

Does the River Spill Over?

Estimating the Economic Returns to Attending a Racially Diverse College

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Abstract

This paper evaluates the frequently argued but heretofore little-tested hypothesis that increasing minority representation in elite colleges generates tangible benefits for majority-race students. Using data on graduates of 30 selective universities, we find only weak evidence of any relationship between collegiate racial composition and the post-graduation outcomes of white or Asian students. Moreover, the strongest evidence we uncover suggests that increasing minority representation by lowering admissions standards is unlikely to produce benefits, and may in fact cause harm by reducing the representation of minority students on less-selective campuses. While affirmative action may still be desirable for the benefits it conveys on minority students, these results provide little support for “spillover” effects on majority-race students.

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“[T]he attainment of a diverse student body ... is a constitutionally permissible goal for an institution of higher education. ... The atmosphere of ‘speculation, experiment and creation’ - so essential to the quality of higher education - is widely believed to be promoted by a diverse student body.”

–Lewis Powell, *Regents of the University of California v. Bakke* (438 U.S. 265, 1978, pp. 311-312, quoting *Sweezy v. New Hampshire*, 354 U.S. 234, 1957, p.263)

1 Introduction

For more than a quarter century, the belief that diversity contributes to the quality of undergraduate and graduate education has motivated court opinions and college policies regarding racial preferences in admissions.¹ Surprisingly, the social sciences have provided very little evidence to support or refute this claim. Such evidence would clearly be of great interest both to policy makers and to scholars conducting more general studies of the impacts of affirmative action in higher education.²

In the absence of programs employing random assignment of individuals to campuses with varying degrees of racial diversity, any evidence offered on this question will be subject to criticism that diversity may correlate with unobserved determinants of individual outcomes.³ In such a scenario, policy makers face an unenviable choice of making uninformed decisions or paying attention to potentially imperfect research findings.

This paper does not claim to solve all the issues involved in the identification of racial diversity effects. As described below, however, we use a promising data source and a variety of identification

¹The most prominent recent example is the Supreme Court’s 2003 rulings in the cases *Gratz v. Bollinger* and *Grutter v. Bollinger*. In these cases, the court upheld the use of racial preferences in admissions, so long as applicants receive “truly individualized consideration.” Excluded from the set of legal practices was a policy at the University of Michigan which granted under-represented minorities a fixed number of points in an admission rating system. See Golden, D. “Colleges Cut Back Minority Programs After Court Rulings,” *Wall Street Journal*, December 30, 2003, p.A1

²For example, Arcidiacono (2005) estimates a model of college applications, school acceptance and financial aid decisions, the choice of major, and earnings to simulate how affirmative action in admissions and financial aid affects expected earnings for blacks. However, he assumes that diversity plays no role in the education decision-making of blacks or whites. If diversity improves one’s undergraduate education, estimates of the changes in decision-making due to the removal of affirmative action will be incorrect.

³There have been analyses exploiting random assignment of students to roommates of varying race or ethnicity, see for example Duncan et al. 2006. The impact of cross-racial roommate assignments, however, may be sensitive to the degree of affirmative action practiced on an individual campus, and hence may provide very little insight as to the prospective impact of altering overall racial composition.

strategies to gain some degree of insight into the question of whether exposure to diversity is beneficial for college students. We begin by translating Powell’s hypothesis into economic terms. Building on the existing concepts of human capital (Becker 1964) and ethnic capital (Borjas 1992; Borjas 1995), and inspired by Lazear’s (1995) model of cultural assimilation, we introduce the concept of “diversity capital.” We define diversity capital as a measure of an individual’s ability to create surplus in interactions with individuals of different racial, ethnic, or socioeconomic backgrounds. In this context, the beliefs articulated by Lewis Powell in 1978 translate into a hypothesis that a diverse student body contributes, directly or indirectly, to diversity capital. With this proposed causal mechanism in mind, we focus our empirical analysis on a direct estimation of the relationship between minority representation and the post-graduation outcomes of undergraduates on elite campuses.

Although our model of the returns to collegiate diversity is simple, empirical estimation of the returns to diversity is complicated by an omitted variables problem: college racial composition may correlate with unobserved institution-level components of education quality, or with individual-level determinants of productivity. A priori, the sign of this bias is unclear. To address this serious concern, we employ models that exploit *within-institution* variation in racial composition, based on students’ declared majors, incorporating both college- and major-specific fixed effects. These specifications test whether engineering majors, for example, attain superior postgraduation outcomes when the cohort of engineering majors at their college is more racially diverse *relative to the college-wide average* than other cohorts of engineering majors. In other specifications, we use students’ own estimates of the quality of their collegiate exposure to racial diversity in place of these measures. In still others, we allow the effect of exposure to diversity to vary with the relative position of individual students and peers in the SAT score distribution. While these methods may insufficiently purge all forms of omitted variable bias from our estimates, the results suggest that a more perfect strategy would not change the paper’s ultimate conclusions.

Our empirical tests utilize the College and Beyond data set, which merges a set of administrative records for students matriculating at one of 30 selective colleges in 1976 with follow-up survey information collected from the same students in 1995. The administrative data allow us to observe the racial composition of each student’s cohort, defined at either the college or major-within-college level. The survey data provide us with outcome measures, including earnings, educational attainment, and subjective measures of career and life satisfaction.⁴

⁴Our focus on these outcome measures follows in part existing literature on college quality (Behrman et al. 1996;

Our most basic specifications find a positive, but at most marginally significant, relationship between institution-level racial diversity and the earnings of white and Asian matriculants. Further tests utilizing major-level variation in diversity, and subjective variation in the quality of students' exposure to persons of different races, uniformly fail to reproduce this result. In fact, our preferred specifications show a negative relationship between a white or Asian student's self-report of exposure to diversity and post-graduate outcomes.

Decomposition results suggest that white and Asian students benefit from exposure to under-represented minorities with SAT scores near or above their own. Exposure to minority students with significantly lower SAT scores, to the extent it predicts anything, is associated with more negative post-graduate outcomes.⁵ These associations are generally stronger in specifications using institution-level, rather than major-level, measures of minority representation. Accepting these associations as causal, the evidence thus suggests that a policy of maximizing the benefits of diversity accruing to majority-race students would involve reducing or eliminating cross-race differences in admission standards. This implies that there is actually a trade-off between conferring benefits on under-represented minorities and producing gains from exposure to diversity.

2 Existing Literature

The "widely believed" view that racial diversity improves the quality of education is based on astonishingly little empirical evidence. While some research has touched on the subject of classroom racial composition and the quality of education at the primary or secondary levels (Rivkin 2000, Hanushek et al. 2003, Hoxby 2000), none of these studies provide any evidence consistent with the hypothesis that racial diversity improves education. Indeed, most existing studies report adverse effects of racial or ethnic diversity on a host of outcomes (see, for example, Alesina et al. 1999; Alesina and La Ferrara 2000, 2001; Easterly and Levine, 1997; Gugerty and Miguel 2005; Vigdor 2004; see Aldrich, Arcidiacono, and Vigdor 2005 for a notable exception). Previous work analyzing

Behrman, Rosenzweig and Taubman, 1996; Brewer et al. 1999; Dale and Krueger 2002), as well as a growing strand of economics literature emphasizing ordinal measures of happiness (Clark and Oswald, 1994; Di Tella et al. 2001; Gruber and Mullainathan, 2005). The College and Beyond data set is the same source used in Bowen and Bok's (1998) study of the impact of affirmative action and Dale and Krueger's (2002) analysis of the returns to attending a more selective college.

⁵Arcidiacono and Vigdor (2005) present evidence corroborating this pattern, by showing that across-race interaction is most likely to occur when students of different races are relatively well matched on SAT scores.

the impact of diversity in higher education has generally not focused on the outcome measures usually associated with the literature on college quality, such as postgraduate earnings, and has relied primarily on correlational evidence (Bowen and Bok, 1998; Gurin 1999). Duncan et al. (2006) exploit conditional random roommate assignment at one large public university to show that cross-racial exposure influences individual attitudes and friendship patterns; however the data set used does not contain information on postgraduate outcomes.

