Are Community College Transfer Students Less Likely to Earn a Bachelor's Degree than students who started at a 4-year institution?

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Introduction

- Community college debate
  - Democratization vs. Diversion (Rouse, 1995)
- Educational outcomes of transfer students (mixed results)
  - Community college transfer students are less likely to complete a bachelor's degree
    - Doyle (2009)
    - Long, B. T., & Kurlaender, M. (2009).
  - Community college transfer students have similar graduation rates as students who started at a four-year institution.
    - Melguizo, Kienzl, & Alfonso (2011)
    - Xu, Jaggars, Fletcher, Fink (2018)

Research question

- Are Community College Transfer Students Less Likely to Earn a Bachelor's Degree than students who started at a 4-year institution?

Data

- National Education Longitudinal Study of 1988 (NELS:88)
  - Nationally representative, longitudinal study of 8th graders in 1988.
  - A sample of students followed throughout secondary and postsecondary years.
- Limitation: restricted data use file
  - Transcript-level data:
    - Number of non-remedial credits earned
    - Credits associated with threshold to identify transfer vs. rising junior
  - Regional data:
    - County-level labor market outcomes
    - Higher education characteristics (e.g. tuition by county)

Data

TABLE 1 Descriptive Statistics of Transfers and Rising Junior Students

Variable	Mean.Tr	SD.Tr	Mean.Co	SD.Co	Diff. stat. sign
Completed bachelor's degree by 2000	0.61	0.49	0.78	0.42	**
Individual characteristics					
Female	0.54	0.50	0.54	0.50	
Asian	0.07	0.25	0.09	0.29	*
black	0.04	0.19	0.07	0.25	**
Hispanic	0.13	0.34	0.06	0.25	**
White	0.76	0.43	0.77	0.42	
Socioeconomic status (range -1 to 1)	0.09	0.23	0.20	0.26	**
High school academic preparation and other characteristics					
High school test score (math and verbal)	53.10	7.19	57.93	6.78	**
Academic program in high school	0.48	0.50	0.59	0.49	**
Participated in honors program in high school	0.15	0.36	0.22	0.42	**
Participated in student government in high school	0.11	0.32	0.16	0.36	**
Had a child by 1992	0.00	0.07	0.00	0.05	
Married by 1992	0.04	0.19	0.01	0.12	**
Bachelor's degree expectations	0.97	0.17	0.98	0.13	
Financial aid and work related activities					
Received a grant	0.38	0.49	0.51	0.50	**
Took out a loan	0.14	0.35	0.34	0.47	**
Worked on-campus	0.11	0.31	0.30	0.46	**
Working on 92-93	0.93	0.25	0.91	0.29	*
Regional characteristics					
College in Northeast region	0.15	0.36	0.23	0.42	**
College in Midwest region	0.24	0.43	0.31	0.46	**
College in South region	0.34	0.47	0.32	0.47	
College in West region	0.26	0.44	0.13	0.34	**
N		654		2944	

Notes.
Differences are: * Significant at 5%; ** Significant at 1%
Values marked in red differ substantially from those in the original paper
Source. national education longitudinal study of 1988/2000 (NCES 2003-402)

Empirical Strategy

OLS & Probit

$$BA_i = Transfer_i\beta + X_i\gamma + \epsilon$$

- BA_i: Bachelor attainment, =1 if the student attained a bachelor's degree within eight years of high school graduation.
- $Transfer_i$: Transfer student, =1 for students who first attended a community college and transferred to a four-year college.
- X_i: Individual-specific covariates:
  - Includes individual characteristics (sex, race/ethnicity, SES, etc.)
  - High school academic preparation and other characteristics (test scores, bachelor degree expectations, etc.)
  - Financial aid and work related activities (received grant, took out a loan, etc.)
  - Regional characteristics (region of college attended)

Empirical Strategy

OLS & Probit

TABLE 2 Differences on Bachelor's Degree Attainment (OLS & Probit)

