

2004 AIR RESEARCH GRANT PROPOSAL

Predicting College Attainment of Hispanic Students: Individual, Institutional, and Environmental Factors

Database: NELS:88 - 2000

Grant Amount Requested: \$30,000

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Project Summary

Hispanics are the fastest growing and youngest population group in the United States. The participation of minorities in higher education has increased substantially during the last twenty years (Harvey, 2003); however, Hispanic youth continue to show lower college participation and graduation rates than their African American and white counterparts. In the near future Hispanics will become the second largest group in the labor force; therefore their lack of educational attainment is likely to impact the economic productivity of the nation.

The purpose of this study is to examine a model of college persistence and attainment among Hispanic students who graduated from high school in 1992 and enrolled in post-secondary education in 1992 or 1993, using the NELS 1988-2000 data files. The model examines pre-college, institutional, and environmental factors expected to predict outcomes at different points in the college pathway, including: (a) type of college first enrolled in (two-year versus four-year institution), (b) college persistence in 1994, (c) transfer from two-year to four-year institution, and (d) degree attainment by 2000. The independent variables examined have been selected based on Nora's (2003) Student/Institution Engagement Model regarding college persistence and attainment among Hispanic students.

Logistic regression analysis will be utilized to test the proposed conceptual framework and the underlying explanatory patterns among variables in the hypothesized model. The focus of the analysis is on the probability of the selected outcomes; Goodness-of-fit tests will be used to determine the best prediction with the fewest predictors. Tests of interaction effects will be conducted to examine effects of gender and type of institution where students initiate their college studies (two-versus four-year colleges). Findings of the study will be of interest to policymakers, college and university administrators, and institutional researchers.

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Statement of Problem

In the United States opportunities for career development and choice are closely related to level of academic attainment. Educational attainment is also closely related to the opportunities and rewards people experience in the labor market. In the year 2000, among people 25 years and older, 1.7% of those with a bachelor's degree or higher were unemployed while the same was true for 3.5% of high school graduates and 6.4% of high school dropouts. Similarly, those with higher levels of education garner better incomes. In 1999 the median annual income (in 2001 dollars) for year-round full-time male workers was about \$25,000 for high school dropouts, \$33,000 for high school graduates, and \$53,000 for college graduates (the median incomes for women were, \$17,000, \$23,000 and \$38,000, respectively). Overall, a college graduate is estimated to earn one million dollars more in income and benefits over a lifetime than a high school graduate (National Center for Educational Statistics, 2001).

During the last twenty years the participation of minorities in higher education has increased substantially (Harvey, 2003). However, Hispanic youth continue to show lower college participation and graduation rates than their African American and white counterparts. The percentage of 25 to 29 year olds with at least a bachelor's degree in 2000 was lower for Hispanics (10%) as compared to African Americans (18%) or Whites (34%) (National Center for Educational Statistics, 2002).

One of the most often cited explanations for the under-representation of Hispanics in higher education is the high incidence of school dropouts among this population. In 2000 the school dropout rates among 16 to 24 years olds was much higher for Hispanics (28%) than for African Americans (13%) or Whites (7%) (National Center for Education Statistics, 2002). It is estimated that the dropout rates among Hispanics and African American students enrolled in

inner-city or urban school districts may be as high as 56% (National Center for Education Statistics, 2000). The low high school completion rates among Hispanics underscores the need to facilitate the college attendance and completion rates among those Hispanic students who beat the odds and graduate from high school.

Another issue of concern regarding Hispanic participation in higher education is their disproportionate representation in two-year colleges (Chronicle of Higher Education, 2001; Nora, Rendon & Cuadraz, 1999). In the Fall of 2000, 58% of Hispanics enrolled in college were attending two-year institutions whereas the same was true for 42% of African American and 36% of White students (Harvey, 2003). Contrary to what was once thought, community colleges have not served as the gateway to a bachelor's degree for large numbers of lower income and ethnic minority populations. Approximately 25% of Hispanic students in the Beginning Postsecondary Students Longitudinal Study (BPS:96/01) who attended a two-year college intended to transfer to a four-year institution and obtain a bachelors degree. However, six years after first enrolling in the community college only 6% had obtained a bachelor's degree and an additional 12% remained enrolled in college (Hoachlander, Sikora, Horn, & Carroll, 2003). Because more than half of Hispanic college students initially enroll in community colleges, understanding the factors associated with their successful transition to four-year institutions is vital in promoting the retention of Hispanic students in higher education and facilitating their completion of a bachelor's degree.

The purpose of the study described in this proposal is to examine a model of college persistence and degree attainment among Hispanic students who graduated from high school in 1992 and enrolled in a post-secondary institution in 1992 or 1993, using the NELS 1988-2000 data files. The model examined includes pre-college, college, and environmental factors to

predict outcomes at different points in the college pathway, including: (a) type of college first enrolled in (two-year versus four-year institution), (b) college persistence in 1994, (c) transfer from two-year to four-year institution, and (d) college degree attainment by 2000.

