

2008 AIR/NCES/NSF/NPEC RESEARCH GRANT PROPOSAL

**The Impact of Personal, Structural, and External Factors on the Transfer
and Degree Attainment among Hispanic Students**

Grant Amount Requested: \$39,988

Database: Beginning Postsecondary Student Longitudinal Study

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Project Summary

Improving access and success of Hispanic students at all postsecondary levels has been declared a national priority by the Clinton and Bush administrations (Fry, 2004). Hispanic students are currently disproportionately represented at two-year colleges (Chronicle of Higher Education, 2001; Nora, Rendon, & Cuadraz, 1999), are over-represented in developmental courses, and are subsequently less likely to successfully transfer to a four-year institution or earn a college degree (Wirt, Choy, Rooney, Provasnik, Sen, & Tobin, 2004). In turn, a noticeable decline in the percentage of community college students transferring from the community college to the university has been witnessed over the past thirty years despite research findings that 85% of Hispanic students who attend two-year institutions view the institution as a first step to obtaining an undergraduate degree (Rendon & Nora, 1997).

Although research on the variables influencing the transfer and persistence of Hispanic students is in its infancy stages, the current literature points to several key factors influencing the overall academic success of students including: academic performance in college (e.g. Nora, 2004; Nora & Cabrera, 1996; Nora, Cabrera, Hagedorn, & Pascarella, 1996; Hu & St. John, 2001); educational aspirations (e.g. Cabrera, Nora & Castaneda, 1993; Nora, Castaneda, & Cabrera, 1992); pre-college experiences (Pascarella & Terenzini, 1990); financial assistance (Cabrera, Nora & Castaneda, 1993; Cabrera, Stampen, & Hansen, 1990; Stampen & Cabrera, 1988); social and academic experiences (Nora, 1987; Rendon, 1994); environmental pull factors (Nora, Cabrera, Hagedorn, & Pascarella, 1999); and familial support and encouragement (e.g. Cabrera, Nora, & Castaneda, 1993; Nora, 1987; Nora & Cabrera, 1996).

Despite the prevalence of Hispanic students in developmental programs, to date no studies have isolated the impact of developmental coursework on transfer, persistence and degree completion within the context of a comprehensive theoretical model of Hispanic community college students. The primary focus of grant activities will be to examine a longitudinal model of college transfer, persistence and degree attainment among Hispanic community college students who began their higher education enrollment in developmental courses using the Beginning Postsecondary Student Longitudinal Study (BPS: 04/06) data files. More specifically, the proposed model will examine the impact of individual pre-collegiate factors, structural characteristics of the campus setting (including enrollment in developmental coursework), and external environmental factors that are believed to predict transfer and degree attainment among Hispanic students.

Covariance modeling will be utilized to test the proposed quantitative structural model and the underlying explanatory patterns among the hypothesized variables. The focus of the analysis will center on estimating path coefficients that have direct and indirect effects on selected outcomes (i.e. transfer, persistence, degree attainment). Goodness-of-fit indices will be used to determine the overall validity of the hypothesized model, and t-values and modification indices will be used to determine the best-fitting path coefficients for the individual predictor variables in the final reduced model.

The gap between Hispanics and other racial and ethnic student groups has not narrowed much over the past years. Differences in participation rates, persistence rates and degree attainment continue to indicate that there is still much to be learned regarding the academic preparation, adjustment and performance of Latina/o students in higher education, particularly those who begin their introduction into a postsecondary setting through the two-year sector. Empirical and theoretically-based evidence is necessary to guide policy, intervention efforts and practices aimed at achieving equity in higher education among Hispanic students.

Results of the present study will be therefore important to researchers, administrators and policy makers who are interested in achieving equity in higher education among Hispanic students. Interventions and policies designed to improve success of Hispanic students in higher education should be informed by research using longitudinal, nationally representative databases such as the BPS Longitudinal Study. Findings will provide theoretically-driven results produced from sophisticated statistical analyzes, which will provide institutional researchers with a better understanding of the multi-dimensional components of Hispanic students' academic experiences. Moreover, results will benefit college administrators who are interested in developing theoretically-sound interventions designed to improve the academic success of Hispanic community college students enrolled in developmental coursework.

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Project Description

Improving access and success of Hispanic students at all postsecondary levels has been declared a national priority by the Clinton and Bush administrations (Fry, 2004). According to the 2000 Census, there are 35.3 million Hispanics living in the United States, a near 60% increase from just ten years earlier (Pew Hispanic Center, 2005). Unfortunately, Hispanics lag behind other groups educationally (Fry, 2004). Figures from the 2000-01 California Postsecondary Education Commission (CPEC) provide a sobering illustration of Hispanic postsecondary educational pathways in the state. According to CPEC, of every 100 Hispanic students who graduate from California high schools only 40 enroll at a post-secondary institution. Of these 40 students, 30 begin at one of the state's community colleges (CCC), 3 are admitted and enroll at the University of California (UC) and 7 at California State University (CSU) system campuses (Solorzano, Villalpando & Oseguera, 2005).

Unfortunately, the figures present in California appear to be reflective of Hispanic students around the country as Hispanic students are disproportionately represented at two-year colleges (Chronicle of Higher Education, 2001; Nora, Rendon, & Cuadraz, 1999). Once there, students attending community colleges face obstacles different from most students attending four-year institutions. Community college students usually do not live on campus, are not active in social activities with peers, and do not attend college full-time, which are all factors leading to degree attainment (Cohen & Brawer, 2003). In addition, many students do not receive adequate academic and social support, and as a result do not persist to graduation (Astin, 1984; Hurtado & Carter, 1997; Nora, 1987; Pascarella & Terenzini, 1976). Moreover, community college students also enroll with lower levels of academic preparation and achievement in high school compared to four-year students (Bailey & Alfonso, 2005) making successful transfer to a four-year institution difficult.

A noticeable decline in the percentage of community college students transferring from the community college to the university has been witnessed over the past thirty years. For instance, in contrast to over 40% of students participating in transfer programs in the 1970's, it is currently estimated that only 15 to 20% of students actually transfer to a four-year institution (Dougherty, 1992; Nora & Rendon, 1998). While the percentage of students participating in a transfer program may be disheartening, it is even more discouraging when those figures are contrasted with findings from the National Center for Urban Partnerships database that indicates 85% of Hispanic students who attend two-year institutions view the institution as a first step to obtaining an undergraduate degree (Rendon & Nora, 1997). Among those are Latino students required to enroll in developmental courses prior

to registering in credit bearing courses that can be applied to a degree and can be transferred to a four-year institution.

