Identifying Factors that Facilitate and Impede Student Success Cohort 2013 First-Time Freshmen College of Liberal Arts Data Team March 7, 2018

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Guiding Principles

Emphasize Inclusive Collaboration Ground Project in Scholarly Literature

Include both Qualitative and Quantitative Methods

Recognize Project Limitations

Focus on a

Range of Data

Analytic

Approaches

Today's Focus

- Project design and sample
- Analytic Approach #1: Regression Analyses (Steimetz and Stormes)
- Analytic Approach #2: Path Analyses (Bolkan)
- Analytic Approach #3: Latent Class Analysis (Lanza)
 - Next Steps

Project Design







Steps in Creating Online Survey



Survey Measures

MOTIVATION

- Attitude: 4-year
- Self-efficacy: 4-year
- Attitude: 15 units
- Self-efficacy: 15 units
- Campus connections
- Grit: Cognitive control
- Important to family that I graduate

OPPORTUNITY

- Advising quality
- Advising: 4-year
- *#* Times changed majors
- # of people responsible for (dependents)
- Experienced a family emergency
- Difficulty scheduling classes
- Commute time

BACKGROUND

- Sex
- High School GPA
- SAT/ACT
- URM/NURM
- Remediation needs
- DSS

Focus Groups



- Personalized hand-delivered invitations
- \$ Incentives
- Theoretical sampling approach to data collection



Sample



CSULB Freshmen Cohort 2013 Select Characteristics



Other Characteristics	%
Female	57.8
First Generation To Attend	31.9
Pell Eligible	51.0
Remediation Needed	29.8
EOP Admission	11.8
LBUSD	15.6
International	7.8
Lived in CSULB Housing	38.0

College of Liberal Arts Survey Data Select Respondent Characteristics

Survey Respondent Data		Institutional Data Matched to Respondent Data	1
Avg. Hours Worked per Week	17.5	Female	76.0%
Avg. Commute Minutes	25.3	First Generation to Attend	42.0%
Pays for College by Self	39.3%	Pell Eligible	66.6%
Contributes Money to Family	13.3%	EOP Admission	13.6%
Lives with Parents/Grandparents	65.3%	LBUSD	17.7%
Has One or More Dependents	10.7%	Underrepresented Minority	56.5%
Plans to Attend Grad School	29.3%	Lived in CSULB Housing	34.7%
Has Job After Graduation	9.5%		

Four-Year Graduation Rates CSULB Freshmen Cohort 2013



Four-Year Graduation Rates (by entry college) CSULB Freshmen Cohort 2013





<u>Example:</u> How does being an underrepresented minority affect the probability of 4-year graduation, *holding all other factors constant*?

What Factors Affect the Probability of Graduating Within 4 years?

- Binary Logit Maximum Likelihood Estimation
- CSULB Freshmen Cohort 2013 (4,166 students)
 - College of Liberal Arts Survey (312 students)

Reporting Results:

- Effects are interpreted as holding all other factors constant
- Effect sizes depend on levels of independent variables
- "Modifier" effects can be obtained by specifying independent variable values
- Only statistically-significant effects are reported (5% significance using single-tailed tests)

Probability of Four-Year Graduation CSULB Freshmen Cohort 2013 (n = 4,166)

Factors associated with an INCREASE in probability	An increase of	Implies an increase of
CSULB GPA	0.1 points	1.1 % points
Units attempted per semester	1 unit	9.5 % points
Percent of attempted units completed	1% point	1.4 % points
Percent of units taken online	1% point	1.6 % points
College units earned before entry	3 units	2.1 % points
CBA major at entry (vs. undeclared)		5.8 % points
CHHS major at entry (vs. undeclared)		4.6 % points
CLA major at entry (vs. undeclared)		13.2 % points

Probability of Four-Year Graduation CSULB Freshmen Cohort 2013 (n = 4,166)

Factors associated with a <u>DECREASE</u> in probability	Implies a decrease of
Pell eligible	2.7 % points
Remedial courses needed (2+)	5.2 % points
LBUSD	4.6 % points
COE major at entry (vs. undeclared)	4.1 % points

Factors associated with an INCREASE in probability	Implies an increase of
Female	10.9 % points
First generation to attend	12.8 % points
Units attempted per semester	7.6 % points for each unit
Hours worked per week	0.5 % points for each hour
Lives with parents	11.9 % points

Factors associated with an **INCREASE** in probability

Implies an increase of...

