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AFFIRMATIVE ACTION AND INTERRACIAL FRIENDSHIPS

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Abstract

In two recent cases involving the University of Michigan, the Supreme Court examined whether race should be allowed to play an explicit role in the admission decisions of schools. The primary argument in these court cases and others has been that racial diversity strengthens the quality of education offered to all students. Underlying this argument is the notion that educational benefits arise if interactions between students of different races improve preparation for life after college by, among other things, fostering mutual understanding and correcting misperceptions. A comprehensive study of this issue would ideally examine two conditions: first, whether students actually have incorrect perceptions about their friendship compatibility with students of other races at the time of college entrance; second, if misperceptions exist, whether diversity on campus is effective in changing students' beliefs about individuals of different races. In this paper we provide, to the best of our knowledge, the first direct evidence about both conditions by taking advantage of unique new data that was collected specifically for this purpose.

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1 Introduction

In two recent cases involving the University of Michigan (Gratz v. Bollinger and Grutter v. Bollinger), the Supreme Court examined whether race should be allowed to play an explicit role in the admission decisions of schools. The prominent argument in these court cases and others has been that racial diversity strengthens the quality of education offered to all students. For example, when describing the defense put forward by the University of Michigan in the Gratz v. Bollinger case, a Syllabus of the Supreme Court explains that "Respondents contended that the College of Literature, Science, and Arts has just such an interest in the educational benefits that result from having a racially and ethnically diverse student body and that its program is narrowly tailored to serve that purpose" (Gratz v. Bollinger, Syllabus, 2003).[1]

Jonathan Alger, who coordinated the University of Michigan's legal efforts in the two Supreme Court cases, stressed that the primary legal argument in support of affirmative action should center on the notion that educational gains are achieved when students of all races "discover just how much they have in common" (Alger, 1997). He elaborates: "...members of every racial group differ in their life experiences...The range of similarities and differences within and among racial groups is precisely what gives diversity in higher education its educational value. For example, by seeing firsthand that all black or Hispanic students in their classes do not act or think alike, white students can overcome learned prejudices that may have arisen in part from a lack of direct exposure to individuals of other races." Further, the majority opinion in the Grutter v. Bollinger case supported the validity of this primary legal argument by noting that the educational benefits of diversity include "cross–racial understanding" and the breaking down of racial stereotypes.[2]

[1] There are other motivations for affirmative action. However, understanding the attractiveness of the primary legal argument is of fundamental importance for groups on both sides of the affirmative action debate given the reality that the other rationales stand on less solid legal footing. For example, courts have made it difficult to defend affirmative action programs on the grounds of remedying past discrimination by focusing narrowly on an institution's ability to remedy discrimination that occurred at that institution (Alger, 1999). According to Baez (2003), "Many scholars believe that providing empirical evidence of the compelling need for diversity is the only hope for saving affirmative action."

[2] Supporters of affirmative action admission policies have noted that educational benefits could also arise because learning in a diverse environment may lead students to think in deeper ways, prepare students for participation in a democratic society, help foster leaderships skills, or potentially increase earnings (Becton

In this paper, we provide evidence about the primary legal argument that affirmative action is beneficial because it allows students to correct misperceptions about how much they have in common with students from different races. The particular belief we study is whether a student perceives that, on average, his friendship compatibility is higher with students of his race than it is with students of other races. There may be other beliefs in which one might also be interested. Nonetheless, beliefs about interracial friendship compatibility seemingly incorporate a variety of views of relevance for understanding whether an individual thinks that he has much in common with individuals of other races, and recent research motivated by affirmative action admission policies has examined friendship decisions in college (Arcidiacono et al., 2007; Marmaros and Sacerdote, 2006; Mayer and Puller, 2008).

A comprehensive study of this issue would ideally examine two conditions: first, whether students actually have incorrect perceptions about their friendship compatibility with students of other races at the time of college entrance; second, if misperceptions exist, whether diversity on campus is effective in changing students' beliefs about individuals of different races. We address both conditions in this paper.

We begin in Section 2 with a description of our data, which comes from the Berea Panel Study (BPS). We initiated this survey at Berea College, in part, for the purposes of this paper. As discussed in more detail later, we take advantage of both specific institutional details of the school and the fact that the BPS is unique among higher education data sources in that it allows us to directly identify each student's friends.[3]

We address the issue of misperceptions at the time of entrance in Section 3. A standard "revealed preference" approach for this question would require that a researcher: 1)

et al., 2003; Daniel et al. 2001; Gurin, 1999; Syverud, 1999). The courts views of these arguments have been somewhat mixed. For example, Alger points out that the courts have often not been sympathetic to the notion that the benefits of diversity arise because students from different races have different points of view: "The courts frown on this (notion)...This is a group–based, stereotypical assumption, when the reality is the exactly the opposite" (Elgass, 1998). However, the majority opinion in Grutter v. Bollinger did note that "major American businesses have made clear that the skills needed in today's increasingly global marketplace can only be developed through exposure to widely diverse people, cultures, ideas, and viewpoints." Regardless, the potential to correct misperceptions clearly plays a central role in the legal argument.

[3]In terms of identifying friendships, most similar to the data used in this paper is the Addhealth data that identifies the friends of high school students (Fryer and Torelli, 2006). The Michigan Student Study collects information about the proportion of a student's close friends that are of various races.

characterize the amount of racial sorting in friendships at the time of entrance; 2) identify beliefs about interracial friendship compatibility at the time of entrance from the observed friendship decisions; and 3) provide evidence about actual interracial friendship compatibility at the time of entrance. We are in a unique position to provide, to the best of our knowledge, the first evidence about whether students have misperceptions at the time of entrance because, as discussed below, we are able to provide evidence about each of these three individual issues.

We start in Subsection 3.1 with a description of the basic empirical difficulty that is present if one wishes to characterize the amount of racial sorting in friendships—that friendship decisions are not observed directly in higher education data sources. We then discuss previous approaches for characterizing the amount of sorting which involve the use of indirect measures of friendship. Finally, we describe the friendship information that we have used to directly document friendships, discuss how the flexibility of our survey efforts allowed us to collect this information at the end of the short orientation period that occurs immediately before the start of classes, and detail the amount of racial sorting that is present at this time.

In Subsection 3.2, we begin by describing the difficulty involved in identifying beliefs about interracial friendship compatibility from observed friendships at a point in time—that friendship choices are influenced not only by beliefs about interracial friendship compatibility, but also by the process which governs how students meet potential friends. We then discuss our approach which takes advantage of the fact that we consider friendship decisions made at a point in time—immediately before classes began in the students' freshman year—when institutional details related to the orientation program and housing assignment procedure at Berea suggest that the process by which a person meets potential friends is, to a close approximation, unconditionally random.

In Subsection 3.3 we describe how we provide perhaps the first direct evidence about actual interracial friendship compatibility. We take advantage of an experiment which arises because students at Berea are randomly (and unconditionally) assigned roommates in their freshman year. In essence, this experiment forces some students to learn about their friendship compatibility with an individual of a different race.

The results and discussion in Section 3 suggest that: 1) substantial racial sorting exists in friendships at the time of college entrance; 2) the most plausible explanation of this sorting would seem to be that some students believe that they are more compatible with students of their own race than with students of different races; and 3) in reality, students from different races are as compatible as students from the same race. Informally, these results taken together suggest the interpretation that incorrect beliefs about individuals from other races may exist at the time of entrance. However, to make our investigation more formal and to provide a framework for considering reasons why our conclusions may not be appropriate, in Section 4 we specify a simple but flexible model of friendship–making under uncertainty and: 1) interpret the results of Section 3 under the prism of this model; 2) consider changes to the model that would imply that our conclusions about beliefs would be wrong.

We turn to the question of the effectiveness of diversity in correcting misperceptions in Section 5. In Subsection 5.1 we provide the first evidence about whether the amount of racial sorting changes across semesters in school. While this information is of fundamental importance for understanding the effectiveness of affirmative action policies, previous work has not been able to address this issue because the indirect techniques employed to identify measures of friendship permit the construction of only a single cross–section. In contrast, our data allow us to observe friendship decisions both at the time of entrance and at an additional time each year.

In Subsection 5.2 we provide some of the first direct evidence about whether policy can influence the amount of interracial friendship interaction during college. To do this we again utilize the experiment in which at entrance some students are randomly assigned roommates of the same race while other students are randomly assigned roommates of a different race, but now examine the total amount of interracial interaction that a person has at various points in school. Our findings in this subsection and the previous one indicate that the total amount of racial sorting remains roughly constant over time in the sample as a whole, but that, in the long-run, white students who are randomly assigned black roommates have a significantly larger proportion of black friends than white students who are assigned white roommates, even when randomly assigned roommates are not included in the calculation of the proportions. Strikingly, the proportion for white students who are assigned black

roommates is similar to the overall proportion of black students at the school.

This last finding is important in and of itself. Indeed, much of the literature on affirmative action has made providing evidence about whether the amount of interracial interaction can be affected by policy its primary objective, in essence taking as given that interactions are sufficient to generate the changes in perceptions that are of ultimate interest. (Mayer and Puller, 2008; Arcidiacono et al., 2007; Marmaros and Sacerdote, 2006). However, ideally, we would also like to provide some direct evidence about whether perceptions are actually changing both for the entire group of students at the school and for those whose amount of interracial interaction is influenced by the roommate policy. The difficulty of providing evidence from observed friendship choices arises because the process by which students meet potential friends is no longer unconditionally random after the end of the orientation period. We discuss this issue in Subsection 5.3 and suggest some possible approaches which are motivated by previous work and made possible by unique features of our longitudinal data.

From the standpoint of providing direct evidence about whether affirmative action can have effects, the results in Section 5 are an important complement to Boisjoly et al. (2006), who study the effect of being assigned a black roommate on specific beliefs such as "whether affirmative action in college admission should be abolished." The appeal of studying whether affirmative action influences specific beliefs is obvious. However, the motivation for examining whether affirmative action influences social interactions or the less–specific beliefs about interracial friendship compatibility is equally strong; the affirmative action literature has paid close attention to the issue of social interactions in part because many of the beliefs of interest that might be influenced by affirmative action are likely to be either subtle in nature or very difficult to measure accurately using survey questions, especially if there is an inclination for students to answer survey questions in a politically correct fashion. Indeed, Boisjoly et al. (2006) recognize the importance of understanding the effect of affirmative action on social interactions, but find that the use of survey questions asking whether "I have personal contact with people from other racial/ethnic groups", "I interact comfortably with people from other racial/ethnic groups", and "I socialize with someone with an African American Background" do not produce a particularly clear or consistent picture. Importantly, our findings using our direct friendship measures strongly contradict their tentative

conclusion that roommates "have little or no effect on harder–to change behavior (such as befriending or socializing with someone from another racial/ethnic group)."