The most noteworthy existing study of collegiate diversity and postgraduate outcomes, Black, Daniel and Smith (2001), reports a positive relationship between college percent black and earnings in the National Longitudinal Survey of Youth.⁶ This finding holds under a number of specifications where the endogeneity of college choice is dealt with using selection on observables. While supportive of Lewis Powell’s hypothesis at face value, two caveats should be attached to the Black, Daniel and Smith study. First, their analysis relies only on college-level variation in percentage black. If higher quality colleges have more aggressive affirmative action programs, a higher percentage black may be picking up the causal effect of an unobserved quality measure. This is the primary empirical concern we address below. Second, the study uses a broad sample of undergraduate institutions, including many less competitive institutions where affirmative action is not an issue (Kane 1998). Even accepting this positive result as unbiased, then, it may reflect a heterogenous underlying mechanism, whereby the impact of diversity is positive in less-selective institutions and unimportant in elite colleges. In such a scenario, affirmative action programs in elite colleges could actually be counterproductive, as they would reduce minority representation on those campuses where it has the most beneficial impact. We present evidence below that is broadly consistent with this scenario. To judge the worthiness of affirmative action policies at elite undergraduate institutions, it is most appropriate to study the impact of minority representation in those institutions themselves.⁷

Our study addresses the two caveats associated with the Black, Daniel, and Smith study directly. We use within-institution variation in racial composition, allowing the introduction of college fixed effects. We also focus on a sample of highly selective institutions where affirmative action policies have a clear impact on overall racial composition. To be sure, clear concerns remain with our methodology. Even within schools, exposure to diversity may be correlated with unobserved

⁶A more detailed explanation of their methodology is given in Black, Daniel and Smith (1997).

⁷Further study of the impact of minority representation at less-selective institutions, particularly study that can take advantage of within-institution variation in representation, would appear to be a promising venue for further research. Unfortunately, we are not aware of any dataset that would allow such a study.

determinants of student outcomes. Moreover, the direction of this correlation is unclear a priori. In the absence of direct experimental manipulation of exposure to diversity, on a scale larger than that utilized by Duncan et al. (2006), our goal is to present the most reliable evidence that can be feasibly gleaned from appropriate data.

3 Interpreting Powell: Diversity Capital

In the standard economic model of investment in education, each individual chooses to acquire additional education if the present value of expected future returns from their up-front investment exceed those available in other asset markets. These educational investments produce human capital (Becker, 1964) that then have a return in the labor market. Lewis Powell’s argument that diversity promotes an “atmosphere of ‘speculation experiment and creation... essential to the quality of higher education” can thus be translated into a hypothesis that the effect of college education on an individual’s stock of human capital depends on the degree of racial diversity at the university where the education takes place. In this section, we develop this notion in a simple model that makes two assumptions beyond Powell’s assertion. First, we assume that the component of human capital influenced by racial diversity is a distinct quantity, which we refer to as diversity capital. Second, inspired by Lazear’s (1995) model of cultural assimilation and Borjas’ (1992; 1995) idea that productivity and other traits are transmitted within well-defined groups in close mutual contact, we assume that the returns to diversity capital accrue when individuals are forced to interact with persons of different racial backgrounds in the marketplace.

Consider a two period model where in the first period an individual invests in skills and in the second period receives payoffs for the skills acquired. Let there be two ethnic groups. In the second period, all individuals share a common location with a fixed group composition. In the investment period, locations vary in their ethnic composition and individuals can choose their preferred level of across-group interaction. We ignore other human capital investments which serve only to complicate the model while not changing the substantive results. Interaction with members of the other ethnic group produces ‘diversity capital’, D , that has a return in the labor market. Consider an individual in the i th ethnic group. Let γ_j^i be the fraction of individuals at first-period location j that are from the other group. The cost of acquiring k units of diversity capital is given by $c(k, \gamma_j^i)$, a function that is increasing in its first argument, decreasing in its second, and convex.⁸ In our empirical work,

⁸The hypothesis that increasing collegiate diversity contributes to the formation of diversity capital hinges on the

we will introduce the possibility that the cost of acquiring diversity capital depends not only on the representation of the other group, but on the characteristics of those other group members. We discuss the implications of this type of extension below.

The payoff for investing in diversity capital comes in the second period. In the second period individuals enter the marketplace. These interactions generate some level of surplus which is divided evenly between the two partners, labeled 1 and 2 respectively. When two members of the same ethnic group interact, per-person surplus is a constant which we normalize to one. When members of different group interact, the surplus depends upon the amount of diversity capital each individual possesses. This mapping is given by $f(D^1, D^2)$ where we assume that the ordering of the partners is not relevant: $f(D^1, D^2) = f(D^2, D^1)$. The function is increasing in both of its arguments, bounded below by zero, and bounded above by one.

In the second period individuals interact with N partners. The probability of an interaction occurring with a member of the other ethnic group in the workplace given that the individual is a member of the i th ethnic group is given by γ_w^i . The expected surplus for individual i in the second period who is a member of the majority group is then given by:

$$E_i(S) = \sum_{n=1}^N [(1 - \gamma_w^i) + \gamma_w^i E f(D_i, D_n)] \quad (1)$$

where the expectation is taken over the diversity capital of one's future partners. Conditional on the initial location, the individual's maximization problem is then:

$$\max_{D_i} \sum_{n=1}^N [(1 - \gamma_w^i) + \gamma_w^i E f(D_i, D_n)] - c(D_i, \gamma_j^i) \quad (2)$$

There are important features of the maximization problem above. First, all else equal, individuals would prefer to attend colleges with higher percentages of under-represented minorities as this lowers the cost of acquiring diversity capital. In an extended model where individuals sorted into first-period locations by paying a tuition-like rent, more diverse locations would command higher rents. Hence, that colleges compete for high representations of minority students is consistent with the model. Second, from a social perspective individuals will naturally under-invest in diversity capital.

impact of increased diversity on interracial interaction. The effect of increasing the proportion of under-represented groups on interracial interaction might be muted if, for example, the share increase creates a "critical mass" of minority students who independently choose to self segregate, or if increasing the share of minorities on elite campuses entails introducing a mismatch in ability levels or other factors predictive of individual sorting into cliques. Bowen and Bok (1998) present some evidence linking higher black share to the probability of interacting with blacks in college.

To see this, note that both the majority and the minority individual benefit when the other has more diversity capital. In the individual's maximization problem he does not take into account the positive externalities associated with his investment decision.⁹

The Powell hypothesis, then, is an argument that greater diversity in higher education is preferable for efficiency reasons. This stands in direct contrast to the traditional equity-based argument that preferential admissions for minority students are justifiable as restitution for past discrimination.

If the collegiate contribution to diversity capital depends on minority student characteristics beyond their mere number, preferential admissions for minority students may or may not be a desirable policy from an efficiency perspective. If diversity capital contributions are greater when students of different races tend to have different ability levels, the argument for preferential admissions is stronger. If, on the other hand, contributions are lessened when disparities in ability levels exist, the argument for preferential admissions is weaker.

Having introduced the concept of diversity capital, it is important to note that we do not intend to test directly for the existence of such a concept in the analysis below. Instead, we are jointly testing the hypothesis that diversity capital matters and minority representation (or self-reported information on the extent of cross-racial interaction) increases it. In some sense, the existence of diversity capital in some form is almost impossible to deny – a traveller in a foreign country, for example, will almost certainly generate more surplus if she can speak the local language and is aware of local bargaining customs. Rather than provide a generalized test, we hope to shed light on a narrower question: whether a specific variable easily manipulated by policy has the potential, through the causal mechanism identified above, to improve an individual's productivity and well-being.

⁹This argument also implies that efforts to measure the benefits of collegiate diversity by examining earnings or other measures of surplus may understate the true magnitude of benefits. So long as some positive fraction of the returns to individual diversity capital accrue to the possessor, however, the existence of private returns is a necessary and sufficient condition for the existence of social returns.

4 Data and Methods

To examine the impact of collegiate diversity on postgraduate outcomes, we employ the College and Beyond Data set, made available by the Andrew W. Mellon Foundation.¹⁰ This data set contains information from two sources: administrative information a set of mostly selective undergraduate institutions, and survey responses collected from a sample of students who matriculated at those institutions in one of four cohorts. Our analysis focuses on the 1976 entering cohort, a group that was enrolled at the time of the Supreme Court’s *Bakke* decision.^{11 12}

The administrative data include information on each matriculant’s SAT scores, major subject, and means of exit, whether graduation, transfer, or withdrawal. For most institutions, the administrative data cover the entire population of matriculants, regardless of whether they responded to the follow-up survey. A few institutions provide only a random sample of administrative records; sampling weights are provided to render the set of records fully representative of the student body. The administrative data permit us to construct a set of characteristics describing each student’s cohort, defined either at the institution or major-within-institution level.¹³ Cohort characteristics

¹⁰We omit observations from historically black colleges as affirmative action is not relevant at these schools. While in theory inclusion of these institutions could help us identify the impact of racial composition on the outcomes of African-American students, we are particularly concerned that these campuses vary dramatically from the other C&B institutions not only in terms of minority representation, but unobserved indicators of education quality. Moreover, our desire to address the specific issue of spillovers associated with affirmative action policy leads us to focus explicitly on those students who do not directly benefit from the policy.