Recent research has shown community college students are 10 to 18% more likely to drop out of college when compared to students attending four-year schools, even after controlling for background, ability, high school grades, and aspirations toward a college degree (Dougherty, 1992). Several factors have been identified as contributing to the low persistence and transfer rates among community college students. However, there are two major omissions in the literature: (1) those factors have not been examined specifically among Hispanic community college students and (2) the influence of remediation, coupled with factors found in prior studies, on student persistence and transfer among Latinos enrolled in the two-year higher education sector has not been investigated.

Developmental education is a critical component in serving community college students (Higbee, Arendale, & Lundell, 2005). Transcripts of high school seniors in 1992 who enrolled in college between 1992 and 2000 show that 61% of students who first attended a two-year college completed at least one developmental course. More recently, it has been estimated that the percentage of students requiring remediation upon entering the community college sector may be as high as 80% (A. Nora, personal communication, June 29, 2006). Data from *Remedial Education at Higher Education Institutions* (Smith, Young, Bae, Choy, & Alsalam, 1997) report that 78% of higher education institutions offered at least one remedial reading, writing or mathematics course. Moreover, one hundred percent of public two-year institutions and 94% of institutions with high minority enrollments offered developmental courses in 1995.

Advocates of remediation believe that these institutional efforts provide several benefits to students, including their impact on persistence (Boylan, Bonham, & Bliss, 1994; Brattin, 1993; England, 1993; Wyatt, 1992). However, recent findings indicate that students who complete developmental coursework are less likely to earn a degree compared to students who do not receive remediation (Wirt, Choy, Rooney, Provasnik, Sen, & Tobin, 2004). High remediation rates appear to be an enormous challenge for community colleges in part because a student's pre-college academic preparation is the most powerful predictor of the quality, type, and standard of instruction and curriculum offered in a community college (Cohen & Brawer, 2003).

The effectiveness of developmental education may be also linked to the perceptions, attitudes, and values that developmental students have with regard to remediation as developmental students who do not value the utility of remediation have been found to be at risk of dropping out (Nora & Garcia, 1999). Research by Morawski and

Brunhuber (1993) found that “students who have a positive self-concept view reading as enjoyable, motivating, and relevant, while students who have a negative self-concept view reading as stressful, discouraging, meaningless, and anxiety laden” (p. 43). Morawski and Brunhuber’s (1993) study noted the link between self-concept and reading achievement and that failure in reading might be a behavioral manifestation of poor self-concept. Moreover, attitudes and perceptions that developmental students have regarding themselves as learners, their attitudes about developmental programs, and the manner in which they perceive their relationships and interactions with faculty and peers have not been explored.

Current research (i.e. Boylan, Bonham, & Bliss, 1994; England, 1993; Heerman & Maleki, 1994; Morawski & Brunhuber, 1993; Wyatt, 1992) has failed to uncover whether enrollment in developmental classes fosters student perceptions that affect not only their academic progress in developmental courses, but their persistence to graduation as well. Moreover, the overall effectiveness of developmental education programs has not been properly evaluated. As such, research is needed to track students, who enroll in developmental education courses to credit-bearing classes, and successful persistence and transfer to a four-year institution (Higbee, Arendale, & Lundell, 2005). At the same time, there is also a need to better understand the current issues surrounding access and the in- and out-of-college experiences, which lead to persistence for Hispanic developmental students. More specifically, an understanding of the multi-dimensional components of Hispanic students’ academic experiences is critical (Castellanos & Jones, 2004).

Review of Related Literature

Although research on the variables influencing the transfer and persistence of Hispanic students is in its infancy stages, the current literature points to several key factors influencing the overall academic success of students including academic performance in college, educational goal commitments, pre-college experiences, financial assistance, social and academic experiences, environmental pull factors, and familial support and encouragement. The literature indicates that the most influential factor on a Hispanic student’s decision to persist is his or her *academic performance* (i.e. cumulative grade point average) during their first year in college (Nora, 2004; Nora & Cabrera, 1996; Nora, Cabrera, Hagedorn, & Pascarella, 1996; Hu & St. John, 2001). Conversely, research has also shown that Hispanic students are more likely to persist as college GPA increases. Research by Nora, Kraemer, and Hagedorn (1997) and Hu and St. John (2001) substantiated the importance of academic performance on the persistence decisions of non-traditional Hispanic students, finding that the grade point average of these

students had a significant and positive direct influence on those students' decisions to remain in college. Moreover, Nora and Cabrera (1996) found that not only did the academic achievement of Hispanic students have a positive impact on persistence, but that even the perceptions that they had made cognitive gains during their first year in college were influential in a Hispanic student's decision to remain enrolled in college.

Another influential factor on both Hispanic and non-Hispanic students' decision to remain enrolled in college are *students' educational aspirations*. Research has established that Hispanic students' educational hopes play a part in a student's decision to remain in college (Cabrera, Nora & Castaneda, 1993; Nora, Castaneda, & Cabrera, 1992). At the same time however, circumstances have been identified that negatively influence the educational aspirations of Hispanic students. These factors include having to deal with family responsibilities, working off-campus as opposed to on-campus, commuting long distances to a college campus, performing poorly in coursework, and perceiving a sense of prejudice and discrimination on a campus (e.g. Cabrera & Nora, 1994; Cabrera, Nora & Castaneda, 1992; Nora, 2002, 2004; Nora & Cabrera, 1996; Nora & Lang, 2001).

Although not specific to Hispanic students, research utilizing Tinto's (1987, 1993) model of student persistence has consistently shown *pre-college factors*, operationally defined as student's entering academic ability, high school rank at time of graduation and desire to attend college, to influence students' decisions to remain enrolled in college (e.g. Pascarella & Terenzini, 1990). Moreover, Nora and Lang (1999) identified a set of high school psychosocial experiences engaged by students prior to enrolling in college as representing pre-college student characteristics. The authors found that past leadership experiences, anticipatory attitudes to attend college, a student's sense of his or her social self-efficacy, close personal relationships with peers, and the importance of attending college expressed by parents significantly impacted a student's transition to a college environment as well as the student's decision to persist.

The impact of *applying and receiving financial aid* within the student persistence process is also well-established (Cabrera, Nora & Castaneda, 1993; Cabrera, Stampen, & Hansen, 1990; Stampen & Cabrera, 1988). Hu and St. John (2001) examined the effects of receiving financial aid on the persistence of Hispanic, African American and white students. Their findings confirmed that the receipt of financial assistance serves an important role in equalizing the playing field and providing opportunities for Hispanic and African American students. In comparing the odds of persisting between those that had received a financial aid package versus those students of each

ethnic/racial group that did not receive aid, Hispanic and African American students who received financial aid were more likely to persist than their non-financial aid counterparts.