In terms of providing direct evidence about effects, this paper also differentiates itself through its ability to examine the time–path of certain changes, a contribution that we find to be important. Finally, it is unique to be able to view changes resulting from policy in a context where something is known about the underlying truth. This is possible because our results in Sections 3 and 4 provide a unique backdrop for the results in Section 5.

We finish in Section 6 with a discussion of how the conclusions of this work should be shaped by the reality that we are studying one particular school.

2 The Berea Panel Study

The data come from the Berea Panel Study (BPS) which, as described in detail in Stinebrickner and Stinebrickner (2004, 2006, 2008a), was initiated by Todd Stinebrickner and Ralph Stinebrickner with the goal of understanding a variety of decisions that students from low income families make after entering college. Berea College is located in central Kentucky and has a very strong reputation for promoting understanding and harmony between individuals of different races.[4] Given this reputation, it seems likely that individuals who select Berea would be relatively open to relationships with individuals of other races. This suggests that if information problems exist between students of different races at Berea at the time of college entrance, then such problems are likely to exist elsewhere at the time of college entrance, although in the conclusion we stress the need to be cautious when thinking about how the results here might generalize to other schools.

The BPS consists of two cohorts that entered Berea in the fall of 2000 and 2001, respectively, and were surveyed between ten and twelve times each year while in school. Unique identifiers allow the survey data to be matched with student information from the school's

[4]Berea was founded in 1855 as the first interracial college in the South and operates under a mission of "promoting understanding and kinship among all people." The daughter of South African Archbishop Desmond Tutu is a graduate of Berea and he served as Berea's 2005 graduation speaker. Berea College was recently named the 13th best college for African-American students in a DayStar ranking published in Black Enterprise magazine, with about half of the schools ranked above it being historically black colleges.

administrative database.

Of particular importance for this paper, the BPS collected substantial information about friends and roommates at multiple times each year while students were in school. Here we only discuss sample sizes and response rates. One key difference between the two BPS cohorts is that friendship information was collected at the time of entrance only for the 2001 cohort. Given this, we focus on the 2001 cohort for much of our work. For this cohort, the participation rate for the baseline survey was approximately .90 and Table 1 shows descriptive statistics for our sample of 375 students from this cohort. Approximately 43% of students at Berea are male and 15.8% of students are black. We note that, because the very large majority of non–black students are Caucasian, we combine all non–black students into a group that we refer to as "white" in the remainder of the paper. Consistent with the mission of the school to provide an education to students of "great promise but limited economic resources," students at Berea are all relatively poor and have an average family income of only approximately $25,000. The reality that students are quite homogenous in this respect is noteworthy for reasons discussed later.

The number of observations for which friendship information is observed at the time of entrance (354) is slightly smaller than the total sample size at the time of entrance (375) because two students indicated that they had no friends and nineteen students listed no friends that could be matched with individuals in our student data base. The latter arises primarily because, at the time of our baseline survey, students had been at Berea for a short time and some individuals did not know both the first and last names of some of their friends. Nonetheless, students were reasonably knowledgeable about the names of their friends even at this early point in their college careers; we were able to find approximately 75% of the listed friends in our official database.

Our survey collection efforts also allow us to directly identify friendships for students at the middle of the first, second, and third years. The total number of students for which friendship observations are observed at these points are 335, 275, and 238, respectively. The decrease in sample size after the baseline is almost exclusively due to attrition—response rates were approximately 95% after the baseline survey among individuals who were still enrolled at Berea and we were able to find approximately 95% of the listed friends after the

baseline survey. We describe the sample construction in Appendix B.

While the fact that the 2000 cohort did not answer the baseline survey makes its use problematic in some parts of the paper, this cohort is useful for examining certain issues in which having a larger sample size is of help. For the 2000 cohort, the total number of observations for which friendships are observed in the middle of the first, second, and third years are 353, 248, and 233, respectively.

3 Evidence About Misperceptions

In this section we examine the three issues described in the Introduction that are of interest individually and are necessary to think about whether students have misperceptions about interracial friendship compatibility at the time of college entrance.

3.1 Sorting at the Time of Entrance

Non–trivial interactions between students of different races are necessary for affirmative action policies to be useful. Given the recognition that misperceptions are likely to be changed most easily through close friendships, one goal of recent literature has been to document the amount of sorting that is present in close friendships on a college campus. The empirical difficulty that is encountered in this exercise is that friendship decisions are not observed directly in higher education data sources. In response to this difficulty, previous work has found creative, although sometimes indirect, measures of close friendships. For example, Marmaros and Sacerdote (2006) proxy for friendships using the quantity of email that is exchanged between pairs of students. Mayer and Puller (2008) obtain a more direct measure by examining friendship links from Facebook.com, although one might worry that these links capture both close friendships and acquaintances.[5]

The BPS contains very direct measures of friendship. For reasons that we discuss in

[5] As an extreme example, 7,000 Facebook friend requests that Michael Phelps received in several days after winning eight gold medals in the 2008 Summer Olympics undoubtedly came from people who did not know him personally. Closer to home, it seems likely that many of the 200+ friends that we have accumulated using our Berea Panel Study Facebook page would not truly consider us close friends.

the next subsection, we focus here on our first friendship measurement. At the end of the orientation period, immediately before classes began in the freshman year, we elicited friendship information for students in the 2001 cohort by using the following question on our baseline BPS survey.[6]

Question A. Please list the names of the four people you currently consider your best friends at Berea College and provide information about where you met each of them. Please list in order with the person you would consider your best friend first.

	First Name	Last Name	Where I met this person Circle ONE		
1.	_____	_____	Hometown	At Berea College	Other (specify) _____
2.	_____	_____	Hometown	At Berea College	Other (specify) _____
3.	_____	_____	Hometown	At Berea College	Other (specify) _____
4.	_____	_____	Hometown	At Berea College	Other (specify) _____

Table 2A shows that a very significant amount of sorting by race is present at the start of classes when we characterize sorting using the person that is listed as the best friend in Question A. Pooling males and females and computing sample proportions, the first column shows that 69.6% of black students in our sample have best friends who are black while only 5.7% of white students in our sample have best friends who are black. If sorting were purely random, then, in large samples, the proportion of black students who have black best friends would be 15.8% and the proportion of white students who have black best friends would also be 15.8%. Statistical tests overwhelmingly reject the former hypothesis, the latter hypothesis, and the hypothesis that the two conditions are jointly true.[7,8] The first column

[6] As a general note, it is never possible to know how answers to a particular survey question might be influenced by respondents' perceptions about how the question will be used. However, in this respect, it is worth noting that Question A below, which does not refer to race in any way, was embedded in a very substantial survey with an obvious focus on academic performance and educational attainment. Regardless, if such anticipation did occur and if students tend to answer questions in a politically correct manner, then the descriptive statistics discussed in the remainder of this section would understate the degree of sorting that is present, in which case our subsequent results would be strengthened further.

[7] The test of the null hypothesis that the proportion of black students who have black best friends is 15.8% has a standard normal test statistic of 11.334. The test of the null hypothesis that the proportion of white students who have black best friends is 15.8% has a standard normal test statistic of 4.778. A test that the proportion of black students who have black best friends is the same as the proportion of white students who have black best friends has a standard normal test statistic of 12.030.

[8] Sixty percent of male black students in the sample have black best friends while 77% of female black students in the sample have black best friends. Given that this difference is not statistically significant

of Table 2B shows similar results at the start of classes when we characterize sorting using information about all individuals that are listed as friends in Question A. Pooling males and females we find that, on average (across sample members), 66.8% of the friends listed by a black student are black while only 9.8% of the friends listed by a white student are black.[9]

As will be discussed in Section 4, it is of interest to know whether there exists evidence that a substantial amount of the sorting in the first columns of Tables 2A and 2B arises because individuals make friendship decisions on the basis of other variables that are strongly correlated with race. The second column of Table 2A again examines the proportion of students who have a black best friend, but uses a linear probability model, with whether a person's best friend is black as the dependent variable, to control for a variety of other characteristics that we are able to observe and could be correlated with race. The second column of Table 2B again examines the proportion of a student's friends who are black, but uses a regression model, with the proportion of a student's friends that are black as the dependent variable, to control for the same set of characteristics. In both Table 2A and Table 2B, the entries related to the WHITE and BLACK variables remain virtually unchanged when the additional characteristics are added.

3.2 Beliefs at the Time of Entrance

The difficulty in identifying beliefs about interracial friendship compatibility from observed friendship choices at a particular point arises because friendship choices are influenced not only by beliefs about interracial friendship compatibility, but also by the process which governs how students meet potential friends. If the meeting process is random, then, roughly speaking, observed choices would reveal a student's beliefs about interracial friendship com-

at traditional levels, we do not pay specific attention to differences by sex in the remainder of the paper, although we do find statistically different sorting patterns by sex at some points after the first year.

[9] Our calculation which takes the mean of the individual–specific black proportions is very similar to taking the proportion of overall friendship observations that are black (it would be identical if all people report four friends). However, keeping in mind that the statistic in Table 2B (and similar subsequent results) is a mean (of proportions), not a proportion, is worthwhile for looking at sample sizes and thinking about precision. For example, while n=56 shows the number of individual–specific proportions used to construct the mean for black students, each individual–specific proportion is computed with up to four friendship observations. In other words, if each of the 56 black students reported four friendships, the total number of observations that would be used to construct the proportion of all friends that are black for this group would be 224.

patibility. However, identification problems arise if, as would be expected, the meeting process is not random. For example, a student who believes that, on average, he is equally compatible with students of his race and other races would still have a disproportionate number of friends of his race if he is involved in clubs, activities, social circles, or classes in which he meets a disproportionate number of students of his race.