¹¹Other cohorts available in the C&B data set include the classes entering in 1951 and 1989. We omit the 1951 cohort since minority enrollment were universally small at that point in time. We omit the 1989 cohort since the 1996 follow-up survey found a significant fraction who had not yet completed their post-graduate education in 1995.

¹²For most institutions, the administrative data represents the entire entering cohort. For the remainder, the data comprise a nonrandom sample of the student body. Weights are provided to adjust for this sampling. A complete list of institutions represented appears in Table A1 in the appendix.

¹³Since the menu of majors varies across institutions, and certain majors may display a high degree of correlation in substance, we recode each student’s major into one of eleven groups. The eleven categories are: (1) natural sciences (physics, chemistry, and geology), (2) biology and related fields such as plant or animal science, (3) engineering, computer science and math, (4) psychology, sociology, and related social sciences, (5) humanities, including history, philosophy, classics, and area studies, (6) economics, (7) political science, (8) language and literature, (9) arts, architecture, and communication, (10) business, (11) education and other professionally oriented majors. The choice to keep certain categories separate, such as economics and business, was driven by a desire to prevent any individual category from representing a disproportionate share of the overall sample. The decision to combine certain disparate majors, such as history and philosophy, was driven by a comparable desire to prevent any individual category from

include average SAT scores and racial composition. In the empirical specifications below, we equate diversity with the percent of cohort members who belong to racial or ethnic groups that have been historically under-represented in college: African-Americans, Hispanics, and Native Americans.¹⁴ For brevity, we refer to members of these groups as under-represented minorities (URMs).

Figure 1 reveals the extent of variation in URM share across the 30 institutions in our sample: a significant number of white and Asian students in the 1976 entering cohort witnessed URM shares below 2%, while others experienced URM shares as high as 13%. Let i index the individual and j index the school. Our baseline specifications consider outcome Y_{ij} as a function of the characteristics of the individual, X_i , the URM share at the school, SHR_j , other characteristics of the school, Z_j , and an error term, ϵ_{ij} :

$$Y_{ij}^* = \alpha_0 + X_i\alpha_1 + SHR_j\alpha_2 + Z_j\alpha_3 + \epsilon_{ij} \quad (3)$$

This is the specification used in Black, Daniel, and Smith (1997, 2001), which examine a nationally representative sample of colleges. As noted above, our data set focuses on elite colleges where race conscious admissions are most relevant.

As outlined in the introduction, studies such as ours must be concerned with the potential for unobserved determinants of labor market or life satisfaction outcomes that are correlated with the observed factor of interest, in this case minority representation.¹⁵ Our strategy for circumventing this criticism rests on the assumption that the dimension of college quality we are interested in, namely exposure to racial diversity, can vary significantly within a university. Once students matriculate at an undergraduate institution, their curricular choices have a significant impact on the racial composition of their classrooms. Table 1 illustrates this within-school variation by listing the URM share for students reporting different majors at three universities in the College and Beyond sample. Each of the three listed universities has an overall URM share between 10 and 13 percent. Although representing only a tiny share of the overall sample. Our results are not sensitive to the categorization of majors, or to the complete disaggregation of majors. Roughly 754 observations are missing information on college major and are therefore omitted from the analysis.

¹⁴Alternative operationalizations of diversity, such as using the fraction of African-American students in the cohort or a Herfindahl-style fractionalization index, yield similar results in all empirical exercises reported below.

¹⁵Recent literature has sought to eliminate bias of this sort either by modelling the college choice process (Brewer et al. 1999, Arcidiacono 2004, Arcidiacono 2005), comparing the outcomes of twins who attended different colleges (Behrman, Rosenzweig and Taubman, 1996), comparing outcomes of individuals accepted to a similar set of colleges but making different choices within that set (Dale and Krueger 2002), using instrumental variable techniques (Behrman et al. 1996), or by modeling selection on observables (Black, Daniel, and Smith 1997).

the universities look quite similar in terms of the diversity experienced by undergraduates, further examination reveals that students’ classroom diversity experience varies considerably across majors. White and Asian political science majors at Colleges B and C, for example, have a very high share of URM classmates, while political science majors at College A experience a URM share very close to the university average. Psychology or sociology majors at College B exhibit a URM share more than twice the university average, while those at Colleges A and C fall very close to their respective averages. Finally, students majoring in physics, chemistry or geology at Colleges B and C have very few, if any, URM classmates, while such majors at College A have a relatively large share of blacks, Hispanics, and Native Americans in their courses. This within-college variation in racial composition presumably leads to significant differences in the probability of interracial interaction within colleges.¹⁶ As Figure 3 illustrates, within-major URM shares were below 5% for about half of all white and Asian students, but reached as high as 30% for others. Letting k index the major, we then estimate models of the form:

$$Y_{ijk}^* = \alpha_0 + X_i\alpha_1 + SHR_{jk}\alpha_2 + Z_{jk}\alpha_3 + \delta_j + \epsilon_{ijk} \quad (4)$$

where URM share is now at the school-major level as are the other institutional characteristics in Z_{jk} . The δ_j ’s are then the school fixed effects.

This estimation strategy can be considered suspect if the marginal students in all universities tend to gravitate towards certain “easy” subjects, and if these subjects vary across institutions.¹⁷ Presuming that under-represented minority students are disproportionately represented in the pool of marginal students, and that student quality is not adequately captured by the controls we employ in our regressions, such a pattern would bias us towards finding a negative effect of minority share on later outcomes. In our own investigation of this matter, we found that white and Asian students in high-minority majors have significantly lower verbal SAT scores than white and Asian students

¹⁶Some justification for this presumption is found in the 1989 cohort of the College & Beyond. We do not use this cohort in our life outcome analysis because the follow-up survey was done while many students were enrolled in graduate programs. This data set does, however, ask more detailed questions about where inter-racial interactions occur. The possible responses included class or study groups, dorm or roommates, playing sports, parties and other social activities, and other extra-curricular activities. Individuals could mark as many response as were applicable. By far the most common response was that the interactions occurred in the class or study group. Arcidiacono, Khan, and Vigdor (2007) study the 1989 cohort in detail, examining whether individuals have preferences for racial diversity.

¹⁷By contrast, if the identity of “easy” subjects does not vary across institutions, major fixed effects eliminate this type of concern.

in comparatively homogeneous majors, controlling for college and major fixed effects. A similar significant effect is not found for the regression of SAT math scores on URM share. While verbal SAT scores are not significant positive predictors of earnings and other postgraduate outcomes in our analysis below, this does indicate the potential for correlation between URM share in a student’s major and unobserved ability. We therefore acknowledge a potential negative bias in these specifications; given our expectation that the bias in our Table 2 specifications is likely to be positive, our two sets of estimates may bound on the true effect.

As noted previously, we also estimate models where the effect of minority representation can vary across students. Specifically, we develop a model that nests the relationship between the URM share of outcomes in equation (3) but allows for similarity in SAT scores across the distribution to matter. This permits us to test the hypothesis that white and Asian students benefit most from exposure to URM students at similar – or potentially, dissimilar – ability levels. For each white or Asian student in the sample, we divide URM classmates into three groups: those with SAT scores 160 above their own (*HIGH*), 160 points below their own (*LOW*), and within 160 points of their own score (*MED*).¹⁸ Dividing these numbers by the total number of classmates then gives the joint probability of being in the particular SAT group and in the racial group in question. We then allow increasing the shares of each of these groups to differ in their effect on inter-racial interaction. This leads to the following specification when using institutional variation:¹⁹

$$Y_{ij}^* = \alpha_0 + X_i\alpha_1 + \mathbf{SHR}_j\alpha_2 + Z_j + \epsilon_{ij} \tag{5}$$

where

$$\mathbf{SHR}_j\alpha_2 = \frac{\alpha_{20}N_{jHIGH} + \alpha_{21}N_{jMED} + \alpha_{22}N_{jLOW}}{N_j}$$

N_{jHIGH} refers to the number of students at school j , who have SAT scores 160 points above individual i while N_j refers to the total number of students at school j .

Evidence of heterogeneity in the impact of minority representation on white and Asian outcomes might indicate, as suggested in section 3 above, that the causal impact of exposure to diversity depends on more than just the raw number of other-group members in the student body. There are other potential explanations for any such pattern, however, some causal in nature and others not.

