Do More Diverse Environments Increase the Diversity of Subsequent Interaction? Evidence from Random Dorm Assignment

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Abstract

If universities expose students to a more diverse set of peers, do students form more diverse social networks in subsequent interaction outside of the environment directly controlled by the university? We address this question by exploiting unique data on social contacts from Facebook.com for a university that randomly assigns students to dormitories. We find that the exogenous exposure to members of a different race increases the number of different race friends in the dorm environment, but does not increase the diversity of social networks outside that environment.

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1. Introduction

We study the formation of social contacts on university campuses. Our contribution is to analyze the effect of randomly assigned peers on subsequent interaction outside of the environment that the university directly controls. We contribute to a growing literature on social interaction in college (e.g. Marmaros and Sacerdote [2006], Arcidiacono et al. [2007], Camargo et al. [2008]).

Many economists are interested in the formation of social ties because social connections influence information transmission in the economy.[1] Our results are of direct interest to university administrators who want to manage the influence of peers. Moreover, our findings provide evidence for a central argument in the affirmative action debate in the United States. Proponents of affirmative action reason that a racially diverse environment is beneficial for non-minority students and for society overall.[2] They argue that exposure to a diverse environment can change attitudes, improve mutual understanding, and help to overcome misperceptions.

Even though it is recognized that understanding the formation of social networks is important, there is relatively little empirical research on the topic. There are two reasons for this lack of empirical analysis. First, social interactions are difficult to measure.[3] Second, network formation is a complex process driven by unobservable characteristics and preferences. Hence, even if it is possible to measure social interactions, endogeneity issues usually prevent causal inference. We exploit unique data to overcome both obstacles. We use information from the online social network Facebook.com to measure interaction between students. We overcome endogeneity concerns by exploiting the random assignment to dormitories at Rice University.

We find that the (exogenous) exposure to members of a different race increases the number of different race friends *in the dorm environment*. However, it does not increase the diversity of social networks *outside that environment*. In particular, students with more (randomly assigned) Black dormmates have more Black friends within the dorm, but do not have more Black friends outside the dorm. The same pattern holds for Asian friends.

[1] See Jackson (2006) and Ioannides and Datcher-Loury (2004) for surveys.
[2] See two recent US Supreme Court decisions: Gratz et al. v. Bollinger (2003) and Grutter v. Bollinger (2003).
[3] Exceptions include Weinberg (2006) who uses AddHealth data, Marmaros and Sacerdote (2006) who use email among Dartmouth students, and Mayer and Puller (2008) who use Facebook.com data.

2. Data

Rice University is a private university in Houston, Texas that enrolls approximately 2800 undergraduates. Entering students are randomly assigned to one of nine residential colleges (dorms). Almost all students maintain their affiliation with that dorm for their remaining years in college.

Our data include all undergraduates at Rice who were registered on Facebook.com in January 2005. Facebook.com is a social networking website. Students set up a profile page that includes a picture, name, gender, major, and other information. The students' profiles contain a list of 'friends' at Rice, which indicate bidirectional friendships between students on campus. We use these friend connections as a proxy for a student's campus social network. At the time our data were collected, 80% of all undergraduates at Rice were members of Facebook.

Students do not report their race on Facebook. Therefore, undergraduate research assistants classified the pictures on the Facebook profiles by race. The race categories used in this classification are: White/Hispanic, Black, and Asian.[4] For a detailed data description and discussion of the connection between Facebook friendships and educational outcomes, see Mayer and Puller (2008).

After excluding students who could not be assigned to a race category and students with other missing information, we obtain a sample of 1016 students. On average students have 26 Facebook friends in their own dorm and 19 friends in other dorms. Table 1 describes the composition of the sample and the friendship networks for different groups of students. The racial composition reflects the overall student body at Rice. Most students are White or Hispanic, about 11% are ethnically Asian and 5% are Black. Students tend to choose friends with similar characteristics. Black students have disproportionately many Black friends -- 25% of friends of Black students are Black despite Blacks representing only 5% of the population. Similarly, Asian students have a disproportionately high share of Asian friends.

[4] Each picture was evaluated by two research assistants. We only include students in the analysis if both research assistants' race evaluation coincides. Mayer and Puller (2008) show that the race evaluation by the RAs largely coincides with official race classification at Texas A&M University.

3. Methodology

Any analysis of network formation must address endogeneity concerns. We can identify the effect of the composition of a student's own dorm on his/her social network because dorm composition is random and hence not correlated with student characteristics.

