

The Community College Penalty and Bachelor's Degree Completion: Fact or Fiction?

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Focus on Illinois Education Research Symposium

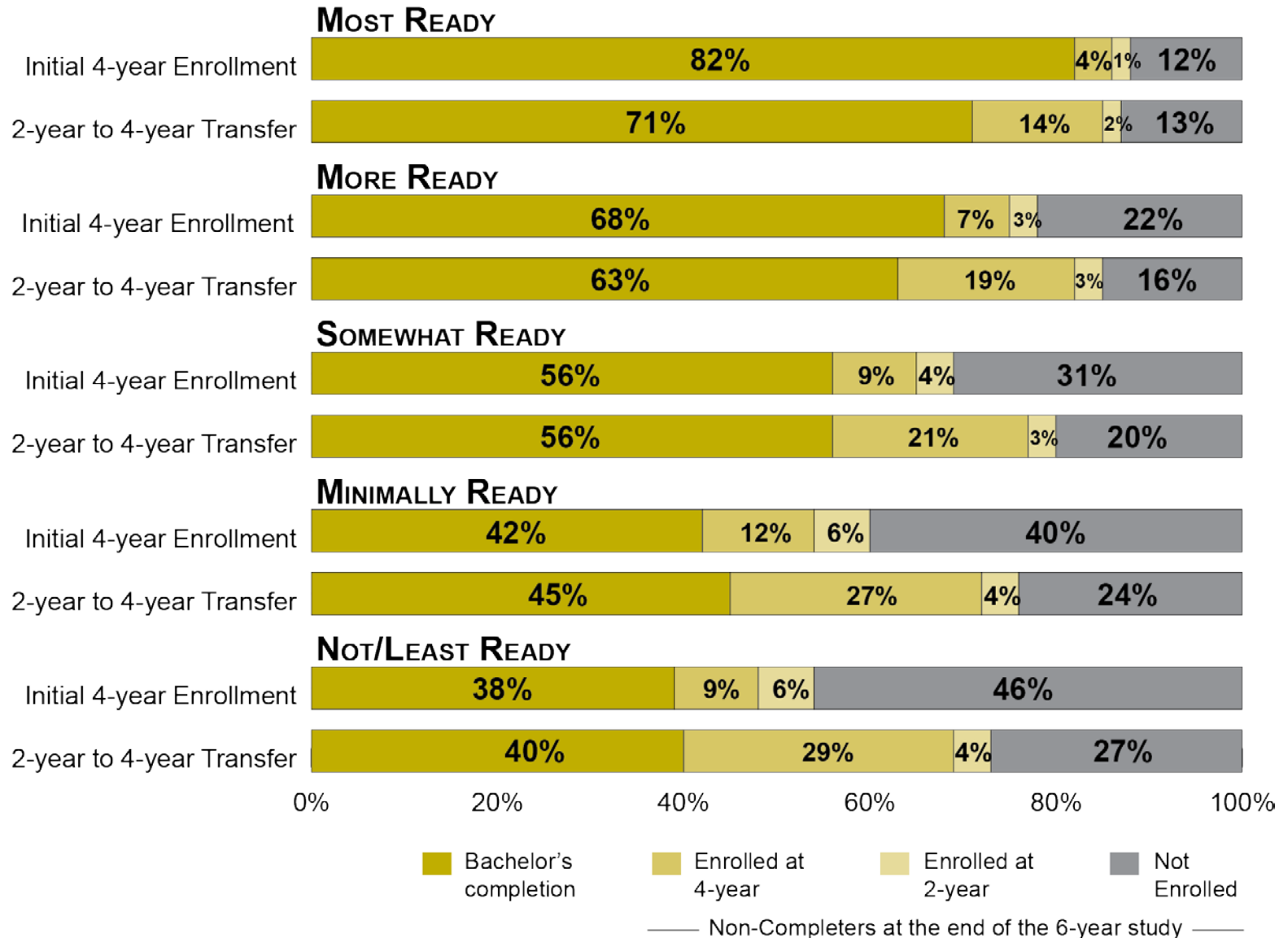
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Community College Penalty and Bachelor's Degree Completion?