Studies on minority and non-minority students in two- and four-year institutions reveal some overall conclusions regarding the importance of social experiences of Hispanics and their relationship to student persistence. Nora (1987) found that the influence of *social experiences*, at least in a small way, impacted Hispanic students' decisions to remain enrolled in college. Similarly, in Nora and Cabrera's (1996) study on the role of perceptions of prejudice and discrimination within a theoretically -based model of college persistence, the authors hypothesized that social interactions with peers and faculty positively influenced student persistence decisions equally for majority and non-majority college students. In contrast to what had previously been established among white student populations, Nora and Cabrera found that social experiences only had a minimal indirect effect on the persistence of minority students as opposed to Whites where the effect was much more direct. Moreover, Nora, Cabrera, Hagedorn, and Pascarella (1996) found that student interactions were not significantly related to the persistence of minority students. The indication is that factors other than the social integration of Hispanic students in college may be more important in deciding whether to return to college for a second year. As such, social experiences of Hispanic students are thought to play a much lesser role within the persistence process.

In contrast, constructive *academic experiences* during the first year of college have been shown to play an important role in enhancing Hispanic students' commitment to earn a college degree and to remain in college. Rendon (1994) found that when Hispanic students were engaged in positive and validating classroom and laboratory experiences, study groups and academic discussions, they were more likely to stick to their goals and to continue to return to college for another academic year. Similarly, in one of their earlier studies, Hurtado, Carter, and Spuler (1996) focused on those features that affected Hispanic students' adjustment and attachment to college. One measure of adjustment to college concentrated on academic integration. The authors found the size of the Hispanic population at a university and the students' perceptions of their interactions with faculty positively influenced the academic adjustment of Hispanic students. A large concentration of Hispanic student enrollment and positive interactions between students and faculty were identified as two major reasons contributing to the retention of Hispanic students.

Early on in the research on student persistence, Nora and Wedham (1991) proposed that a set of *environmental factors* would exert a "pulling away" or a "drawing in" of students into the academic and social

campus environments and that, subsequently, these pulls would impact on a student's tenacity to continue a college education. These pulls centered on factors external to university life: having to work off-campus immediately before or after classes, family responsibilities (i.e. taking care of children, siblings, parents or their entire family), and having to commute to campus. The findings revealed that while working on-campus resulted in a positive pull by providing the opportunity to interact with faculty and peers, working off-campus only increased the chances of dropping out of college. Nora, Cabrera, Hagedorn, and Pascarella (1999) later examined differences between minority and non-minority male and female students on a national sample of two- and four-year institutions on those pull factors earlier identified by Nora and Wedham (1991). Hispanic and African American students who commuted large distances to campus, who left campus to work elsewhere, and who assumed responsibility to take care of family members before or after classes were less likely to persist in college. The pulling away brought on by family responsibilities was particularly detrimental to female students. Women who assumed those household tasks were 83 percent more likely to give up attending college and their educational goals.

Finally, the importance of a support system through words (and actions) of encouragement and validation by parents has long been established as significantly impacting on student persistence (Cabrera, Nora, & Castaneda, 1993; Nora, 1987; Nora & Cabrera, 1996). Nora (2004) notes that encouragement and support come in different forms (e.g. financial, emotional, psychological, etc.) and from different sources (e.g. parents, spouses, professors, etc.). Collectively these different types of encouragement from a variety of people provide a safety net for Hispanic students that they come to rely on under stressful and non-stressful circumstances. Most importantly, *la familia* has been identified as a major source of support affecting Hispanic persistence decisions (Hurtado, Carter, & Spuler, 1996). The importance of family in the Latino/a culture makes it central in considering the impact that a family support system exerts on student persistence (Castellanos & Jones, 2004). For example, Flores (1992) established that Hispanic students, whose mothers and fathers provided continuous encouragement to attend college and remain in college, increased the likelihood that Hispanic students would persist. Sanchez, Marder, Berry and Ross (1992) found that Latino/a students who were not retained reported family and related financial obligations and the need to take on adult roles as major reasons for dropping out of college.

Theoretical Framework

Predictor variables within the theoretical framework are based on Nora's (2003) Student/Institution Engagement Model regarding college persistence and attainment among Hispanic students, which emphasizes the

unique interaction between the student and the institution. This interaction, influenced by a variety of elements, produces a connection (i.e., engagement) between the student and the institution that leads to persistence. As students enter higher education, they bring with them a distinct set of pre-college characteristics; likewise, they are also influenced by certain environmental pull-factors. These pre-college characteristics include the collective high school experiences, academic achievement, individual financial circumstances, and specific psychosocial factors developed in both the home and school environments. The level of encouragement and support from parent and significant others also plays a crucial role. The environmental pull-factors include various family responsibilities, work responsibilities, and whether the student commutes to college. All these factors influence students' transition and adjustment to college.

As students enter higher education, they bring with them a sense of purpose as well as an allegiance to their chosen institution. Students with a positive view of college and a clear sense of direction are more likely to engage in activities that will help them to integrate socially and academically into the institution. Furthermore, students strongly committed to their chosen institution are more likely than their less committed peers to participate in the types of academic and social activities that provide the support they need to meet the challenges faced during the initial year of college.

Once the academic year begins, students are presented with a multitude of opportunities both in and out of the classroom that facilitate their academic and social integration. The students commitment to attaining a degree is solidified through the encouragement and support received through interactions with faculty and fellow students in both the academic and non-academic arenas. Participating in campus organizations, attending various social events, having mentoring relationships, interacting informally with faculty, or receiving academic support are all examples by which academic and non-academic interactions occur. Several cognitive and non-cognitive outcomes result from the academic and social experiences such as critical thinking, appreciation of fine arts, conceptualization skills, as well as the actual academic performance. Students that experience gains in their academic and social lives come to value obtaining an undergraduate degree. Included in these gains is the belief that there is a benefit to obtaining a degree from their specific institution; in addition, students come to view their college experience as worthwhile in the long term. This increased institutional commitment is a result of students feeling like they belong to their chosen institutions and that others accept them; in other words, they have found an individual niche. Nora (2003) saw the choice between withdrawal and persistence as directly impacted by the collective sum of all these factors, from pre-

college characteristics to institutional factors to environmental pulls. In sum, Nora's (2003) Student/Institution Engagement Model addresses pre-college, institutional, and environmental factors related to the college experience that influence student transfer, persistence and ultimate graduation (see Appendix A).