Our dependent variable is the share of a White/Hispanic student's friends who are Black (or Asian). We construct this measure for friends in the same dorm, and friends in a different dorm. Our independent variable of interest is the racial composition of the dorm for the student's cohort. We measure the composition of the environment of student *i* by dividing the number of Blacks (or Asians) in the dorm and cohort of student *i* by the number of all students in the dorm and cohort of student *i*. Hence, for each type of friendship we estimate two regression models:

$$\left(\text{Share of Friends } \textit{Same} \text{ Dorm}\right)_i = \beta X_i + \gamma_S \left(\text{Composition of Dorm}\right)_i + \varepsilon_i \quad (1)$$

$$\left(\text{Share of Friends } \textit{Outside} \text{ Dorm}\right)_i = \beta X_i + \gamma_O \left(\text{Composition of Dorm}\right)_i + \varepsilon_i \quad (2)$$

where X_i denotes controls for major, gender, cohort, political orientation, and relationship status. If the composition of the dorm is not random but correlated with factors that affect the selection of friends, then the error term ε_i is correlated with the variable of interest and the estimate $\hat{\gamma}$ is biased. This concern does not apply in our setting because dorm assignment is random.

If exposure plays a role in friendship formation, the composition of a student's dorm affects friendships within the dorm and $\gamma_S > 0$. If exposure changes attitudes, the dorm composition influences friendships outside the own dorm and $\gamma_O > 0$.[5] γ_O allows us to address our primary research question: does exposure to more diverse environments increase the diversity of subsequent interaction?

[5] Exposure *within* a dorm to students of a different race can affect friendships *outside* the dorm via two mechanisms. See Mayer and Puller (2008) for a formal model of social network formation. Briefly, friendship between two students results from two events: meeting which occurs with some probability, and, conditional upon meeting, forming social ties based upon preferences. Increased exposure to Black students can increase the probability of meeting the Black friends of the Black dormmate. Alternatively, the increased exposure to Black students in the dorm can change the White student's preferences for friend characteristics. Because the first effect is weakly positive, exposure changing preferences implies $\gamma_o>0$. This paper measures the total effect of both mechanisms in γ_o.

4. Results

First we investigate friendships between Whites/Hispanics and Blacks. The first two columns of Table 2 show the results of regressions (1) and (2). Column one shows that living in a dorm with disproportionately many Black students in the same cohort increases the share of Blacks among friends in the same dorm, $\hat{\gamma}_S = .343$. Increasing the share of Blacks dormmates from 5% to 10% increases the share of Black within-dorm friends by 1.7 percentage points (.343*.05=.017). Like Marmaros and Sacerdote (2006), we find that friendship networks reflect the composition of students' residential environment.

Column two brings us to our primary research question -- the effect of exposing White/Hispanic students to Black dormmates on friendships with Blacks *outside the dorm*. An exogenous increase in the fraction of Black dormmates does not significantly change the number of Black friends outside the dorm.

Columns three and four contain comparable estimates for the share of Asian friends among Whites/Hispanics. We find qualitatively similar results. A high share of Asians in the same cohort and dorm increases the share of within-dorm Asian friends but does not affect the share of Asian friends outside the dorm.

In regressions not reported here[6], we investigated the same effects using not only the composition of the dorm within the same cohort but considered other cohorts as well. In general, the results are consistent with the findings reported in Table 2. The composition of a dorm affects within-dorm friendships but does not affect friendships outside the dorm. A high share of Blacks in the same dorm and a different cohort sometimes even decreases the share of Black friends outside the dorm.

5. Conclusion

This paper contributes to our understanding of one dimension of university efforts to promote diversity. We find that the racial composition of a student's dorm does not affect the composition of that student's friendship networks outside the dorm. Our results suggest that promoting more diverse environments does not lead to a substantial increase in diversity of subsequent social interaction, at least in the short run.

[6] Results available on request.

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Table 1

Composition of Student Body and Friendship Networks

Race	Population	Share of Friends who are:		
		White or Hispanic	Black	Asian
White or Hispanic	0.83	0.86	0.66	0.66
Black	0.05	0.05	0.25	0.05
Asian	0.11	0.10	0.09	0.29

Table 2

Effect of Dorm Composition on Friendship Shares of Whites/Hispanics

Dependent Variable:	Fraction of Friends in *Same* Dorm Black	Fraction of Friends *Outside* Dorm Black	Fraction of Friends in *Same* Dorm Asian	Fraction of Friends *Outside* Dorm Asian
Column:	***1***	***2***	***3***	***4***
Female	0.013	0.004	-0.016	-0.025
	(3.03)**	(0.72)	(2.41)*	(2.57)*
Freshman	0.003	-0.024	-0.015	0.027
	(0.57)	(3.21)**	(1.73)	(2.03)*
Sophomore	0.004	-0.011	-0.005	0.027
	(0.64)	(1.47)	(0.52)	(1.98)*
Junior	-0.002	-0.005	0.018	0.009
	(0.24)	(0.57)	(1.93)	(0.66)
Fraction Black in Dorm-Cohort	0.343	-0.069		
	(5.77)**	(0.90)		
Fraction Asian in Dorm-Cohort			0.578	0.025
			(10.31)**	(0.30)
R-squared	0.13	0.09	0.22	0.11
Observations	794	789	794	789

All regressions include controls for major, political orientation, and relationship status.
Absolute value of t-statistics in parentheses.
* significant at 5% level; ** significant at 1% level
The number of observations varies because a few students do not have friends.