- Penalty seems to be related to the point at which the given study commences tracking outcomes
 - At initial community college enrollment
 - After vertical transfer
- Can't earn a bachelor's degree at a community college
- Parallel point of entry

Controlling for Point of Entry



Study Groups

- **Treatment group** ($n=2,154$): those initially enrolling at a community college FT, maintaining that enrollment through their 1st and 2nd years, and then transferring to a four-year college (no lateral transfers).
- **Comparison group** ($n=21,522$): rising four-year college juniors with a similar pattern of full-time enrollment (no lateral transfer)

Propensity Score Matching

- Quasi-experimental
- Counterfactual
- Logistic regression-likelihood of being a community college transfer

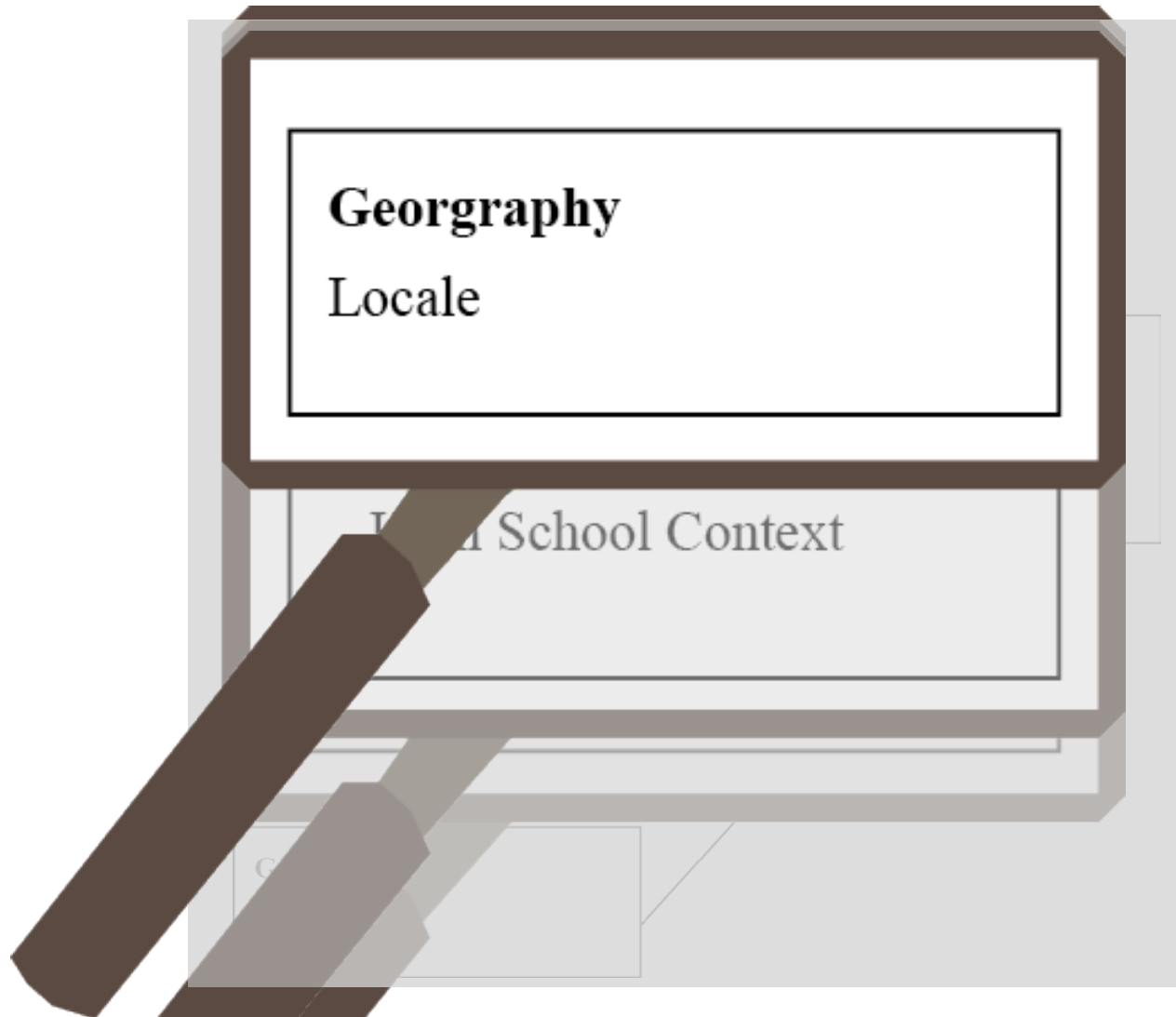
Research Questions

1. Is there a community college penalty with regard to bachelor's degree completion after achieving sufficient balance on the pre-treatment characteristics?
2. Is there a community college penalty with regard to bachelor's degree completion after achieving sufficient balance on the post-treatment adjustment?

Data Sources

- ACT HS Class of 2003
 - ACT Scores
 - Student Interest Profiler
- National Student Clearinghouse
 - Enrollment
 - Degree completion
- Illinois Interactive Report Card
- Barron's

Conceptual Framework for Propensity Score Matching Model



Process for PSM

- Exact match on high school
- Nearest neighbor (one-to-one)
- Caliper (.25 standard deviation units)
- Replacement
- Second match with a post-treatment adjustment

Post-Treatment Adjustment

- Controlled for college context
- Exact match on the selectivity (Barron's) of their undergraduate college
- Large differences in bachelor's completion by selectivity level even after controlling for academic preparation (Lichtenberger & Dietrich, 2012)