¹⁸160 points corresponds to the standard deviation in SAT scores across the population of College & Beyond students.

¹⁹The specification using major variation adds an additional k subscript to Y_{ij} , \mathbf{SHR}_j , and Z_j as well as adding institution fixed effects, the δ_j ’s from (4).

In our discussion of empirical results below we will refer to specification checks undertaken to test alternative explanations.

All individuals in the administrative data were surveyed in 1996 with a response rate of around 80%. This survey provides all of our outcome measures, as well as our alternative measure of a student’s exposure to racial diversity. Respondents were asked to report their income, measured categorically on a ten-point scale, their satisfaction with their career, on a five-point Likert-type scale, and their satisfaction with their lives since graduation, again on a five-point scale. We transform income logarithmically, using the midpoint of each income category, with a value equal to 112.5% of the topcode for the highest category.²⁰ Individuals with zero income are not distinguishable from those with small positive income levels in this survey; results are not sensitive to the imputed value assigned to this group.

The follow-up survey asks matriculants to provide their own subjective estimation of the contribution that their undergraduate experience made to their “ability to work effectively and get along well with people from different races/cultures.” This hypothesized ability conforms relatively well to our conceptualization of diversity capital. We therefore use responses to this survey item as a direct, albeit subjective, measure of the impact of college-era experiences on diversity capital. Responses to this survey item were quite varied: among white and Asian respondents, about one-fifth gave response 5, indicating that their undergraduate experience contributed “a great deal” to their diversity capital. About one-quarter gave responses 3 and 4, one-sixth gave response 2, and one-twelfth gave response 1, indicating that their undergraduate experience contributed nothing to their diversity capital.²¹

5 Earnings

We first examine the relationship between earnings and both objective diversity measures and subjective perceptions about how the individual’s experience at the institution affected their ability to get along well with members of other races. We focus on males, though selecting the sample on the basis of labor force participation rather than gender yields similar results. All specifications control

²⁰This is the same imputation method used by Dale and Krueger (2002). Changing the treatment of topcoded income does not substantively influence the results. Estimating earnings models using ordered probits rather than OLS regression also produces qualitatively similar results. Some sample members, who received a pilot survey instrument, have income reported in nine categorical intervals. We use a similar imputation strategy for these respondents.

²¹About 1% of respondents answered “uncertain”; these respondents are excluded from the empirical analysis.

for cohort average SAT scores, an indicator for whether the individual is Asian rather than white, and the respondent’s own SAT scores as reported by the institution.

5.1 Minority representation and earnings

Table 2 uses the percentage of either the school population or the percentage of the major-cross-school population that are under-represented minorities as the diversity measure. The first column shows results of a baseline specification using school-level diversity. The effect of URM share is positive but very imprecisely estimated. The relatively large standard error reflects the small number of independent observations on institutional racial composition in this sample. Taken at face value, the coefficient suggests that a one percentage point increase in the share of under-represented minorities at a university increases the earnings of white and Asian matriculants by 0.4%. The other matriculating cohort characteristics in this regression, mean SAT math and verbal scores, are small in magnitude and also statistically insignificant. Individual SAT scores are comparably stronger predictors of postgraduate earnings. Consistent with Arcidiacono (2004), we find a split effect of a graduate’s own SAT scores: higher math scores predict higher earnings, but higher verbal scores predict lower earnings.²² The point estimate suggests that Asian matriculants earn less than their white counterparts, but the effect is not statistically significant.

The second specification adds a more complete set of control variables, including indicators for educational attainment, sector of employment, and categorical controls for major.²³ Controls for educational attainment and training are common in the literature and we include the sector controls to capture compensating differentials that may be associated with certain types of jobs.²⁴ In this specification, the estimated impact of URM share on earnings more than doubles and attains statistical significance at the 10% level. The point estimate now suggests that a one percentage point increase in URM share predicts an 0.8% increase in the earnings of white and Asian matriculants. The added controls diminish the impact of a matriculant’s own SAT scores, and are themselves uniformly statistically significant. Higher educational attainment, with the exception of non-professional graduate degrees, is associated with higher earnings. Workers in the non-profit and

²²Arcidiacono (2004) provides an extensive discussion of this seemingly anomalous result. This result has also been confirmed in similar studies using different datasets; see, for example Arcidiacono, Cooley and Hussey (forthcoming).

²³There may be concern that educational attainment is itself an endogenous function of minority representation, in which case including it as a control would reduce the estimated impact of that variable itself. As the results here and in Table 4 indicate, this proves to be of some concern.

²⁴In Table 7 we will pursue this vein further by analyzing variation in job satisfaction directly.

government sectors, and those who are self-employed, earn less. The estimated effects of increased URM share is consistent with the Lewis Powell-diversity capital hypothesis, as well as Black, Daniel and Smith (2001). Moreover, the magnitude of the estimated effect, though imprecisely estimated, is large enough to be economically meaningful.

In the third and fourth columns of Table 2, we redefine our measures of peer group racial composition and SAT scores at the major-by-college level. This strategy allows us to introduce institution fixed effects, which eliminate any concerns regarding the general superiority or inferiority of institutions that manage to enroll a higher share of minority students. It presents the additional advantage of creating more variation in the independent variable of interest, which gives us an opportunity to more precisely estimate the effects of interest. In these specifications, we continue to control for major-specific fixed effects which eliminate from consideration all variation in earnings associated with major-specific factors.

Within institutions, white and Asian students enrolled in majors with a disproportionate share of under-represented minorities showed no tendency to earn more than their colleagues in comparatively homogeneous majors. The point estimates on URM share within a student’s major are negative and insignificant. There is some evidence, however, of peer influence on post-graduate outcomes: within-major peer math SAT scores have a significant positive impact on earnings.²⁵ The individual-level covariates continue to display the patterns of significance first observed in Table 2.

Table 3 tests for heterogeneity in the impact of minority representation by splitting out the fraction of under-represented minorities into three groups. For each white or Asian student in the sample, these groups consist of those with significantly higher SAT scores, those with significantly lower SAT scores, and those with similar SAT scores. The first two columns show that the positive effects of diversity found using institution-level variation can be attributed to a tendency for white and Asian students to earn more following exposure to minority students with SAT scores similar to their own. These effects are quite large— increasing the share of classmates who are minorities with similar SAT scores by one point increases earnings by 2.5% in the baseline specification (column 1). Increasing the share of classmates who are minorities with significant lower SAT scores, by contrast, is associated with a large negative, though insignificant, impact on earnings. Introducing a broader array of controls, in column 2, reduces the magnitude of the similar-SAT score effect by about one-fifth, and the magnitude of the lower-SAT score effect to zero.

²⁵Recall that these specifications control for institution and major-specific fixed effects, which assuage many concerns regarding peer characteristics proxying for unobserved ability or institutional characteristics.

Columns 3 and 4 examine the effects of minority representation stratified by relative SAT score within majors rather than institutions. While point estimates on the effect of exposure to minorities with similar and lower SAT scores align with the earlier specifications, they are smaller in magnitude and insignificant.²⁶ The point estimates suggest a one point increase in the share of same-major classmates who are URMs with similar SAT scores predicts a 0.5% increase in earnings, while a one point increase in the share of same-major classmates who are lower-scoring URMs predicts a 0.5% decrease in earnings.

The evidence as a whole suggests that, to the extent that exposure to diversity matters at all, preferential admissions policies for URM students reduce rather than increase the benefits associated with diversity. By definition, these policies move minority students away from campuses where their SAT scores would match that of other racial groups and towards campuses where their scores are significantly below those of other racial groups. This pattern could also explain the difference between our results and those of Black, Daniel, and Smith (1997; 2001). Their sample includes a broader array of non-selective universities, where racial differences in SAT scores will in general be less acute than in the highly selective colleges we study.

Although these results are consistent with the view that exposure to similar-scoring URM students is most beneficial, there are at least two alternative explanations. First, exposure to diversity may be most important for low-scoring white and Asian students at elite colleges—those most likely to have URM classmates with similar SAT scores. This could occur because these students will have the most opportunities to profit from interracial interaction after college. We tested this hypothesis by directly interacting own SAT score with URM share. Instead of the negative sign predicted by this alternative explanation, the result is positive.

A second alternative is that low-scoring white and Asian students attending elite colleges that practice more aggressive affirmative action are different from other students along some unobserved dimension. To test this possibility, we interacted own-SAT score with school average SAT scores. Estimated effects are generally not significant. While it remains possible that below-average white and Asian students perform better only in those colleges with aggressive affirmative action, these results argue against any general pattern of an interaction between diversity and superior unobservables for low-scoring white or Asian students.