Here we take advantage of the fact that, while randomness in the meeting process would in general not be a good assumption, unique institutional details suggest that it is quite plausibly a good assumption at Berea during the orientation period which occurs before the freshman year. In terms of formal assignments made by the school, randomness is the appropriate way to characterize how students are assigned to their official orientation group, how students are assigned roommates and dormmates, and how students are assigned to a job in Berea's mandatory work–study program.[10] Randomness also seems to be a reasonable approximation for how students encounter potential friends through other social avenues during orientation. Indeed, particular clubs that might interest specific types of students do not begin activities during the orientation period and informal events (e.g., parties) held by upperclassmen (which might draw disproportionate numbers of particular types of students) are unlikely during this period since school rules imply that almost all students live on campus and upperclassmen are not present on campus during the orientation period.[11] Instead, the

[10]For those that need roommates, the assignment process is unconditionally random (see Footnote 12). A housing preference questionnaire is not used at Berea, due to a belief that such questionnaires are of limited usefulness due to misreporting of behaviors such as smoking. Two weeks before the start of school (and after all members of the freshman class have been determined) pairs of roommates were drawn using a random number generator and each pair was randomly assigned to a room on a freshmen dorm floor. As a result, the process ensures randomness with respect to both one's roommate and the students in neighboring rooms. Stinebrickner and Stinebrickner (2004) provide indirect evidence of the randomness in the roommate assignment process by examining the correlation between several observable characteristics of students and their roommates. In addition, in the data used in Subsection 3.3 we find no evidence of a relationship between a student's race and the race of his assigned roommate. Randomness is also a very reasonable assumption for assignment to work–study jobs (Stinebrickner and Stinebrickner, 2003) and the official orientation group.

[11]Contributing to the reality that it is very reasonable to assume that off–campus parties represent a negligible portion of social activities during the orientation period is the very low prevalence of alcohol use at Berea (Stinebrickner and Stinebrickner, 2008b). In some schools, one might worry that the assumption of randomness might be violated due to the presence of athletics. However, largely because a football team does not exist, the number of freshmen at Berea who would be on–campus for athletics before/during the orientation period is small. Further, using administrative data we find that athletes at Berea are not disproportionately of any particular race.

primary social events would be general types of functions (e.g., cookouts, etc.) provided by the school that would presumably be of similar interest to all types of students.[12]

What makes our approach feasible is the flexibility of our survey collection efforts which allowed us to collect the friendship information at the end of the orientation period described in the previous subsection. If randomness is indeed a good way to characterize meetings during the orientation period, the most plausible explanation for the observed sorting in Subsection 3.1 would seem to be that some students believe they are more compatible with students of their own race than with students of different races. The question we need to address is whether these perceptions are correct or not.

3.3 Evidence About Actual Compatibility

In addition to being important for examining whether misperceptions exist, understanding whether black and white students are compatible as friends is of direct interest given that arguments about the benefits of educational diversity are often premised on the notion that students from different races have much in common. To the best of our knowledge, very little evidence exists about this issue.

To provide evidence about actual interracial friendship compatibility, we take advantage of the fact that students are assigned roommates in an entirely random manner which, for example, does not take into account any characteristics or preferences of students. To the extent that sharing a room makes a non–trivial amount of interaction and observation unavoidable, this implies that some students are, in essence, forced to learn about their true match quality with one randomly chosen roommate of the same race while other students are, in essence, forced to learn about their true match quality with one randomly chosen roommate of a different race. Then, seeing how roommates appear in friendship outcomes after the point at which learning has taken place reveals evidence about true interracial friendship compatibility.

[12] In reality, the orientation period consists of two mandatory portions: a summer weekend and a short period immediately before the beginning of courses. We do not make a distinction between these two portions in this section because institutional details suggest that the assumption of randomness of meetings is relevant for both portions. This distinction does have some significance in Section 4, and we discuss it in more detail at that point.

It seems reasonable to believe that much is learned about one's roommate after a couple of months of sharing a room, and we examine friendship choices starting with our middle–of–the–first–year survey which was collected in November. At this point, for the 2001 cohort we have 27 white students in our 2001 sample who were identified as having been randomly assigned black roommates and 155 white students who were identified as having been randomly assigned white roommates.[13] The first column (2nd panel) of Table 3B shows that, for this cohort, 44.4% of black roommates are listed as one of the four friends and 35.4% of white roommates are listed as one of the four friends. The first column (2nd panel) of Table 3A shows that 18.5% of black roommates become best friends and 18.7% of white roommates become best friends.[14]

Combining the 2000 and 2001 cohorts to increase the number of observations, we have 60 white students who were identified as having been randomly assigned black roommates and 321 white students who were identified as having been randomly assigned white roommates. The first column (1st panel) of Table 3B shows that 35.0% of black roommates are listed as one of the four friends and 36.7% of white roommates are listed as one of the four friends. The first column (1st panel) of Table 3A shows that 16.7% of black roommates become best

[13]The reality that, as described in Footnote 12, the orientation period actually consists of two portions is the primary reason that the number of observations in this section is smaller than that in Table 2—30% of students request a roommate that they have met in the first (summer) portion. Although we are not able to use these 30% of the observations for analyses that require randomly assigned roommates, we stress that they are not problematic for the analysis more generally because they simply represent friendship decisions that came out of a random meeting process in the summer portion of the orientation period. Of the 298 white students in Column 1 of Table 2, 24 were assigned a single room, lived off–campus, or we could either not determine whom the student's roommate was or whether the student requested a roommate. Of the remaining 274 students, 193 were randomly assigned roommates (155 white, 27 black, 11 race missing–not used). Of the 56 black students in Column 1 of Table 2, 5 students were assigned a single room, lived off–campus, or we could either not determine whom the student's roommate was or whether the student requested a roommate. Of the remaining 51 students, 32 were randomly assigned roommates (28 white, 3 black, 1 race missing–not used). Students who choose roommates themselves during the first orientation period may be different than those that do not. However, in practice, we find that these students have very similar proportions as the entire sample - the proportions analogous to those in the first column of Table 2A are .718 and .086 for this group.and the three tests described earlier in Footnote 7 continue to be overwhelmingly rejected with standard normal test statistics of 11.047, 4.314, and 8.715, respectively. We note that, technically speaking, our conclusions about whether misperceptions exist at the time of entrance are directly relevant for the group of students who are randomly assigned roommates.

[14]The standard errors associated with the proportions are .095, .038, .074, and .021, respectively.

friends and 16.5% of white roommates become best friends.[15] Thus, because the sample proportions are always close for black and white roommates and are often higher for black roommates, we are never close to rejecting the null hypothesis that white students are equally compatible with black students as they are with white students.[16] In other words, consistent with the notion that black and white students do have a lot in common, we find evidence in support of the notion that white students are, on average, as compatible with black students as they are with other white students.

It is not possible to provide much information about the compatibility of black students with other black students since the random assignment implies that only a very small fraction of all matches would involve two black students.[17] However, we can examine whether black students in the interracial pairs have views about their interracial roommates that are similar to those held by the white students in the interracial pairs. We find that this is the case. We have 28 black students in our initial sample who were identified as having been randomly assigned white roommates.[18] In the first column (second panel) of Table 3B we see that, for this cohort, 39.3% of these roommates are listed as one of the four friends (compared to 44.4% for white students in interracial pairs). In the first column (second panel) of Table 3A, we see that, for this cohort, 17.9% of these students become best friends (compared to 18.5% for white students in interracial pairs).[19] Combining the 2000 and 2001 cohorts, we have 60 black students who were identified as having been randomly assigned white roommates. In the first column (first panel) of Table 3B, we find that 34.4% of these roommates are

[15] The standard errors associated with the proportions are .061, .026, .020, and .048, respectively.

[16] One might be interested in confidence intervals (CI) associated with the difference between the sample proportion when the roommate is black and the sample proportion when the roommate is white. While negative values will be contained in the confidence intervals, the negative values are often not large relative to the proportion of roommates that are reported as friends. For example, the 90% CI for the difference in proportions (one of four friends) in the middle of the first year for the 2001 cohort is (-.075, .254), so that even the lower bound is only 17% of the proportion of black roommates that are reported as friends (.444). Further, as will be discussed, some 90% confidence intervals in later years do not even include zero.

[17] From Footnote 13 we see that 14.2% of the students who were randomly assigned roommates are black so that roughly $(.142)^2 = .002$ of all matches would involve two black students. In the sample we find that .014 of all matches for which the race of the roommate can be identified involve two black students.

[18] The number of black students who have white roommates (28) does not have to be the same as the number of white students who have black roommates (27) because, in some cases, one of two roommates did not participate in the BPS.

[19] The standard errors associated with the proportions are .092 and .072, respectively.

listed as one of a the four friends (compared to 35.0% for white students in interracial pairs). In the first column (first panel) of Table 3A, we find that 18.0% of these students become best friends (compared to 16.7% for white students in interracial pairs).[20] Thus, it seems reasonable to conclude that there is evidence in support of the notion that black students are as compatible with white students as they are with other black students. This would be true, for example, if the compatibility of black students with other black students is roughly the same as the compatibility of white students with other white students.

One might wonder if, for some reason, the criteria used to name an assigned roommate as a friend is fundamentally different from the criteria used to name a non–roommate as a friend. If this were the case, then the results in this section might provide evidence that students from different races are very compatible as roommates, but would not necessarily provide evidence that students from different races are very compatible as true friends. Given our belief that students typically wish to live with their actual friends when given the choice, this concern can be addressed by examining whether the initial roommate continued to be named as a friend after the first year when there is no longer a requirement for him to remain a roommate.[21] Column two of Table 3B examines whether the original roommate was named as one of the four best friends in the middle of the second year. Column two of Table 3A examines whether the original roommate was named as the best friend in the middle of the second year. The results indicate that, in all cases, white students in the sample more often remain friends (and best friends) with their roommate in the second year if they were assigned a black roommate than if they were assigned a white roommate. For example, the second column (1st panel) of Table 3B shows that 22.9% of black roommates are listed as one of the four friends in the middle of the second year and 13.3% of white roommates are listed as one of the four friends in the middle of the second year.[22] Similarly, column 3 of Tables 3A and 3B reveal that white students in the sample more often remain friends (and best friends) with their roommate in the third year if they were assigned a black roommate

[20] The standard errors associated with the proportions are .062 and .048 respectively.

[21] The validity of the experiment after the first year relies on the assumption that the race of the assigned roommate does not influence college drop–out decisions or survey participation decisions. This seems reasonable given that students are equally happy with black and white roommates.

[22] The 90% confidence interval for this difference, (.003, .187), does not include zero, providing strong evidence of interracial compatibility.

than if they are assigned a white roommate.

One might also worry that a person's true interracial friendship compatibility could change as a result of spending time with someone of a different race. If this were the case, the results of this section might provide evidence that students from different races are very compatible as friends at a time subsequent to the time of entrance, but would not necessarily provide evidence that students from different races are very compatible as friends at the time of entrance. It seems that concerns about this issue should be greatly mitigated by the fact that the flexibility of our survey collection did allow us to choose a time that is quite close (2 months) to the beginning of the year. Nonetheless, we address this issue in Sections 4 and 5, noting that a model in which the true value of interracial compatibility changes very quickly when exposed to a roommate of a different race will typically have very different (and testable) implications for observed friendship choices than a model in which the true value does not change quickly.

