Where and when

AN EVENT HISTORY ANALYSIS OF STUDENT FLOW IN POSTSECONDARY EDUCATION

Association for Institutional Research Annual Forum, 2010
Chicago, IL

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This material is based upon work supported by the Association for Institutional Research, the National Center for Education Statistics, the National Science Foundation, and the National Postsecondary Education Cooperative under Association for Institutional Research Grant #09-260.

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Research Questions

- What are the most common forms of student movement among all public two- and four-year institutions in Indiana?
- To what extent are forms of movement more or less common by different institutional type?
- To what extent do student background characteristics affect propensity to move, controlling for all else?
- To what extent do policies (i.e., developmental education, financial aid) affect propensity to move, controlling for all else?

Sample Selection

- First-time, first-year degree seeking students enrolled in all Indiana's public colleges and universities in 1999 (n=46,417)
- Followed from 1999 to 2006 (8 years in all)

Selected Sample Characteristics

		Count	Proportion
Gender	Female	23,401	50.4%
	Male	23,016	49.6%
Race/Ethnicity	African American	3,318	7.1%
	Hispanic	1,147	2.5%
	Race missing	1,696	3.7%
Age	Under 21	35,190	75.8%
	21-24	3,507	7.6%
	25-29	2,677	5.8%
	30-35	1,904	4.1%
	36 and older	3,139	6.8%
Institution type	Community College	13,344	28.7%
	State universities	6,977	15.0%
	Regional campuses	8,591	18.5%
	Urban university	4,181	9.0%
	Research university	13,324	28.7%
Began in AA Program		16,226	35.0%
Began in BA Program		30,191	65.0%

Data Sources

- Statewide Longitudinal Data System (SLDS) developed at Indiana University encompassing State of Indiana's public postsecondary institutions
- Integrated Postsecondary Education Data System
- Indiana Department of Education

Method

- Event history model
- Missing data (income, high school rank, SAT, % free/reduced lunch) addressed through multiple random imputation

Event History Analysis Basics

- Longitudinal analysis of when individuals or organizations experience an event of interest
- EHA techniques developed in biostatistics, engineering, and economics
- Much of the terminology derives from these fields (hence potentially problematic terms like *at risk* or *failure*)

Conceptual Model

Movement= *f(time, student background, academic preparation, campus characteristics, college enrollment characteristics, financial aid)*

$$\log h_i(t) = \alpha(t) + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \beta_5 x_{i5}$$

Bean (1980); Braxton, J. M., Sullivan, A. S., & Johnson, R. M. (1997); Pascarella, E. T., & Terenzini, P. T. (1980); Spady, W. G. (1971); St. John, E. P., Cabrera, A. F., Nora, A., & Asker, E. H. (2000); Tinto, V. (1975)

Operationalizing Conceptual Models

Student Background	Academic Preparation	Campus Characteristics[ab]	College Enrollment Characteristics[a]	Financial Aid[ab]
Age[a]	% Free lunch HS	% Students of Color	Housing[b]	Net price
Gender	High school rank	% Faculty of Color	Credits attempted[b]	Cumulative loan debt
Race/ethnicity	SAT score		Dev. ed. credits[b]	Applied for aid
Income[a]			Cumulative credits	Received aid
			Declared major[b]	Need-based aid receipt
			GPA[b]	
			Institution type[b]	
			Yrs. Stopped-out[a]	

a denotes time-varying variables

b denotes lagged variables

Note: All aid amounts in $1,000s

Models

Model	Event
1	Instructional home move
2	Transferred credits
3	Instructional home move, restart
4	Associate's degree completion
5	Bachelor's degree completion

Limitations & Scope

- Focus on first-time, first-year students limits generalizability (e.g., adult completers)
- Data do not include information about students who transfer to private institutions or out-of-state institutions *(likely understating prevalence & incidence)*
- Students who were enrolled in multiple campuses at one time are excluded
- Rely on EHA vs. pre-defined types

	Count	%ofCohort
1999	2307	0.05
2000	2818	0.08
2001	2199	0.07
2002	1521	0.06
2003	1092	0.06
2004	623	0.05
2005	403	0.05
2006	365	0.06

Selected Descriptive Results

KEY FINDINGS:

- THOUSANDS OF ENROLLMENT PATTERNS
- MOST STUDENTS DON'T EARN A DEGREE
- MOVEMENT IS COMMON
- ABOUT 3,500 STUDENTS RESTARTED
- NOT A SINGLE PATH TO A DEGREE