Attitudinal factors measured on a 5-point scale

Attitude toward 4-year graduation	9.1 % points
Perception of self-efficacy	11.0 % points
Perception that advisor promotes 4-year graduation	3.1 % points
Index of Grit—sustained focus	4.8 % points
Other personal hardships aside from physical, mental, financial	4.4 % points

Why 4 years? Honestly, I don't think I could do 15 units or 18 units...Both my parents are undocumented and it's like, do you need college? I have a different experience, so I just take my time with 12 units.

Factors associated with an **INCREASE** in probability

Implies an increase of...

Attitudinal factors measured on a 5-point scale

Attitude toward 4-year graduation	9.1 % points
Perception of self-efficacy	11.0 % points
Perception that advisor promotes 4-year graduation	3.1 % points
Index of Grit—sustained focus	4.8 % points
Other personal hardships aside from physical, mental, financial	4.4 % points

My advisor walked me through the steps to graduate in 4 years. If there were any classes on my list that I did not have to take, she'd say, "Take this one instead; it will be better for what you are trying to do.

Factors associated with a DECREASE in probability	Implies a decrease of
Underrepresented minority (URM)	16.7 % points
Math remediation needed	14.7 % points
Number of times switched major	6.9% points for each switch
Number of dependents	10.9 % points for each
Percent of family expenses contributed	2.9 % points for each % point

Factors associated with a <u>DECREASE</u> in probability	Implies a decrease of	
Attitudinal factors measured on a 5-point scale		I had to use a credit card for a pretty big
Concerns about money	4.6 % points	expense. Things happen so I was the
Physical health concerns	5.6 % points	to help out my parents But now I
Perception of advising quality	11.5 % points	worry about paying

Which Factors Predict CSULB GPA?

- Ordinary Least Squares Regression
- CSULB Freshmen Cohort 2013 (4,166 students)

Reporting Results:

- Effects are interpreted as holding all other factors constant
- Effect sizes are given by coefficient values
- No "modifiers" or "interactions" are estimated
- Only statistically-significant effects are reported (5% significance using single-tailed tests)

CSULB Freshmen Cohort 2013 (n = 4,166)

Factors associated with an INCREASE in CSULB GPA	Implies an increase of
EOP Admission	0.08 points
Athlete	0.14 points
Female	0.12 points
CLA major at entry (vs. undeclared)	0.09 points
COED major at entry (vs. undeclared)	0.22 points
COTA major at entry (vs. undeclared)	0.16 points
College units earned before entry	0.02 points for each 3 units

Secause I did the EOP Summer Bridge Program, I met a lot people and now know all the different resources offered on campus.

CSULB Freshmen Cohort 2013 (n = 4,166)

Factors associated with a <u>DECREASE</u> in CSULB GPA	Implies a decrease of
Underrepresented minority (URM)	0.17 points
Pell eligible	0.05 points
First generation to attend	0.12 points
Remedial courses needed (2+)	0.13 points
International student	0.19 points
CBA major at entry (vs. undeclared)	0.17 points
COE major at entry (vs. undeclared)	0.16 points
CNSM major at entry (vs. undeclared)	0.13 points

Path Analyses

- **Social Cognitive Theory:** Environmental and personal factors predict performance
 - **Self-efficacy** (regarding 4-year graduation)
 - 02 Expected outcomes (attitude toward graduating in 4 years)
 - **Academic goals** (short-term pursuit of 4 year graduation; i.e., units per semester)

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Contextual influences (Advising, demographics, major switching)

These variables are not simply additive, instead they influence one another

Path Analyses

✓ Variables for Consideration

Variables OUTSIDE Students'	Variables WITHIN Students'
Immediate Control	Immediate Control
Advising Ethnicity Sex SAT HS GPA 4-Year graduation (yes or no)	Self-efficacy Units per semester Outcome expectations (i.e., Attitude) Number of times switched majors

Figure 1: Social Cognitive Career Theory Performance Model





Note: All paths are standardized, * = p < .05, ** = p < .01. Dashed lines represent nonsignificant path coefficients. 4-Year Graduation is scored 1 for students who graduated and 0 for students who did not. Sex is scored 1 for women and 0 for men. Ethnicity is scored 1 for White and Asian students, and 0 for Black and Hispanic students.