4 A Model of Friendship Formation

Informally, the results of Section 3 put together seem to suggest that incorrect beliefs about individuals from other races may exist at the time of entrance. However, to make our analysis more formal and to provide a framework for considering reasons why the above conclusion may not be appropriate, in this section we specify a simple but flexible model of friendship–making under uncertainty and examine the results of Section 3 under the light of this model. The implication of our model—that if true friendship compatibility does not depend on race and students meet randomly during the freshman orientation period, then sorting can only be observed if some students have incorrect perceptions about interracial friendship compatibility—confirms our informal interpretation of the results in Section 3. We note that the theoretical result is hardly surprising. Nonetheless, the formulation of the model provides a natural framework for discussing at the end of this section the attractiveness of various assumptions and the robustness of our conclusions to changes in these assumptions.

4.1 Setup

We first describe payoffs and then describe the process by which students form friendships.

Payoffs. Students in college receive utility from friendships. At any point in time, a student can have at most one (best) friend. The flow utility that student i receives from a friendship with student j is u_{ij}. This utility depends on a variety of characteristics of j. Characteristics of relevance may include, for instance, j's sense of humor and other personality traits, religious and political views, hobbies, interests, and past experiences. The key point is that many of these friendship–relevant characteristics are not easily observable at the time two people initially meet so that i does not know the value of u_{ij} when she first meets j. In order to simplify the exposition, we take this point to an extreme by assuming that the only characteristic that can be initially observed is a person's race (black or white). We discuss later why our conclusions are not sensitive to this assumption. The payoff to i from a match with j also depends on i's own characteristics but, for ease of exposition, from now on, except in Subsection 4.3, we make this implicit in our notation and index payoffs and other relevant variables by j only.

We assume that students do not care about race per se, but may be more likely to find the characteristics that they do care about among students of a particular race. More specifically, we posit that $u_j = v_j$ when j is of the same race as i and $u_j = \mu + v_j$ when j is of the opposite race as i, where μ is a fixed term that can depend only on i's race and the v_j are i.i.d. normal with mean zero and variance σ_v^2 that is the same for all students in college.[23] Hence, for each race the average within-race match quality is higher than the average interracial match quality when $\mu < 0$ and lower when $\mu > 0$. Students do not know μ and start college with a prior belief about μ that is normally distributed with mean m_μ and variance σ_μ^2, where these quantities need not be the same for all students.

The results of Subsection 3.3 suggest that μ, the true value of average interracial friendship compatibility, is zero. We discuss this in more detail in Subsection 4.3. The objective

[23] The assumption of a constant variance can be motivated, in part, by the fact that, as described earlier, students at Berea have similar socio–economic backgrounds. This assumption also means that the variance of friendship quality does not depend on whether person i is considering black or white potential friends. The analysis of this subsection can be modified to accommodate a model where σ_v^2 depends on the identity of a student, but not on the race of his potential friends.

in what follows is to determine for what values of m_μ, the belief about average interracial friendship compatibility, does the model predict sorting by race when μ is equal to zero.

Choosing Friends. The information from the last columns of the survey question shown in Subsection 3.1 indicates that almost all friendships were formed after students arrived at Berea.[24] Here we describe how students choose friends.

Students arrive at college for an orientation program before classes begin in their freshman year, at the end of which they complete the baseline BPS survey. We assume that each student is assigned to an orientation group with $N > 1$ other students and spends orientation with this group. This orientation group is a somewhat artificial construct which is meant to represent the types of people to which a student is exposed during the orientation period through both the formal and informal channels described in Subsection 3.2, and, therefore, could potentially be chosen as friends. The important point is that, as discussed in Subsection 3.2, it is reasonable to believe that the process by which a person meets potential friends is, to a close approximation, unconditionally random.

Students choose friends in a two–stage process. First, after observing the race of each student in their orientation group, they select a group of $K < N$ individuals with which to interact. For simplicity, we take K to be the same for all students. Then they observe a signal ξ_j of match quality for each person j that is in their selected group and choose an individual of this group with whom to form a friendship.[25,26] The first stage reflects the fact that each student encounters many other students during the orientation period, and so their interaction with some of them will necessarily be superficial, if it happens at all.

We note that we implicitly take a rather broad view of friendship compatibility. For example, if a student ends up with a disproportionate number of individuals of the same race

[24] We find that 95% of friends were met at Berea. The results in Section 3.1 use all friends, but removing friends who were not met at Berea or removing students who have at least one friend who was not met at Berea leads to virtually no change in the results.

[25] Thus, friendship decisions in our model are unilateral. This is a weak view of friendship, where a friend is just someone that a person hangs around with or pays attention to. We do not mean for this assumption to be taken literally, although it would be broadly consistent with the notion that dorms at Berea are rather open places. This assumption is also consistent with the measure of friendship we use in Subsection 3.1.

[26] We are implicitly assuming that a student always finds it desirable to form a friendship at the beginning of college. This corresponds to the extreme case where the value of not forming a friendship is $-\infty$. None of our conclusions depend on this particular assumption.

in her subgroup because she believes that commonality in background experiences makes it easier to "break the ice" with individuals of the same race, then we interpret this as evidence that the student believes she is more compatible with students of her own race. Likewise, if a student believes it is more costly for her to initiate a friendship with someone of the opposite race, then we also interpret this as evidence that the student believes she is more compatible with students of her own race. In other words, for our purposes, compatibility means both having enough in common to be able to start a conversation and having the desire to continue the relationship.

Finally, we assume that students are myopic. We argue at the end of this section that relaxing this assumption, which is made for convenience, would strengthen our results.

4.2 Results

We do not know how informative are the signals ξ_j that a student observes in her chosen subgroup. This is in part because we do not know exactly how students allocate their time during the couple of days of the orientation period before they complete our baseline survey. In what follows we consider two alternatives that are amenable to a transparent analysis.

We first consider the case where the signals ξ_j provide little information about payoffs. This, in essence, corresponds to the situation in which, during the orientation period, students are very busy registering for courses or performing other tasks in preparation for the start of courses so that they have little time to learn much more than the names of the people they have chosen for their subgroup. In this case, the only thing that matters for a student when selecting a subgroup is the expected payoff of forming a friendship with each individual in her orientation group. In particular, if a student has $m_\mu = 0$, then she is indifferent between all the possible subgroups she can select and, once a subgroup is chosen, she is indifferent between all the individuals in her selected subgroup. Assuming that a student randomizes when indifferent, we have the following result.

Proposition 1. *Suppose signals are uninformative. Then, racial sorting can only be observed if some students have $m_\mu < 0$ at the time they enter college. In particular, if $\mu = 0$, then some students will be incorrectly pessimistic about the value of interracial friendship compatibility.*

A limitation of the case where signals are non–informative is that the amount of sorting implied by the model is independent of the true value of μ. This is not true in the polar case where the signals ξ_j are very informative, which we now consider. This corresponds to the situation where each student spends much quality time with the students in her selected subgroup and, as a result, is able to observe the payoff of forming a match with each of the individuals in this subgroup; i.e., $\xi_j = u_j$. The decision of which friendship to make once a subgroup is chosen is then straightforward: choose a member of the subgroup for which the friendship payoff is the highest. What is left to determine is how students select subgroups.

For this, notice that if individual j in student i's orientation group is of the same race, then i's perception is that $u_j \sim N(0, \sigma_v^2)$, while if j is of the opposite race, then i's perception is that $u_j \sim N(m_\mu, \sigma_o^2)$, where $\sigma_o^2 = \sigma_\mu^2 + \sigma_v^2$. Hence, if $m_\mu = 0$, then the distribution of possible payoffs from interracial friendships has the same mean, but fatter tails. Now notice that a student only cares about the highest friendship payoff in her selected subgroup. Hence, if she believes that the average friendship payoff is the same for both races, then the greater the number of individuals of the opposite race that she selects, the greater is the chance that one of the people in her subgroup will turn out to be a very good match. Increasing the prior mean only reinforces the bias towards opposite race matches. More importantly, since expected payoffs are continuous in m_μ, this bias persists if m_μ is not too negative. We then have the following result. Its proof and the proof of Proposition 2 below are in Appendix A.

Lemma 1. *There is $\underline{m} < 0$ such that if a student's prior mean is greater than $\underline{m}$, then it is optimal for her to select a subgroup with as many individuals of the opposite race as possible no matter the racial composition of her orientation group.*

Now observe if $\mu = 0$ for a student, then before the signals ξ_j are observed all individuals in her selected subgroup are equally likely to be chosen as a friend. The following result, Proposition 2, follows from this observation. Together with Proposition 1 they constitute the two main results of our model.

Proposition 2. *Suppose signals are informative. If $\mu = 0$ for both races, then racial sorting can only be observed if some students enter college with $m_\mu < 0$, that is, if some students enter college incorrectly pessimistic about the value of interracial friendship compatibility.*

We show in Appendix A that the conclusion of Proposition 2 remains the same if instead of being equal to zero for both races, μ is close to zero for both races.

4.3 True Friendship Compatibility and Racial Sorting

Evidence about whether $\mu = 0$ comes from Subsection 3.3. It is plausible to assume that, by some time T sufficiently late in the first academic year, each student i has learned the payoff u_{iR} of a friendship with her assigned roommate R. Then, comparing the average value of u_{iR} for roommate pairs where $\text{Race}_i = \text{Race}_R$ to the average value of u_{iR} for roommate pairs where $\text{Race}_i \neq \text{Race}_R$ would provide direct evidence about whether $\mu = 0$.

In reality, we do not observe match quality directly, but we do observe whether a roommate eventually becomes a best friend. For the exercise here it is not necessary to describe how friendship decisions evolve over time between the beginning of the year and T. Rather, it is sufficient to note that at T this process would produce a best non–roommate friend B. For simplicity, we assume that there is no uncertainty about u_{iB} at T so that information about whether roommates are best friends at T yields an estimate of $\Pr(u_{iR} > u_{iB})$ for roommate pairs where $\text{Race}_i = \text{Race}_R$ and an estimate of $\Pr(u_{iR} > u_{iB})$ for roommate pairs where $\text{Race}_i \neq \text{Race}_R$. Then, we cannot reject the null hypothesis that individuals are, on average, equally compatible with students of the same race (i.e., the null hypothesis that $\mu = 0$) because the estimates in Subsection 3.3 provide virtually no evidence against the null hypothesis that $\Pr(u_{iR} > u_{iB})$ is the same for roommate pairs where $\text{Race}_i = \text{Race}_R$ as it is for roommate pairs where $\text{Race}_i \neq \text{Race}_R$.[27] Similarly, we can also gain information about μ by examining whether a roommate becomes one of a person's four friends. In this case, the inference concerns whether $\Pr(u_{iR} > u_{iB4})$ is the same for roommate pairs $\text{Race}_i = \text{Race}_R$ as it is for roommate pairs where $\text{Race}_i \neq \text{Race}_R$, where $B4$ denotes the fourth best non–roommate friend. Again, the results in Subsection 3.3 do not allow us to reject the null hypothesis that $\mu = 0$.

