



Where and when



AN EVENT HISTORY ANALYSIS OF STUDENT FLOW IN POSTSECONDARY EDUCATION

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Research Questions

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- 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

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- 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

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		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

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- 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

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

Event History Analysis Basics

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- 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

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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

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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

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- 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

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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

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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

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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

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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

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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 were 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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



References

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Selected Means



	<u>Mean</u>
% 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)**
Developmental 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					