In the end, the most skeptical reader may still wish to conclude that the associations shown

²⁶The effects associated with higher-scoring URM classmates are consistently noisy due to the small number of under-represented minorities with SAT scores 160 points above their white and Asian counterparts.

in Table 3 are not causal in nature. Even less skeptical readers might note the lack of statistical significance in the major-level analysis. This conclusion would imply that there is no evidence of an impact of affirmative action policies on the later earnings of white and Asian students. Given the evidence in the table, that conclusion now represents a best-case scenario.

5.2 Self-reported gains in diversity capital and earnings

The previous sub-section analyzed how objective measures of diversity translated into earnings outcomes. It is possible, however, that these measures fail to capture the representation of minority students in the most important campus subgroups, whether defined by residence, social circle, or extra-curricular activity. To address this concern, we now examine an alternative measure of a college’s contribution to diversity capital: graduates’ self-reported perceptions of how their school influenced their ability to work with individuals of other races. Table 4 presents results of earnings regressions that replace minority representation measures with self-reported ordinal data on the contribution an individual’s undergraduate education made to their “ability to work effectively and get along well with people from different races/cultures,” which we assume is synonymous with diversity capital.²⁷ Also included in the specifications are the set of control variables used in the last columns of Tables 2 and 3, except cohort URM share.

The results in the first regression in Table 4 show no significant return to collegiate investments in diversity capital. Point estimates suggest that respondents who indicated that college contributed at least something to their diversity capital earn about 3% more than respondents who report that college contributed nothing. The pattern of coefficients is neither significant nor monotonic across ordinal categories.

While these estimates control for a number of important determinants of earnings, including educational attainment, college and major fixed effects, it is reasonable to be concerned that subjective estimates of college’s contribution to diversity capital are correlated with respondent’s opinion regarding other aspects of their college education. Particularly successful respondents may feel,

²⁷Minority representation within a student’s major is a significant predictor of this subjective diversity capital investment measure, but it explains only a small fraction of the variance in the measure. In an ordered probit regression, major-level URM share has a positive coefficient with a p -value of 0.065, controlling for institution and major fixed effects. The pseudo- R^2 for this specification is 0.013. Thus, it seems plausible that minority representation within a student’s institution or major would be a very imprecise indicator of an undergraduate’s diversity capital investment.

rightly or wrongly, that their college contributed a great deal to every component of their human capital. The College and Beyond survey instrument, however, also collects subjective estimates of the impact a respondent’s college had on 14 other personal qualities that can be considered components of human capital. Among these personal qualities are the ability to form and retain friendships, the ability to write clearly and effectively, and the ability to think critically. As with the diversity capital variable, responses vary along a five-point scale and are entered into regression analysis categorically.

The second regression reported in Table 4 reflects the inclusion of categorical controls for respondents’ subjective estimates of their college’s contribution to these fourteen other components of human capital. The pattern of results on the diversity capital variables is reversed relative to the first specification. Respondents who reported that college contributed a great deal to their diversity capital now report 14% lower earnings than respondents who reported that college contributed nothing to their diversity capital.²⁸

The results as a whole suggest that interacting with other groups may not be beneficial—and indeed may be harmful—to one’s future earnings. These findings echo results in Table 3 above, which indicate that white or Asian students report lower earnings following exposure to URM students with SAT scores significantly below their own.

6 Educational Outcomes

Earnings are the canonical outcome measure in traditional studies of human capital investment and school quality. There are other means of assessing college quality, however. In this section, we use educational attainment measures as outcome variables. In the following section, we used self-reported satisfaction measures. The two measures of educational attainment we consider are graduation and attending graduate school, with effects estimated by probit models. The sample in

²⁸Among the 14 other components of human capital, several exhibit a significant relationship with earnings. The human capital components contributing positively to earnings include competitiveness, leadership abilities, the ability to work cooperatively, the ability to work independently, the ability to have a good rapport with people holding different beliefs, and the ability to form and retain friendships. Human capital components contributing negatively to earnings, aside from diversity capital, include knowledge of a particular field/discipline, the ability to write clearly and effectively, religious values, the ability to adapt to change, and the ability to communicate well orally. At first glance, it appears that successful students report being well-prepared along lines generally viewed as important in the marketplace.

both cases now includes both males and females.²⁹ Although we control for gender, the individual’s own and peer SAT scores (split by math and verbal), and major fixed effects throughout, we only report the coefficients on the diversity measures.

6.1 Minority representation and educational outcomes

Table 5 shows the effects of different diversity measures on the probability of graduating or attending graduate school. The entries in Table 5 have been rescaled to show the marginal effects of a unit increase in an independent variable when all covariates are set equal to their respective means. The first two columns show results using the aggregate percentage of under-represented minorities, first at the institution level and then at the major level. The effect of increasing URM share at the institution level is negative and significant: a percentage point increase in URM share is associated with a 0.6 percentage point decline in the probability of graduation. The presence of negative effects in these specifications can explain patterns observed in Tables 2 and 3, where controlling for educational attainment has the effect of making the estimated relationship between URM share and earnings less negative or more positive.³⁰ At the major-level, the effect is a third of the magnitude and is not significant.

The third and fourth columns of Table 5 partitions URM share, reporting the impact of increasing the share of classmates who are minority students with higher, comparable, or lower SAT scores. The third column uses institutional variation in the formation of the groups and shows that all three share measures are statistically significant. Exposure to higher-scoring URM students is associated with a higher probability of graduation. In contrast with earnings specifications, the impact of exposure to similar-scoring URM students is negative here. However, it is still much less negative—less than half the magnitude—of the effect of exposure to lower-scoring URM students. The estimated decrease in graduation probabilities from a one percentage point increase in the share of lower-scoring URM classmates is 1.3 percentage points. The fourth column uses major-level variation in minority representation. Here, neither the share with significantly higher SAT scores nor the share with similar SAT scores has a statistically significant effect on graduation probabilities, though both

²⁹Estimation on the sample of male matriculants yields comparable results.

³⁰If accepted as causal, these results suggest that specifications without controls for education are more appropriate for judging the full impact of interracial exposure on earnings. If taken as a sign of a selection issue, it is interesting to note that selection appears much more severe at the institution level than at the major level, which implies that the major-level results are more reliable.

signs are positive. Consistent with the institution-level results, however, the effect of increasing the representation of lower-scoring URM students is negative and significant.

Columns 5-8 replicate the analysis of the first four columns, replacing the outcome measure with graduate school attendance. There are no significant diversity effects when controlling for aggregate URM share at either the institution or major level. When we decompose URM share into three categories, we see a positive and quite large effect for the share of higher-scoring URMs at the institution level. This is the only group that has a statistically significant effect at either the institution or major level and then only at the institution level. However, once again URM share significantly below one's SAT has the most negative effect across both the institution and major level analysis.

Overall, the effects suggest that exposure to diversity may improve the educational attainment of white and Asian students. As with the earnings results, however, the mechanism underlying the effect is not likely to be activated by preferential admissions policies. Moreover, the results are consistently stronger when using institution-level measures of minority representation, which present the clearest concerns regarding correlation with unobserved student or institutional characteristics.

6.2 Self-reported gains in diversity capital and educational outcomes

Similar to Table 4, Table 6 uses self-reported measures of collegiate contributions to diversity capital. Here we report specifications that control for the 14 other subjective measures of how the institution affected the individual. The coefficients suggest that both the probability of graduation and the probability of attaining a graduate degree were lower among those students who reported a greater impact of college on their ability to interact with members of different races. Respondents claiming that their college contributed a great deal to their diversity capital were 3 percentage points less likely to graduate and 7 percentage points less likely to attain a graduate degree. Overall, the evidence suggests that increasing minority representation through relaxed admission standards if anything harms the education prospects of non-minority students.

7 Satisfaction Outcomes

The estimated relationships between minority representation and the earnings and educational outcomes of whites and Asians may reflect a tendency for some students to pursue careers or lifecourses that offer more nonpecuniary rewards. In this section, we take advantage of two items asked of

College & Beyond survey respondents, relating to their overall satisfaction with their job and life.³¹ Responses varied along a five point scale: the highest response category in each case is “very satisfied,” followed by “somewhat satisfied,” “neither satisfied nor dissatisfied,” “somewhat dissatisfied” or “very dissatisfied.” We use the same controls here as were used in the section on educational outcomes and add to these measures for the educational outcomes themselves. Our sample includes both males and females for life satisfaction but only males for job satisfaction.