Review of Relevant Literature

Tinto's (1975, 1987, 1993) model of student persistence has been tested extensively by a host of researchers interested in persistence in higher education (e.g., Braxton & Brier, 1989; Braxton, Vesper, & Hossler, 1995; Cabrera, Nora, & Castaneda, 1992, 1993; Cabrera, Nora 1987; Nora, Attinasi, & Matonak, 1990; Nora & Cabrera, 1993, 1996; Nora, Cabrera, Hagerdon, & Pascarella, 1996). Braxton, Sullivan, and Johnson (1997) empirically tested the primary propositions of Tinto's (1975) original model. Of the 13 propositions in the model, only four were empirically supported by multi-institutional tests and only five with single-institutional tests. Braxton et al. (1997) extensively examined numerous research studies exploring Tinto's theory (e.g., Braxton & Brier, 1989; Cabrera, Nora, & Castaneda, 1992, 1993; Nora, 1987; Nora, Attinasi, & Matonak, 1990) focusing on the central construct of academic integration and how it impacts institutional commitment and student persistence. They examined the importance of two factors, how the research was performed (i.e., multi-institutional tests versus single-institutional tests) and type of institution (e.g., two-year colleges, residential colleges and universities, four-year commuter universities, etc.), on the influence of academic integration on both institutional commitment and persistence. Braxton et al. (1997) concluded that multi-institutional approaches provided "robust empirical backing" for the impact of academic integration on both institutional commitment and student departure decisions. Single-institutional studies, however, provided only modest support for the influence of academic integration on either institutional commitment or student persistence.

Nora and Cabrera's (1996) Student Adjustment Model was developed based on both Tinto's (1975) Student Integration Model and Bean's (1980) Model of Student Departure. Cabrera, Castaneda, Nora and Hengstler (1992) explored the merging of these two theories and found difficulties with each theory. With Tinto's (1975, 1987) theoretical model, for example, the researchers discovered that results were mixed due to a lack of control on environmental variables and how these variable shaped perceptions, commitments, and preferences. In addition, they found that some studies applying Tinto's model yielded contradictory findings and inconsistencies in the measurement of the constructs. Cabrera et al. (1992) cited the work of Bean and Vesper (1990) who found that only six of the 50 environmental, personal and organizational variables accounted for most of the variance in drop out criterion among a sample of freshmen class students. Comparing Tinto's (1975) and Bean's (1980) models, Cabrera et al. (1992) noted that both (1) regard persistence as an interwoven set of interactions, (2) acknowledge the importance of pre-college characteristics, and (3) argue that persistence is influenced by the level of fit between the student and the institution.

Nora and Cabrera's (1996) Student Adjustment Model effectively combines the Student Integration Model and the Student Attrition Model. The model displays how the experiences of college students are represented by two domains: a social domain, involving experiences with fellow students, and an academic domain, involving experiences with faculty and other academic staff of the institution. These collective experiences enhance the students' academic and cognitive development, leading to academic and intellectual development, and increased commitments to both the institution and obtaining a college degree. This theory also draws on the theoretical frameworks of Tinto (1987) and Bean and Metzner (1985), presupposing that academic experiences and social integration are not mutually exclusive, as "positive experiences

in one domain are seen as conducive of positive experiences in the other domain” (Nora & Cabrera, 1996, p. 123).

In addition, Nora and Cabrera’s (1996) Student Adjustment Model addresses several crucial assertions related to the factors involved in the persistence of both minority and nontraditional students. Four major categories hold these crucial assertions. First, academic preparedness does not exert a stronger effect for minorities over non-minority students. Second, the model establishes that separation from one’s family and community does not hinder the persistence process. Finally, in looking at the uniqueness and applicability of existing models on persistence decisions of non-minorities, the study supports the premise that such models are useful in explaining minority student persistence.

Expanding on Nora and Cabrera’s (1996) model, Nora (2003) proposed the Student/Institution Engagement Model that 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 play 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 persistence and graduation.

Proposal of Work

The main focus of the study described in this proposal is to examine pre-college, institutional, and environmental factors that predict college persistence and bachelor's degree attainment among Hispanic students using the NELS 88-2000 data base. The independent variables included in the model have been selected based on Nora's (2003) Student/Institution Engagement Model. The influence of these independent variables in four college related outcomes will be examined. Next, the data base, the sample, and the independent and dependent variables included in the model are described in more detail.