[27] An implicit assumption is that the expected value of u_{iB} does not depend on whether a person's roommate is of the same race or a different race. The conclusion that we learn specifically about μ by comparing $\Pr(u_{iR} > u_{iB})$ across same race and different race roommate pairs comes from our assumption that the variance of match quality does not depend on the race of one's potential friend.

Therefore, under the assumptions of our model, Propositions 1 and 2 imply that some students enter college with incorrect perceptions about the value of interracial friendship compatibility. Thus, as discussed in the first paragraph of this section, the implications of the model confirm our informal interpretation of the results in Section 3.

4.4 Modeling Choices

Here we discuss some of our modeling choices. We begin with the assumption that friendship decisions are myopic. Since students believe it is possible that interracial matches are better than same–race ones, choosing someone of the opposite race to interact with provides valuable information for future friendship decisions. Hence, if a student is forward looking when choosing friends, she may be willing to sacrifice some of her payoffs during the orientation period and include more students of the opposite race in her subgroup than she would if she were myopic. This means that Propositions 1 and 2 not only do not depend on the assumption of myopic behavior, but the restrictions on m_μ and μ necessary to generate racial sorting are less stringent if students are forward looking.

We also make the simplifying assumption that friendship decisions are unilateral. This is not a realistic assumption, but, if anything, it makes it more difficult for racial sorting to take place. Indeed, a model where friendship decisions are bilateral should produce stronger conclusions regarding the effect of misperceptions on friendship patterns for the simple reason that for racial sorting to happen it is now only necessary for one side of a potential interracial match to be biased.

Finally, we assume that an individual observes only race when she first meets a potential friend. It is easy to see that our conclusions stay the same if, in addition to race, a person also observes a set of friendship–relevant characteristics that are uncorrelated with race. Thus, the potentially relevant case is the one where, in addition to race, a person also observes a set of friendship–relevant characteristics that are correlated with race. At the end of Subsection 3.1 we discuss that we are not able to find evidence of these types of characteristics at Berea. Nevertheless, for the sake of illustration, consider the extreme case where the sorting by race in our data is generated because individuals make friendship decisions based on a single

observable friendship–relevant characteristic that is strongly correlated with race. In this case, even though the students do not consider race in any way when making friendship decisions, they nevertheless believe that they are more compatible with individuals of the same race (as long as they notice that the characteristic is correlated with race). Thus, for our purposes, this case is no different than our assumed case in which individuals take into account race when making decisions because they believe that race is correlated with unobserved characteristics that are valuable.[28]

4.5 Alternative Explanations

While we think that our model captures the fundamental features of the friendship–making process at the time of college entrance, it is worth considering possible changes to it that might imply that our conclusions about beliefs would be wrong. One possibility is that social norms (stigmas) imply that there is a cost to having both black friends and white friends. For example, if the same race friends of a student criticize her for having friends of a different race, then a person may not choose to have friends of both races even if she thinks that she is equally compatible with students of both races. However, there are a couple of things to note. First, if such a situation does exist, then it is strongly suggestive that at least some people on campus believe that blacks and whites are quite different and probably not particularly compatible—a view that is consistent with our conclusions about beliefs. Second, in such a situation, if, social norms aside, black students were truly indifferent between having black and white friends, our model suggests that they would choose to have only white friends as they are the majority group. Of course, this would not be the case if a black person with white friends is outwardly harassed on campus by black non–friends, a view of things that seems very inconsistent with the environment at Berea. Thus, at least

[28] However, the two situations suggest different reasons for why a misperception might exist. In the case where decisions are made solely on the basis of an observed friendship characteristic that is correlated with race, misperceptions would have to arise because the characteristic is not as important for friendship quality as one expected. In the case where a person takes into account race when making decisions because she believes that race is correlated with unobserved characteristics that are valuable, misperceptions arise if the student is wrong about how race is correlated with these other unobserved characteristics.

at Berea, issues related to social norms would not seem to change our basic conclusion.[29]

A second possibility is that both white and black students correctly believe that they are equally compatible with students of the other race, but at least one group believes that the other is biased. Thus, racial sorting would occur because students do not try friendships with individuals of the other race for fear of not being reciprocated. This is a somewhat different view of the data, but the conclusion for policy is essentially the same: there is something to be learned at school.

A third possibility (mentioned in Subsection 3.3) is that, while the roommate experiment reveals the true interracial compatibility after two months in school, it might not necessarily reveal the true interracial compatibility at the time of entrance. Suppose, for example, that a person's compatibility with someone of a given race depends on a race–specific stock of common experiences. Then pre–college segregation could generate differences at the time of entrance that could be alleviated during the early portions of school. This scenario could create a situation in which individuals are correctly pessimistic about interracial compatibility at the time of entrance, even though no true differences exist after two months.[30] However, a consequence of this scenario would be that, starting at the time when the true difference in compatibility disappears, the non–roommate friendship decisions of a student would vary with the race of his randomly assigned roommate, a fact that is not supported by the data we describe in the next section.

A fourth possibility, raised by Cornell and Welch (1996) in a labor market context, would be that students believe they are equally compatible with students of all races, but they are worse at evaluating their friendship compatibility with a person of a different race, making it more likely that students become friends with other students of the same race. The results in the next section suggest that if this is the case, then a white student randomly assigned to a black student overcomes this deficit in the long–run. Thus, affirmative action is potentially beneficial, but for a different reason.

[29] A variant of this explanation would be that social stigmas are present because of the views of parents. For example, a student who believes that she is equally compatible with students of all races might end up with more friends of the same race if it is unpleasant to introduce a friend of a different race to her family.

[30] One would have to believe that initial differences in stock are not too large and that the marginal return to the race–specific stock from spending time with a person of a particular race is large at the time of entrance but decreases sufficiently quickly.

5 Evidence About Effectiveness

Here we turn to the question of the effectiveness of affirmative action.

5.1 Interracial Interactions Over Time

From the standpoint of the data needed to use a revealed preference approach to examine the effectiveness of affirmative action, perhaps most fundamental is the information about how sorting by race in friendships changes during school. The reality that previous research on this topic has not been able to provide evidence about this issue stems from the fact that the approaches used in these other papers for measuring friendships allowed only for the construction of a single cross–section.[31]

We provide direct information about how sorting changes over time by taking advantage of the fact that, as discussed earlier, we are able to identify friendships not only at the time of entrance, but also in the middle of the first, second, and third years of college. Recall that the first columns of Tables 2A and 2B show the amount of sorting at the time of entrance for the 2001 cohort (and that friendships are not observed for the 2000 cohort at the time of entrance). The first columns of Tables 4A (best friends) and 4B (all friends) repeat the proportions from Tables 2A and 2B, respectively, and add proportions showing the amount of sorting for the 2001 cohort in the middle of the first, second, and third years using all observations that are available at each time. The second columns of Tables 4A (best friends) and 4B (all friends) show the amount of sorting for the 2001 cohort in the middle of the first, second, and third years using only observations for students who participated in all survey waves. The results from the first two columns of Tables 4A and 4B provide no evidence of decreased sorting over time, with the majority of the sample proportions moving in the

[31] While, in theory, one could examine sorting across time by taking advantage of the fact that individuals at different stages of school are present in the single cross–section, in practice, this would not be very successful. For example, only 11% of freshmen and 23% of sophomores appear as "primary" sample members in the cross–section of Marmaros and Sacerdote (2006), with the implication being that roughly 80% of the email exchanged between two freshmen and roughly 60% of email exchanged between two sophomores would not be observed. In Mayer and Puller (2008), one would seemingly need to attempt to adjust for the reality that a students's Facebook friends at a point in time likely represent the cumulative set of friends that the person has met by that point in school (since people do not tend to remove friends from their Facebook pages). Regardless, providing this type of evidence is not a focus of either work.

direction of more sorting after the time of entrance. The first two columns of Tables 4C (best friends) and 4D (all friends) show similar results when we increase the sample size by combining both the 2000 and 2001 cohorts. We note that attrition rates of black students are generally similar to those of white students so that the proportion of black students at the school, which is .158 at entrance, remains quite stable over time.

5.2 Can Policy Influence Interactions?

The results of Section 5.1 indicate that, for the sample as a whole, there is significant racial sorting throughout college. This is important since a well–recognized condition that is necessary for affirmative action to be useful is that there exists interaction between individuals of different races. It is natural to wonder whether school policy can influence the amount of interaction. Indeed, much of the literature in this area has made providing evidence about this issue its primary objective.

The approach taken by Mayer and Puller (2008) to address this question is to specify a model which imposes significant structure on the meeting process.[32] Specifically, they assume that individuals first meet friends at random and then enter an iterative process involving several rounds of meeting friends of friends. They calibrate the parameters of their model using their Facebook data and use the estimates of the parameters characterizing students' preferences for friendships with individuals of different races to simulate the effect of counterfactual policies (e.g., changes to housing assignment rules or other changes that affect the likelihood that black and white students meet) on the amount of interracial friendships.

In the absence of an experiment, the approach of imposing structure in order to make progress on the question of whether policy can influence interactions seems reasonable. At the same time, assumptions about the meeting process and a variety of other assumptions that are needed for this approach to be viable are fundamentally unobservable, and it is not readily apparent how changes to the particular structure that is imposed would influence conclusions. For example, in order to achieve identification, Mayer and Puller (2008) assumes

[32] The model of Mayer and Puller (2008) is based on Jackson and Rogers (2007). The latter, in work that does not focus on racial issues, examine a model of network formation in which an individual can form links (friendships) with other individuals either randomly or through his existing friends.

that preferences/beliefs about people from different races are not changing over time. But the motivation for affirmative action is that interaction is useful exactly because it might change preferences/beliefs.[33]

We provide direct evidence about this issue by taking further advantage of the experiment involving randomly assigned roommates described in Subsection 3.3. Table 5 shows the percentage of a person's friends that are black in the middle of years one, two, and three at school, stratified by the race of the roommate that was randomly assigned for the freshman year. The proportions in the first panel include the roommate assigned originally if this roommate is identified as a friend in the year being examined. The first column (first panel) shows that, on average, students have 16.5% black friends in the middle of the first year if they were randomly assigned a black roommate and 6.0% black friends in the middle of the first year if they were randomly assigned a white roommate. The null hypothesis that the average proportion of black friends in the middle of the first year does not depend on the race of the randomly assigned roommate is rejected at all traditional significance levels with the t-statistic having a value of -4.863. The second and third columns (first panel) show similar results for the middle of the second and third years. Thus, the results indicate that policy can have a substantial effect on the amount of interracial interaction. Indeed, the average proportion of black friends in the sample for white students assigned black roommates is greater than the proportion of black students (.158) at the school.

