



Student Progress and Achievement

Examining factors that contribute
to student progress and achievement in the
Colleges of the Kern Community College District



Prepared by the District Institutional Research Team

District Institutional Research Team



- Bakersfield College: Ann Morgan, Ed.D.
Heidi Gilliard
- Cerro Coso
Community College: Tina Tuttle
- Porterville College: Michael Carley
- District Office: Lisa Fitzgerald

Presentation Content

- Project Background
- Cohort Description
- College Pathway Model
- Methodology
- Findings
- Discussion and Questions

3

Research Questions

- How do different factors and student characteristics contribute to success?
- How do these factors function at the three colleges in student success?

4

Project Description

- We conducted a cohort study to examine factors known to contribute to student progress and achievement

What is a cohort study?

Very simply, one in which you examine a defined group of students over a period of time

- Ideally, the cohort study follows the path of one group of students so the college can make appropriate policy decisions to continually improve the student experience.

5

Project Outline

- Chancellor's Office (CCCCO) ARCC outcomes data linked to local data
- Various contributory factors from literature reviews were considered
- Intensive data validation for both accuracy and understanding
- Statistical analysis
- Interpretation of results

6

Data Issues or ...

“Why did this project take so long?”

- Questions regarding the ARCC methodology used by the CCCCCO
- System issues affecting the reliability of the data warehouse and the availability of IT support
- Data integrity issues and validity checking of each field in our system
- **Stay tuned** for specific recommendations from the research team soon regarding system issues and data integrity

7

Accountability Reporting for Community Colleges (ARCC)

- Established in response to AB1417, which required a framework for annual evaluation of community college performance in meeting statewide educational outcome priorities
- Seven system and eight college performance indicators are reported annually
- Management Information Systems (MIS) data is the primary data source

8

ARCC SPAR

One of the eight college indicators reported by ARCC is Student Progress and Achievement Rate (SPAR)

- Student progress and achievement defined by one of five measures

SPAR Success

- 1) Earning of an associate's degree
- 2) Earning of a vocational certificate
- 3) Transfer to a 4-year college
- 4) Achieving "transfer directed" status
- 5) Achieving "transfer prepared" status

- Counts coursework and outcomes from other colleges

9

Cohort Description

- The three cohorts of the 2010 ARCC report were examined
 - Cohorts consisted of first-time students with 'Intent to Complete'
 - The cohort years were 2001-02, 2002-03, and 2003-04
 - The cohorts were combined into one dataset to increase sample size
 - ARCC data provided long term outcomes about students who were tracked for six years

10

Cohort Description

- ARCC outcomes data were linked to the district's data warehouse to include factors that may have contributed to student success
- Given that each college varies in its student population, policies, and practices, a separate analysis was conducted for each college

	Bakersfield	Cerro Coso	Porterville	Total
2001-02	2,452	600	745	3,789
2002-03	2,468	527	775	3,759
2003-04	2,249	502	564	3,303
Total	7,169	1,629	2,084	10,851

11

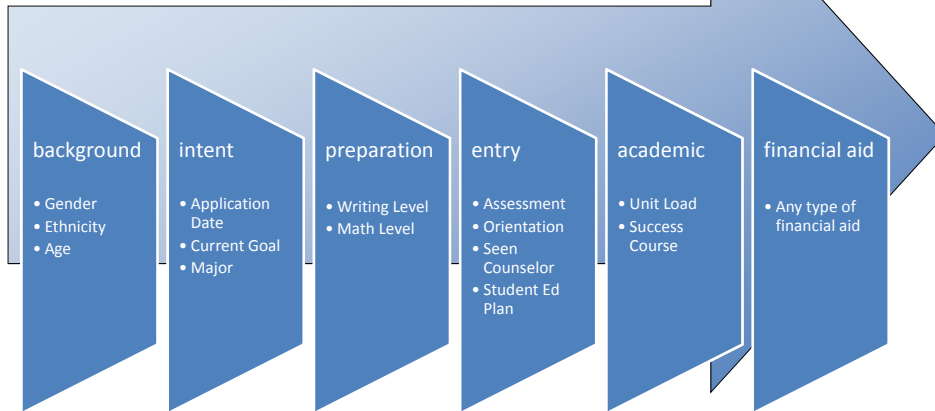
Research Model

- Modeling moves from describing an outcome (e.g. 58% White or 62% success rate) to exploring the effects of many factors simultaneously on an outcome
- A "model" describes and tests the relationships between different factors in achieving a certain outcome
- We tested variables known in success research against SPAR achievement
- DIRT adapted a well-known "workable models approach" to assess student success