Data Base and Sample The data gathered in the NELS:88 included interviews with students, teachers, and parents as well as students' high school and post-secondary school transcripts. Data were first collected from a nationally representative sample of 8th graders (26,432 students across the U.S.) in the spring of 1988 and follow up surveys were conducted in 1990, 1992, 1994, and 2000. Hispanic students were oversampled in 1988, the base year, and retained with disproportionate probability in 1990 and 1994 subsamplings. A total of 1,622 Hispanics participated in the NELS:88 fourth follow-up in 2000. Of these, 54.6% (n = 885) reported having some post-secondary education but no bachelors degree and 15.2 % (n = 245) reported having obtained a bachelor's degree or higher (Ingels et al., 2002). A limitation of the NELS:88 is that students with low proficiency in English were excluded from the study. Therefore, it will be possible to generalize findings from the study only to English speaking Hispanic students of traditional college age. These limitations notwithstanding, both the non-restricted and restricted

transcript NELS 88 - 2000 data files are ideally suited for the analyses of the long-term college-going behaviors of Hispanic students because they provides a wealth of information regarding the educational trajectories of a relatively large group of nationally representative Hispanic high school graduates during an eight year span (1992 to 2000).

Independent Variables. A graphic representation of the model and a list of the NELS: 88 – 2000 variables that will be used to operationalize the dependent variables in the model are included in Appendix 1.

Pre-college factors. Researchers have consistently found that skills and attitudes students bring to college influence their academic achievement and persistence in higher education. The following pre-college social background and individual characteristics will be included in the model examined: parental education, academic resources, educational plans, leadership and involvement in extracurricular activities, and academic self concept.

The academic resources students bring to college, measured primarily in terms of the quality and rigor of the high school curriculum, has emerged as one of the strongest predictors of bachelors degree attainment (Adelman, 1999; Warburton, Bugarin, & Nuñez, 2001) and of completion of a two-year degree or transfer to a four-year college among community college students (Hoachlander et al., 2003). Nora (2003) proposed that students' high school psychosocial experiences including leadership and involvement in extracurricular activities and academic self-efficacy influence their social and academic adjustment and persistence in college. Because students whose parents lack a college education are less likely than their peers with college educated parents to obtain a college degree (Horn & Chen, 1998; Warburton et al., 2001), parental education is also included.

Institutional factors. Research findings have indicated that students' experience in college may be as important for their persistence as their pre-college characteristics (Tinto, 1993; Nora, 2003). The following institutional factors will be included in the model examined: educational goal commitment, academic performance, and academic and social integration.

Research with Hispanics has shown that college students' commitment to the goal of obtaining the degree (Cabrera, Nora, and Castaneda, 1993) as well as their early academic performance (Nora & Cabrera, 1996) influences their decision to remain in college. Nora and Cabrera (1996) found that college grade point average was three times more important in college persistence for Hispanic and African American students as compared to their white counterparts. Academic performance in college has been used by many researchers as a form of academic integration, primarily because Tinto (1993) postulated that college grades are an indicator of a fit between the intellectual orientations of the student and the institution. Social integration to the campus environment has been measured in terms of informal friendships, contact with faculty, and participation in extracurricular activities (Hurtado & Carter, 1997). Nora et al. (1996) noted that even though academic performance was more influential in minority students' persistence, social experiences also contributed to these students re-enrollment in college. Therefore, social integration measured in terms of extent of participation in extracurricular activities is included in the model.

Environmental factors. Research findings with at-risk and ethnic minority populations, including Hispanics, have shown that environmental factors outside of the college context also influence students' decisions to remain in college (Nora, 2003; Nora et al., 1996). The following environmental factors will be included in the model examined: financial circumstances, hours

worked per week, family responsibilities (marriage status and number of dependent children), and support for college enrollment from father, mother, and friends.

Family responsibilities and working off-campus may exert a pull away effect on students' social and academic integration and in their decision to remain enrolled (Nora & Wedham, 1991). Hispanic and African American women who reported taking care of a family member were 83 percent more likely to leave college than their counterparts without such responsibility (Nora et al., 1996). Studies have consistently shown that encouragement from significant others (parents, teachers, and friends) has a positive effect on Hispanic and African American two- and four-year college students' integration to college, academic performance and commitments, and persistence (Galindo & Escamilla, 1995; Gandara, 1995; Nora, 1987; Cabrera et al., 1987; Nora & Cabrera, 1996; Nora & Rendón, 1990). Receiving financial aid is also an important factor in college persistence among low SES students (Cabrera, Stampen, & Hansen, 1990; Murdock, 1987; Nora, 1990; Nora, 2003), even though researchers disagree about the impact grants and work-study awards have on persistence as compared to loans (Cabrera et al., 1990).

Dependent Variables. Information for the dependent variables included in the model will be obtained from both the public NELS:88 data files and the restricted transcript files (license to use restricted data files will be requested). The variables PSEFIRTY (public) and REFINST (restricted) will be used to determine the type of institution of first enrollment. The variable ENRLO894 (public file - type of institution student was enrolled in August of 1994) will be used to determine persistence in college and if students who first attended a community college transferred to a four year institution. To assess highest post secondary education level the

following variables will be used F3PSEATN and F4HHDG (self-reported included in the public file) for years 1994 and 2000, respectively and HDEG from the restricted transcript file.