Latent Class Analysis

There is no single student characteristic that has a high accuracy of predicting four-year graduation Person-centered Approach:

Latent Class Analysis (LCA) used to identify latent classes of characteristics, behaviors, symptoms, etc.

Identify underlying patterns of student characteristics linked to lower and higher likelihood of four-year graduation

LCA identified classes/subgroups and estimated the probability of graduating in four years based on class membership

Method

Fall 2013 CLA Cohort (N=972)

- OP Selected 11 student demographic characteristics from IR&A data
- **Student characteristics were evaluated** (and recoded to categorical responses)
- Of Best-fitting class model identified (added covariates and outcomes to assess association with particular latent classes)

✓ 1st Generation College
✓ Pell-Eligible

- EOP
- ✓ Region (local)
- LBUSD
- ✓ High School GPA
- ✓ Residential Housing
- ✓ Remedial
- ✓ College at Entry
- ✓ Probation
- ✓ Department at Exit

Fall 2013 CLA Cohort (n=972) Institutional Research Student Characteristics Identified Subgroups Using Latent Class Analysis Class 3: First Generation/ Class 4: First Generation/ Class 1: Declared/ Class 2: Local(non-LBUSD) Non-Local/ Pell-Eligible Local/ Undeclared Non-Local/ Non-EOP / Non-EOP Exit Other Dept (28.1%)(32.3%)(17.9%)(21.7%)100% 90% Region Tier 4/ GPA 4.0 and above/ Entry Other Ρ 80% College/ Exit SOC r 70% 0 b 60% = Parents No College (11%) ■ Parents Grad College/ Region Tier 3/ GPA 3.5 to а 3.99/ Entry Undeclared/ Exit - PSYC 50% = Parents Some College (26%) b = Parent Graduated College (63%) 40% Parents Some College/ Region Tier 2/ LBUSD/ 30% Residential/ Pell Eligible/ EOP/ Remedial/ 20% Probation/ GPA 3.0 to 3.49/ Entry CLA/ Exit HDEV У 10% Parents No College/ Region Tier 1/ Non-LBSUD/ Non-Residential/ Non-Pell/ Non-EOP/ Non-0% Residential Pell Eligible EOP Probation Dept Exit Pell Eligible EOP Remedial/ Non-Probation/ GPA 2.5 to 2.99/ Entry iers-Region LBUSD Remedial HS GPA LBUSD EOP Student Edu Gen Residential Dept Exit Edu Gen Residential Pell Eligible Entry БОР **Fiers-Region** Remedial College Entry Dept Exit College Entry Probation Dept Exit ent Edu Gen iers-Region Pell Eligible Remedial College Entry HS GPA Probation Student Edu Gen LBUSD Remedial HS GPA Probation idential HS GPA liers-Regio HHS/ Exit COMM lege Resi Student 00 Stude **Student Characteristic**







Fall 2013 CLA Cohort (n=972) Institutional Research Student Characteristics Identified Subgroups Using Latent Class Analysis



Fall 2013 CLA Cohort (n=972) Institutional Research Student Characteristics Identified Subgroups Using Latent Class Analysis





Students in Class 4 had a significantly <u>lower</u> likelihood of graduating in 4 years than any other subgroup



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¹⁰⁰ **Probability of Graduating in 4 Years**



Students in Class 4 had a significantly <u>lower</u> likelihood of graduating in 4 years than any other subgroup

Next Steps

Present current findings to various stakeholders

⁰² Publish findings in peer-reviewed journals

- OB Conduct additional analyses
 - Expand our definition of student success; examine other outcome variables
 - Why do students leave CSULB? (survival analyses)
 - How do migration patterns into CLA affect student success?
 - Are CLA internship practices inclusive?

Implement data-informed practices and programming