12

Model Factors Tested

Modified Pathway Model



Model adapted from Tinto (1976); St John et al. (1994, 2000, etc); Adelman (1999 & 2007); Hossler et al. (1999 & 2006)

13

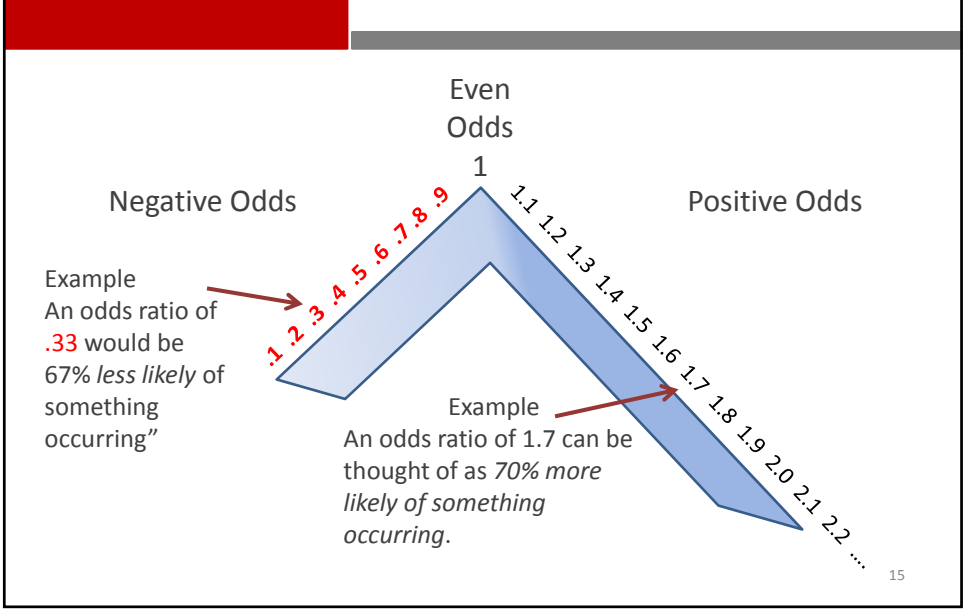
Methodology

Used Sequential Logistic Regression to “model” the student pathway data analytically

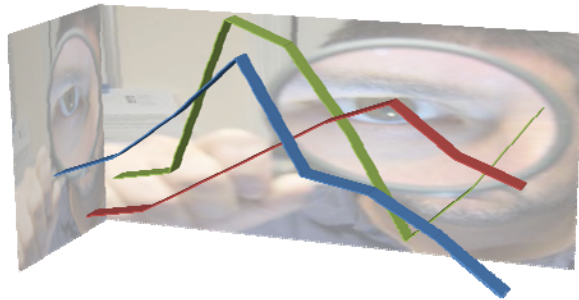
- Allows examination of all factors together that influence student progress and achievement
- Permits us to see the effect of each student pathway factor on Student Progress and Achievement with odds ratios while controlling for the other factors

14

What is an Odds Ratio?



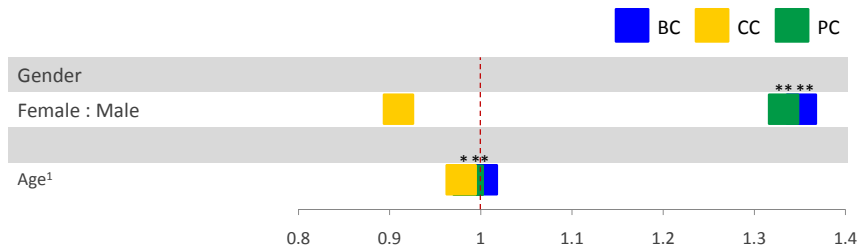
Findings



Background: Age, Gender

Women at BC and PC were more likely than men to achieve SPAR (34% and 33% respectively).

