Academic Benefits of Living On Campus

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Measuring Impact on Grade Point Average

Measure the impact of living on campus on students' academic performance, both immediately and in the long-run.

Dependent Variables

- Single semester GPA: used to measure immediate effects.
- Cumulative GPA: used to measure permanent effects.

Explanatory (Treatment) Variables

- Student lived on-campus during Spring 2008: used to measure immediate effects.
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Measuring Channels for Improved Performance

Campus Resources

Are students that live on campus...

- study with campus resources: common study areas, computer labs, libraries?
- more likely to see a tutor?
- more likely to engage in extra-curricular activities?
- more likely to use university-provided fitness centers?
- spend more time studying?

Peer Influences

Are students that live on campus...

- more likely to study with roommates and/or classmates?
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Policy Significance

Policy Questions

1. Can changing residence hall resources and/or residence hall policies effect academic performance?
2. If so, *how?*

Search for Causation

- Essential to establish *causation* for policy implications.
- A laboratory scientist would *randomly (independently)* assign subjects to a control and treatment group.
- Instrumental Variable Regression: statistical technique that identifies an *independent variable* to identify causation.

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Instrumental Variable Regression

Sample Selection Bias

- Subjects *are not randomly* put into treatment and control groups.
- More highly motivated students *may choose* to live in dorms.
- Students who know they could use the benefits from living on campus *may choose* to live in dorms.

Instrumental Variables

- Find variable(s) *unrelated to academic performance* that influence treatment/control assignment.
- Instruments: distance of hometown from school, denied housing due to space limitations.

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Literature

On Campus Residence

- Positive impact for freshman: Thompson, et. al. (1993).
- No difference: Delucchi (1993).
- Critical thinking skills: Pascarella et. al. (1993):
- Social development skills: Flowers (2004).
- Positive impact for first-gen students: Pike and Kuh (2005).

Literature

Peer Influences

- Positive influences are dominant: Henderson et. al. (1978).
- Negative influences carry through college: Betts and Morell (1999).
- "Average" students most susceptible to peer influence: Zimmerman (2003).

Campus Resources

- Faculty student interaction: Pascarella and Terenzini (1991), Astin (1993), Kuh and Hu (2001a)
- Information technology: Kuh and Hu (2001b)
- Institutional spending / not necessarily academic support: Toutkoushian and Smart (2001)

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Need for More Research

- Find evidence of causation.
- Investigate the *channels* of dormitory influences.
- Changes in student characteristics and features of higher learning likely changes how students learn: Pascarella and Terenzini (1991).

Population and Sample

Population

- Undergraduate students at Indiana University Purdue University - Indianapolis.
- Approximately 19,700 students under age 25.
- Extremely limited on-campus housing capacity: 1,107.
- No on-campus housing requirements.

Sample

- Electronic survey given to 6,000 undergraduate in Fall 2008.
- 363 completed questionnaire [see Sax et. al. (2003)]
- Questions included: living situation, social life, study habits, campus resource utilization, cultural background, academic background.

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Measure of academic performance

- Semester GPA.
- Cumulative GPA.

(Each examined in turn)

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- Student lived on campus in concurrent semester.
- Student lived on campus anytime while at IUPUI.
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Instrumental variables

- Distance of hometown from campus - positively related to whether a student lived on-campus.
- On-campus housing turned down due to lack of available space (dummy).

Controls

- Gender
- Parents' income
- Non-traditional student dummy (age>25)
- ACT/SAT percentiles
- Number of semesters completed
- Number of credits in Spring 2008.

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Channel Variables

University Provided Resources: Fall 2008

- Use of fitness resources (hours per week – Tobit).
- Use of tutors (hours per week - Robust OLS).
- Engagement in extra-curricular activities (dummy - Probit).
- Hours using campus resources (hours per week - Tobit).
- Hours studying (hours per week - Tobit).

Peer-Influenced Variables: Fall 2008

- Number of drinks per week (Robust OLS)
- Ever used drugs while at IUPUI (Probit)
- Study with roommates (hours per week - Tobit)
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Estimating Academic Benefits

Estimation Procedure

1. OLS (No instruments / no control for self-selection bias)
2. IV: Just-identified using only distance from campus.
3. GMM using both instruments.
4. Two-stage MLE (first stage probit) using both instruments.

Three Specifications

1. Cumulative GPA on DORM_EVER.
2. Spring Semester 2008 GPA on DORM_EVER.
3. Spring Semester 2008 GPA on DORM_S08.

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Results for Academic Benefits

Coefficient on Living on Campus Dummy

Cumulative GPA on DORM_EVER			
OLS	IV	GMM	MLE
0.210**	0.312*	0.448***	0.431***
[0.087]	[0.187]	[0.140]	[0.156]
Spring 2008 Semester GPA on DORM_EVER			
OLS	IV	GMM	MLE
0.185*	0.221	0.416**	0.410**
[0.095]	[0.289]	[0.212]	[0.166]
Spring 2008 Semester GPA on DORM_S08			
OLS	IV	GMM	MLE
0.303***	0.490	0.973*	0.693***
[0.096]	[0.642]	[0.526]	[0.201]

Standard errors in parenthesis.

Estimating Channels

- Explanatory Variables:
  - DORM_PAST: Whether or not student lived on campus in the past.
  - DORM_F08: Whether or not student lived on campus in Fall 2008 semester.
    (Both included simultaneously)
  - Same set of controls.
- No IV estimation:
  - Computationally, it's hard with limited dependent variables.
  - Limited sample size and limited explanatory power.

Results for Campus Resources

Campus Resource Variables

	FITNESS Tobit	TUTORS Robust OLS	XTCUR Probit	CAMPUS Tobit	STUDY Tobit
DORM_F08	-3.687** [1.459]	0.153 [0.136]	0.788* [0.429]	-6.613*** [2.066]	-1.702 [1.55]
DORM_PAST	0.023 [1.069]	-0.279** [0.11]	0.937*** [0.268]	0.916 [1.532]	1.296 [1.317]
N	207	225	232	231	225
F-stat	1.67	1.46	—	3.09***	1.46
Wald Stat	—	—	50.45***	—	—
(Pseudo) R^2	0.0163	0.0206	0.1663	0.0228	0.0025

- Except for extra-curricular activities, significant values have opposite than expected signs.
- Engaging in extra-curricular activities has an immediate and permanent effect.

Results for Peer Influences

Peer-Influenced Variables

	DRINKS Robust OLS	DRUGS Probit	STUDCLASS Tobit	STUDROOM Tobit
DORM_F08	-0.186	0.200	0.051	2.077
	[0.183]	[0.389]	[1.156]	[1.803]
DORM_PAST	-0.341***	0.204	2.313***	2.467**
	[0.131]	[0.312]	[0.812]	[1.218]
N	226	230	231	230
F-stat	4.58***	—	2.37**	3.50***
Wald Stat	—	26.98***	—	—
(Pseudo) R^2	0.1322	0.1140	0.0272	0.0601

Delayed but significant long term effects:

- Less likely to consume alcohol.
- More likely to study with peers.

Conclusion

Academic Benefits

- Immediate effect: estimates range from 0.303 (OLS) to 0.973 (IV/GMM) increase in semester GPA.
- Permanent effect: estimates range from 0.210 (OLS) to 0.448 (IV/GMM) increase in cumulative GPA.

Channels

- More likely to develop productive relationships with peers.
- Consume less alcohol in *subsequent* semesters.
- More likely to participate in extra-curricular activities, stay involved.
- Largely failed to identify channels to explain an immediate effect.

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