Purpose

Although the current literature demonstrates the influence of the above-mentioned factors on the academic success of Hispanic students, the direct and indirect effect of developmental coursework within a comprehensive theoretical model among Hispanic community college students has not been previously examined. Moreover, no study to date has properly examined transfer, persistence and degree attainment as dependent outcome measures within a comprehensive theoretical model. Therefore, the purpose of this study will be to examine a structural model of college transfer, persistence and degree attainment among Hispanic community college students who enrolled in developmental courses using the Beginning Postsecondary Student Longitudinal Study (BPS: 04/06) data files. More specifically, the proposed model will examine the impact of individual pre-collegiate factors, structural characteristics of the campus setting (including enrollment in developmental coursework), and external environmental factors that are believed to predict transfer and degree attainment among Hispanic students.

Data Base and Sample

The Beginning Postsecondary Students Longitudinal Study tracks students longitudinally in an attempt to collect data specific to transfer patterns, co-enrollment, persistence and degree attainment. Students sampled in the BPS Longitudinal Study ($n = 23,090$) were classified as first-time beginners (FTB's) during the base-year survey of the National Postsecondary Student Aid Study (NPSAS:04). FTB's were operationally defined as students who first enrolled at a post-secondary institution during the 2003-04 academic year. Participants were initially interviewed in 2004, at the end of their first year in college, and then interviewed again three years later in the first follow-up study (BPS: 04/06). Data sources included in the BPS:04/06 are derived from institutional records, federal and Pell grant records, federal financial aid applications, National Student Clearinghouse enrollment records, college admissions test agencies, and student interviews. Approximately 15,000 students completed an interview in 2006, resulting in a 77 percent weighted response rate. The sample utilized in the present study will include a weighted sample of Hispanic students who first enrolled at a two-year public community college and took at least one developmental course in the 2003-2004 academic year ($n = 297$).

Data Analyses

The proposed data analysis will focus on the explanatory influence of predictor variables (e.g. pre-college, institutional, environmental factors) on three outcome measures (transfer versus non-transfer, persistence versus non-persistence, and graduation versus no degree attainment). The statistical analyses will concentrate on deriving individual parameter estimates and indices of the overall fit of the model tested to discern the relationships among the variables (Maruyama, 1998), and which effects are direct or indirect. Covariance structural modeling is an extremely powerful tool for validating a hypothesized causal model through the quantification of matrices underlying a conceptual framework (success in college).

The theoretical framework in the current proposal specifies the impact of a set of developmental- and non-developmental related variables on student transfer, persistence and subsequent graduation. Further, it hypothesizes that there are mediating effects that are provided by some of the explanatory variables in the model. As a result, structural equation modeling (SEM) is the most appropriate strategy for analyzing the data. Firmly grounded in a conceptual framework, SEM is a method employing two models, a measurement model and a structural model, to examine the specific relationships among variables. The researchers will rely on AMOS 7.0 to test the validity of both the measurement and structural models.

Prior to testing the hypothesized structural model, a corresponding measurement model will be constructed to appropriately establish indicators of the latent constructs in the structural model. Survey items from the BPS Longitudinal Study data file identified to capture the constructs in the hypothesized model will be submitted to a confirmatory factor analysis so that the reliability of those items intended to measure the different latent constructs in the data will be verified. Confirmatory factor analysis (CFA) is particularly useful in SEM because it establishes the interrelationships between latent and observed measures and provides a methodology for linking observed measures to underlying theoretical variables (Maruyama, 1998). Using a covariance matrix, the confirmatory factor analysis will estimate parameters, or factor loadings, and unique variances to establish reliability and construct validity through a maximum likelihood solution. The structural model, representing the quantitative relationships among the latent constructs, will be empirically tested as an omnibus analysis, examining the entire data set in a single analysis. Latent constructs will be differentiated as to the effects they exert on other latent constructs in the model and are themselves unaffected (exogenous) or whether they are affected by other latent constructs (endogenous). Covariance modeling estimates causal and non-causal relationships as well as direct and indirect

effects. In structural modeling (unlike path analysis), regression coefficients are based on latent variables, and residuals (error terms) may be correlated.

Overall Goodness of Fit. The logic of structural equation modeling is that the model hypothesizes certain relationships among latent constructs. Testing the hypothesized quantitative model involves deriving indicators of the goodness of fit of the overall model. These indices provide a measure of the validity of the causal model that is hypothesized prior to estimating path coefficients. The different measures of the overall fit of the model are derived from an analysis of the differences in the residuals between the hypothesized model and the observed data. The smaller the residuals, the better the hypothesized model fits the observed data. Acceptable model fit will be defined by the following goodness of fit criteria: $\chi^2 = ns$, χ^2/df (<2.5), AGFI ($\geq .90$), RMSEA (<.06), RMR (<.08), NFI ($\geq .90$), CFI ($\geq .95$), TLI ($\geq .95$) (Garson, 2006; Mulaik, James, Van Alstine, Bennett, Lind, & Stillwell, 1989; Pedhazur, 1982; Thompson, 2005).

Significance of Individual Variables in the Final Models. Once the overall fit of the hypothesized model is established, it is important to assess the significance of particular paths. Statistics used to assess particular paths included squared multiple correlations (r^2) to identify the total variance accounted for by predictor variables in particular equations, critical ratios (t-values) to determine the significance of individual structural coefficients, and modification indices to identify the possibility of significant paths not included in the model (Byrne, 1989).

Dissemination plan

In addition to the presentation at the 2008 Annual AIR Forum, the results of this study will be submitted for presentation at the ASHE or AERA annual meetings, and submitted for publication in the three primary higher education research journals. Further, the results will be shared with Bob Morse at U.S. News and World Report, with whom the University of Houston is already engaged in discussion about more accurate ways to evaluate public urban research universities, and with Dr. Raymond Paredes, Higher Education Commissioner for the Texas Higher Education Coordinating Board (THCEB) to inform the Texas Higher Education Task Force in their recommendations for narrowing the gaps for Hispanics students in Texas colleges and universities. The intent of the dissemination efforts is to gather input from multiple audiences regarding the benefits of relying on national datasets to more accurately illuminate the persistence process for non-traditional students. Finally, results will be shared with the Hispanic Association of Colleges and Universities, state and national Achieving the Dream initiatives, the

Educational Testing Service, The College Board, and the Southern Education Foundation (SEF) as part of a commissioned paper for the SEF's New Latino and Black Education Initiative.