At CC and PC, as students' age increased, their chances of achievement decreased slightly.



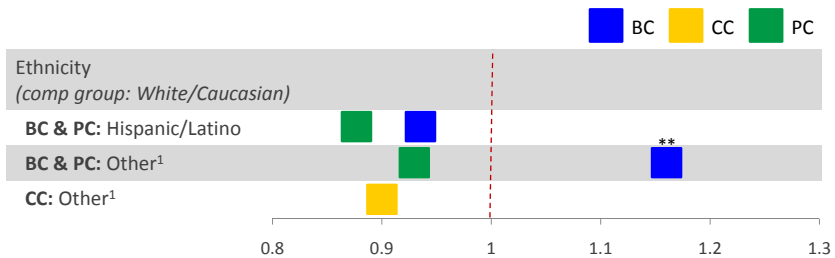
** Standard significance ($p < 0.05$)
* Marginal significance ($0.05 < p < 0.10$)

¹ Age is measured on an interval scale and does not have a comparison group

17

Background: Ethnicity

When controlling for all other factors, ethnicity has little effect on student success.



** Standard significance ($p < 0.05$)
* Marginal significance ($0.05 < p < 0.10$)

¹ It was necessary to combine ethnicity categories to adhere to statistical requirements. At BC and PC, the 'other' ethnicity category includes African American, American Indian, Asian, Filipino, Pacific Islander, 'other' and unknown ethnicities. At CC, Hispanic/Latino students were also included in the 'other' category.

18

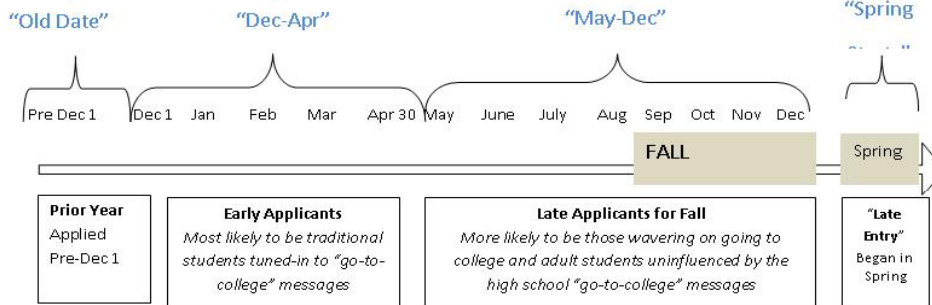
College Admission Application Timing:

a silent proxy for academic preparation?

GENERAL COLLEGE ADMISSIONS CYCLE

Although the traditional college admission cycle is thought to be more relevant to 4-year institutions, this study tested whether admission application time was related to long term student success.

Categories used in the study



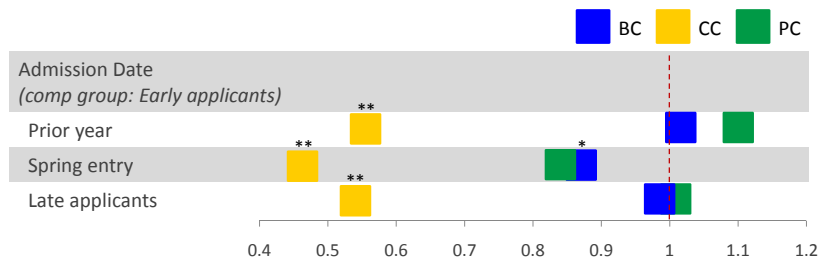
Students who were included in categories "Old Date", "Dec-Apr", "May-Dec", were enrolling in Fall. Spring enrollees could have applied at any time.

Intent/Aspiration: Admission Date

Of the four date groups, the most successful group—those who applied Dec thru April (early applicants) prior to fall—were chosen as the comparison group.

At BC and PC, those who were admitted in the spring semester were less likely to be successful.

At CC, achieving SPAR was much less likely for all groups compared to early applicants.