Analyses Logistic regression analysis will be utilized to examine the proposed conceptual framework and the underlying explanatory patterns among variables in the hypothesized model. Logistic regression assumes that the outcome variable (i.e., transfer, persistence, or graduation) have a probability that varies as a function of the values for each independent subject, yielding an *S*-shaped distribution with values from .0 to 1.0 as the slope ranges from negative to positive infinity. A maximum likelihood (ML) method allows for the estimation of the equation's parameters (betas). The focus of the analysis is on the probability of a given outcome rather than the matrix of correlations among dependent and independent variables. Goodness-of-fit tests will be used to determine the best prediction with the fewest predictors. Tests of interaction effects will be conducted to examine to what extent predictors of college persistence and attainment vary by gender and by the type of institution where students initiate their college studies (two-versus four-year college).

Initially, a stepwise procedure will be conducted to assess the unique contribution of each of the major theoretical dimensions that have been shown to explain the different outcome variables. A series of logistic regression models will be used to assess each conceptual block of variables. A test for significant changes in scaled deviance (G^2) will be used to assess the contribution of each major dimension. The model of best fit will be the one that produces a significantly smaller G^2 . This test will be conducted by examining the differences in G^2 s between given models to the degrees of freedom in a chi-square distribution table that is equal to the differences in degrees of freedom between two different models. A model accounts for a significant improvement of fit as indicated by G^2 reductions at the $p < .05$ level (Cabrera, 1994).

A second level of model testing will employ several goodness-of-fit indicators to assess each of the logistic regression models. The expected cell frequencies for all pairs of discrete variables, including the outcome variables will be evaluated. The indicators used will include the pseudo “ R^2 ”, the G^2/df ratio, and the proportion of cases correctly predicted by the model (PCP). The pseudo R^2 is the proportion of error variance that an alternative model reduces in relation to the null model. To further judge the model's validity, an overall indicator of fit will be provided by the proportion of cases correctly predicted. Using the G^2/df ratio as an indicator of fit, the model will be accepted when the G^2/df ratio is less than 2.5. A log-likelihood will be calculated by summing the probabilities associated with both the predicted and actual outcomes for each case. The $-\log$ likelihoods will be compared once distributed as chi-squares, and decrease or increase as predictors are added. Finally, coefficient estimates and the corresponding standard errors will be used to ascertain the statistical significance of each variable within the blocks used to explain the different outcomes. Logistic regression coefficients will be used to estimate odds ratios for each of the independent variables in the models to establish the contributions made by each.

Dissemination Plan

Findings from the study will be disseminated through national conference presentations and scholarly publications. As required by the grant, findings from the study will be presented to the institutional research community at the Association for Institutional Research Annual Forum in 2005 in San Diego, California. Paper presentations will also be submitted to conferences sponsored by the Association for the Study of Higher Education, the American Psychological Association, or the American Educational Research Association. Manuscripts based on the study

will be submitted to professional journals including *Research in Higher Education*, *Journal of Higher Education* and/or *Journal of College Student Development*.

Description of Policy Relevance

Hispanics are the fastest growing and youngest population group in the United States (Suro & Passel, 2003). In the near future they will become the second largest group in the labor force; therefore the lack of educational attainment among Hispanics will limit the United States' ability to compete economically (President's Advisory Commission on Educational Excellence for Hispanics, 2003). Because the economic status of Hispanics will depend on their access to and success in higher education, it seems a matter of national interest to examine the factors that predict college graduation among young, primarily English speaking Hispanics, the segment of the Hispanic population over sampled in the NELS 88-00 database. The study proposed here 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; ... 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).

Innovative Aspects of the Project

This project will extend current research on Hispanic college persistence in three areas:

A. The factors that predict students' long-term persistence and college degree attainment.

Most studies of college persistence among Hispanic students have included small samples or

have examined short-term retention rates at one institution, usually retention at the end of the first year (Braxton et al., 1997; Nora, 2003). Because many students change institutions in their path to a degree, studies that focus on only one institution are not able to distinguish dropouts from transfer students, underestimating post- secondary persistence (Choy, 2002).