- This approach is theoretically supported by Flores and Flores-Lagunes (2009) and Frangakis and Rubin (2002)

Balancing Diagnostics

- Comparisons of mean propensity scores
- Standardized differences-
 - 10% or less indicates balance
 - 20% or more indicated a large difference

Differences in Demographics

	Prior to Matching
Control	Standardized Difference
Race: White	26.32
Race: Latino	-5.43
Race: Asian	-18.16
Race: African American	-21.65
Race: Other	3.27
Gender: Male	8.19
Family Income: High \$80k+	-32.37
Family Income: Mid High \$50k-<\$80k	9.95
Family Income: Mid Low \$30k-<\$50k	16.27
Family Income: Low \$<30k	6.70
Family Income: Missing	0.00

* Cells are shaded according to their difference from zero

Difference favoring 4-year group



Difference favoring community college group

Differences in Academic Factors

	Prior to Matching
Control	Standardized Difference
HS GPA: 3.5+	-37.07
HS GPA: 3.0-3.4	11.99
HS GPA: 2.5-2.9	19.51
HS GPA: <2.5	22.23
HS GPA: Missing	4.71
ACT Math	-80.05
ACT English	-80.11
ACT Reading	-62.94
ACT Science	-67.67
ACT Composite	-84.18
HS Program: College Prep	-27.99
HS Program: CTE	19.25
HS Program: General	21.35
HS Program: Missing	4.65
HS Class Rank: Top 25%	-33.93
HS Class Rank: Second 25%	26.22
HS Class Rank: Third 25%	22.49
HS Class Rank: Bottom 25%	0.00
HS Class Rank: Missing	4.71

* Cells are shaded according to their difference from zero

Difference favoring 4-year group



Difference favoring community college group

Differences in Environmental Factors

	Prior to Matching
Control	Standardized Difference
Work Expectation: Yes	4.05
Work Expectation: No	-9.12
Work Expectation: Missing	4.86
Aid Expectation: Yes	-2.06
Aid Expectation: No	-2.83
Aid Expectation: Missing	2.44
Number of Siblings	-3.57
Locale: Chicago	-27.11
Locale: Other Urban	0.00
Locale: Suburban	-29.63
Locale: Town	32.90
Locale: Rural	35.65

