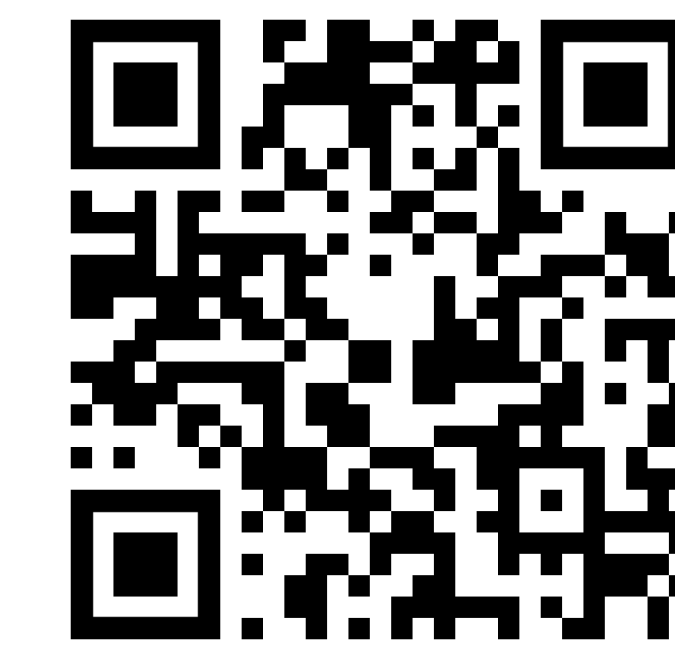# Identifying Factors in Student Attrition, Developing a Predictive Retention Model, and Implementing Strategies to Increase Student Persistence

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Scan the QR code on your mobile device to access more information on the Data Fellow's program.
1. Open your camera app on your mobile device.
2. Hold your device over the QR code so that it is clearly visible.
3. Open the website when it pops up on your screen.

Research Questions

We seek to identify psychosocial and institutional factors which influence attrition and retention at CSULB and to develop and implement strategies to increase student persistence and success. Guiding questions include:

- What factors lead students to leave the university?
- When do students leave? Where do they go?
- What is the relationship between attrition and academic probation?
- What factors might be "protective" in promoting student retention and success?
- What stakeholder groups are working to combat attrition on campus? What are their understandings of the issues and their challenges/successes?

Introduction

According to the National Student Clearinghouse, the retention rate for public four-year institutions in higher education is 76.3%. That means that one in four students left their institution to study elsewhere, or not at all. Attrition has been heavily studied at both the national and campus level (see, for example, Vincent Tinto's classic book *Leaving College: Rethinking the Causes of Student Attrition* and "Abating Attrition," one of several earlier Data Fellows projects) yet the problem has remained sticky and is growing in significance at a time of demographically-driven enrollment declines.

Although we are a team from the College of Liberal Arts, we have chosen to look at university-wide attrition, building upon prior CLA Data Fellows studies on migration patterns, innovative academic advising through ATLAS, and the development of programs that encourage student involvement and engagement. This project aligns with campus strategic priorities, including the desire to engage all students and to expand access to higher education.

Methods

We conducted a logistic regression on SSD 2.0 data for the 2013, 2017, and 2020 cohorts of first-time, first-year students, combined with large-scale Freshman Survey data, to analyze what factors may be leading students to leave the university. We also undertook a "deep dive" into a subset of student records from the 2013 cohort to develop "portraits" of students who left the university to better understand their trajectory over time.

Data Overview:

Dashboard Data: SSD 2.0 for the 2013 (12 semesters of data), 2017 (8 semesters of data), and 2020 (2 semesters of data) first-time first-year cohorts.

Freshman Survey data for 2013 and 2017.

Our work builds upon a prior longitudinal analysis of attrition, probation status, and changes in GPA in the 2013 freshman cohort, using merged data from SSD 2.0 and the Freshman Survey. We found that factors including ethnicity, family, income, and mental health influenced attrition, while other factors such as gender, first generation status, and physical health affected probation status and changes in GPA.

Results

In 2013, 50% of the students who left were never on probation. In 2017, there was a slightly higher overall probability of attrition and 40% of students who left were never on probation while 60% were on probation. Among students who were ever on probation, 2/3rds of students in both cohorts left the university. Roughly 23% and 25% of students did not persist or graduate in these two cohorts. Most attrition took place after terms 02 and 04. What factors predict attrition?