	OLS	Probit	Probit (marginal effects)
(Intercept)	-0.254 ***	-2.517 ***	
	(0.075)	(0.278)	
Transfer vs. Rising Junior	-0.060 **	-0.184 **	-0.057**
	(0.019)	(0.063)	(0.021)
Control individual characteristics, high school academic preparation and other characteristics, financial aid and work related activities, regional characteristics	Y	Y	Y
N	3598	3598	3598

Notes.
Differences are: * Significant at 5%; ** Significant at 1%
Source. national education longitudinal study of 1988/2000 (NCES 2003-402)

Empirical Strategy

PSM

- Individuals might self-select into specific types of institutions based on many observed and unobserved individual characteristics.
- Matching groups of students based on observable pre-treatment characteristics to approximate randomization.
- Based on strong assumption: all the factors related to college degree attainment were observed and all observed characteristics to match individuals are used in the estimation strategy.
- Propensity scores are estimated using all of the control variables in a probit function.

Empirical Strategy

PSM

TABLE 3 Differences on Bachelor's Degree Attainment (Probit and PSM)

		PSM		
	Probit	ATT	ATE	ATU
Transfer vs.	-0.057**	-0.046*	-0.105***	-0.046*
Rising Junior	(0.021)	(0.028)	(0.032)	(0.028)

Notes.
Differences are: * Significant at 5%; ** Significant at 1%
Source. national education longitudinal study of 1988/2000 (NCES 2003-402)

Sensitivity analysis

Using sensitivity analysis, we can discuss the causal estimates posed by the authors, challenge their assumption of no unobserved confounding, and investigate how confounders might change the research conclusions.

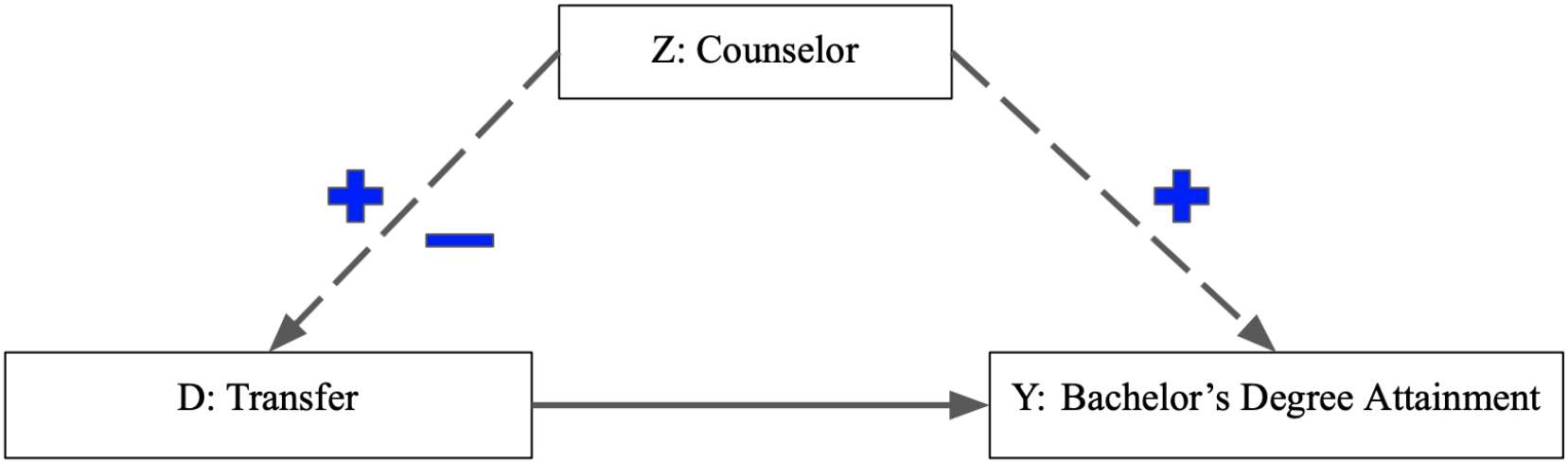
Sensitivity analysis

Confounders

- Non-random selection in college admission and applicant enrollment decision
  - Affect both institutional selection and academic performance
  - Including, but not limited to: individual ability, ambition, motivation, hard work, academic preparation, maturity, access to resources (e.g. school counselors), and family characteristics
- The influence of institutional-level factors is confounded by the nonrandom selection of students into institutions with different qualities.
  - For instance, if highly motivated students self-select themselves into a particular type of institution, then a particular type of institution would seem to be doing a better job of graduating students, even though the true reason for the higher graduation rates is that the institution attracts students who are more likely to graduate (Melguizo, & Dowd, 2009).