Description of policy relevance

The present study is set to inform policy and intervention efforts aimed at achieving equity in higher education among Hispanic students by providing empirically and theoretically-based evidence regarding the academic preparation, experiences and success of Latino community college students enrolled in developmental courses. Moreover, the proposed study is consistent with the President's Advisory Commission on Educational Excellence for Hispanics (2003), who recommended that: "Research on the educational attainment of Hispanic students should: 1) use existing national assessments and longitudinal studies to identify potential risk factors and protective factors related to Hispanic student achievement; [and]... 3) expand existing research programs to include more studies of Hispanic American students" (pp.29-30). Furthermore, in their report the Commission noted that "... colleges and universities must bear a greater responsibility for increasing the number of Hispanic students who enroll in their institutions and ultimately graduate with a four-year degree" (p. 37).

Discussion of innovative aspects of project

This project will extend current research among two of the most at-risk student populations in higher education:

- (1) *Hispanic students attending community colleges* - With the exception of a recent study conducted by Arbona and Nora (2007) and funded by the AIR/NCES/NSF/NPEC Grant Program, research regarding the factors that predict actual transfer and persistence behavior among Hispanic students who first enroll in community college has been substantially limited. Rather, studies to date among Hispanic students suffer from small sample sizes or exclusively measure short-term retention rates at a single institution (Braxton, Sullivan, & Johnson, 1997; Nora, 2003). Therefore, the present study is innovative in that it will add to our understanding of the multi-dimensional components of Hispanic students' academic experiences that lead to successful transfer, persistence and degree attainment, using much needed longitudinal, theoretically based national datasets.
- (2) *Students who place into developmental courses* - The overall impact of enrollment in developmental education for different racial/ethnic groups has not been properly evaluated. As such, research is needed to track students who

enroll in developmental education courses to credit-bearing classes and successful persistence and transfer to four-year institutions (Higbee, Arendale, & Lundell, 2005). The proposed study is unique in that it is the first to examine and test the direct and indirect effects of developmental coursework within a comprehensive theoretical model using a longitudinal, national dataset.

Justification for Multi-Institutional Collaboration Effort

Drs. Amaury Nora and Gloria Crisp have collaborated and published several journal articles and book chapters focusing on Latino students at specific two- and four-year institutions:

Nora, A., & Crisp, G. (2007). Mentoring students: Conceptualizing and validating the multi-dimensions of a support system. *Journal of College Student Retention: Theory and Practice*, 9(3), 337-356.

Nora, A., Barlow, L., & Crisp, G. (2006). Examining the tangible and psychosocial benefits of financial aid with student access, engagement and degree attainment. In W.G. Tierney, K. M. Venegas, & M. L. de la Rosa (Eds.), *Financial aid and access to college: The public policy challenges. American Behavioral Scientist*, 49(12), 1-16.

Nora, A., Barlow, L., & Crisp, G. (2005). An assessment of Hispanic students in four-year institutions of higher education. In J. Castellanos & A. Gloria's (Eds.), *The Latina/o pathway to the Ph.D.* Stylus Publishing, pps. 55-77.

Nora, A., Barlow, L., & Crisp, G. (2005). Student persistence and degree attainment beyond the first year in college: The need for research. In A. Siedman's (Ed.), *College student retention: Formula for student success.* Praeger Publishers, 129-154.

These bodies of work represent their collaborative efforts in examining factors related to the academic preparation, enrollment and degree attainment of Hispanic students at one community college and a single four-year institution as well as comprehensive reviews of the existing literature on Latino students. The research that will be performed on the BPS: 04.06 will not only examine a longitudinal model of college transfer, persistence and degree attainment among Hispanic community college students who began their higher education enrollment in developmental courses but will extend their research to a national level using the Beginning Postsecondary Student Longitudinal Study (BPS: 04/06) data files.

Both investigators have shared in all aspects of the publication process, from data gathering to data analyses to authorship. Dr. Crisp accepted an Assistant Professor position at the University of Texas at San Antonio in fall 2007 and is no longer at the University of Houston. Their collaborative efforts, based on their individual and collective conceptual and methodological skills, will significantly strengthen the research project by allowing for the continuation of a series of studies that builds on the previous work of both researchers leading to findings that are generalizable/applicable at the national level. Dr. Crisp will utilize her extensive institutional research experience

working with large databases to extract, clean and format the BPS: 04/06 data files. Dr. Nora's expertise of theory testing and interpretation of structural models will inform the multivariate analyses that will be performed on the data files. To ensure a much boarder dissemination of the findings, both researchers will work collectively and individually in professional presentations of the findings.

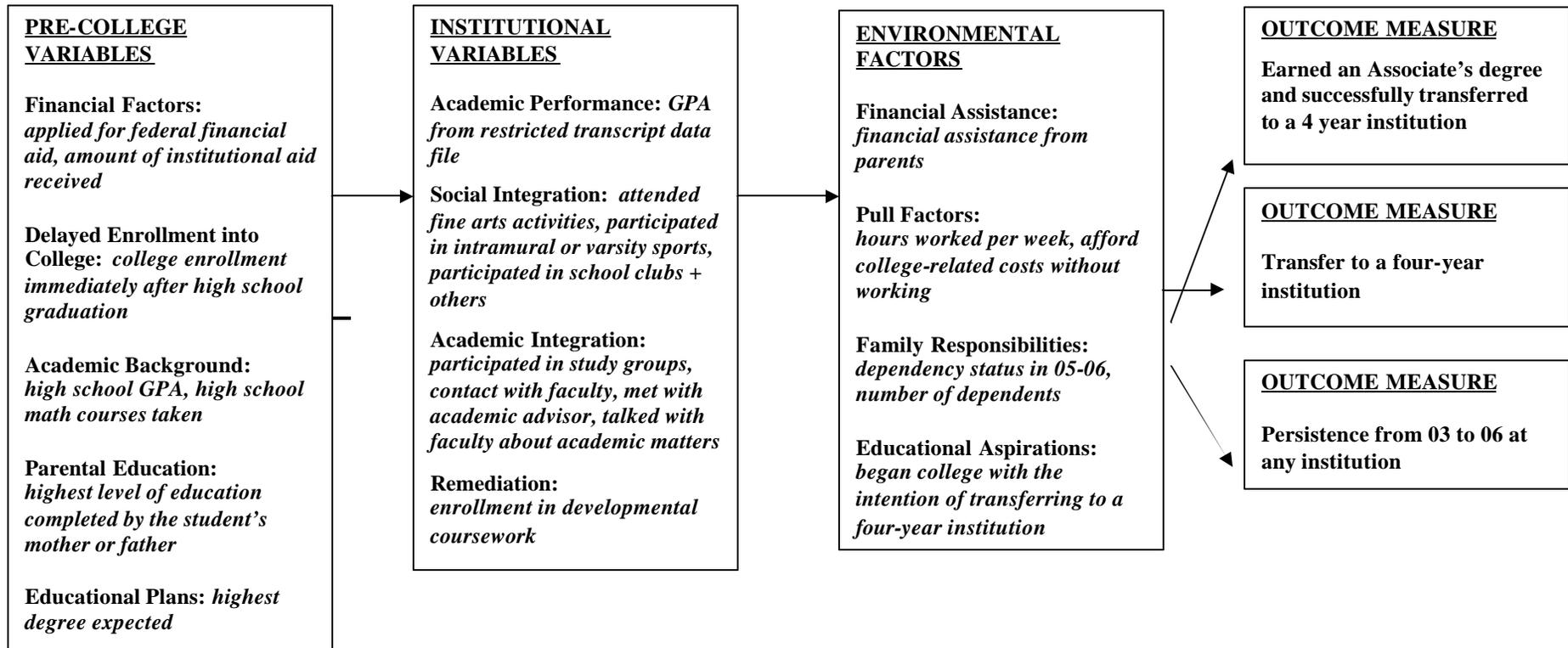
Discussion of audience to whom the project will be important