2013 Cohort: Predicting Attrition (Logistic Regression)

	B	S.E.	Wald	Sig.	Exp(B)
Age	.081	.084	.846	.358	.882
Sex at Birth (male=1)	-.035	.097	.152	.697	.966
Minoritized Status	.075	.097	.590	.442	1.077
Pell Eligibility	-.232	.100	5.425	.020	.793
School District (LBUSD=1)	-.219	.120	3.333	.068	.803
High School GPA	-.125	.136	.846	.358	.882
First Generation	-.051	.118	.183	.669	.951
Ever on Probation	2.177	.155	196.876	<.001	8.822
First Generation X Probation	.352	.196	3.233	.072	1.422

2017 Cohort: Predicting Attrition (Logistic Regression)

	B	S.E.	Wald	Sig.	Exp(B)
Age	.047	.086	.302	.583	1.048
Sex at Birth (male=1)	.106	.096	1.227	.268	1.112
Minoritized Status	-.037	.101	.133	.715	1.038
Pell Eligibility	-.141	.104	1.837	.966	.995
School District (LBUSD=1)	.158	.111	2.056	.152	1.172
High School GPA	-.330	.139	5.653	.017	.719
First Generation	-.006	.128	.002	.966	.995
Ever on Probation	2.215	.174	161.815	<.001	9.163
First Generation X Probation	.456	.204	4.980	.026	1.577

Probation (unsurprisingly) predicted attrition across both cohorts. However, probation also interacted with 1st generation status:

First Generation Status x Probation Predicting Attrition
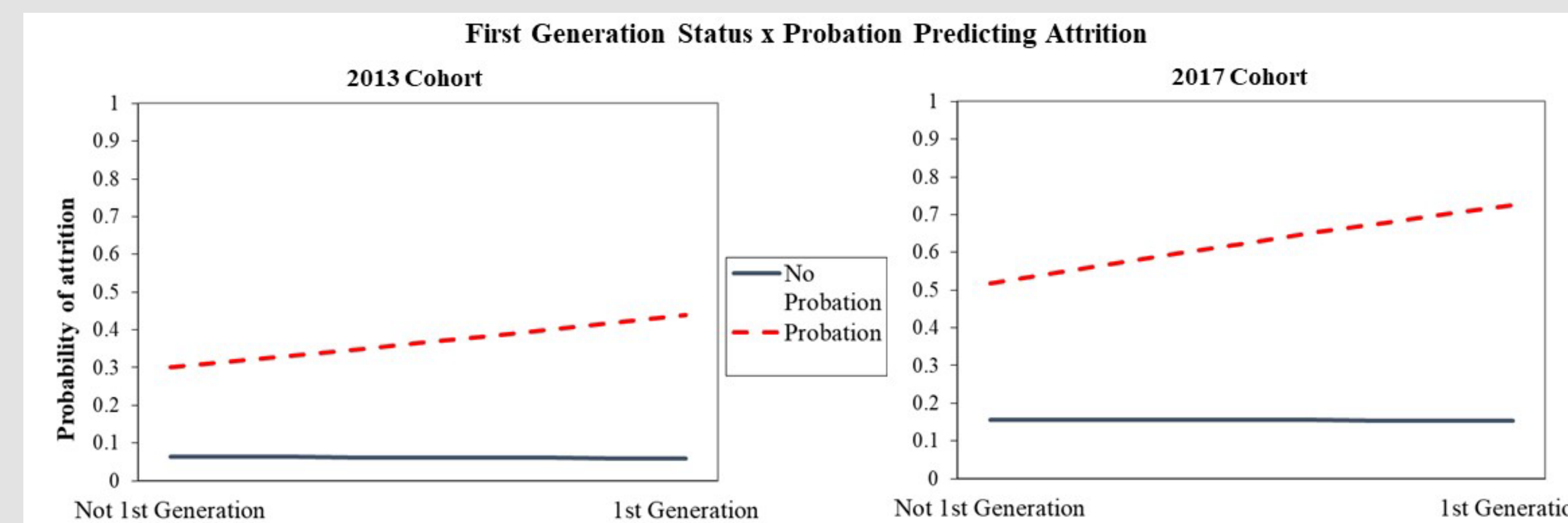
1st generation students on probation were more likely to leave than students whose parents graduated from college. This pattern was consistent across the 2013 and 2017 cohorts. Probation status is clearly a key predictor of attrition. What are key predictors of probation status and are these predictors consistent across the 2013, 2017, and (more recently) the 2020 cohort?