Sensitivity analysis

Confounders

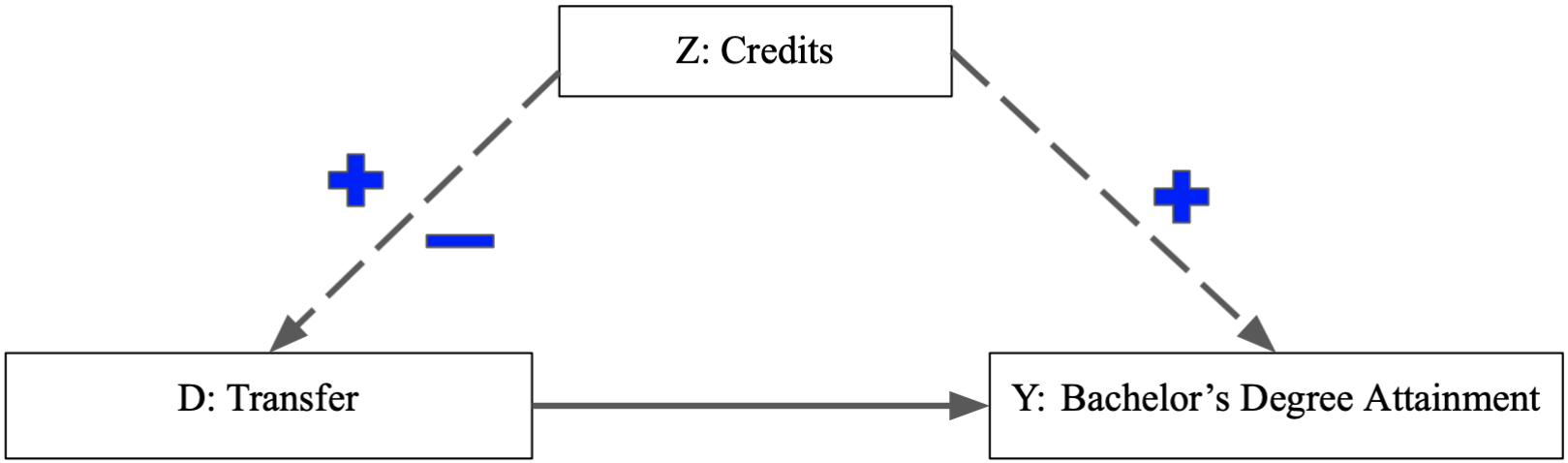


Having access to resources such as a college counselor may have a positive effect on transfer. The quality of those interactions may change the direction of the effect, if for example, college counselors give students the wrong information which may impact their ability to transfer.

Access to resources such as college counselors may have a positive effect on academic performance in the form of exposure to navigational resources.