7.1 Diversity measures and satisfaction outcomes

Table 7 reports the results of ordered probit specifications that analyze these responses using our objective diversity measures. The first and fifth columns illustrate that there is a negative, but insignificant, relationship between institution-level URM share and job or life satisfaction, controlling for a standard set of individual characteristics, major fixed effects, and institution-level average SAT scores. The second and sixth regressions replace institution-level variables with major-level ones, and find positive but insignificant coefficients.³²

When considering the effect of minority representation stratified by SAT score, no significant effects appear in specifications analyzing job satisfaction. As shown in columns 6 and 8, however, we find the insignificant overall effect of minority representation on life satisfaction is masking both positive and negative effects at the sub-group level. Increasing the share of classmates who are URMs with comparable SAT scores has a positive estimated impact on life satisfaction using either the institution-level or the major-level variation. Increasing the share of classmates who are URMs with either higher or lower test scores predicts lower satisfaction in each specification; the coefficients are statistically significant when using institution-level variation. These results are consistent with the notion that minority representation has a positive impact primarily among those white and Asian students with similar academic backgrounds. As with earlier results, these imply that policies that introduce disparities between the academic backgrounds of minority and non-minority students are unlikely to generate benefits for non-minorities, and may in fact be costly in the aggregate.

³¹The use of ordinal satisfaction measures in economic research is neither unprecedented (Clark and Oswald, 1994; Di Tella et al. 2001; Gruber and Mullainathan, 2005) nor uncontroversial (Bertrand and Mullainathan, 2001). As stated above, our use of these measures is motivated primarily by the possibility that increases in individual productivity may not translate entirely into labor market earnings. Using measures of life satisfaction as well as job satisfaction also presents the possibility of measuring returns to individual utility that accrue through nonmarket interaction.

³²This pattern of coefficients is the exact opposite of that found in earnings regressions, which should serve as a caution to readers interpreting these coefficients as bounds on a true effect.

7.2 Self reported gains in diversity capital and satisfaction measures

Table 8 examines how graduates' self-reports of their institution's contribution to their ability to get along well with individuals from other races correlates with job and life satisfaction. As in previous analyses of self-reports, we control for the 14 other measures of subjective gains from attending the institution collected in the survey instrument. The estimated coefficients are negative and fairly monotonic: higher levels of perceived gains in diversity capital during college are associated with lower job and life satisfaction. The negative effects of these self-reported measures are our most consistent finding as they are found in earnings, educational outcomes, and satisfaction measures.

8 Conclusions

Do white and Asian students at elite schools benefit from the presence of under-represented minority students on campus or in the college classroom? The body of evidence in this paper presents a decidedly mixed view. Our empirical results cover a broad range of outcomes, including earnings, educational attainment, and satisfaction with both one's life and one's job. While there is some evidence to suggest a positive association between minority representation and earnings across College & Beyond schools, we were unable to replicate this result in our preferred specifications, which exploit within-institution variation in minority representation to address concerns that representation correlates with unobserved attributes of a college or its matriculants. Moreover, further analysis indicates that this effect, if causal, operates through a mechanism that improves the outcomes of white and Asian students with similar academic credentials. Preferential admission policies by definition reduce the degree of similarity in credentials across races on each individual campus. Our evidence indicates that the impact of exposure to minority students with lower credentials is if anything negative. We also find persistent negative associations between white and Asian students' self-reported experiences of diversity on campus and postgraduate outcomes.

The results are then broadly consistent with the view that introducing more minority students to a campus is not a sufficient strategy for increasing interracial contact. Policies designed to enhance the degree of interaction between students of different races may effectively complement representation-oriented policies to maximize the likelihood of meaningful interaction. Another key to realizing the benefits of interracial interaction on college campuses may be improving the quality of primary and secondary education for minority students, to reduce racial disparities in the credentials

of potential college matriculants. Our results indicate that under the present regime, students who self-report little to no meaningful interracial contact during their undergraduate experience appear to suffer no ill effects in the marketplace or in their self-reported well-being.

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Table 1: Illustration of variation in exposure across majors and colleges

Institution	Percent under-represented minority in the 1976 entering cohort			
	Overall	Political Science majors	Psychology/ Sociology majors	Physics/Chemistry/Geology majors
College A	12.3%	11.1%	14.9%	16.1%
College B	13.4%	22.5%	28.7%	0.0%
College C	9.9%	29.0%	14.3%	4.0%

Table 2: Minority enrollment and earnings, 1976 White and Asian male C&B matriculants

Independent variable	Dependent variable: ln(earned income, 1995)			
	Institution-level cohorts		Major-level cohorts	
URM share in cohort	0.367 (0.904)	0.844* (0.474)	-0.327 (0.402)	-0.298 (0.310)
Entering cohort average SAT math score (/100)	0.071 (0.138)	-0.027 (0.102)	0.266** (0.122)	0.139** (0.070)
Entering cohort average SAT verbal score (/100)	-0.006 (0.143)	0.053 (0.108)	-0.173 (0.105)	-0.141* (0.082)
Own SAT math score (/100)	0.103** (0.016)	0.065** (0.015)	0.080** (0.015)	0.050** (0.014)
Own SAT verbal score (/100)	-0.076** (0.018)	-0.071** (0.012)	-0.085** (0.014)	-0.075** (0.013)
Asian	-0.070 (0.046)	-0.006 (0.028)	-0.057* (0.030)	-0.005 (0.030)
Graduated from matriculating institution	—	0.216** (0.053)	—	0.223** (0.035)
Any graduate degree	—	-0.042** (0.024)	—	-0.037 (0.027)
MBA degree	—	0.333** (0.030)	—	0.317** (0.030)
JD degree	—	0.431** (0.046)	—	0.415** (0.034)
MD degree	—	0.960** (0.030)	—	0.930** (0.037)
Nonprofit sector	—	-0.469** (0.030)	—	-0.466** (0.033)
Government employee	—	-0.469** (0.027)	—	-0.459** (0.023)
Self-employed	—	-0.190** (0.033)	—	-0.188** (0.030)
Institution fixed effects	No	No	Yes	Yes
Major category fixed effects	Yes	Yes	Yes	Yes
N	9,250	9,225	9,250	9,225
R ²	0.049	0.209	0.073	0.220

Note: Standard errors, corrected for potential correlation within cohorts, appear in parentheses. Data source is the College and Beyond survey of the 1976 entering cohort. Observations are weighted using C&B survey weights. ** denotes a coefficient significant at the 5% level, * the 10% level.

Table 3: Minority enrollment and earnings, 1976 White and Asian male C&B matriculants

Independent variable	Dependent variable: ln(earned income, 1995)			
	Institution-level cohorts		Major-level cohorts	
URM share among students with significantly higher SAT scores	1.153 (2.775)	0.248 (2.181)	-1.142 (1.177)	-0.822 (0.984)
URM share among students with comparable SAT scores (+/- 160 points)	2.487* (1.422)	2.058** (0.944)	0.552 (0.535)	0.457 (0.445)
URM share among students with significantly lower SAT scores	-1.292 (0.883)	-0.097 (0.603)	-0.563 (0.456)	-0.531 (0.371)
Entering cohort average SAT math score (/100)	0.074 (0.114)	-0.030 (0.084)	0.264** (0.124)	0.135* (0.070)
Entering cohort average SAT verbal score (/100)	-0.029 (0.123)	0.048 (0.092)	-0.178* (0.105)	-0.144* (0.082)
Own SAT math score (/100)	0.134** (0.021)	0.080** (0.018)	0.086** (0.016)	0.056** (0.015)
Own SAT verbal score (/100)	-0.041* (0.021)	-0.053** (0.015)	-0.077** (0.016)	-0.068** (0.014)
Asian	-0.065 (0.045)	-0.005 (0.027)	-0.056* (0.030)	-0.004 (0.030)
Graduated from matriculating institution	—	0.212** (0.052)	—	0.221** (0.036)
Any graduate degree	—	-0.041* (0.024)	—	-0.038 (0.027)
MBA degree	—	0.331** (0.030)	—	0.317** (0.030)
JD degree	—	0.430** (0.046)	—	0.416** (0.034)
MD degree	—	0.956** (0.030)	—	0.931** (0.037)
Nonprofit sector	—	-0.468** (0.030)	—	-0.466** (0.033)
Government employee	—	-0.467** (0.027)	—	-0.459** (0.023)
Self-employed	—	-0.191** (0.034)	—	-0.189** (0.030)
N	9,250	9,225	9,250	9,225
R ²	0.052	0.209	0.074	0.220

Note: Standard errors, corrected for potential correlation within cohorts, appear in parentheses. Data source is the College and Beyond survey of the 1976 entering cohort. Observations are weighted using C&B survey weights. ** denotes a coefficient significant at the 5% level, * the 10% level.