* Cells are shaded according to their difference from zero

Difference favoring 4-year group



Difference favoring community college group

Differences in Institutional Selectivity

Barron's Institutional Selectivity	Prior to Matching
	Standardized Difference
Barron's: Most/Highly Competitive	-49.15
Barron's: Very Competitive	-34.98
Barron's: Competitive	60.94
Barron's: Less/Non Competitive	21.32
Barron's: Other	14.36

* Cells are shaded according to their difference from zero

Difference favoring 4-year group



Difference favoring community college group



- Rising four-year juniors were more likely to be at more competitive institutions.
- Community college transfer were more likely to be at less competitive institutions.

Differences in Institutional Selectivity

Barron's Institutional Selectivity	Prior to Matching	After Propensity Score Matching
	Standardized Difference	Standardized Difference
Barron's: Most/Highly Competitive	-49.15	-14.82
Barron's: Very Competitive	-34.98	-21.03
Barron's: Competitive	60.94	11.72
Barron's: Less/Non Competitive	21.32	8.70
Barron's: Other	14.36	10.10

* Cells are shaded according to their difference from zero

Difference favoring 4-year group



Difference favoring community college group



- After PSM
 - Rising four-year juniors were slightly more likely to be at very or most competitive colleges.
 - Community college transfers were slightly more likely to be at competitive institutions and those lacking a Barron's ranking.

Differences in Institutional Selectivity

Barron's Institutional Selectivity	Prior to Matching	After Propensity Score Matching	After Post-Treatment Adjustment
	Standardized Difference	Standardized Difference	Standardized Difference
Barron's: Most/Highly Competitive	-49.15	-14.82	0.00
Barron's: Very Competitive	-34.98	-21.03	0.00
Barron's: Competitive	60.94	11.72	0.00
Barron's: Less/Non Competitive	21.32	8.70	0.00
Barron's: Other	14.36	10.10	0.00

* Cells are shaded according to their difference from zero

Difference favoring 4-year group



Difference favoring community college group



- After the Post-Treatment Adjustment- perfect balance on institutional selectivity

Differences in Demographics

	Prior to Matching	After Propensity Score Matching	After Post-Treatment Adjustment
Control	Standardized Difference	Standardized Difference	Standardized Difference
Race: White	26.32	-3.41	-4.91
Race: Latino	-5.43	0.00	0.00
Race: Asian	-18.16	8.29	5.44
Race: African American	-21.65	7.22	0.00
Race: Other	3.27	0.00	0.00
Gender: Male	8.19	0.00	4.03
Family Income: High \$80k+	-32.37	11.29	2.63
Family Income: Mid High \$50k-<\$80k	9.95	-3.41	7.19
Family Income: Mid Low \$30k-<\$50k	16.27	-3.60	0.00
Family Income: Low \$<30k	6.70	4.52	0.00
Family Income: Missing	0.00	-6.12	-8.51

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Difference favoring 4-year group