Sensitivity analysis

Confounders

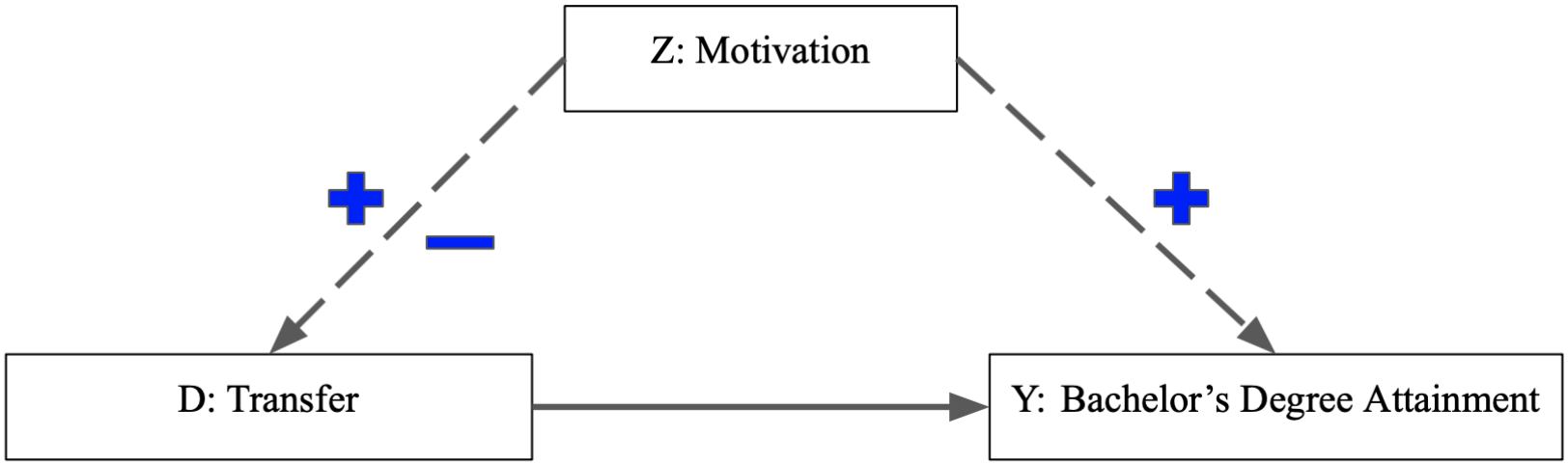


Non-remedial credits earned may have a positive effect on transfering to a 4-year institution. After a certain point, however, the number of credits earned may change the direction of the effect if there is no progress towards transfering.

Non-remedial credits earned may have a positive effect on bachelor's degree attainment as credits earned count towards students' major requirements for degree completion.

Sensitivity analysis

Confounders



Motivation may have effects on institutional selection where more motivated students may self-select into a particular type of institution. Students who successfully transfer into a four-year college through the complicated transitional process between different education settings are strongly motivated and more inclined to persist.

Motivation may affect academic performance, that is students that are highly motivated may do better academically and have higher rates of Bachelor's Degree attainment.

Sensitivity analysis

Benchmarking

Socioeconomic status, constructed from a composite of parental education, parental occupation and household income, is used as the benchmark variables to bound the relative strength of the unobserved confounders. The benchmark variable was chosen because it is a strong and visible predictor of bachelor's degree attainment theoretically and empirically (Melguizo et al, 2011; Wang, 2009), and likely explains more of the residual variation than any unobserved confounders.