Table 4: Subjective measures of collegiate contributions to diversity capital and earnings

Independent variable	Dependent variable: ln(earned income, 1995)	
Respondent rates collegiate contribution to diversity capital as 2 on a 5-point scale	0.030 (0.034)	-0.034 (0.039)
Respondent rates collegiate contribution to diversity capital as 3 on a 5-point scale	0.035 (0.035)	-0.071* (0.040)
Respondent rates collegiate contribution to diversity capital as 4 on a 5-point scale	0.039 (0.032)	-0.118** (0.045)
Respondent rates collegiate contribution to diversity capital as 5 on a 5-point scale	0.028 (0.035)	-0.139** (0.050)
Institution fixed effects	Yes	Yes
Major category fixed effects	Yes	Yes
Additional Table 2 control variables	Yes	Yes
Controls for subjective estimates of collegiate contribution to 14 other forms of human capital	No	Yes
N	8,434	8,434
R ²	0.225	0.249

Note: Standard errors, corrected for potential correlation within relevant cohorts, appear in parentheses. The “relevant cohort” is the group at which the peer characteristic variables, URM share and SAT scores, are defined. Diversity capital is defined as the “ability to work effectively and get along well with people from different races/cultures.” Data source is the College and Beyond survey of the 1976 entering cohort. Sample is restricted to white and asian males. Observations are weighted using C&B survey weights.

** denotes a coefficient significant at the 5% level, * the 10% level.

Table 5: Diversity and educational outcomes

Independent variable	Dependent variable: indicator for graduation from matriculating institution				Dependent variable: indicator for receipt of any postgraduate degree			
	Institution-level cohorts		Major-level cohorts		Institution-level cohorts		Major-level cohorts	
URM share	-0.645** (0.247)	—	-0.243 (0.238)	—	0.309 (0.311)	—	-0.222 (0.216)	—
URM share among students with significantly higher SAT scores	—	2.440** (0.728)	—	0.467 (0.350)	—	3.657** (1.043)	—	0.190 (0.447)
URM share among students with comparable SAT scores (+/- 160 points)	—	-0.537* (0.290)	—	0.101 (0.187)	—	0.025 (0.412)	—	-0.167 (0.260)
URM share among students with significantly lower SAT scores	—	-1.342** (0.340)	—	-0.500** (0.230)	—	-0.410 (0.438)	—	-0.246 (0.228)
N	25,155	25,155	25,155	25,155	18,184	18,184	18,184	18,184
Pseudo-R ²	0.175	0.181	0.236	0.239	0.074	0.076	0.090	0.090

Note: Table entries are probit coefficients, scaled to represent marginal effects of a one-unit change in the independent variable when other independent variables are set equal to their respective means. Standard errors, corrected for potential correlation within relevant cohorts, appear in parentheses. All specifications control for individual SAT math and verbal scores, major cohort mean math and verbal scores, major category fixed effects, and indicator variables for race and gender. The third, fourth, seventh and eighth specifications control for institution fixed effects. Data source is the College and Beyond survey of the 1976 entering cohort. Sample is restricted to white and asian matriculants. Observations are weighted using C&B survey weights. ** denotes a coefficient significant at the 5% level, * the 10% level.

Table 6: Diversity and educational outcomes

Independent variable	Dependent variable: indicator for graduation from matriculating institution	Dependent variable: indicator for receipt of any postgraduate degree
Respondent rates collegiate contribution to diversity capital as 2 on a 5-point scale	-0.005 (0.006)	-0.011 (0.022)
Respondent rates collegiate contribution to diversity capital as 3 on a 5-point scale	-0.010 (0.007)	-0.022 (0.024)
Respondent rates collegiate contribution to diversity capital as 4 on a 5-point scale	-0.016** (0.008)	-0.058** (0.024)
Respondent rates collegiate contribution to diversity capital as 5 on a 5-point scale	-0.028** (0.011)	-0.069** (0.028)
N	13,321	16,310
Pseudo-R ²	0.309	0.104

Note: Table entries are probit coefficients, scaled to represent marginal effects of a one-unit change in the independent variable when other independent variables are set equal to their respective means. Standard errors, corrected for potential correlation within relevant cohorts, appear in parentheses. All specifications control for individual SAT math and verbal scores, major cohort mean math and verbal scores, major category fixed effects, and indicator variables for race and gender. All specifications control for subjective estimates of collegiate contribution to 14 other forms of human capital and institution-level fixed effects. Diversity capital is defined as the “ability to work effectively and get along well with people from different races/cultures.” Data source is the College and Beyond survey of the 1976 entering cohort. Sample is restricted to white and asian matriculants. Observations are weighted using C&B survey weights.

** denotes a coefficient significant at the 5% level, * the 10% level.

Table 7: Diversity and subjective satisfaction measures

Independent variable	Dependent variable: ordinal measure of satisfaction with job held in 1995 (5-point scale)				Dependent variable: ordinal measure of life satisfaction (5-point scale)			
	Institution-level cohorts		Major-level cohorts		Institution-level cohorts		Major-level cohorts	
URM share	-0.716	—	0.714	—	-0.240	—	0.060	—
	(0.515)		(0.475)		(0.385)		(0.261)	
URM share among students with significantly higher SAT scores	—	-0.040	—	0.971	—	-2.639**	—	-1.021
		(1.531)		(1.120)		(1.224)		(0.950)
URM share among students with comparable SAT scores (+/- 160 points)	—	-1.250	—	0.056	—	2.297**	—	1.120**
		(0.913)		(0.690)		(0.637)		(0.451)
URM share among students with significantly lower SAT scores	—	-0.548	—	0.828	—	-1.177**	—	-0.185
		(0.687)		(0.533)		(0.515)		(0.308)
N	9,283	9,283	9,283	9,283	18,109	18,109	18,109	18,109
Pseudo-R ²	0.010	0.012	0.012	0.014	0.008	0.009	0.010	0.010

Note: Table entries are probit coefficients, scaled to represent marginal effects of a one-unit change in the independent variable when other independent variables are set equal to their respective means. Standard errors, corrected for potential correlation within relevant cohorts, appear in parentheses. All specifications control for individual SAT math and verbal scores, major cohort mean math and verbal scores, major category fixed effects, and indicator variables for race and gender. The third, fourth, seventh, and eighth specifications control for institution fixed effects. The third and sixth specifications control for subjective estimates of collegiate contribution to 14 other forms of human capital. Data source is the College and Beyond survey of the 1976 entering cohort. Sample is restricted to white and asian matriculants. Observations are weighted using C&B survey weights. ** denotes a coefficient significant at the 5% level, * the 10% level.

Table 8: Diversity and subjective satisfaction measures

Independent variable	Dependent variable: ordinal measure of satisfaction with job held in 1995 (5-point scale)	Dependent variable: ordinal measure of life satisfaction (5-point scale)
Respondent rates collegiate contribution to diversity capital as 2 on a 5-point scale	-0.055 (0.062)	0.016 (0.053)
Respondent rates collegiate contribution to diversity capital as 3 on a 5-point scale	-0.131* (0.075)	-0.026 (0.055)
Respondent rates collegiate contribution to diversity capital as 4 on a 5-point scale	-0.109 (0.079)	-0.042 (0.056)
Respondent rates collegiate contribution to diversity capital as 5 on a 5-point scale	-0.206** (0.083)	-0.135** (0.060)
N	8,484	16,251
Pseudo-R ²	0.026	0.029

Note: Table entries are probit coefficients, scaled to represent marginal effects of a one-unit change in the independent variable when other independent variables are set equal to their respective means. Standard errors, corrected for potential correlation within relevant cohorts, appear in parentheses. All specifications control for individual SAT math and verbal scores, major cohort mean math and verbal scores, major category fixed effects, and indicator variables for race and gender. All specifications control for subjective estimates of collegiate contribution to 14 other forms of human capital and institution-level fixed effects. Diversity capital is defined as the “ability to work effectively and get along well with people from different races/cultures.” Data source is the College and Beyond survey of the 1976 entering cohort. Sample is restricted to white and asian matriculants. Observations are weighted using C&B survey weights.