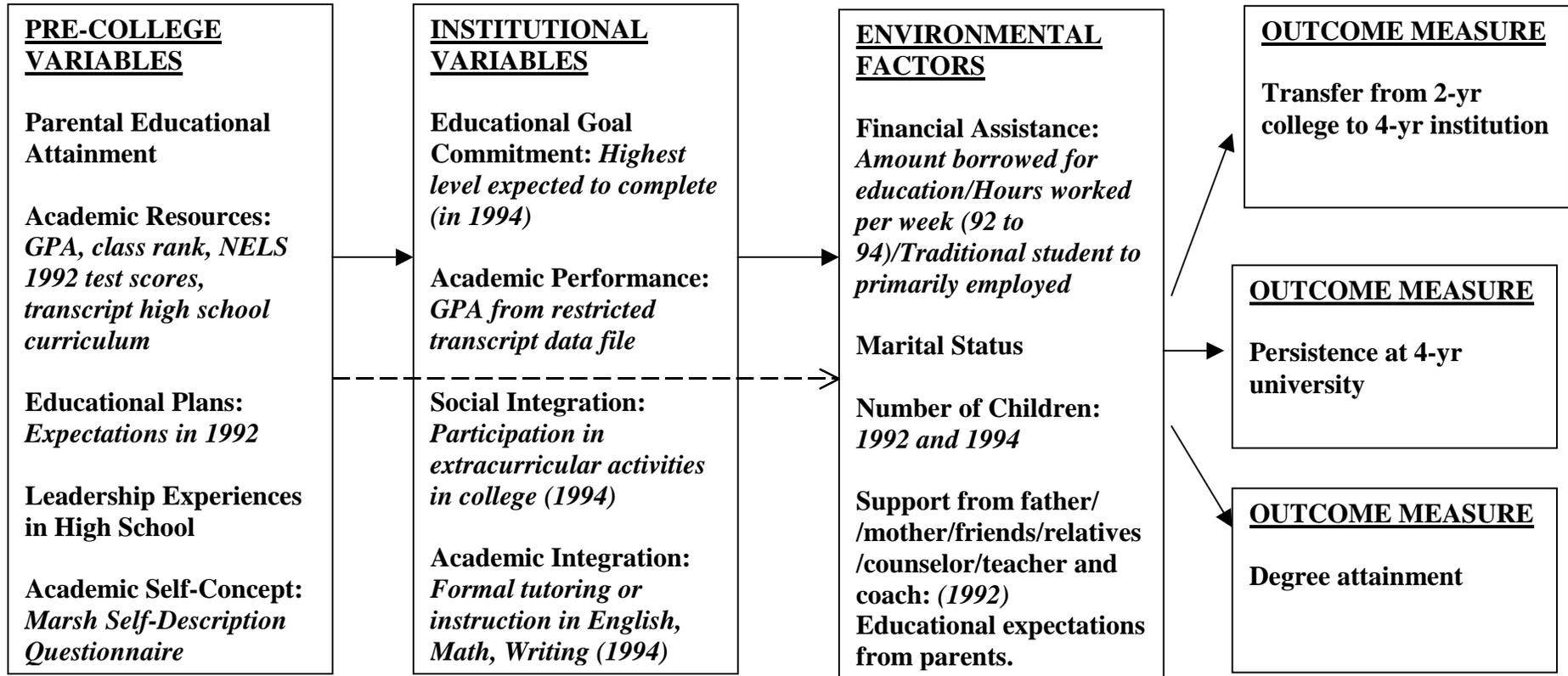
B. The factors that predict transfer from two- to four-year colleges and degree attainment following the transfer. Hispanic college students are disproportionately represented in two-year colleges (Choy, 2000; Harvey, 2003). However, research regarding the factors that predict actual transfer behavior and bachelor's degree attainment among Hispanic students who first enroll in community college is practically non-existent.

C. Gender differences in college persistence and degree attainment. The importance of variables that predict college enrollment and persistence differ by race and ethnicity (Nora et al., 1996; St. John, 1991). Furthermore, the relationship between gender and college related behaviors vary across ethnic groups (Bean & Metzner, 1985; Leppel, 2002; Perna, 2000). Therefore, research is needed that examines within group differences, including gender, in college persistence and attainment among students from the same racial and ethnic background.

Audience To Whom Project Will Be Important

A higher level of education is associated with higher productivity and civic involvement as well as with lower dependence on public welfare and lower crime rates (Perna, 2000). Therefore, the lower college graduation rates of Hispanics relative to other ethnic groups should be of concern to policymakers, college and university administrators, and institutional researchers. This information also will be useful to policymakers and administrators of secondary education programs interested in nurturing the academic achievement and college participation rates of Hispanic students while they are still in high school.

Appendix 1
Theoretical Framework Underlying Data Analysis
National Educational Longitudinal Study: 1988-2000 Data



NELS 88-2000 Variables

F2N8A & F2N8B
 CQCOMV2
 F2RTRPRG
 F2ASPIRE
 F2S30BA to F2S30BK
 F1S63A- F1S63A

EDEXPECT
 GPA
 INTRATH, PERFARTS,NEWSRADI
 STDGOV,SOCLCLUB,VOLUSTDT,
 TUTOR
 SPECINST

TOTLBORW
 HRSWORK1;HRSWORK2;
 HRSWORK3
 LABOR93
 F2S73(92)/MARSTATUS(94)
 F2S76(92)/DEPCHILD(94)
 F2S41A-G/F2S4A-B

PSEFIRTY
 REFINST
 ENROLO894
 F3SEATN
 F4HHDG
 HDEG

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Nora, A. & Wedham, E. (1991, April). Off-campus experiences: The pull factors affecting freshman- year attrition on a commuter campus. Paper presented at the annual meeting of the American Educational Research Association, Chicago: IL.

