

## **A Competing Events Model of the Effects of Financial Aid on Latinos' Enrollment Patterns**

## Abstract

Using a competing risks event history model this study will explore the effects of differentiated forms of financial aid on the postsecondary enrollment patterns of Latinos. Much of the prior research on financial aid has employed cross-sectional methods, which assume that the effects of aid do not vary across time. Knowing more about the relationships between timing of aid and academic success among Latinos has practical implications for enrollment managers and campus financial aid practitioners who—empowered with knowledge about when aid is most effective—might be able to more effectively distribute scarce resources to students.

At a time when Latinos make up an increasing proportion of the U.S. school population and increasingly seek entrance to postsecondary education the role of financial aid in postsecondary access remains in flux and uncertain. Though federal, state, and institutional grants have historically helped the lowest income students pay for their educational costs, grants have generally not kept pace with increasing costs (Advisory Committee on Student Financial Assistance, 2001; Ficklen & Stone, 2002). Understanding what factors promote the education attainment of Latino students is an area of significant need for further research in the field of higher education. Demographic trends, shifts in the financing of postsecondary education, and continuing inequity between racial/ethnic groups in terms of academic success all are increasing the likelihood that more and more of the U.S. population will be kept outside the doors of postsecondary education, or without a degree in hand.

It is in this context then that this study responds to calls for more research on the effects of financial aid on underrepresented students. Using the college impact (Berger & Milem, 2000) and student adjustment models (Nora & Cabrera, 1996) as the theoretical frameworks, this study asks “To what extent do loans, grants, institutional aid, and work-study affect the enrollment patterns of Latinos and how do these effects change over time?” In addition, this study seeks to extend existing approaches to studying financial aid use among underrepresented students by employing event history analysis. The goal is to not only understand more about *how* aid (or the lack thereof) promotes or perturbs access for Latinos, but as importantly *when* those effects occur and how they may vary over time. Understanding more about how the *timing* of aid affects enrollment can help financial aid officers and enrollment managers target aid more effectively to promote the attainment of Latinos.

## Research Methods

### *Sample and Data Sources*

This study follows all baccalaureate-degree-enrolled Latinos who earned at least six credits during their first year enrolled in Indiana from the 1999-2000 to the 2005-2006 academic year ( $n=4,774$ ). Since the dependent variable in event history modeling is the distribution of time to an event of interest, it is necessary to specify a *clock* for measuring analysis time. A year is the unit of time used in this study, primarily because the data used here are reported annually. Data for this study come from the Indiana Commission for Higher Education's (ICHE) statewide student information systems (SIS) unit record database, the State Student Assistance Commission of Indiana's (SSACI)—which oversees the Free Application for Federal Student Aid for all residents—unit record database, the National Center for Education Statistics Integrated Postsecondary Education Data Systems (IPEDS), and the Indiana Department of Education's (IDOE) K-12 school database. Data from each of these sources are available from 1999-2006 and have been merged into a single longitudinal SUR.

### *Models and Methods*

Though persistence is a temporal process with explanatory variables that change over time, relatively few researchers have employed time-sensitive analytic approaches in their analyses (DesJardins, McCall, Ahlburg, & Moye, 2002). To address this shortcoming in the research on student persistence, a handful of education scholars have begun employing event history modeling techniques borrowed from other fields—notably demography, biology, and engineering—in the study of persistence (DesJardins, Ahlburg, & McCall, 1994, 2002; DesJardins, Kim, & Rzonca, 2003; DesJardins, McCall, et al., 2002; Doyle, 2006). Event history analysis (EHA), in its most basic form, is the longitudinal analysis of individuals or organizations experiencing events of interest (Allison, 1984). Unlike traditional approaches to

regression, EHA explicitly incorporates temporal dimensions in estimating coefficients and the overall fit of the model while allowing for variation from period to period in explanatory variables.

Once a student begins postsecondary education there are several outcomes or potentially competing events a student might experience: Obtaining an associate's degree, taking time off school, or leaving school all together prior to receiving a formal credential. Therefore, a competing risks model was estimated via multinomial logistic regression to jointly model the effects of institutional contexts on likelihood of first departure or earning a postsecondary credential equivalent to an associate's degree or higher.

Equation 1 below denotes the general form of the model where  $h(t_j)$  represents the hazard rate of experience the events of interest (stop-out, departure, continued enrollment, earning a postsecondary credential) at a discrete point in time,  $D$  represents the baseline hazard intercept parameter at time periods one through six, and  $\beta_1$  through  $\beta_5$  represent the slope coefficients for the blocks of predictor variables.

Equation 1. General form of discrete-time survival model

$$\text{multinomial logit } h(t_j) = \frac{[\alpha_1 D_1 + \alpha_2 D_2 + \dots + \alpha_6 D_6] + [\beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5]}{[\beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5]}$$

The models control for factors posited by theory and previous research to affect academic success, including: (a) student background variables ( $\beta_1$ ), (b) academic preparation variables ( $\beta_2$ ), (c) college experience variables ( $\beta_3$ ), (d) measure of academic momentum ( $\beta_4$ ), and (e) financial aid ( $\beta_5$ ). Table 1 below specifies the variables included in each of the event history models. Consistent with the Student Adjustment framework the models also include measures of secondary and tertiary school contexts, such as structural diversity.

Table 1: Variables included in event history models

Student background	Academic preparation	Academic momentum	College enrollment characteristics	Financial aid
Race/ethnicity	High school rank	Credits attempted*	Campus residence*	Unmet need*
Gender	Combined SAT score		State residency	Loans*
Income*	High school diploma		Declared major?*	Work-study*
	HS proportion receiving free/reduced lunch		Developmental education	Grant aid*
			Structural diversity*	Institutional aid*
			Institutional type*	Other gift aid*

\*Time-varying explanatory variables

### Implementation and Dissemination

Disseminating this work to the preceding audiences will occur through (a) attending conferences for practitioners as well as scholars (i.e., AACRAO's Strategic Enrollment Management Conference and the Annual Conference for the National Association of Student Financial Aid Administrators); (b) releasing policy briefs via the Project on Academic Success for state higher education officials; and (c) sharing written work via scholarly journals such as the Review of Higher Education and the Journal of Student Financial Aid. Attending scholarly and practitioner gatherings will be a major venue for sharing this work.

Though the longitudinal, unit record database that will be used in this study has been largely created, considerable work remains to convert the data to a person-period format (necessary for event history modeling) and to create the outcome variables. As Allison (1984) notes, event history modeling is no more arduous from a technical perspective than logistic regression, however it requires substantial investment in data preparation. Financial support from this grant will be used to fund graduate student support in finishing database preparations and supplemental support for data analysis.

## References

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