Statewide Patterns of Enrollment

Institutional type	CC= Community College; RES=Research; STATE= State university, BRNCH=Regional university; URB=Urban university
Declared major	MAJ= Declared Major; UND=Major Undecided
Credit-taking	AY= Academic year only; AYS= Academic year and summer; SO= Summer only
Full- or part-time	1= Full time; 0=Part time;
Degree status	AA= Associate; BA= Baccalaureate
*	Not enrolled

Statewide Patterns of Enrollment

Statewide (19,826 patterns)

1999	2000	2001	2002	2003	2004	2005	2006	Frequency
CC,AY,MAJ,0	*	*	*	*	*	*	*	2720
RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1BA	*	*	*	*	1116
BRNCH,AY,MAJ,0	*	*	*	*	*	*	*	837
RES,AY,UND,0	*	*	*	*	*	*	*	750
CC,AY,MAJ,0	CC,AY,MAJ,0	*	*	*	*	*	*	680
BRNCH,AY,UND,0	*	*	*	*	*	*	*	532
CC,AY,MAJ,1	*	*	*	*	*	*	*	469
URB,AY,MAJ,0	*	*	*	*	*	*	*	425
RES,AY,MAJ,1	*	*	*	*	*	*	*	415
RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,0,BA	*	*	*	359
CC,SO,MAJ,0	*	*	*	*	*	*	*	335
RES,AY,MAJ,0	*	*	*	*	*	*	*	298
STATE,AY,MAJ,0	*	*	*	*	*	*	*	292

Top Community College Enrollment Patterns

Community College (3,995 patterns)

1999	2000	2001	2002	2003	2004	2005	2006	Frequency
AY,MAJ,0	*	*	*	*	*	*	*	2720
AY,MAJ,0	AY,MAJ,0	*	*	*	*	*	*	680
AY,MAJ,1	*	*	*	*	*	*	*	469
SO,MAJ,0	*	*	*	*	*	*	*	335
AYS,MAJ,0	AY,MAJ,0	*	*	*	*	*	*	291

Top Community College Completion Patterns

1999	2000	2001	2002	2003	2004	2005	2006	Frequency
AY,MAJ,0	AY,MAJ,0	AY,MAJ,0	AY,MAJ,0	AY,MAJ,0,AA	*	*	*	120
AY,MAJ,1	AY,MAJ,1,AA	*	*	*	*	*	*	77
AY,MAJ,0	AY,MAJ,0	AY,MAJ,0	AY,MAJ,0,AA	*	*	*	*	47
AY,MAJ,0	RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1,BA	*	*	*	22
AY,MAJ,0	AY,MAJ,0	RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1	RES,AY,MAJ,1,BA	*	*	10
AY,MAJ,0	STATE,MAJ,1	STATE,MAJ,1	STATE,MAJ,1	STATE,MAJ,1,BA	*	*	*	10

Temporal Patterns of Movement

Moved instructional home								
Frequency	1999	2000	2001	2002	2003	2004	2005	2006
2262	.	.	X	.	.	.	.	.
2261	.	X	.	.	.	.	.	.
1640	.	.	.	X	.	.	.	.
1241	.	.	.	.	X	.	.	.
891	.	.	.	.	.	X	.	.
778	.	.	.	.	.	.		X
671	.	.	.	.	.	.	X	X
536	.	.	.	.	.	.	X	
509	.	.	.	.	.	X	.	X
(n=15,853; 34%)								

Temporal Patterns of Movement

Frequency	1999	2000	2001	2002	2003	2004	2005	2006
Transferred credit (n=4,543; 9.8%)								
1056	.	.	X	.	.	.	.	.
938	.	X	.	.	.	.	.	.
595	.	.	.	X	.	.	.	.
533	.	.	.	.	X	.	.	.
Restarted (n=3,566; 7.7%)								
892	.	X	.	.	.	.	.	.
710	.	.	X	.	.	.	.	.
528	.	.	.	X	.	.	.	.
473	.	.	.	.	.	X	.	.

Note: Not mutually exclusive categories. 11,486 students moved campuses during the study period, but w ere classified as continuing.

Selected Inferential Results

KEY FINDING: ALL FORMS OF MOVEMENT REDUCE LIKELIHOOD OF DEGREE COMPLETION, NET OF STUDENT BACKGROUND, COLLEGE ENROLLMENT, AND OTHER VARIABLES

Background: Gender

- Women more likely to move instructional homes, transfer credit, and restart than men
- Women less likely to earn an AA than men
- Women more likely to earn a BA, net of mobility

Background: Race/ethnicity

- Latinos/as were less likely to move instructional homes and less likely to transfer credits than their White peers. They were also less likely to earn a BA degree.
- African Americans/Blacks were less likely to transfer credits. They were less likely than their White peers to earn any type of degree, controlling for all else.