As shown in Subsection 3.3, many randomly assigned roommates end up being friends. This raises the important question of whether the results in the first panel are being driven entirely by interactions with the assigned roommate. To examine this issue, the proportions in the second panel of Table 5 exclude the roommate that was randomly assigned in the freshman year if this roommate is identified as a friend in the year being examined. The results in the first column (second panel) show that, on average, white students have 8.1% black friends in the middle of the first year if they were randomly assigned a black roommate and 6.7% black friends in the middle of the first year if they were randomly assigned a white

[33] One also might be concerned, for example, about the assumption that all meetings are random unless they occur through common friends or the assumption, which Mayer and Puller (2008) make, that the probability of turning a meeting into an actual friendship is independent of whether the potential friend was met through a common friend or was met randomly.

roommate. The null hypothesis that the average proportion of black friends in the middle of the first year does not depend on the race of the randomly assigned roommate cannot be rejected at any traditional significance levels since the t-statistic from the test has a value of -.657. Thus, in the middle of the first year, the increased interracial interaction generated by the roommate assignment appears to be generated by the fact that roommates are often friends rather than by increases in the number of chosen non–roommate friends that are black. This finding is not consistent with the third alternative explanation discussed in Subsection 4.5 since this explanation hypothesizes that sorting at the time of entrance is generated by true differences in compatibility by race (rather than misperceptions) that disappear by the middle of the first year for the group of white students who are randomly assigned black roommates.[34]

The results when roommates are excluded are much different in the second and third years, though. For example, the results in the second column of Table 5 (second panel) show that, on average, white students in the sample have 15.9% black friends in the middle of the second year if they were randomly assigned a black roommate in the freshman year and 5.4% black friends in the middle of the second year if they were randomly assigned a white roommate. The null hypothesis that the average proportion of black friends in the middle of the second year does not depend on the race of the randomly assigned roommate in the freshman year is rejected at all traditional significance levels since the t-statistic from the test has a value of -4.341. The third column of Table 5 (second panel) shows similar results in the middle of the third year.

Thus, our results show that policy can have a substantial influence on interracial friendship interactions. Further, while the effect arises in the first year simply because students

[34]This explanation implies that if friends in the middle of the second year were all new friends and the meeting process were random, then whites assigned black roommates should have a substantially higher number of black friends then whites assigned white roommates. Of course, the meeting process is not random, but, if anything, whites who are assigned black roommates should meet more black potential friends than whites who are assigned white roommates. Students are also not dropping all their old friends, but, as discussed in Footnote 36, we find that there is a very large amount of turnover in friendships early in school. Finally, to the extent that one is worried that there may be a lag between the time that true changes occur in friendship compatibility and the time that this change impacts friendship decisions, further support comes from the fact that we observe almost identical results when we look at friendships from a friendship survey taken several months later in the second semester.

often become friends with their assigned roommate, the effect arises in subsequent years because students who are assigned black roommates are significantly more likely to choose new friends who are black. The effect after the first year could come either from a situation in which students' beliefs about interracial friendship compatibility change when they are assigned a black roommate in their freshman year or from a situation in which network effects imply that students meet more potential friends who are black when they are assigned a black roommate in their freshman year. We discuss this issue in detail in the next subsection.

5.3 Learning About Compatibility

The evidence in Section 3 suggests that, while in reality students from different races are very compatible as friends, they may not realize this at the time of college entrance. An open question is whether the interracial interactions that occur on a campus are effective in correcting this possible misperception. If we wish to continue to employ a standard revealed preference approach, the pertinent question becomes whether we can learn something about how beliefs change after entrance by seeing how observed friendship choices change over time for the entire group of students (Subsection 5.1) and for the sample stratified by the race of the randomly assigned roommate (Subsection 5.2).

In Section 3, we were able to ascertain beliefs at the end of the orientation period from observed friendship choices because: 1) students were making all new friends during the orientation period and 2) the process by which students meet potential friends during the orientation period is to, a close approximation, unconditionally random. Ascertaining beliefs from friendship choices after the orientation period is much more difficult given that neither of these conditions are likely to remain true. The concern is that, if there is little turnover in friendships or network effects are very strong (so that most new friends are met through other friends), then initial amounts of racial sorting will tend to persist over time even if interracial interactions are effective in correcting misperceptions.

In reality, the two strong conditions that we took advantage of when analyzing friendship decisions at the time of entrance are not necessary to make progress. Suppose, for example, that at least some chosen friends in a particular period are new friends and were met through

a process that, to a reasonable approximation, is random.[35] Then, if one could observe the group of current friends who fit this description, one could examine beliefs about interracial friendship compatibility by comparing the proportion of the students in this group who are of a particular race to the proportion of students of the particular race at the school.

While the data requirements necessary to determine the group of new students who were met randomly at some point in time are extremely high, the panel nature of our data allows the best possible opportunity to pursue this approach. To begin, the comparison of a student's friends in some time t with her friends in time $t-1$ allows us to remove any friends in t who are identified as being returning friends. The question of which of the remaining new friends were met randomly is more difficult. Here we seek guidance from Jackson and Rogers (2007) and Mayer and Puller (2008) who, in their models, maintain the assumption that a student meets new friends either through her existing friends or through a process that is random in nature. Under this assumption, once we remove any of a student's new friends who we can identify as being a friend of any of her (up to) four friends from the previous period, we are left with the group of new friends who were met randomly.[36]

Then, the question of whether beliefs change over time is one of whether the amount of sorting changes over time when one focusses on the group of new friends that were randomly met. For the 2001 cohort, the sorting results focussing only on this group are shown in the last columns of Tables 4A (best friends) and 4B (all friends). For the combined 2000 and 2001 cohorts, the sorting results focussing on this group are shown in the last columns of Tables 4C (best friends) and 4D (all friends). The results in the last columns of Tables 4A, 4B, 4C, and 4D show sorting in all periods that is very similar to that observed for the group

[35] These new friends might, for example, be met while walking around campus, standing in line in the cafeteria, or taking part in classes or activities that are not of particular interest to any specific type or race of student.

[36] We find that 23.7% of friends in the middle of the first year were listed as friends at the end of the orientation period (i.e., they are not new), and that 32.1% of friends in the middle of the second year and 41.6% of friends in the middle of the third year were listed as friends in the middle of the previous year. These numbers do not vary significantly by race. We find that network effects are relatively strong in the meeting process. A new friend of a student i in the middle of the first year has a .0969 probability of being a friend with any of i's friends at the end of the orientation period. A new friend of a student i in the middle of the second (third) year has a .132 (.084) probability of being a friend with any of i's friends in the middle of the first (second) year.

of all students in the first columns of Tables 4A, 4B, 4C, and 4D. Then, to the extent that we are able to accurately identify the group of a student's new friends who were met randomly, the fact that there are no discernible reductions in sorting over time implies that there is no evidence of important changes in perceptions about interracial friendship compatibility during school for the overall group of students. However, we think that it is most reasonable to view these results as suggestive in nature since, in reality, our ability to identify the group of new friends who are met randomly is undoubtedly imperfect.[37]

An important question is whether one might come to a different conclusion about the group of white students who were randomly assigned black roommates in their freshman year given that this group is involved in a very large percentage of the total black–white friendships in the earliest periods. Recall that the results in Table 5 indicate that, by the middle of the second year, this group has, on average, approximately the same sample proportion of black friends (.159) as are present at the school, even if one does not count the roommate that was assigned for the freshman year. Then, one could conclude that this group believes that they are equally compatible with black students as they are with white students as long as one does not believe that this group has met a disproportionate number of black potential friends during the first 1.5 years of school. There is no obvious reason to believe that this group has met a disproportionate number of black students during the first 1.5 years. Even counting the assigned black roommate, Table 5 found that the proportion of friends who are black in the middle of the first year (.165) is very similar to the proportion of black students at the school, so that meetings through social networks between this point and the middle of the second year does not seem to disproportionately favor any particular race.

We can attempt to provide more direct evidence about whether the group of white students randomly assigned to black roommates in their freshman year believe that they are equally compatible with black and white students using the approach just described. Table 6 shows the results in the second panel of Table 5 when we focus only on the group of new friends that were met randomly. The second row shows no evidence of a change over time

[37] One can certainly question the assumption borrowed from Jackson and Rogers (2007) and Mayer and Puller (2008). One might also wonder whether yearly friendship observations are frequent enough to accurately identify returning friends and friends that are met through other friends.

for white students who were assigned white roommates. However, the first row shows that the proportions for white students assigned to black roommates are significantly higher in the middle of the second and third years than in the middle of the first year.[38] The sample average proportion in the middle of the second year (.203) is higher than the proportion of black students at the school (.158) and the 90% confidence interval is (.145,.260), providing strong evidence in support of the notion that these students are choosing new black friends in a proportion that is similar to the proportion of black friends at the school. In the third year, the sample average proportion in the first row (.156) is very similar to the proportion of black students at the school. Thus, this direct evidence is consistent with the notion that white students who were assigned black roommates have beliefs that change after the first year and that they eventually realize that they are very compatible with black students.

6 Conclusion

We find evidence that students from different races are very compatible as friends at Berea College and that a reasonable interpretation of the data is that some students enter college with a misperception about this compatibility. Given the history and reputation of Berea, it seems quite possible that students who select it are more informed about interracial compatibility than students elsewhere. This would suggest that if misperceptions exist at Berea, then they would also likely exist elsewhere. However, we feel that it is important to be cautious about this conclusion since, among other things, it is possible that the true value of interracial friendship compatibility may be different elsewhere. Nonetheless, this paper makes a valuable contribution by providing evidence in support of the notion that there do indeed exist situations where students from different races have a lot in common but do not fully realize that this is the case.

Examining what happens over time to the overall sample suggests that a diverse group of students on campus by itself may not cause large amounts of interracial friendship interaction or lead to substantial changes in perceptions about interracial friendship compatibility.

[38] A test of the null hypothesis that the average proportion is the same in the 2nd year as it is in the first year has a standard normal test statistic of 3.18. A test of the null hypothesis that the average proportion is the same in the 3rd year as it is in the first year has a standard normal test statistic of 1.99.