Difference favoring community college group

Differences in Academic Factors

	Prior to Matching	After Propensity Score Matching	After Post-Treatment Adjustment
Control	Standardized Difference	Standardized Difference	Standardized Difference
HS GPA: 3.5+	-37.07	3.12	2.24
HS GPA: 3.0-3.4	11.99	3.22	0.00
HS GPA: 2.5-2.9	19.51	8.41	9.08
HS GPA: <2.5	22.23	0.00	0.00
HS GPA: Missing	4.71	-12.90	-6.72
ACT Math	-80.05	-5.61	-3.04
ACT English	-80.11	-2.77	-2.30
ACT Reading	-62.94	-3.03	-0.40
ACT Science	-67.67	-3.63	-0.29
ACT Composite	-84.18	-4.24	-1.14
HS Program: College Prep	-27.99	0.00	0.00
HS Program: CTE	19.25	-5.21	0.00
HS Program: General	21.35	10.61	10.21
HS Program: Missing	4.65	-9.56	-8.92
HS Class Rank: Top 25%	-33.93	0.00	0.00
HS Class Rank: Second 25%	26.22	6.23	2.22
HS Class Rank: Third 25%	22.49	4.94	3.59
HS Class Rank: Bottom 25%	0.00	0.00	0.00
HS Class Rank: Missing	4.71	-12.90	-8.92

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Difference favoring 4-year group



Difference favoring community college group

Differences in Environmental Factors

	Prior to Matching	After Propensity Score Matching	After Post-Treatment Adjustment
Control	Standardized Difference	Standardized Difference	Standardized Difference
Work Expectation: Yes	4.05	5.68	12.02
Work Expectation: No	-9.12	3.36	-7.08
Work Expectation: Missing	4.86	-10.08	-6.89
Aid Expectation: Yes	-2.06	5.86	6.17
Aid Expectation: No	-2.83	4.08	2.93
Aid Expectation: Missing	2.44	-10.08	-6.89
Number of Siblings	-3.57	-3.48	1.79
Locale: Chicago	-27.11	0.00	0.00
Locale: Other Urban	0.00	0.00	0.00
Locale: Suburban	-29.63	0.00	0.00
Locale: Town	32.90	0.00	0.00
Locale: Rural	35.65	0.00	0.00

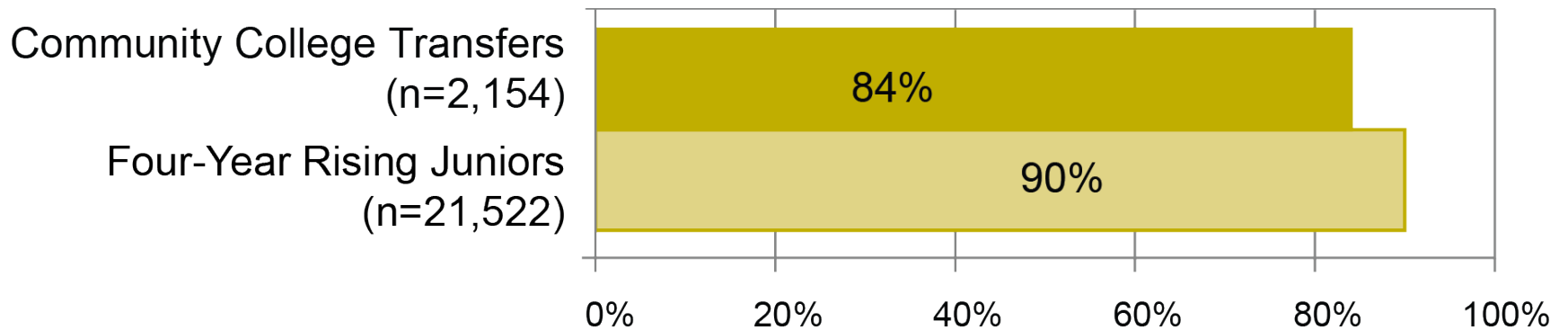
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Difference favoring 4-year group