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St. John, E. P. (1991). What really influence minority attendance? Sequential analyses of the High School and Beyond sophomore cohort. *Research in Higher Education, 32*, 141-158.

Suro, R. & Passel, J. (2003). *The rise of the second generation: Changing patterns in Hispanic population growth*. Washington, D. C.: Pew Hispanic Center.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*, 89-125.

Tinto, V. (1987). *Leaving College: Rethinking the causes and cures of student attrition*. Chicago, IL.: University of Chicago Press.

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Warburton, E., Bugarin, R., & Nuñez, A. (2001). *Bridging the gap: Academic preparation and postsecondary success of first-generation students* (NCES 2001-153). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Autobiographical Statement: Consuelo Arbona

Dr. Consuelo Arbona is a professor of counseling Psychology at the University of Houston, Texas. Her research interests center around the career development and academic achievement of Hispanic populations. In her scholarly work she has examined the applicability of career related theories to Hispanic students, and has investigated factors associated with Hispanic students' career development, including ethnic identity, antisocial behaviors, attachment-autonomy, and academic achievement. Dr. Arbona has published several reviews of the research literature regarding the factors associated with the academic achievement of school aged youth (Arbona, 1996, 2000) and, more recently, conducted a review of college-access programs to examine to what extent these programs have been successful in promoting access to a college education for at-risk and minority students (Arbona, in press). In these reviews she incorporated several empirical reports utilizing the NELS: 88 data bases published by NCES as well as by independent researchers.

Dr. Arbona also has examined issues related to the academic achievement of at-risk and ethnic minority adolescents in her consulting work with the U.S. Department of Education, Office of Planning and Analysis. From 1993 to 2000 she participated in several national evaluations of federal programs designed to facilitate the academic achievement and college attainment of at-risk and minority students funded by the Department of Education including Talent Search, School-to-Work, and GEAR-UP (details included in abbreviated Vita). In her empirical work she has gained experience with large databases as well as with multivariate statistics using SPSS including general linear models and logistic regression analysis. She has published studies using these analytic strategies in refereed journals including the *Journal of Counseling Psychology* (APA journal), *Journal of College Student Development*, *Hispanic*

Journal of Behavioral Sciences, and *Journal of Early Adolescence*. She has served on the editorial board of the *Counseling Psychologist* and the *Career Development Quarterly*. Dr. Arbona is a Fellow of the American Psychological Association and in 1996 she received the University of Wisconsin-Madison School of Education Alumni Achievement Award.

The study of career related issues has made it clear that the notion of career choice is predicated upon academic achievement. Research findings have suggested that many of the existing theories and interventions related to the career choice process are relevant for Hispanics who are college educated (Arbona, 1990). Therefore, attending to the academic achievement of Hispanic students is crucial in facilitating their career development. This conclusion led to Dr. Arbona's present interest in examining empirically the longitudinal factors associated with college completion among Hispanic young adults. Given Dr. Arbona's research background and experience and the collaboration of her co-investigator, Dr. Nora, who has extensive experience in conducting longitudinal studies of college persistence among minority students, this grant will allow for the fulfillment of two objectives: conducting the proposed study and gaining in-depth familiarity with the NELS:88 database to pursue further studies related to the career development and academic achievement of Hispanic students using the wealth of information contained in this longitudinal database.

Abbreviated Curriculum Vitae

Education

Ph.D.	University of Wisconsin - Madison - Counseling Psychology
M.Ed.	University of Puerto Rico - Counseling and Guidance
B.A.	College of New Rochelle - Economics and Education

Professional Experience

2001 – Present	Professor, Counseling Psychology, University of Houston
1996-2001	Director of Training, Counseling Psychology Program University of Houston

1994-1995 Associate Chair, Department of Educational Psychology
University of Houston
1992-2001 Associate Professor, Counseling Psychology
University of Houston
1986-1992 Assistant Professor, Counseling Psychology
University of Houston

Selected Publications

Arbona, C. (in press). Promoting the career development and academic achievement of at-risk youth: College access programs. In S. Brown & R. Lent (Eds.) *Career development counseling: Putting theory and research to work*. Hoboken, NJ: John Wiley & Sons

Arbona, C. (2003). Work-Oriented Midcareer Development: A Commentary. Invited reaction to a major contribution, *The Counseling Psychologist*, 31, 198-204.

Arbona, C., & Power, T. F. (2003) Parental attachment, self-esteem, and antisocial behaviors among African American, European American and Mexican American adolescents. *Journal of Counseling Psychology*, 50, 40-51.