Sensitivity analysis

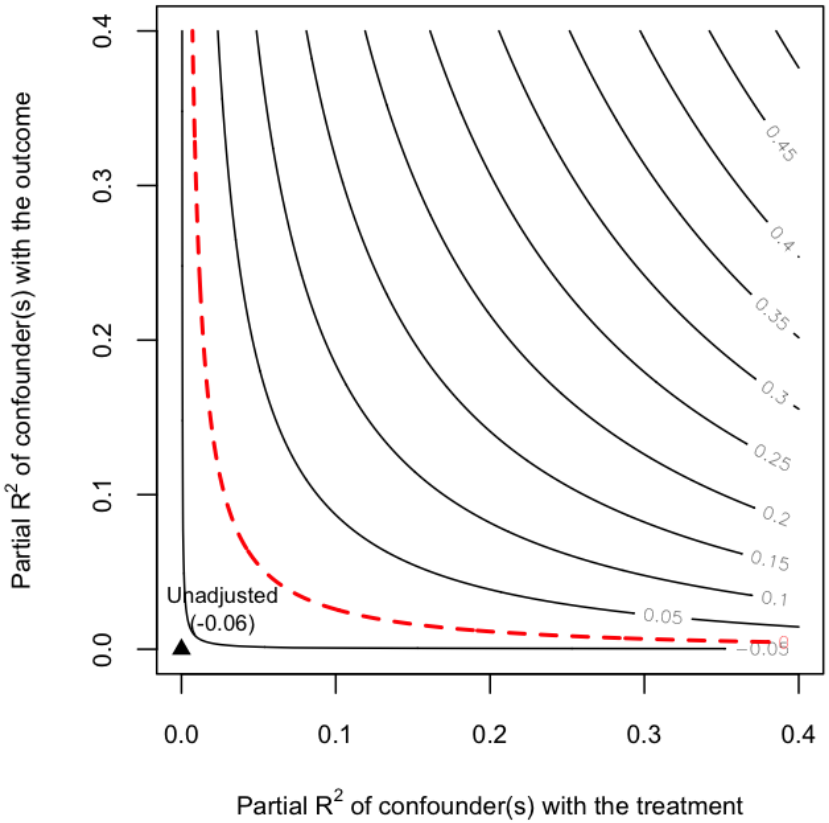
Results

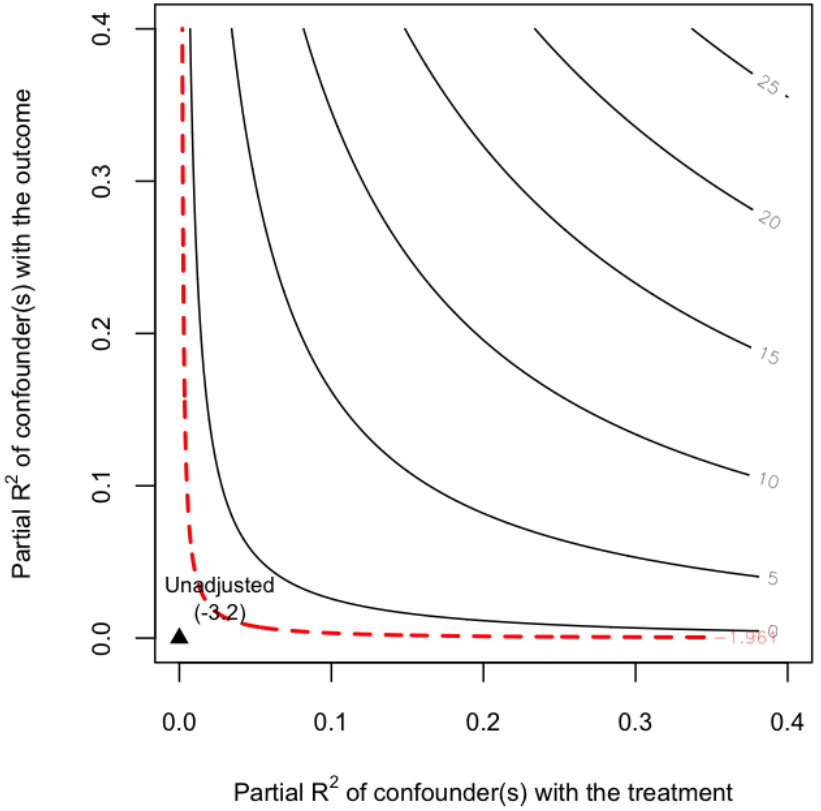
TABLE 4 Sensitivity Analysis Result

Treatment	Est.	SE	t-stat	$R^2_{Y\tilde{}D\|X}$	RV	$RV_{\alpha=0.05}$	df
Transfer vs. Rising Junior	-0.06	0.019	-3.204	0.29%	5.21%	2.06%	3598