** denotes a coefficient significant at the 5% level, * the 10% level.

Figure 1

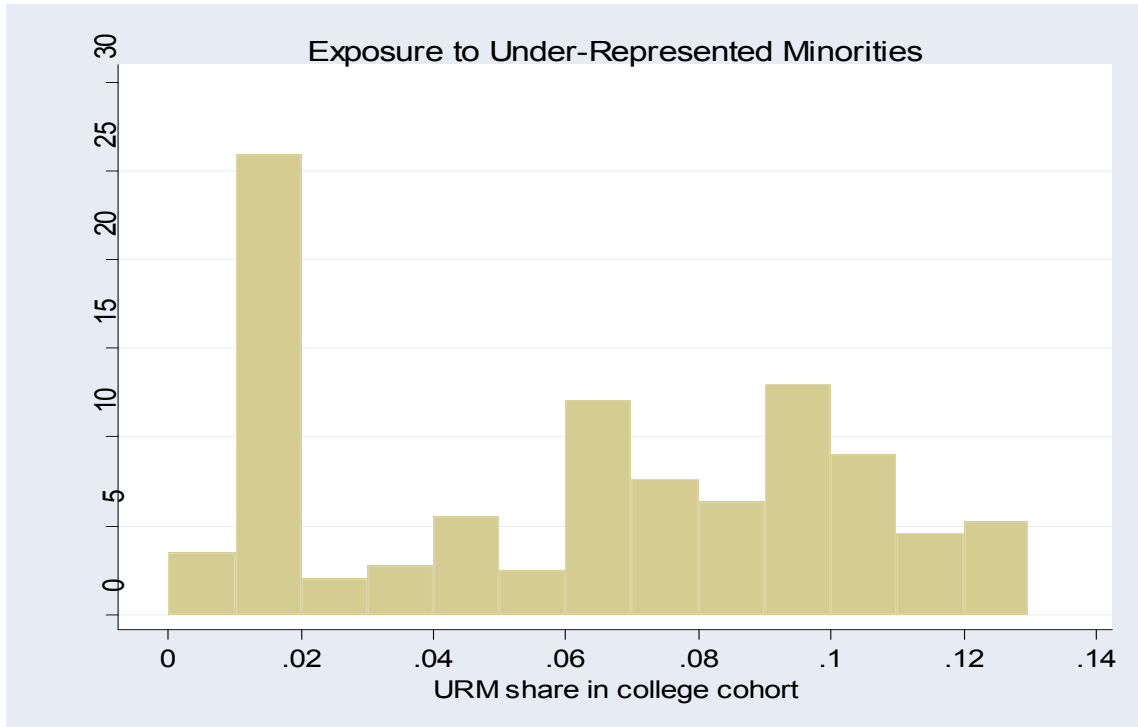


Figure 2

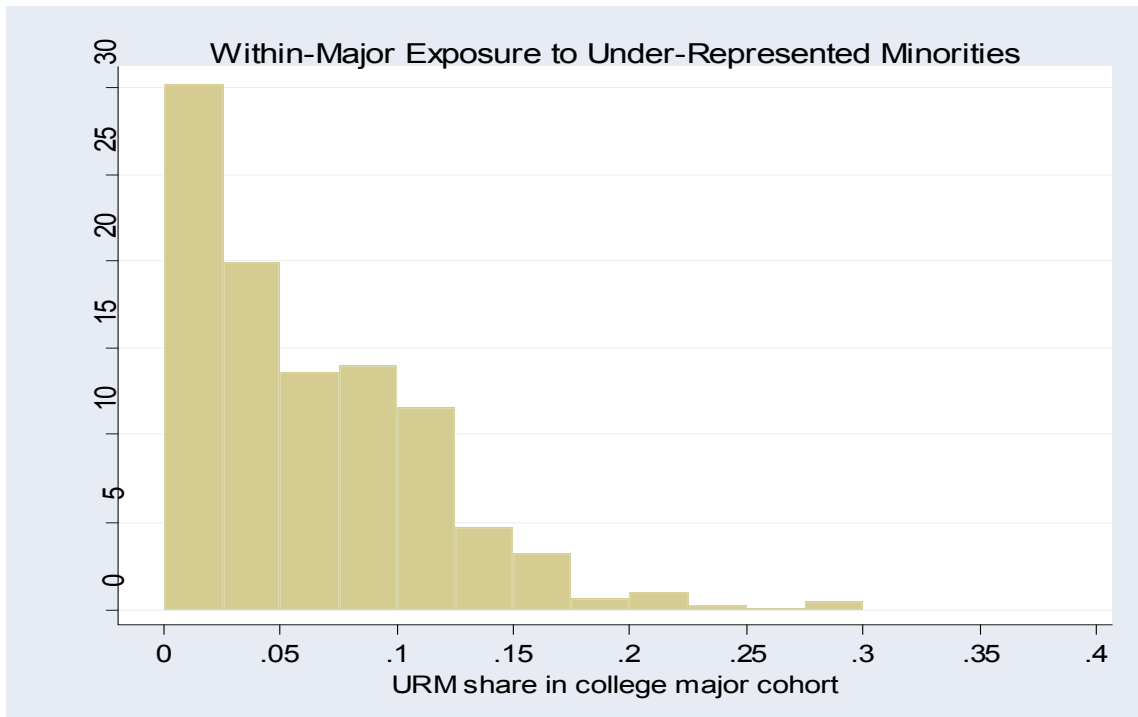


Table A1: List of institutions represented in the College and Beyond database

Barnard College
Bryn Mawr College
Columbia University
Denison University
Duke University
Emory University
Georgetown University
Hamilton College
Kenyon College
Miami University (Ohio)
Northwestern University
Oberlin College
Pennsylvania State University, State College
Princeton University
Rice University
Smith College
Stanford University
Swarthmore College
Tufts University
Tulane University
University of Michigan, Ann Arbor
University of North Carolina, Chapel Hill
University of Notre Dame
University of Pennsylvania
Vanderbilt University
Washington University, Saint Louis
Wellesley College
Wesleyan University
Williams College
Yale University

Table A2: Major classifications

1	Chemistry, Physics, Geology, Other Physical Sciences
2	Engineering, Computer and Information Sciences, Mathematics
3	Agriculture, Biological Sciences, Pre-Med, Nursing, Dentistry, Health Sciences
4	Psychology, Sociology, Other Social Sciences
5	East Asian Studies, Area Studies, Soviet & East European Studies, Near or Middle Eastern Studies, Judaic Studies, African American Studies, Latin American Studies, Hispanic Studies, British Studies, Other Studies, Asian and French Area Studies, History, Classics, Philosophy, Religion, General Humanities, General Arts & Sciences
6	Economics
7	Political Science
8	Comparative Literature, Linguistics, English Literature, General Letters, French, Latin, Greek, German, Italian, Russian, Romance Languages, Slavic Languages, Chinese, Japanese, Hebrew, Arabic, Foreign Languages and Literature
9	Art History, Music, Theater, Art, Communications, Architecture, Environmental Design
10	Business, Management
11	Education, Other Fields

Table A3: Summary Statistics

Variable	Obs.	Mean	Std. Dev.
ln(earned income, 95)	10,004	11.16	0.865
URM share at undergraduate institution	28,255	6.10%	3.61%
Over 160 points above own SAT score	28,255	0.62%	1.20%
Within 160 points of own SAT score	28,255	2.22%	2.65%
Over 160 points below own SAT score	28,255	3.74%	2.90%
Entering cohort average SAT math score (/100)	28,255	5.684	0.677
Entering cohort average SAT verbal score (/100)	28,255	5.258	0.686
Own SAT math score (/100)	28,255	6.109	0.916
Own SAT verbal score (/100)	28,255	5.639	0.940
Graduated from matriculating institution	28,255	0.798	—
Received any postgraduate degree	19,788	0.539	—
Respondent rates collegiate contribution to diversity capital as 2 on a 5-point scale	19,538	0.171	—
Respondent rates collegiate contribution to diversity capital as 3 on a 5-point scale	19,538	0.280	—
Respondent rates collegiate contribution to diversity capital as 4 on a 5-point scale	19,538	0.277	—
Respondent rates collegiate contribution to diversity capital as 5 on a 5-point scale	19,538	0.187	—
Career satisfaction ratings (on a 5-point scale):			
5 (highest)	10,054	0.502	—
4	10,054	0.370	—
3	10,054	0.032	—
2	10,054	0.066	—
Life satisfaction ratings (on a 5-point scale):			
5 (highest)	19,758	0.441	—
4	19,758	0.454	—
3	19,758	0.037	—
2	19,758	0.057	—

Note: Sample for both log earnings and career satisfaction includes only males. All means are conditional on having valid observations for SAT scores and are conditional on being White or Asian.