Background: Age & Income

- Older students were less likely to move instructional homes, transfer credit, and restart
- They were also less likely to earn any type of degree
- Higher income students less likely to move at all, but those who did were less likely to transfer credit or restart
- The poverty level of a students' high school was not significantly related to movement, but it did negatively affect BA degree completion

Developmental Education

- Very few students took and developmental courses (about 7%)
- Interestingly, taking developmental courses reduced the likelihood of a student moving, transferring credit, or restarting
- However, taking developmental courses reduced the likelihood of earning any type of degree
- May be an interaction effect between developmental courses and credit accumulation and GPA

College Enrollment Characteristics

- Having a higher GPA was associated with decreased likelihood of movement and increased likelihood of earning any type of degree
- Accumulating credits was associated with being less likely to move and more likely to earn a degree
- Attending an institution with a higher % Students of Color was associated with decreased likelihood of movement, though it was negatively related to BA degree completion

College Enrollment Characteristics

- Students at research universities the least likely to move and the most likely to graduate
- Students at community colleges the most likely to restart enrollment
- Students at regional universities most likely to restart and most likely to transfer credit

Financial Aid

- Higher cost of attendance increased likelihood of moving and restarting, but decreased likelihood of transferring credit
- Higher cost was associated with increased likelihood of completing a BA degree, however
- An increase in cumulative loans was associated with an increased likelihood of movement and decreased likelihood of earning any type of degree
- Receiving need-based aid was associated with being more likely to move and less likely to earn a BA

Conclusions

- Findings consistent with prior work (e.g., Hossler) that suggests women encounter more push/pull factors but also tend to do better in school
- Movement likely differs based on proximity of racial/ethnic communities
- Movement is likely a deliberate strategy for students (e.g., community college restarters)
- Movement occurs for financial reasons and academic reasons

Tensions

- Movement is not generally a good thing in terms of degree completion
- Yet, movement is a deliberate strategy of lower-income, less-prepared students
- Developmental education increasingly under scrutiny, yet it appears to reduce likelihood of movement and indirectly affect graduation
- Are typologies of movement useful and how do we develop them?

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SLIDES AND PAPER AVAILABLE BY REQUEST.

Appended Slides

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Selected Means

	Mean
% Students of Color on Campus	11.51
% Faculty of Color on Campus	4.01
% Free Lunch Recipients	12.37
High School Rank	54.62
College GPA	2.27
Credits Attempted, Entire Year	21.77
Developmental Credits	.74
Income	$ 36,266
Cumulative Loans	$ 1,255.29
Net Price	$ 5,010.00

Dual Enrollment Patterns by Year

	1999	2000	2001	2002	2003	2004	2005	2006
Summer A, Fall, Spring, Summer B	0	0	0	0	1	0	0	0
Summer A, Fall, Spring	4	6	14	14	6	4	2	2
Fall, Spring	54	49	62	41	47	24	15	15
Summer A, Fall	4	8	10	13	24	8	8	10
Fall	93	67	88	70	82	63	27	38
Spring	973	875	647	460	322	195	135	128
Summer A	227	1008	861	543	335	156	93	80
Winter	18	37	39	0	49	21	14	9
Summer B	745	591	337	186	86	27	27	23
Credit Earned, No Term Specified	0	0	0	66	0	0	0	0
No credit	189	177	141	128	140	125	82	60
	2307	2818	2199	1521	1092	623	403	365