Examining what happens over time to students assigned a roommate of a different race suggests that an active policy can make a substantial difference, though. However, it is worth noting that, when the number of minority students is not large, many majority students cannot receive the treatment of being assigned a minority roommate. Further, the nature of the roommate instrument is quite unique; it is hard to think of other potential policy instruments which, in essence, force students to learn so much about each other.

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Appendix A—Proofs

Proof of Lemma 1: Suppose that a student's orientation group has $n \geq 1$ individuals of the opposite race and consider a policy that selects a subgroup with r of them. Notice that r is at most $\overline{r}(n) = \min\{n, K\}$. Now observe that conditional on race, all members of a student's orientation group look the same before she selects which subgroup to interact with. Hence, any policy that selects r individuals of the opposite race has the same expected payoff, that we denote by $u(r|n, m_\mu, \sigma_\mu^2)$ since it also depends on a student's prior mean and variance. Let X_{m,σ^2} denote the normal random variable with mean m and variance σ^2. Then, by construction,

$$u(r|n, m_\mu, \sigma_\mu^2) = \int \max\{z_1, \ldots, z_K\} dX_{m_\mu, \sigma_o^2}(z_1) \cdots dX_{m_\mu, \sigma_o^2}(z_r) dX_{0, \sigma_v^2}(z_{r+1}) \cdots dX_{0, \sigma_v^2}(z_K),$$

where we recall that $\sigma_o^2 = \sigma_v^2 + \sigma_\mu^2$.

We now show that there is $\underline{m} < 0$ such that if $m_\mu > \underline{m}$, then $u(r|n, m_\mu, \sigma_\mu^2)$ is strictly increasing in r for all $n \in \{1, \ldots, N\}$. For this observe that: (i) X_{m_1,σ^2} first order stochastically dominates X_{m_2,σ^2} if $m_1 > m_2$; and (ii) X_{m,σ_1^2} second order stochastically dominates X_{m,σ_2^2} if $\sigma_1^2 > \sigma_2^2$. Moreover, $\max\{a, z\}$ is increasing and convex in z for all $a \in \mathbb{R}$. Hence, $m_\mu \geq 0$ implies that

$$\begin{aligned}
&u(r|n, m_\mu, \sigma_\mu^2) = \\
&\quad = \int \max\{z_1, \ldots, z_K\} dX_{m_\mu, \sigma_o^2}(z_1) \cdots dX_{m_\mu, \sigma_o^2}(z_r) dX_{0, \sigma_v^2}(z_{r+1}) \cdots dX_{0, \sigma_v^2}(z_K) \\
&\quad \geq \int \max\{z_1, \ldots, z_K\} dX_{m_\mu, \sigma_o^2}(z_1) \cdots dX_{m_\mu, \sigma_o^2}(z_{r-1}) dX_{0, \sigma_o^2}(z_r) dX_{0, \sigma_v^2}(z_{r+1}) \cdots dX_{0, \sigma_v^2}(z_K) \\
&\quad > \int \max\{z_1, \ldots, z_K\} dX_{m_\mu, \sigma_o^2}(z_1) \cdots dX_{m_\mu, \sigma_o^2}(z_{r-1}) dX_{0, \sigma_v^2}(z_r) dX_{0, \sigma_v^2}(z_{r+1}) \cdots dX_{0, \sigma_v^2}(z_K) \\
&\quad = u(r-1|n, m_\mu, \sigma_\mu^2),
\end{aligned}$$

where the first inequality follows from (i) and the second inequality follows from (ii) and the fact that $\int \max\{0, z\} dX_{0,\sigma^2} = \sqrt{\sigma/2\pi}$ is strictly increasing in σ. The desired result is then a consequence of the fact that the functions $u(r|n, m_\mu, \sigma_\mu^2)$ are continuous in m_μ. Notice that $\underline{m}$ depends on σ_μ^2. □

Corollary 1. *Suppose that $\mu = 0$ for a student. There is $\underline{m} < 0$ such that if this student is black (white) and has $m_\mu > \underline{m}$, then the probability that she has a black friend at the end of the orientation period is less (more) than the fraction of black students in college.*

Proof: Let $\pi(\omega, r|\mu)$ be the probability, as a function of μ, that a student of race ω chooses a black student as a friend when the subgroup she selects has r such students. It is well-known that if Z_1 to Z_n are independent draws from the same real-valued random variable Z, then $\Pr[\max\{Z_1, \ldots, Z_r\} \geq \max\{Z_{r+1}, \ldots, Z_n\}] = r/n$ if Z has no mass points. Hence, $\pi(\omega, r|0) = r/K$. Now let b be the fraction of black students in college and let $\Pi(\omega, m_\mu, \sigma_\mu^2|\mu)$ be the probability, as a function of μ, that during the orientation period a student of race ω, prior mean m_μ, and prior variance σ_μ^2 chooses a black student as a friend. By Lemma 1, there exists $\underline{m} = \underline{m}(\sigma_\mu^2) < 0$ such that if $m_\mu > \underline{m}$, then

$$\Pi(\text{white}, m_\mu, \sigma_\mu^2|0) = \sum_{n=0}^{N} \binom{N}{n} b^n (1-b)^{N-n} \pi(\text{white}, \overline{r}(n)|0) > \frac{1}{K} \sum_{n=0}^{N} \binom{N}{n} n b^n (1-b)^{N-n} > b,$$

where the first inequality follows from the assumption that $K < N$. Recall that $\overline{r}(n) = \min\{n, K\}$ is the maximum number of individuals of the opposite race that a student can select when her orientation has n such students. Similarly, $m_\mu > \underline{m}$ implies that

$$\Pi(\text{black}, m_\mu, \sigma_\mu^2|0) = \sum_{n=0}^{N} \binom{N}{n} (1-b)^n b^{N-n} \pi(\text{black}, K - \overline{r}(n)|0) < b.$$

□

Proof of Proposition 2: Proposition 2 follows immediately from Corollary 1. □

Note that Proposition 2 also holds for values of μ that are close to zero. This follows from the fact that the probabilities $\pi(\omega, r|\mu)$ are continuous in μ, and so are the probabilities $\Pi(\omega, m_\mu, \sigma_\mu^2|\mu)$. Indeed, let $m^* < 0$ be the maximum among all students in college of the cutoff $\underline{m}$ given by Lemma 1.[39] Then, $m_\mu > m^*$ implies that $\lim_{\mu \to 0} \Pi(\text{white}, m_\mu, \sigma_\mu|\mu) > b$ and $\lim_{\mu \to 0} \Pi(\text{black}, m_\mu, \sigma_\mu|\mu) < b$. Hence, for $\mu > m^*$ and close to zero, we can only observe racial sorting at the end of the orientation period if a large number of students enters college with a prior mean lower than m^*, and so lower than μ^*.

[39] Notice that $\underline{m}$ also depends on σ_v^2. Hence, if students were to differ in σ_v^2 there would be no change in the proof of Proposition 2 other than that the value of m^* would be different.

Appendix B—Data Construction Description

The 2001 cohort was first asked about friendships on the baseline survey using the question described in Section 3.1. We refer to the friendships that we characterize using this survey as friendships "at the time of college entrance." This cohort was asked about friendships three additional times during their first year using a similar question, and we use these surveys to characterize friendships "during the first year of college." Two of these surveys (4 and 5) took place in November of the first semester while the other surveys took place during the second semester. In order to construct the friendship information for the second year, if the student responded to survey 5, we characterize friendships using information from this survey. If not, we turned to survey 4 and then, if necessary, to Survey 12. Since 94% of our responses come from Surveys 4 or 5, friendships during the first year of college are essentially synonymous with friendships "in the middle of the first year of college." The second cohort was asked about friendships four times during their second year and four times during their third year. Using an approach similar to that described above for the first year, we use this information to construct friendships "during the second year" of college and friendships "during the third year" of college. For ease of illustration, in the paper we sometimes refer to friendships at the beginning of college, during the first year, during the second year, and during the third year as friendships at $t = 0$, $t = 1$, $t = 2$, and $t = 3$, respectively.

We observe friendship information for 335 students during the first year of college, for 275 students during the second year of college, and for 238 students during the third year of college. The numbers are less than the total sample size, 375, for three reasons. First, 14, 84, and 128 of the students in our sample had left Berea at the time of the first, second, and third year friendship surveys, respectively. Second, 21, 14, and 4 students chose not to participate in any of the friendship surveys in the first, second, and third years, respectively. Finally, 5, 2, and 5 of students who participated on the friendship surveys either indicated they had no friends or listed friends that could not be matched in the first, second, and third years, respectively. The numbers above imply that 94%, 95%, and 98% of individuals in our sample who were still at Berea answered one or more friendship surveys for the first, second, and third years respectively.

Table 1 Descriptive Statistics - 2001 cohort

	Beginning of College (t=0) n=375
Male	.432
Black	.158
High school grade point average	3.37 (.48)
American College Test (ACT)	23.34 (3.63)
physical attractiveness at college entrance	2.642 (.734)
population density of home county	363.293 (535.116)
family income at college entrance	25238 (18079.66)
athlete in first year	.189

The table shows the mean (standard deviation) for 2001 Berea Panel Study cohort (n=375).