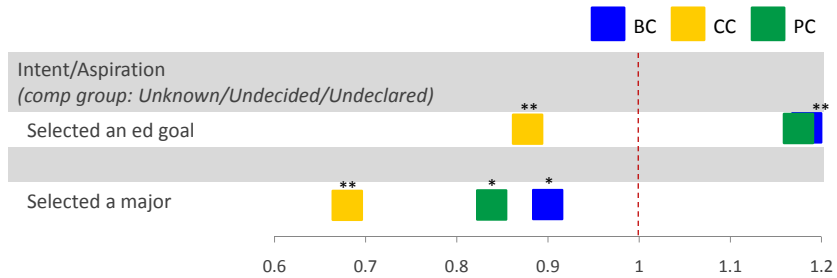


** Standard significance ($p < 0.05$)
* Marginal significance ($0.05 < p < 0.10$)

Intent/Aspiration: Ed Goal, Major

Students at BC and PC who chose an educational goal in their first term were more likely to achieve SPAR, than those that had not selected a goal. The same effect was not evident in the selection of a major.

At CC, selecting an educational goal or a major was negatively associated with SPAR success. A selected major compared to unknown/undecided –one third less likely.



** Standard significance ($p < 0.05$)
 * Marginal significance ($0.05 < p < 0.10$)

21

Placement

Because academic preparation prior to enrollment is such a strong predictor of college success, the study needed a proxy (replacement) measure since neither SAT/ACT nor high school GPA are available.

Placement test results were used as academic preparation indicators.

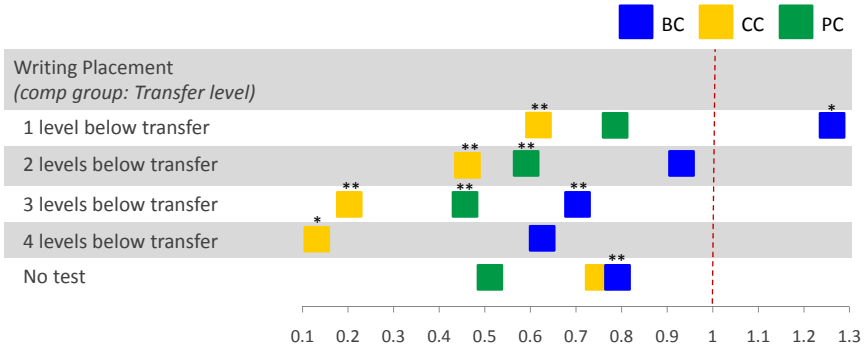
The following findings discuss how different placement levels predict success on SPAR.

22

Placement: Writing

All three colleges demonstrated a very strong relationship between student placement level and chances of being successful at SPAR.

The only exception to this pattern were students at BC who placed "1 level below transfer" were 27% more likely to achieve SPAR than students who placed at "transfer level".



** Standard significance ($p < 0.05$)
* Marginal significance ($0.05 < p < 0.10$)

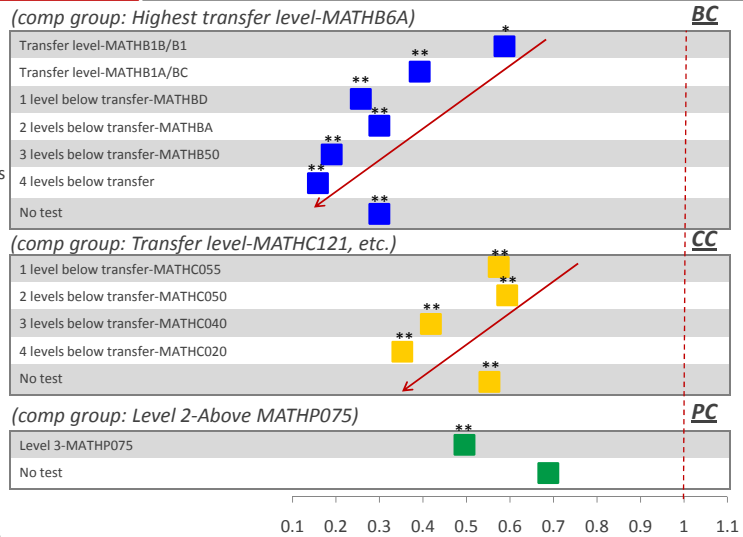
23

Placement: Math

At BC and CC, the higher students placed in math, the greater their odds of success at SPAR.

This observation was consistent at both colleges and became more pronounced the further down they placed from transfer level.