Results of the present study will be important to researchers, administrators and policy makers who are interested in achieving equity in higher education among Hispanic students. As previously discussed, interventions and policies designed to improve success of Hispanic students in higher education should be informed by research using longitudinal nationally representative databases such as the BPS Longitudinal Study. Findings will therefore provide theoretically-driven results produced from sophisticated statistical analyzes which will provide institutional researchers with a better understanding of the multi-dimensional components of Hispanic students' academic experiences. Moreover, results will benefit college administrators who are interested in developing theoretically-sound interventions designed to improve the academic success of Hispanic community college students enrolled in developmental coursework.

Budget Justification

Funds requested in the budget are primarily to provide both researchers summer support to finalize data analyses and publications based on findings. Travel funds will be used by the investigators to present findings at professional conferences and to meet personally at corresponding campuses. Materials will be purchased to print copies for dissemination of findings.

Appendix A
Theoretical Framework Underlying Data Analysis
Beginning Postsecondary Student Longitudinal Study



BPS: 04/06 Variables

FEDAPP
 INSTAMT
 DELAYENR
 HCGPAPREP
 HCMATH
 PAREduc

GPA
 ACAINX04
 SOCINX04
 REMETOOK

PARSP06E
 JOBHOUR2
 JOBAFFOR
 HSIZE06
 DEPEND06
 CCTRACK

TFATT3Y
 TFILTY3Y
 PRAT3Y

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Biographical Sketches

Amaury Nora

Dr. Amaury Nora of the University of Houston will be responsible for project interface, delivery, and development pertaining to the project's work, analyses of project data and dissemination of project findings. Dr. Nora is Professor of Higher Education, Director of the National Center for Student Success in the College of Education at the University of Houston, Houston, Texas and Editor of *The Review of Higher Education*, the journal for the Association for the Study of Higher Education (ASHE). His research focuses on college persistence, the role of college on diverse student populations across different types of institutions, the development of financial aid models that integrate economic theories and college persistence theories, graduate education, and theory building and testing. His inquiries have not only contributed to traditional lines of research on college persistence but have opened research on women and minorities in community colleges.

Dr. Nora has served as Research Associate for the National Center on Postsecondary Teaching, Learning and Assessment (NCTLA), funded by the U.S. Department of Education; consultant to the American Council of Education; National Advisory Board member for the evaluation of GEAR UP; and reviewer for the National Research Council in Washington, DC. He is currently serving on the NCES/AERA Think Tank, a task force organized to improve on the large national databases created by the National Center for Education Statistics (NCES) and the National Science Foundation (NSF). Dr. Nora has also been appointed to the Texas Higher Education Task Force, a collaboration of scholars, educators and researchers to address the data gathering needs in the state of Texas to deal with the State's initiative, *Closing the Gaps by 2015*. The group was appointed by the Higher Education Commissioner for the Texas Higher Education Coordinating Board (THECB).

Nora has also served on the editorial boards of *Research in Higher Education*, *The Review of Higher Education*, *The Journal of Higher Education*, and *The Journal of College Student Retention: Research, Theory, and Practice* and as Program Chair for the 1999 Annual Meeting of the Association for the Study of Higher Education (ASHE). He assumed the role of Editor for *The Review of Higher Education* in January, 2004. Nora was the recipient of the Association for the Study of Higher Education "1991 Early Career Scholar Award" and the College of Education 2000 Research Excellence Award. He has published numerous book chapters and articles in referred journals, including *The Review of Higher Education*, *The Journal of Higher Education*, *Research in Higher*

Education, Higher Education: Handbook of Theory and Research, Community College Review, Education and Urban Society, Journal of College Student Development, and Educational Record.

PUBLICATIONS (Refereed Journals)

Single and First-Authored Articles

Nora, A., & Crisp, G. (2007). Mentoring students: Conceptualizing and validating the multi-dimensions of a support system. *Journal of College Retention: Research, Theory and Practice*, 9(3), 337-356.

Nora, A., Barlow, L., & Crisp, G. (2006). Examining the tangible and psychosocial benefits of financial aid with student access, engagement and degree attainment. *American Behavioral Scientist*, 49(12), 1636-1651.

Nora, A., Barlow, L. & Crisp, G. (2006). An assessment of Hispanic students in four-year institutions of higher education. In J. Castellanos, A. M. Gloria, and M. Kamimura (Eds.) *The Latina/o Pathway to the Ph.D.* Stylus Publishing, LLC.

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Co-authored Articles (Refereed Journals)

Hagedorn, L.S., Pascarella, E.T., Edison, M.I., Nora, A., & Terenzini, P.T. (in press). Does institutional context influence the development of critical thinking? A research note. Review of Higher Education.

Whitt, E.J., Edison, M.I., Pascarella, E.T., Nora, A., & Terenzini, P.T. (in press). Interactions with peers and cognitive outcomes across three years of college. Journal of College Student Development.

Cabrera, A.F., Crissman, J.L., Bernal, E.M., Nora, A., Terenzini, P.T., & Pascarella, E.T. (2002). Journal of College Student Development, 43 (1), 20-34.

Poyrazli, S., McPherson, R., Nora, A., Arbona, C., & Pisecco, St. (2002). Relation between assertiveness, academic self-efficacy, and psychosocial adjustment among international graduate students. Journal of College Student Development, 43 (5), 632-641.

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Cabrera, A.F., Nora, A., Terenzini, P.T., Pascarella, E.T., & Hagedorn, L.S. (1999). Campus racial climates and the adjustment of students to college: A comparison between white students and African American students. Journal of Higher Education, 70 (2), 134-160.