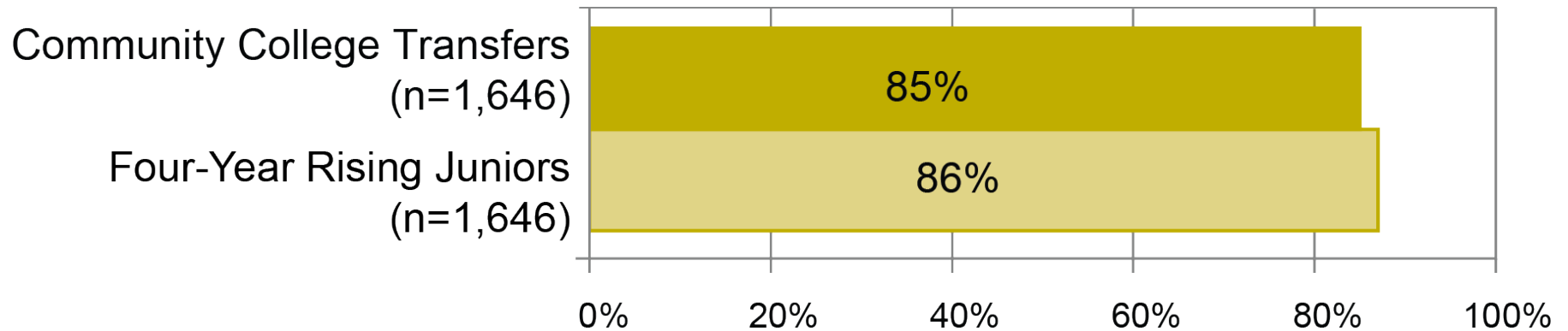
Difference favoring community college group

Bachelor's Completion Rates Prior to Matching



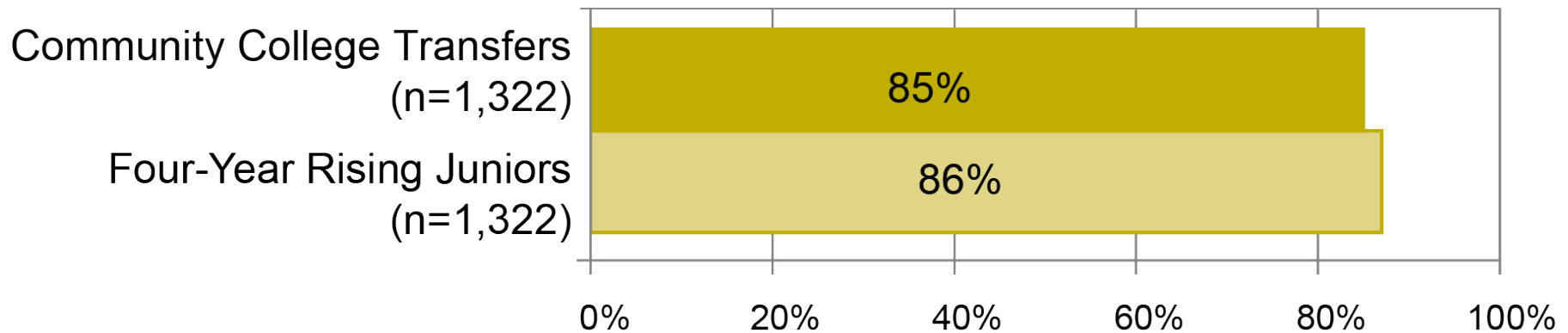
* Statistically significant based on Pearson's Chi Square

Bachelor's Completion Rates after PSM



*Pearson's Chi Square not significant

Bachelor's Completion Rates after Post-Treatment Adjustment



*Pearson's Chi Square not significant

Summary

- The profile of CC transfers was significantly different than that of the rising four-year college juniors prior to matching.
- 84% of the CC transfers had earned a bachelor's degree within 5 academic years of transitioning to a four-year college.
- After matching on key factors, *no community college penalty was evident.*

Policy Implications

- Continue to develop baseline information about statewide transfer performance.
- Set goals for institutional performance related to vertical transfer.
 - Community colleges and four-year institutions
- Help students face their financial aid future by developing information and incentives spanning undergraduate enrollment.

Further Investigation

- Survival analysis (time to degree completion)
- Multiple imputations for missing data
- Differences in terms of majors
- Variation of the treatment effect by subgroup
- A more global view of degree completion

Questions