At PC, students scoring into level 3, the lower level, were about half as likely to achieve SPAR as those who tested higher, into level 2, a large group.



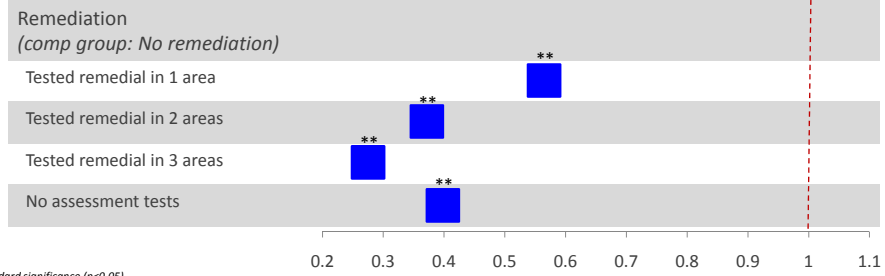
** Standard significance ($p < 0.05$)
* Marginal significance ($0.05 < p < 0.10$)

24

Placement: BC Remediation

Remedial placement carries a higher risk for non-completion, and even controlling for other factors, this study lends strong support to that observation. Requiring remediation in one area decreased odds by 42%; in two areas 62%, three areas 73%.

It is interesting to note that students who took no placement tests were nearly equivalent in success odds as those testing into two remedial areas when compared to those who did not require remedial work.



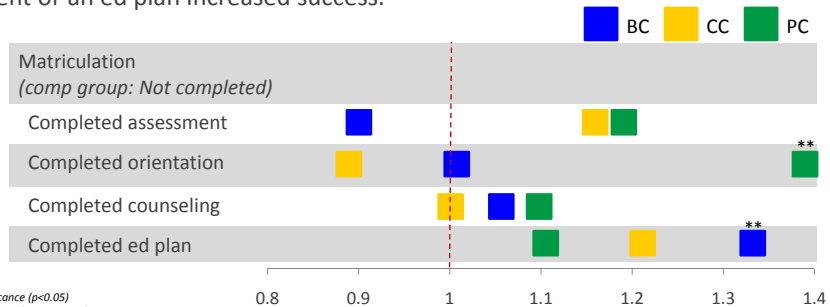
25

Entry: Matriculation Variables

The Entry variables function as the gateway and guidance to college.

At PC, students who completed orientation were 37% more likely to achieve SPAR; completing any part of the matriculation process was linked to long term success.

At BC, completing an ed plan increased chances of success by 33%. At CC completing assessment or an ed plan increased success.

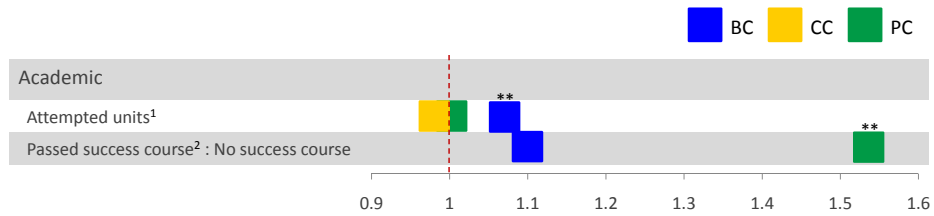


26

Academic: Attempted Units, Success Course

At PC, students who passed a student success course were 54% more likely to achieve SPAR.

At BC, the more units a student attempted, the greater their chances were at success.



** Standard significance ($p < 0.05$)
 * Marginal significance ($0.05 < p < 0.10$)

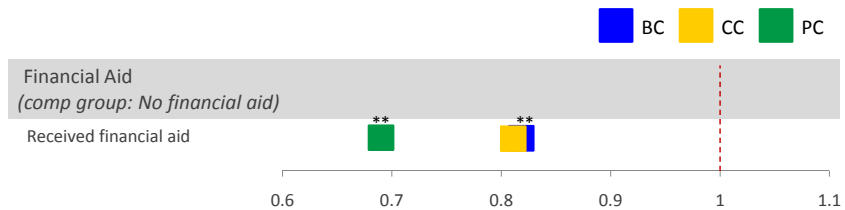
¹ Age is measured on an interval scale and does not have a comparison group

² CC's student success course was removed from the analysis because during this period, it was only emphasized for a small, specific population.

