* staff and any external advisors that assist in the development of a beginning student survey for community college students. This research is a direct attempt to identify the factors that are most highly predictive of success in college and will thus serve as a basis for developing a questionnaire that will measure student experiences that are directly related to student success.

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BIOGRAPHICAL SKETCHS

Dr. C. Nathan Marti

Dr. Marti has been a Senior Research Associate with the Community College Survey of Student Engagement (*CCSSE*) since 2002. Prior to that, he has most recently worked as a statistical consultant at the University of Texas at Austin and has experience in state government and doing market research in the private sector. He received his Ph.D. in 2001 in developmental psychology from the University of Texas at Austin. He received his undergraduate degree from The Evergreen State College (*TESC*) in Olympia, Washington. At *TESC*, he developed an interest in best practices in higher education and collaborative learning by being a student in the innovative learning communities around which *TESC*'s curriculum is based.

Dr. Marti has experience in a wide array of quantitative tools and methods and has applied them in a variety of basic and applied research settings. He is proficient with the SAS system, SPSS, HLM, Stata, and Mplus, and has experience with SUDAAN, Amos, R, and SPlus. In his prior position with the University of Texas' Research Consulting Group, Dr. Marti provided consulting help to students, faculty, and staff from a broad array of academic disciplines. In that position, he also developed and taught courses on statistical software, including, HLM, SAS, and SPSS.

Dr. Marti has participated in all phases of survey data collection in analysis and has worked with weighted survey data in several projects. He was the lead in developing an annual survey of information technology use and satisfaction at the University of Texas. In that project, he developed the survey instrument with input from key stakeholders, pulled a stratified random sample, and developed the weighting scheme. In his current work with *CCSSE*, he has worked on a process for selecting random stratified cluster samples and developed a weighting scheme to account for the bias in the overrepresentation of full-time students in the *CCSSE* sample.

Dr. Marti also has extensive experience with modeling longitudinal data with multilevel models. He has served as a consultant on an alcohol prevention study conducted by Eric Wagner at the Florida International University and a psychoeducational sexuality education program for parents of children with mental retardation developed by Michelle Ballan of Columbia University. He has also used conducted

meta-analyses of eating disorder prevention studies and weight reduction intervention studies for Eric Stice of the Oregon Research Institute.

In his current position with *CCSSE*, Dr. Marti has developed substantive interest in the experience of community college students. He has presented analyses at several institutional research and higher education conferences, including the AIR Forum, the Southern Association of Institutional Research, and the Rocky Mountain Association of Institutional Research, the Council for the Study of Community Colleges, the Association for the Study of Higher Education, and the American Higher Education Research Association. His interests have focused on identifying clusters of community college students through latent class analysis and examining outcomes in relationship to those clusters as well as analyzing engagement in nontraditional and first generation students. He has recently coauthored an article on part- and full-time community college faculty that was accepted for publication in the *Community Review* and has recently completed an article on the psychometric properties of the *Community College Student Report*.

Kay M. McClenney

Kay McClenney is Director of the Community College Survey of Student Engagement and an adjunct faculty member in the Community College Leadership Program (CCLP) at The University of Texas at Austin. Also within the CCLP, she directs the Ford Foundation's coordinating team for the national Community College Bridges to Opportunity Initiative and the MetLife Foundation's national student retention project. She is also Senior Associate with The Pew Forum on Undergraduate Learning and a Distinguished Senior Fellow at the Education Commission of the States (ECS), where she served as Vice President and chief operating officer from 1990 to 2000.

Dr. McClenney has served as a consultant to education institutions, state higher education systems, state government, and professional associations in 48 states and internationally. In addition, she served for nine years as a community college educator, during which she was a faculty member, system administrator, and interim CEO.

A frequent keynote speaker, Dr. McClenney has also authored numerous publications on education issues, strategic planning, accountability, and assessment. She currently serves on the National Advisory Boards for the National Survey of Student Engagement at Indiana University, the College and

Careers Transition Initiative funded by the U.S. Department of Education and the project on Building Engagement and Attainment of Minority Students at the Higher Education Policy Institute.

She earned her Ph.D. in educational administration from the Community College Leadership Program at the University of Texas at Austin, and she has been named a Distinguished Graduate of that program. Her previous degrees include a B.A. from Trinity University and an M.A. in Psychology from Texas Christian University.