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Arbona, C., Flores, C. L., & Novy, D. M. (1995). Cultural awareness and ethnic loyalty: Dimensions of cultural variability among Mexican American college students. *Journal of Counseling and Development, 73*, 610-614.

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Fouad, N. A., & Arbona, C. (1994). Careers in cultural context. *Career Development Quarterly, 43*, 96-104.

Virella, B., Arbona, C., & Novy, D. (1994). Psychometric properties of the Spanish version of the State-Trait Anxiety Inventory. *Journal of Personality Assessment, 63*, 401-412.

Wall, J. A., Power, T. G., & Arbona, C. (1993). Susceptibility to antisocial peer pressure and its relation to acculturation in Mexican American adolescents. *Journal of Adolescent Research, 8*, 403-418.

Casas, J. M., & Arbona, C. (1992). An examination and recommendations relative to Hispanic career related issues, research, and practice. In D. Brown and C. Minor (Eds.), *Career needs of a diverse workplace*. Alexandria, VA: National Career Development Association.

Arbona, C., & Novy, D. M. (1991). Career aspirations and expectations among Black, Mexican-American, and White college students. *Career Development Quarterly, 39*, 231-239.

Arbona, C., & Novy, D. M. (1991). Factor structure of the Non-cognitive Questionnaire for Black, Mexican-American, and White students. *Journal of Instructional Psychology, 18*, 10-16.

Arbona, C., & Novy, D. M. (1991). Hispanic college students: Are there within group differences? *Journal of College Student Development, 32*, 335-341.

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Arbona, C. (1989). Hispanic employment and the Holland typology of work. *Career Development Quarterly, 37*, 257-268.

Technical Reports

Arbona, C., Strauss, R., Jackson, R., Dawson, N. & Beal, J. (2000). *Incorporating promising school-to work practices into programs for at-risk and out-of-school youth*. Houston, TX:

Decision Information Resources, Inc. (commissioned by the U. S. Department of Education Office of Planning and Evaluation).

Arbona, C., & Strauss, R. (1999). *Final report on promising practices in school-to-work programs with at-risk and out-of-school youth*. Houston, TX: Decision Information Resources, Inc., and U. S. Department of Education Office of Planning and Evaluation).

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Arbona, C. (1994). *First generation college students: A review of needs and effective interventions*. Houston, TX: Decision Information Resources, Inc. and U. S. Department of Education Office of Planning and Evaluation.

Arbona, C. & Jackson, R. (1994). *Report on Talent Search program performance criteria*. Houston, TX: Decision Information Resources, Inc. and U. S. Department of Education Office of Planning and Evaluation.

Consulting

Member, Research Team for the National Evaluation of the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) 1999-2000. U.S. Department of Education, Washington, D. C., Westat, Inc., Maryland, and Decision Information Resources, Inc., Houston, Texas.

Senior investigator in the national study “School-to-work promising practices for at-risk and out-of-school youth”, 1998 - 2000. U.S. Department of Education, Washington, D. C. and Decision Information Resources, Inc., Houston, Texas.

Member, Research Team for the National Evaluation of Talent Search Program, 1998-1999. U.S. Department of Education, Washington, D. C., Mathematica, Inc., New Jersey, and Decision Information Resources, Inc., Houston, Texas

Principal investigator in a national study of the Talent Search program, 1993-1994. U. S. Department of Education, Washington, D. C. and Decision Information Resources, Inc., Houston, Texas.

Grants

Co-Investigator. Attachment, autonomy, and patterns of adolescent drinking. National Institute of Health, \$1,817,944, 1990-1995.

Investigator. Noncognitive variables as mediators of minority students’ persistence in college. University of Houston, Research Initiation Grant, \$6,000, Summer 1987.

Biographical Sketch: Amaury Nora

Dr. Amaury Nora is Professor of Higher Education and Associate Dean for Research and Faculty Development in the College of Education at the University of Houston, Houston, Texas. 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. Nora has been a Visiting Professor at the University of Michigan at Ann Arbor (Summer 1990) and Penn State University (Summer 1991). As Associate Professor of Higher Education at the University of Illinois at Chicago, Dr. Nora also served as Research Associate for the National Center on Postsecondary Teaching, Learning and Assessment (NCTLA), funded by the U.S. Department of Education. He has also served as consultant to the American Council of Education, the Ford Foundation, Hispanic Association of Colleges and Universities, U.S. Department of Education, and is currently a reviewer for the National Research Council in Washington, DC.

Nora has 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 will assume the role of Editor for *The Review of Higher Education* 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. (2001-2002). The depiction of significant others in Tinto's "Rites of Passage:" A reconceptualization of the influence of family and community in the persistence process. Journal of College Student Retention: Research, Theory & Practice, 3(1), 41-56.