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Pascarella, E.T., Edison, M.I., Nora, A., Hagedorn, L.S., & Terenzini, P.T. (1998). Does work inhibit cognitive development during college? Educational Evaluation and Policy Analysis, 20(2), 75-93.

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Hagedorn, L., Nora, A., & Pascarella, E.T. (1997). Pre-occupational segregation among first-year college students: An application of the Duncan Dissimilarity Index. Journal of College Student Development, 37(4), 425-437.

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Pascarella, E.T., Edison, M., Nora, A., Hagedorn, L.S., & Terenzini, P.T. (1996). Influences on students' internal locus of attribution for academic success in the first year of college. Research in Higher Education, 37 (6), 731-756.

Hagedorn, L.S. and Nora, A. (1996). Predictors of success: Rethinking admission criteria in graduate and professional programs. In J.G. Haworth (ed.) New Directions in Institutional Research.: Assessing Graduate and Professional Programs 9(2), 31-44. San Francisco: Jossey-Bass.

Springer, L., Palmer, B., Terenzini, P.T., Pascarella, E.T., & Nora, A. (1996). Attitudes toward campus diversity: Participation in a racial or cultural awareness workshop. Review of Higher Education, 20(1), 53-68.

Pascarella, E.T., Bohr, L., Nora, A., & Terenzini, P.T. (1996). Is differential exposure to college linked to the development of critical thinking? Research in Higher Education, 37(2), 159-174.

Chapters in Books

Nora, A. (April 2003). Access to higher education for Hispanic students: Real or illusory? In L. Jones and J. Castellanos' (Eds.) *The majority in the minority: Retaining Latina/o faculty, administrators and students*.

Nora, A. (2002). A theoretical and practical view of student adjustment and academic achievement. In W. Tierney and L Hagedorn (Eds.), Increasing access to college: Extending possibilities for all students. State University of New York Press: Albany.

St. John, E.P., Cabrera, A.F., Nora, A., & Asker, E.H. (2001). Economic perspectives on student persistence. In J. Braxton's (Ed.), Rethinking the departure puzzle: New theory and research on college student retention. Vanderbilt University Press: Nashville.

Rendon, L.I., Jalomo, R., & Nora, A. (2001). Minority student persistence. In J. Braxton's (Ed.), Rethinking the departure puzzle: New theory and research on college student retention. Vanderbilt University Press: Nashville.

Nora, A. (2000). Balancing research, teaching, and service. In M. Garcia's (Ed.), Succeeding in an academic career: A guide for faculty of color. Greenwood Publishing Group.

Rendon, L. & Nora, A. (1994). "Improving Transfer Opportunities for Hispanic Students." In M. Justiz, R. Wilson & L. Bjork (Eds.) Minorities in higher education. ACE/Macmillan.

Attinasi, L. & Nora, A. (1992). "Diverse Students and Complex Issues: A Case for Multiple Methods in College Student Research." In F.K. Stage (Ed.) A diversity of methods for assessment and research on college students. ACPA Media.

SERVICE

Editorial Work

Editor, The Review of Higher Education, January 2004 – Present

Membership on Editorial Review Boards:

Editorial Board, Journal of Hispanic Higher Education, 2002-2008

Editorial Board, Journal of College Student Retention: Theory and Practice, 1998-2008

Editorial Board, The Journal of Higher Education, 1997-2003

Associate Editor on Equity Issues, Higher Education: Handbook of Theory and Research, 1994-1996.

Editorial Board, Research in Higher Education, 1990-2000.

Consulting editor and manuscript reviewer for The Journal of Higher Education, 1989-1995.

Review of Higher Education, 1988-1991.

Manuscript Reviewer, American Educational Research Journal, 2002-2003.

Proposal Reviewer, Research Grants, Association for Institutional Research, 1999-2000.

Proposal Reviewer, Research Grants, Association for Institutional Research, 1997.
Manuscript Reviewer, Research Briefs, American Council on Education, Division of Policy Analysis and Research, 1993-1995.

Grants (accepted and submitted)

National Center on College Access and Technology, Institute of Education Sciences National Center Program (CFDA 84.305), U.S. Department of Education. Funding requested: \$10 million over five years. Co-Principal Investigating Institutions: University of Houston, University of Southern California, The Pennsylvania State University, University of Pennsylvania, and University of Florida (submitted in 2006; awarded to Teachers College at Columbia University).

Grant Award from the Association for Institutional Research, data analysis of NCES database on Hispanic students (\$30,000), AIR/NCES Grant Project (2004-2005).

Quantitative Outcomes Assessment of Houston Annenberg Challenge, subcontract from University of Texas at Austin (\$386,000), Houston, TX (1999-2004).

Building a Community of Differences at Bloomfield College, (\$12,000). NASPA/Ford Diversity Project (1998).

Conceptual problems affecting the progress of Latinos in our education system, (\$5,000). Inter-University Programs for Latino Research/Social Science Research Council (IUP/SSRC). Committee for Public Policy Research on Contemporary Hispanic Issues (1990).

Co-principal investigator and Senior Research Associate for National Study of Student Learning, National Center on Postsecondary Teaching, Learning, and Assessment (NCTLA was a research and development center funded by OERI from 1990-1995 at approximately \$5.9 million).

Research on Graduate Students at UIC (\$90,000). Graduate Office, University of Illinois at Chicago (1990-1991).

Gloria Crisp

Dr. Crisp is an Assistant Professor of Higher Education in the Educational Leadership & Policy Studies Department at the University of Texas at San Antonio. Her research focuses on mentoring college students, community college issues, factors influencing the movement of minority students through the K-20 pipeline, the impact of policy on Hispanic access and persistence, quantitative methods and theory building and testing. Dr. Crisp earned her Ed.D. in Higher Education from the University of Houston in 2006. While pursuing her doctorate, she held the position of Managing Editor of *The Review of Higher Education*, one of the leading research journals in the field of higher education. Dr. Crisp has done extensive work at both two and four-year institutions in the area of institutional research, most recently serving as Associate Director of Research and Institutional Effectiveness at San Jacinto College in Pasadena, Texas.

Dr. Crisp is strongly committed to issues related to access and equity for all students as evidenced by the recent publications centered on access and persistence of minority students. Two of the book chapters specifically addressed Hispanic students in higher education institutions. The first titled “Community colleges, public policy, and Latino student opportunity,” co-authored with Catherine Horn and Stella Flores, draws attention to the state and federal policy contexts surrounding Latino educational opportunity. The second, titled “An assessment of Hispanic students in four-year institutions of higher education,” provides a synthesis of the persistence literature on Hispanic student retention beyond the first year of college. Dr. Crisp also recently co-authored two literature reviews specific to Hispanic student success that were presented alongside her co-author, Dr. Amaury Nora, at several HACU Hispanic Higher Education Research Collective Conferences in summer 2006.