Dr. McClenney served as a member of the Board of Directors of the American Association of Community Colleges (AACC) and the Executive Board of the American Association of Women in Community Colleges (AAWCC). She was the recipient of the 2002 PBS O'Banion Prize for contributions to teaching and learning in America.

Dr. McClenney's vast amount of experience in educational policy making is an enormous asset to the defining the practical application of the proposed models to assessment applications. She has vast experience with applying research results to policy decisions as exemplified by her recent work as director of *CCSSE* and the MetLife Foundation's national student retention project. Her contributions to the present research will ensure that models are of high policy relevance and results lead to potentially actionable outcomes.

Lin Tao

Lin Tao is a graduate research assistant at *CCSSE* and doctoral candidate in Operations Research at the University of Texas at Austin. She earned a B.A in Business English from Southeast University, China and a master's degree in Statistics from Michigan Technological University. She has been contributing her statistical expertise to *CCSSE* validation studies on the relationship between student characteristics (e.g., low income status, students of color, and developmental status, etc.) and engagement. As part of the project funded by the Ford and Lumina foundations, her work on the project entailed programming in the SAS language to standardize for analysis three *CCSSE* datasets, the Achieving the Dream Database, the Florida Community College System Student Database and the HSI/HACU consortium, as well as helping processing the statistical analysis. She helped programming the trajectory analysis of student enrollment and studying the relationship between the enrollment and characteristics

including transfer to 4 year college, financial sources, first generation and GPA. She also assisted studying the linear relationship between the student engagement and developmental and gatekeeper courses.

PROPOSED BUDGET

| | | |
|--|----------------|-----------------|
| Personnel | | |
| Principle Investigator: Dr. Marti | | |
| 2.5-FTE months at \$5439/month | \$13,598 | |
| Co-principal investigator: Dr. McClenney | | |
| .15-FTE months at \$15,245/month | \$2,287 | |
| Graduate Research Assistantship | | |
| 2.5-FTE month at \$1560/month | <u>\$3,900</u> | |
| Total Salaries and Wages: | | \$19,785 |
| Fringe Benefits @ 25% | \$4,946 | |
| Total Fringe Benefits | | \$4,946 |
| Travel | | |
| 2007 AIR Forum, Kansas City | \$900 | |
| 2007 AACC, Tampa Bay | <u>\$1,400</u> | |
| Total Travel | | \$2,300 |
| Publication Costs and Dissemination | \$500 | |
| 12 months Tuition Reimbursement @ \$2149 | <u>\$2,149</u> | |
| Total Other Direct Costs | | \$2,649 |
| TOTAL AMOUNT OF AWARD | | \$29,680 |

BUDGET JUSTIFICATION

The principle salary requirements are for Dr. Marti who will be the primary analyst and author of scholarly papers derived from the proposed analyses. Travel requests are made in order to disseminate results from the proposed research. Operating costs reflect the anticipated expenses associated with dissemination of written and electronic materials. Tuition reimbursement reflects required contributions by the funding agency to grant-funded research conducted at the University of Texas.

CURRENT AND PENDING SUPPORT

Current and Pending Support

A. Current Support

Source: Lumina Foundation
Project: CCSSE Validation Study
Duration: September 1, 2004 – August 31, 2006 Amount: \$250,000
2 months per year for L. Tao
1.5 months per year for K. McClenney
3.5 months per year for C. N. Marti

Source: Lumina Foundation
Project: Achieving the Dream
Duration: November 1, 2005 – September 30, 2009 Amount: \$1,000,000
4.8 months per year for K. McClenney

Source: Ford Foundation
Project: Bridges to Opportunity (supplement)
Duration: July 1, 2005 – September 30, 2006 Amount: \$550,000
1.8 months per year for K. McClenney

Source: MetLife Foundation
Project: MetLife – Best Practices in Student Retention
Duration: November 1, 2004 – June 30, 2006 Amount: \$250,000
.75 months per year for K. McClenney

B. Pending Support

Source: League for Innovation
Project: Community College Transitions Initiative (CCTI)
Duration: January 1, 2006 – December 31, 2006 Amount: \$10,000
.5 month per year for K. McClenney

FACILITIES, EQUIPMENT, AND OTHER RESOURCES

The facilities at the Community College Survey of Student Engagement at the University of Texas at Austin will be used for all analyses and writing. We possess the necessary hardware and software to complete the proposed research plan. The University of Texas is a Carnegie I Research University that possesses excellent computer equipment necessary for the proposed research and possesses site licenses for the software, such as SPSS and SAS that will be used for the project.