	Campus Move	Credit Transfer	Transfer Restart	Associate's Degree	Bachelor's Degree
Moved Instructional Home				-0.13 (0.05)**	-0.4 (0.05)**
Transferred, Credit Transfer				-1.93 (0.24)**	-1.92 (0.28)**
Transferred, Restart				-3.36 (0.71)**	-2.54 (0.58)**
Women compared to men	0.12 (0.02)**	0.1 (0.03)**	0.05 (0.04)	-0.2 (0.03)**	0.08 (0.01)**
Age	-0.06 (0.00)**	-0.09 (0.01)**	-0.12 (0.01)**	-0.01 (0.00)**	-0.01 (0.00)**
Compared to Whites					
Latino/Hispanic	-0.13 (0.05)**	-0.21 (0.10)**	-0.13 (0.13)	-0.07 (0.09)	-0.08 (0.05)*
African American/Black	0 .00 (0.03)	-0.11 (0.06)*	0.11 (0.07)	-0.22 (0.07)**	-0.09 (0.03)**
Asian American/Pacific Islander	-0.22 (0.07)**	-0.34 (0.16)**	-0.27 (0.19)	-0.05 (0.13)	-0.05 (0.04)
Native American, Other	-0.11 (0.13)	0.07 (0.23)	-0.36 (0.34)	-0.03 (0.21)	-0.21 (0.14)
Race missing	-0.28 (0.05)**	-0.26 (0.10)**	-0.51 (0.12)**	0.02 (0.07)	0.01 (0.05)
Income	0.00 (0.00)**	-0.01 (0.00)**	-0.01 (0)**	0.00 (0.00)**	0.00 (0.00)**
% HS Free Lunch	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.01 (0.00)**
HS Rank	0.00 (0.00)**	0.00 (0.00)**	0.00 (0.00)	0.00 (0.00)**	0.01 (0.00)**
Composite SAT	0.00 (0.00)**	0.00 (0.00)**	0.00 (0.00)**	0.00 (0.00)**	0.00 (0.00)**
Compared to On-campus					
Off-Campus	-0.03 (0.02)	-0.23 (0.05)**	-0.04 (0.07)	0.04 (0.06)	0.01 (0.02)
Live with Parents	0.02 (0.04)	-0.13 (0.08)*	0.02 (0.11)	-0.16 (0.11)	0.07 (0.04)**
% Faculty of Color	1.24 (0.04)**	0.15 (0.10)	0.07 (0.12)	-0.15 (0.09)*	0.07 (0.09)
% Students of Color	-1.55 (0.10)**	-0.96 (0.24)**	-2.8 (0.3)**	0.25 (0.2)	-0.26 (0.15)*
Credits Attempted	0.00 (0.00)**	0.01 (0.00)**	-0.03 (0)**	0.01 (0)**	0.03 (0)**
Develpopmental Credits	-0.02 (0.00)**	-0.03 (0.01)**	-0.06 (0.01)**	-0.19 (0.02)**	-0.34 (0.06)**
College GPA	-0.13 (0.01)**	-0.18 (0.01)**	-0.26 (0.02)**	0.36 (0.02)**	0.31 (0.01)**
Cumulative Credits	-0.01 (0.00)**	-0.01 (0)**	-0.02 (0)**	0 (0)**	0.01 (0)**
Declared Major	-0.29 (0.02)**	-0.35 (0.04)**	-0.11 (0.05)**	0.7 (0.1)**	0.4 (0.06)**
Compared to Research University					
State University	0.22 (0.03)**	0.14 (0.06)**	0.54 (0.1)**	1.46 (0.06)**	-0.52 (0.02)**
Regional University	0.07 (0.03)**	0.35 (0.05)**	0.64 (0.08)**	0.21 (0.07)**	0.05 (0.02)**
Urban University	0.3 (0.03)**	0.16 (0.08)**	0.64 (0.11)**	0.73 (0.09)**	-0.57 (0.03)**
Community College	0.44 (0.03)**	0.33 (0.07)**	0.98 (0.1)**	2.48 (0.07)**	-4.07 (0.2)**
Years Stopped Out	-0.8 (0.01)**	-0.73 (0.02)**	-0.74 (0.03)**	-1.34 (0.04)**	-1.5 (0.03)**
Cost of Attendance ($1,000s)	0.03 (0.00)**	-0.01 (0.00)**	0.08 (0.01)**	0.02 (0.00)**	0.01 (0.00)**
Cumulative Loans	0.01 (0.00)**	0.00 (0.00)	0.01 (0.00)**	-0.01 (0.00)**	-0.01 (0.00)**
Received Aid	0.05 (0.03)*	0.32 (0.06)**	-0.09 (0.08)	0.10 (0.06)*	0.09 (0.02)**
Received Need Aid	0.06 (0.02)**	0.04 (0.05)	-0.08 (0.07)	0.19 (0.05)**	-0.09 (0.02)**
Applied for Aid	0.1 (0.02)**	-0.02 (0.04)	0.05 (0.05)	0.31 (0.05)**	-0.03 (0.02)
Began in Associate's Program					-0.36 (0.02)**
n= 46,417					
Log pseudolikelihood =	-227032.54	-48375.657	-31456.6	-40191.835	-143257.08
Events	22,307	4,700	3,107	4,251	15,613

*Significant at the 0.10 level

**Significant at the 0.05 level