2013 Cohort: Predicting Probation (Logistic Regression)

	B	S.E.	Wald	Sig.
Age	.100	.087	1.331	.249
Sex at Birth (male=1)	.401	.092	19.215	<.001
Minoritized Status	.243	.100	5.982	.014
Pell Eligibility	.161	.107	2.266	.132
School District (LBUSD=1)	.434	.110	15.558	<.001
High School GPA	-2.292	.142	261.662	<.001
First Generation	.556	.108	26.635	<.001

2017 Cohort: Predicting Probation (Logistic Regression)

	B	S.E.	Wald	Sig.
Age	.151	.083	3.328	.068
Sex at Birth (male=1)	.343	.094	13.423	<.001
Minoritized Status	.348	.100	12.043	<.001
Pell Eligibility	.413	.104	15.717	<.001
School District (LBUSD=1)	.513	.103	24.945	<.001
High School GPA	-2.848	.141	409.685	<.001
First Generation	.274	.109	6.277	.012

2020 Cohort: Predicting 1st Year Probation (Logistic Regression)

	B	S.E.	Wald	Sig.
Age	.113	.086	1.710	.191
Sex at Birth (male=1)	.243	.098	6.122	.013
Minoritized Status	.538	.100	24.909	<.001
Pell Eligibility	-.108	.106	1.036	.309
School District (LBUSD=1)	.539	.115	22.992	<.001
High School GPA	-2.575	.137	354.428	<.001
First Generation	.411	.116	12.628	<.001

Across all three cohorts, high school GPA (lower), school district (LBUSD) , gender (male), first generation, and URM status predicted a greater likelihood of ending up on probation.

Our deep dive into student records resulted in the creation of composite "portraits" of students from the 2013 cohort. The portraits highlight 4 types of scenarios from our data: (1) students who left after being on probation; (2) students who left after never being on probation but who appear to have been struggling; (3) students who left after high academic achievement; and (4) students who persisted and graduated despite having been on probation.

- **Gone too Quickly.** GTQ was a pre-STEM major. He earned a D and an F in two math classes in his first semester, causing him to be placed on probation. He cleared probation in his second semester with mostly Bs, but still did not pass a required math class and did not earn credit in a pre-baccalaureate science class. He left after just two semesters.
- **Warning Signs** came to CSULB from a Long Beach high school. Although never on academic probation, he earned term GPAs of less than 2.0 for several semesters. He appears to have struggled, changing colleges and majors several times, and withdrawing from multiple classes. WS withdrew from all his classes in his fourth term and did not return.
- **Greener Pastures(?).** GP earned Dean's List for several of her four semesters on campus as a Pre-Nursing Student. She earned 60 units and completed all lower division GE before departing.
- **Struggled and Succeeded** had a rough start in CLA. A Latina first-generation college student, she participated in EOP. After being placed on probation at the end of her 1st term, SS achieved mostly As and Bs for her remaining terms and changed her major once in her 4th term. She successfully graduated in four and a half years.

Conclusion / Discussion

We approach the problem of attrition through four frames or lenses through which we can view student attrition at Long Beach State: structural, political, human resources, and symbolic.

For example, what role do policies like our current academic warning policy play (structural)? What messages are we sending students about belonging and being supported by the campus (symbolic)? How willing is the campus to tackle this issue given the high number of applicants to CSULB (political)? Who are the key points of contact with students at risk of leaving the university who might possibly intervene (human resources)?

One conclusion we have reached is that we need to shift the culture on our campus from the individual student to an institutional focus concerning "academic warning." We have recently changed campus terminology away from "probation," which is punitive and not motivating, to "academic warning," but we still fail to identify students in trouble in a timely manner or see this "academic warning" as an alarm to the institution.

Implications for Action

Create additional and earlier measures of "academic concern" where a student remains in good standing but is required to meet with an advisor. Academic concern could be triggered by term GPAs, withdrawals, and progress rate.

Link our work to the CLA Strategic Planning Process and their development of an equity index that tracks measures for evaluating student progress and success.

Work with other campus stakeholders to identify incoming first-term first-year students who may be at risk and build and/or improve support networks.

Next Steps / Future Directions

Merge SSD and Freshman Survey data for the 2017 and 2020 cohorts, integrating psycho-social factors such as "academic self-concept" in order to create profiles of students at risk of leaving using latent class analysis.

Analyze transfer student data from 2013, 2017 & 2020 cohorts to see if there is continuity of patterns.