Nora, A. (2001). How minority students finance their higher education. ERIC Digest, 171, ERIC Clearinghouse on Urban Education, Office of Educational Research and Improvement, U.S. Department of Education.

Nora, A., Rendon, L.I., & Cuadraz, G. (1999). Access, choice, and outcomes: A profile of Hispanic students in higher education. In A. Tashakkori and H.S. Ochoa's (Eds.), Readings on Equal Education: Education of Hispanics in the U.S.: Policies, policies and outcomes (Vol. 16). AMS Press, Inc: New York.

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Nora, A. & Cabrera, A.F. (1996). The role of perceptions of prejudice and discrimination on the adjustment of minority students to college. Journal of Higher Education, 67(2), 119-148.

Nora, A. & Cabrera, A.F. (1993). The construct validity of institutional commitment: A confirmatory factor analysis. Research in Higher Education, 34(2), 243-262.

Nora, A. & Cabrera, A. (1993). Examining graduate education through structural modeling. In P. Terenzini (Ed.) New Directions for Institutional Researcher. California: Jossey-Bass.

Nora, A. (1993). Two-year colleges and minority students' educational aspirations: Help or hindrance. In J.C. Smart (Ed.) Higher Education: Handbook of Theory and Research, Vol IX. New York, NY: Agathon Press.

Nora, A. & Horvath, F. (1990). Structural pattern differences in course enrollment rates among community college students. Research in Higher Education, 31(6), 539-554.

Nora, A. & Rendon, L. (1990). Determinants of predisposition to transfer among community college students: A structural model. Research in Higher Education, 31(3), 235-255.

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Nora, A. (1987). Determinants of retention among Chicano college students: A structural model. Research in Higher Education, 26(1), 31-59.

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.

Whitt, E.J., Edison, M.I., Pascarella, E.T., Terenzini, P.T., & Nora, A. (2001). Influences on student's openness to diversity and challenge in the second and third year of college. The Journal of Higher Education, 72(2), 172-204.

Hagedorn, L.S., Siadat, M.V., Fogel, S.F., Nora, A., & Pascarella, E.T. (1999). Success in college mathematics: Comparisons between remedial and non-remedial first year college students. Research in Higher Education, 40 (3), 261-284.

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.

Pascarella, E.T., Truckenmiller, R., Nora, A., Terenzini, P.T., Edison, M., & Hagedorn, L.S. (1999). Cognitive impacts of intercollegiate athletic participation: Some further evidence. The Journal of Higher Education, 70 (1), 1-26.

Pascarella, E.T., Whitt, E., Edison, M., Nora, A., & Hagedorn, L.S. (1998). Does community college versus four-year college attendance influence students' educational plans? Journal of College Student Development, 39(2), 179-193.

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.

Pascarella, E.T., Whitt, E., Edison, M., Hagedorn, L.S., Nora, A., Yaeger, P., & Terenzini, P.T. (1997). The "chilly climate" for women and cognitive outcomes in the first year of college. Journal of College Student Development, 38(2), 109-124.

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.

Hagedorn, L.S., Siadat, M.V., Nora, A., Pascarella, E.T. (1997). Factors leading to gains in mathematics during the first year in college: An analysis by gender and ethnicity. Journal of Women and Minorities in Science and Engineering, 3(3), 185-202.

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

Membership on Editorial Review Boards:

Editorial Board, Journal of Hispanic Higher Education, 2002-2003

Editorial Board, Journal of College Student Retention: Theory and Practice, 1998-2003

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.

BUDGET

Predicting College Attainment of Hispanic Students: Individual, Institutional, and Environmental Factors

	AIR Grant	University of Houston College of Education
Personnel		
Principal Investigator C. Arbona 1.4 FTE @ 8,818/month	12,345.00	
Co Principal Investigator A. Nora 1 FTE @ 12,000 /month	12,000.00	
Total Salaries and Wages		24,345.00
Fringe Benefits		
C. Arbona		2,941.34
A. Nora	1,500.00	1,031.93
Travel		
C. Arbona (AIR Forum & other conference)	2,500.00	
A. Nora (AIR Forum)	1,500.00	
Total Benefits and Travel		5,500.00
Other Direct Costs		
Materials and Supplies	100.00	
Publication/Documentation/Dissemination	55.00	
Total Other Direct Costs		155.00
Total Amount Matched Funds U. of Houston College of Education		3,973.27
Total Amount of Award		30,000.00

Budget Justification

Funds requested in the budget are primarily to compensate the two investigators for the time they will spend conducting the analyses and preparing manuscripts and reports related to their findings and to cover travel related costs to present findings at professional conferences.

In addition, the College of Education will provide matching funds to cover all the fringe benefits expenses of Consuelo Arbona and part of the fringe benefits of Amaury Nora.

Current and Pending Support

Dr. Arbona and Dr. Nora 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 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.