27

Financial Aid

At all three schools, the odds of students who received financial aid achieving success were less than students who did not receive aid. This finding was significant at BC and PC.



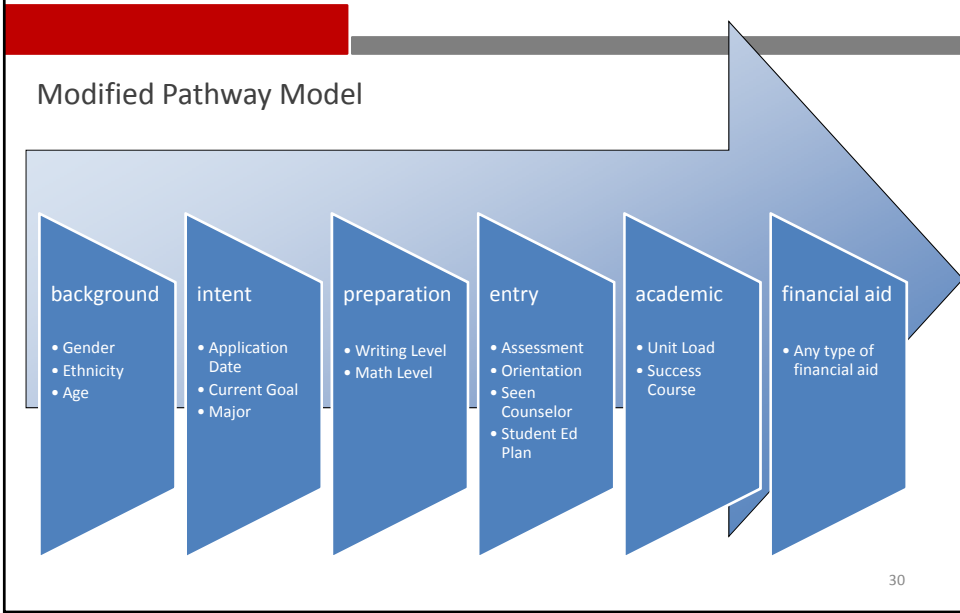
** Standard significance ($p < 0.05$)
 * Marginal significance ($0.05 < p < 0.10$)

28

Discussion and Questions



Discussion and Questions



Discussion and Questions

- Placement Testing is the key to academic ability.
- Understanding an incoming student's **academic preparation** is a very strategic tool to structuring student support during entry to college—from student success courses, proper placement in courses, and more intrusive advising on course selection.

31

Discussion and Questions

Background and Intent/Aspiration

- What can be done to improve the completion rates for male students at BC and PC?
- What could colleges be doing to help students select majors and goals most appropriately and in conjunction with their academic ability?

32

Discussion and Questions

The study of **admission dates** in this project suggest several possibilities:

1. Students applying early, following the traditional admissions cycle, may have been better prepared students. If so, practitioners could focus success services on applicants coming in May 1 and later.
2. Colleges may want to explore the admission and matriculation processes and their role in student success.

33

Discussion and Questions

- Although **Placement Testing** was the best predictor of success, many didn't partake and had success rates similar to those who tested several levels below transfer. Should this be mandatory?

Percentage of Cohort Students With No Assessment Scores			
	Bakersfield	Cerro Coso	Porterville
Writing	17.0%	42.9%	14.7%
Reading	9.4%	32.9%	14.4%
Math	8.2%	30.3%	15.4%

34

Discussion and Questions

- While the components of matriculation are important to success, many do not complete them.

	Bakersfield	Cerro Coso	Porterville
Assessment	17.5%	52.8%	29.0%
Orientation	17.4%	58.6%	27.4%
Counseling	29.7%	45.6%	40.7%
Completed Ed Plan	66.5%	57.2%	72.6%

35

Discussion and Questions

- Part of a larger dialogue now at the State level are **Student Success Courses**, which seek to provide academic skill and help students understand and use college resources and set realistic goals to stay in college and complete.
- PC's program during the period of this study indicated significant and large increase in odds of achievement if they took a SS course.