Sensitivity analysis

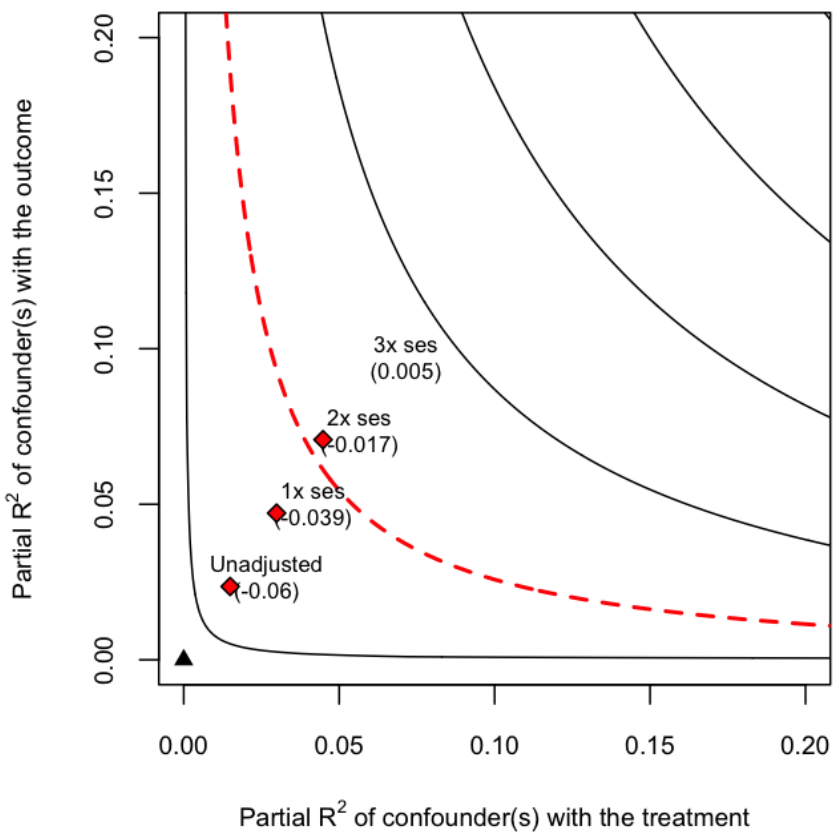
Results

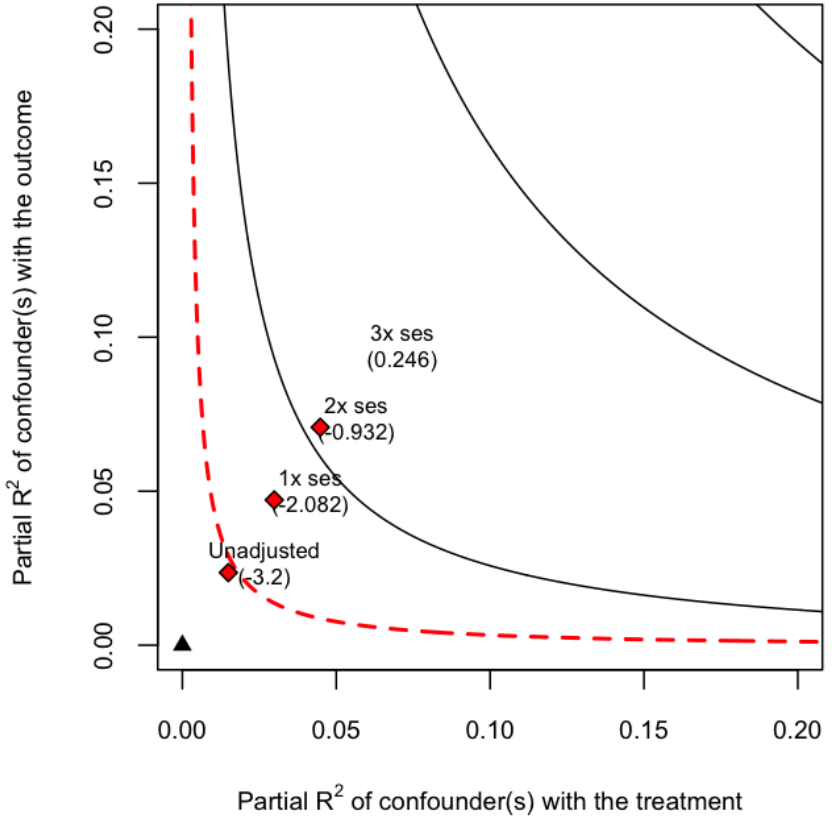




Sensitivity analysis

Results





Conclusion

- The results we described in our empirical strategy are likely sensitive to the unobserved confounders we proposed here.
- The relationship between transfer and bachelor's degree attainment can be overturned by even very weak confounders.
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Thank you!

Questions and feedback are welcome.