Table 2A
The proportion of students who have black best friends at start of classes in the freshman year
Separately by race of student- 2001 Cohort

	n=298 (white) n=56 (black)	n=269 (white) n=55 (black)
Black	.696* (.061)	.676* (.071)
White	.057* (.013)	.063* (.023)
Male		.009 (.033)
(Population density-363.29)/100		.002 (.004)
Athlete in first year		-.048 (.045)
(Family income -25239)/10000		.0005(.008)
ACT-23.34		-.006 (.003)
High school grade point average -3.37		.041 (.037)
R^2		.516

Note. The first entry in the first column shows that the sample proportion of black students who have black best friends at the start of classes in the freshman year is .696 (Question A). The second entry in the first column shows the sample proportion of white students who have black best friends at the start of classes in the freshman year is .057 (Question A). The second column uses a linear probability model (with whether a person's best friend is black as the dependent variable) to also control for other observable characteristics of the student. The sample size is smaller in the second column due to the fact that some of the additional variables are missing for some individuals.
* Significant at 5%

Table 2B
The average proportion of all listed friends who are black at the start of classes in the freshman year
Separately by race of student - 2001 Cohort

	n=298 (white) n=56 (black)	n=269 (white) n=55 (black)
Black	.668* (.046)	.640* (.059)
White	.098* (.012)	.127* (.020)
Male		-.014 (.029)
(Population density-363.29)/100		.004 (.003)
Athlete in first year		-.074 (.034)*
(Family income -25239)/10000		-.009 (.007)
ACT-23.34		-.003 (.003)
High school grade point average -3.37		-.012 (.033)
R^2		.602

Note. The entries shows the average proportion of listed friends who are black for various subsamples of the 2001 cohort. For example, the first entry in the first column shows that, on average, black students report (Question A) that 66.8% of all of their friends are black at the start of classes in the freshman year. The second entry in the first column shows that, on average, white students report (Question A) that 9.8% of all of their friends are black at the start of classes in the freshman year. The second column uses a regression model (with the proportion of a person's reported friends who are black as dependent variable) to also control for other observable characteristics of the student .
* Significant at 5%

Table 3A The proportion of students who list their assigned roommate from the first year as their best friend at different points in college

	Middle of 1st year	Middle of 2nd	Middle of 3rd
Combined 2000 and 2001 Cohorts			
White assigned Black	.167 (n=60)	.083 (n=48)	.136 (n=44)
White assigned White	.165 (n=321)	.058 (n=240)	.042 (n=44)
Black assigned White	.180 (n=61)	.062 (n=48)	.073 (n=41)
2001 Cohort			
White assigned Black	.185 (n=27)	.08 (n=25)	.142 (n=21)
White assigned White	.187 (n=155)	.062 (n=127)	.055 (n=108)
Black assigned White	.179 (n=28)	.086 (n=23)	.111 (n=18)

Table 3B
The proportion of students who list their assigned roommate from the first year as one of their four best friends at different points in college.

	Middle of 1st year	Middle of 2nd	Middle of 3rd
Combined 2000 and 2001 Cohorts			
White assigned Black	.35 (n=60)	.229 (n=48)	.159 (n=44)
White assigned White	.367 (n=321)	.133 (n=240)	.088 (n=214)
Black assigned White	.344 (n=61)	.167 (n=48)	.146 (n=41)
2001 Cohort			
White assigned Black	.444 (n=27)	.24 (n=25)	.142 (n=21)
White assigned White	.354 (n=155)	.118 (n=127)	.083 (n=108)
Black assigned White	.393 (n=28)	.174 (n=23)	.111 (n=18)

Table 4A The proportion of students who have black best friends at the start of classes in the middle of years one, two, and three - 2001 cohort

	All observations	Respondents with friendship observations in all periods	Same as column 1 except omitting whites randomly assigned black roommates	Same as column 1 except omitting returning friends and friends of friends
Black (entrance)	.696 (.061) n=56	.757 (.074) n=33	.696 (.061) n=56	.696 (.061) n=56
Black (year 1)	.767 (.056) n=56	.787 (.071) n=33	.767 (.056) n=56	.904 (.064) n=21
Black (year 2)	.804 (.058) n=46	.787 (.071) n=33	.804 (.058) n=46	.782 (.086) n=24
Black (year 3)	.805 (.065) n=36	.848 (.062) n=33	.805 (.065) n=36	.846 (.100) n=13
White (entrance)	.057 (.013) n=298	.068 (.019) n=175	.033 (.010) n=270	.057 (.013) n=298
White (year 1)	.050 (.013) n=279	.051 (.016) n=175	.035 (.011) n=252	.055 (.018) n=161
White (year 2)	.069 (.016) n=229	.074 (.019) n=175	.058 (.016) n=204	.081 (.024) n=123
White (year 3)	.064 (.016) n=202	.068 (.019) n=175	.049 (.016) n=181	.08 (.031) n=75

The entries show the proportion of students who have black best friends for various subsamples of the 2001 cohort.

Numbers in parentheses are standard errors of the estimator of the population proportion.

Note 1: All friendship observations at entrance come from 2001 cohort. Column 1 uses all observations. Column 2 uses only students that answered the survey at the time of entrance, the middle of the first year, the middle of the second year, and the middle of the third year. Column 3 is the same as column one except that it omits all white students who were randomly assigned black roommates. Column 4 is the same as column one except that it omits all friends of person i at a time t who can be identified as either being friends of i at t-1 or friends of i's friends at t-1.

Table 4B The average proportion of all listed friends who are black at the start of classes in the middle of years one, two, and three - 2001 cohort

	All observations	Respondents with friendship observations in all periods	Same as column 1 except omitting whites randomly assigned blacks	Same as column 1 except omitting returning friends and friends of friends
Black (entrance)	.668 (.046) n=56	.712 (.058) n=175	.668 (.046) n=56	.668 (.045) n=56
Black (year 1)	.654 (.051) n=56	.686 (.065) n=175	.654 (.051) n=56	.647 (.057) n=51
Black (year 2)	.766 (.049) n=46	.724 (.065) n=175	.766 (.049) n=46	.748 (.057) n=46
Black (year 3)	.708 (.057) n=36	.727 (.057) n=175	.708 (.057) n=36	.784 (.059) n=34
White (entrance)	.097 (.012) n=298	.102 (.016) n=33	.066 (.010) n=270	.098 (.012) n=298
White (year 1)	.073 (.009) n=279	.070 (.010) n=33	.063 (.009) n=252	.067 (.010) n=261
White (year 2)	.072 (.009) n=229	.070 (.011) n=33	.062 (.009) n=204	.071 (.012) n=212
White (year 3)	.080 (.011) n=202	.082 (.013) n=33	.071 (.011) n=181	.077 (.015) n=186

The entries show the average proportion of listed friends who are black for various subsamples of the 2001 cohort. For example, the upper left entry shows that the 56 black students observed in the 2001 cohort at the time of entrance have, on average, 66.8% black friends. Numbers in parentheses are standard errors of the estimator of the population mean (i.e., the mean of individual-specific proportions in the population).
Note 1: See Note 1 in Table 4A

Table 4C The proportion of students who have black best friends at the start of classes in the middle of years one, two, and three - Combined 2000 & 2001 cohorts

	All observations	Respondents with friendship observations in all periods	Same as column 1 except omitting whites randomly assigned blacks	Same as column 1 except omitting returning friends and friends of friends
Black (entrance)	.696 (.061) n=56	N.A. (See Note 1)	.696 (.061) n=56	.696 (.061) n=56
Black (year 1)	.773 (.039) n=115	.785 (.049) n=70	.773 (.039) n=115	.812 (.043) n=80
Black (year 2)	.788 (.043) n=90	.80 (.047) n=70	.788 (.043) n=90	.822 (.056) n=45
Black (year 3)	.746 (.050) n=75	.785 (.049) n=70	.746 (.050) n=75	.75 (.096) n=20
White (entrance)	.057 (.013) n=298	N.A. (See Note 1)	.033 (.010) n=270	.057 (.013) n=298
White (year 1)	.052 (.009) n=573	.052 (.011) n=359	.037 (.008) n=513	.054 (.010) n=455
White (year 2)	.066 (.012) n=433	.064 (.012) n=359	.051 (.011) n=385	.078 (.017) n=228
White (year 3)	.058 (.011) n=396	.061 (.012) n=359	.042 (.010) n=352	.071 (.021) n=140

The entries shows the proportion of students who have black best friends for various subsamples of the combined 2000 & 2001 cohorts. Numbers in parentheses are standard errors of the estimator of the population proportion. Note 1: All friendship observations at entrance come from 2001 cohort. Column 1 uses all observations. Column 2 uses only students that answered the survey at the middle of the first year, the middle of the second year, and the middle of the third year. Column 3 is the same as column one except that it omits all white students who were randomly assigned black roommates. Column 4 is the same as column one except that it omits all friends of person i at a time t who can be identified as either being friends of i at t-1 or friends of i's friends at t-

Note 2: All friendship observations at entrance come from 2001 cohort.

Table 4D The average proportion of all listed friends who are black at the start of classes in the middle of years one, two, and three - Combined 2000 & 2001 cohort

	All observations	Respondents with friendship observations in all periods	Same as column 1 except omitting whites randomly assigned black roommates	Same as column 1 except omitting returning friends and friends of friends
Black (entrance)	.668 (.046) n=56	N.A.	.668 (.046) n=56	.668 (.045) n=56
Black (year 1)	.724 (.033) n=115	.730 (.042) n=70	.654 (.051) n=115	.724 (.034) n=110
Black (year 2)	.742 (.036) n=90	.732 (.042) n=70	.766 (.049) n=90	.728 (.041) n=86
Black (year 3)	.72 (.038) n=75	.732 (.039) n=70	.708 (.057) n=75	.760 (.059) n=66
White (entrance)	.097 (.012) n=298	N.A.	.066 (.010) n=270	.098 (.012) n=298
White (year 1)	.070 (.006) n=573	.068 (.007) n=359	.058 (.006) n=513	.066 (.006) n=555
White (year 2)	.072 (.007) n=433	.072 (.008) n=359	.054 (.006) n=385	.079 (.010) n=403
White (year 3)	.070 (.008) n=396	.075 (.009) n=359	.058 (.008) n=352	.062(.009) n=345

The entries shows the average proportion of listed friends who are black for various subsamples of the combined 2000 and 2001 cohorts. For example, an upper left entry shows that the 115 black students observed in the combined 2000 & 2001 cohorts at the middle of the first year have, on average, 72.4% black friends.
Numbers in parentheses are standard errors of the estimator of the population mean (i.e., the mean of individual-specific proportions in the population).
Note 1: See Note 1 in Table 4C.
Note 2: All friendship observations at entrance come from 2001 cohort.

Table 5 The average proportion of friends who are black for students randomly assigned roommates - combined 2000 and 2001 cohorts

	Middle of 1st year	Middle of 2nd	Middle of 3rd
Including roommate assigned in first year			
White assigned Black	.165 (.026) n=60	.213 (.036) n=48	.166 (.036) n=44
White assigned White	.060 (.007) n=321	.053 (.008) n=240	.059 (.010) n=214
t test statistic. Null: proportion does not vary by race of roommate	-4.863	-6.546	-3.705
Not including roommate assigned in first year			
White assigned Black	.081 (.021) n=60	.159 (.035) n=48	.136 (.036) n=44
White assigned White	.067 (.008) n=321	.054 (.008) n=240	.059 (.010) n=214
t test statistic. Null: proportion does not vary by race of roommate	-.656	-4.341	-2.661

Table 6 The average proportion of friends who are black for students randomly assigned roommates - combined 2000 and 2001 cohorts: A replication of panel two of Table 5 using only new friends who were met randomly

	Middle of 1st year	Middle of 2nd	Middle of 3rd
Not including roommate assigned in first year			
White assigned Black	.073 (.021) n=59	.203 (.035) n=47	.156 (.036) n=35
White assigned White	.068 (.008) n=308	.061 (.008) n=225	.049 (.010) n=187