36

Questions



Logistic Regression Results Showing Odds Ratios Indicating Probability of Achieving ARCC SPAR Success

Each factor has a comparison group - using Gender at BC as an example, females were 1.34 times more likely to be successful compared to males.
Highlighted figures in the 'Odds Ratio' columns were statistically significant.

Pathway Points	Factor, Categories and Comparison or Referent Group	Bakersfield College	BC Odds Ratio	Cerro Coso Community College	CC Odds Ratio	Porterville College	PC Odds Ratio	
Background								
	Age¹	Continuous : No Comparison ¹	1.00		0.99 *		0.99 **	
	Gender	Female : Male	1.34 **		0.92		1.33 **	
	Ethnicity	<i>Differs by College ...</i>	Hispanic/Latino : White/Caucasian	0.94	Other: White/Caucasian	0.90	Hispanic/Latino : White/Caucasian	0.87
			Other : White/Caucasian	1.17 **			Other : White/Caucasian	0.93
Intent/Aspiration								
	Admission Date	Old date : Dec - Apr Spring entry : Dec - Apr May-Dec : Dec-Apr	1.02		0.54 **		1.11	
			0.86 *		0.46 **		0.84	
			0.98		0.53 **		1.01	
	Current Goal	Selected : Unknown/Undecided	1.19 **		0.88 **		1.19	
	Major	Declared : Unknown/Undeclared	0.90 *		0.68 **		0.84 *	
Preparation								
	Writing or English Placement	<i>Differs by College ...</i> Each level below transfer compared to the transfer level course	1 level - ENGLB50 : ENGLB1A	1.26 *	1 level - ENGLC070 : ENGLC101	0.63 **	1 level - ENGLP050 : ENGL P101	0.80
			2 levels - ENGL B60 : ENGLB1A	0.92	2 levels - ENGLC040 : ENGLC101	0.47 **	2 levels - ENGLP071 : ENGLP101	0.61 **
			3 levels - ACDEV B68 : ENGLB1A	0.70 **	3 levels - ENGLC030 : ENGLC101	0.20 **	3 levels - ENGLP083 : ENGLP101	0.47 **
			4 levels - Add'l Test : ENGLB1A	0.62	4 levels : ENGLC101	0.13 *	No test : ENGLP101	0.51
			No test : ENGLB1A	0.79 **	No test : ENGLC101	0.76		
	Math Placement	<i>Differs by College ...</i> Each level below transfer compared to the <i>highest</i> transfer level course	Transfer level B1B/B1 : MATHB6A	0.58 *	1 level - MATHC055 : Transfer level	0.58 **	Level 3 : Level 2	0.50 **
			Transfer level B1A/BC : MATHB6A	0.39 **	2 levels - MATHC050 : Transfer level	0.59 **	No test : Level 2	0.69
			1 level - MATHBD : MATHB6A	0.26 **	3 levels - MATHC040 : Transfer level	0.42 **		
			2 levels - MATHBA : MATHB6A	0.30 **	4 levels - MATHC020 : Transfer level	0.34 **		
			3 levels - MATHB50 : MATHB6A	0.18 **	No test : Transfer level	0.56 **		
	Remediation	BC Only	4 levels - Add'l Testing : MATHB6A	0.15 **				
			No test : MATHB6A	0.30 **				
			Remedial 1 Area : No Remedial	0.58 **				
			Remedial 2 Areas : No Remedial	0.38 **				
		Remedial 3 Areas : No Remedial	0.27 **					
		No test : No Remedial	0.40 **					
Entry								
	Matriculation	Had Assessment : No/Refused Had Orientation : No/Refused Had Counseling : No/Refused Did Ed Plan : No/Refused	0.90		1.16		1.19	
			1.01		0.88		1.38 **	
			1.06		1.00		1.11	
			1.33 **		1.22		1.12	
Academic								
	Attemptd Units¹	Continuous : No Comparison ¹	1.06 **		0.99		1.00	
	Success Crse	Passed Success Crse : No Crse	1.10		--		1.54 **	
Financial Aid								
	Financial aid	Awarded Aid : No Aid	0.82 **		0.81		0.69 **	

** standard statistical significance (p < 0.05)

* marginal statistical significance (0.05 < p < 0.10)

¹Age and Attempted Units are treated as interval (continuous) variables and have no comparison group.