Specific to the concept of mentoring, Dr. Crisp’s present research centers on validating the structure or patterns underlying a set of variables hypothesized to make up the mentoring experiences of students using the College Student Mentoring Scale (CSMS). Results of her dissertation indicate that the scale is valid for community college students and that different groups of students may conceptualize mentoring in unique ways based on cultural and background characteristics and experiences. Dr. Crisp is currently seeking funding to expand her research to diverse student populations including four-year, public and private institutions. Once her theoretical framework has been validated, Dr. Crisp plans to examine the impact of mentoring on student achievement and persistence, using an experimental randomized cluster design. Her work has the potential of making an important contribution to the field by confirming students’ views of mentoring as a set of unique, yet interrelated, experiences. Moreover, Dr.

Crisp's research is set to inform educators and practitioners in the implementation of mentoring programs that are theoretically-based and tailored to the needs of specific student populations.

Dr. Crisp's strong research training in the areas of design, methodology and quantitative data analysis has served to provide her the opportunity to integrate her technical knowledge of multivariate analyses such as multiple and logistic regression analysis, factor analysis (exploratory and confirmatory) and structural equation modeling into her major area of research, factors influencing students' decisions to persist. Moreover, Dr. Crisp's experience in Institutional Research has provided her with extensive knowledge in working with large institutional datasets and in merging and analyzing data using both SPSS and SAS. Funding for the current project would extend Dr. Crisp's experience to using national datasets, which would be a tremendous benefit to her long-term research agenda.

Recent Activities and Publications

Nora, A., & Crisp, G. (2007). Mentoring students: Conceptualizing and validating the multi-dimensions of a support system. *Journal of College Retention: Research, Theory and Practice*, 9(3), 337-356.

Crisp, G. (2006). Mentoring community college students: Validating the multi-dimensions of a student support system. Unpublished doctoral dissertation. University of Houston. Houston, TX.

Flores, S. M., Horn, C. L., & Crisp, G. (2006). Community colleges, public policy, and Latino student opportunity. In C. L. Horn, S. M. Flores, & G. Orfield (Eds.) *Latino educational opportunity: New Directions for Community Colleges*. Jossey-Bass.

Nora, A., Barlow, L., & Crisp, G. (2006). Examining the tangible and psychosocial benefits of financial aid with student access, engagement and degree attainment. *American Behavioral Scientist*, 49(12), 1636-1651.

Nora, A., Barlow, L. & Crisp, G. (2006). An assessment of Hispanic students in four-year institutions of higher education. In J. Castellanos, A. M. Gloria, and M. Kamimura (Eds.) *The Latina/o Pathway to the Ph.D.* Stylus Publishing, LLC.

Nora, A., Barlow, L. & Crisp, G. (2005). Student persistence and degree attainment beyond the first year in college: The need for research. In A. Seidman (Ed.) *College Student Retention: Formula for Student Success*. Praeger Publishers.

Nora, A., & Crisp, G. (under review). Hispanics and higher education: An overview of research, theory and practice. Currently under review by *Research in Higher Education*.

Crisp, G. & Nora, A. (under review). An overview of Hispanics in science, mathematics, engineering and technology (STEM): K-16 representation, preparation and participation. Currently under review by *The Journal of Higher Education*.

Crisp, G. (under review). Conceptualization and initial validation of the College Student Mentoring Scale (CSMS). Currently under review by *Educational and Psychological Measurement*.

Crisp, G. & Cruz, I. (under review). Mentoring and academic success of college students: A critical review of the literature between 1990 and 2007. Currently under review by *Review of Educational Research*.

Crisp, G. (in progress). Identifying a causal relationship between mentoring and retention among community college students. Manuscript to be submitted to *The Review of Higher Education*.

Recent Conference Presentations

**Crisp, G. (2007, June). *Mentoring community college students: Validating the multi-dimensions of a student support system*. Presented at the annual forum of the Association for Institutional Research, Kansas City, MS.

*Crisp, G., & Nora, A. (2006, August). *An Overview of Hispanics in Science, Mathematics, Engineering and Technology (STEM): K-16 Representation, Preparation and Participation*. Presented at the HACU Hispanic Higher Education Research Collective Conference, Princeton, NJ.

*Nora, A., & Crisp, G. (2006, August). *Hispanics and higher education: An overview of research, theory and practice*. Presented at the HACU Hispanic Higher Education Research Collective Conference, San Antonio, TX.

*Nora, A., & Crisp, G. (2006, July). *Hispanics and higher education: An overview of research, theory and practice*. Presented at the HACU Hispanic Higher Education Research Collective Conference, Los Angeles, CA.

**Nora, A., & Crisp, G. (2005, November). *Mentoring students: Conceptualizing and validating the multi-dimensions of a support system*. Presented at the 30th Annual Meeting of the Study of Higher Education, Philadelphia, PA.

* Invited presentation.

** Referred presentation.

BUDGET

Personnel	AIR Proposal
Principal Investigator A. Nora (5% of academic year) (summer support, 2.5 months @50%)	\$17,448
Co-Principal Investigator (UTSA) G. Crisp (5% of academic year) (summer support, 2 months @100%)	\$12,726
Total Salaries and Wages	\$30,174
Fringe Benefits	
Principal Investigator A. Nora (5% of academic year) (summer support, 2 months @50%)	\$2,993
Co-Principal Investigator (UTSA) G. Crisp (5% of academic year) (summer support, 2 months @100%)	\$3,671
Travel	
A. Nora (AIR Forum & other Conference, trip to San Antonio)	\$1,450.00
G. Crisp (AIR Forum & other Conference, trip to Houston)	\$1,450.00
Total Benefits and Travel	\$9,564
Other Direct Costs	
Materials and Supplies	\$100.00
Publication/Documentation/Dissemination	\$150.00
Total Other Direct Costs	\$250.00
Total Amount Matched Funds UH and UTSA	
Total Amount of Award	\$39,988

Current and Pending Support

Dr. Nora and Dr. Crisp do not have any current or pending support for this or related projects.

Facilities, Equipment and Other Resources

The investigators have the facilities, equipment, and resources needed to complete the proposed research. At the University of Houston and The University of Texas at San Antonio researchers are equipped with state-of-the-art personal computers and up-to-date software. Therefore, they currently have access to all of the necessary office equipment (including computer hardware, software, and support) and space necessary to complete this project. A license to access the restricted data files will be requested from NCES by the investigators.