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ESTIMATING BENEFITS FROM UNIVERSITY-LEVEL DIVERSITY

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ABSTRACT

One of the continuing areas of controversy surrounding higher education is affirmative action. The Supreme Court has agreed to hear Fisher v. Texas, and their ruling may well influence universities' diversity initiatives, especially if they overturn Grutter v. Bollinger and rule that diversity is no longer a "compelling state interest." But what lies behind a compelling state's interest? One issue that continues to require more information is estimating and understanding the gains for those attending colleges and universities with greater diversity. Most existing studies are either based on evidence from one institution, which has issues of both selectivity and limited "treatments," or focus on selective institutions, which also face issues of selection bias from college choice behaviors. In this research we use Wave 3 of Add Health, collected in 2001–02 of those then attending college. Add Health collected the IPEDS number of each college and matched these to the racial/ethnic composition of the student body. We convert these data into an index of diversity and then ask whether attending a college/university with a more diverse student body influences a variety of outcomes at Wave 4 (2007–08), including years of schooling completed, earnings, family income, composition of friends, and probability of voting. Our results provide evidence of a positive link between attending a college with greater diversity and higher earnings and family income, but not with more schooling or the probability of voting.

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Introduction

One of the continuing areas of controversy surrounding higher education is affirmative action in admissions. The Supreme Court's acceptance to hear *Fisher v. University of Texas at Austin* (2/21/2012) is one piece of evidence that the issue remains unresolved. The legal question seems to focus on whether there is a "compelling state's interest," which was the key argument in the University of Michigan's Supreme Court case, *Grutter v. Bollinger*, 2003. But what lies behind a compelling state's interest? If there is a state interest, is it compelling enough to offset the issue of discrimination in admissions?

In April 2012 a federal appeals court upheld California's ban on using race/ethnicity or gender in admission to the state's public universities and colleges. Six additional states also have such a ban. If individual states, and indeed the nation, are to make such decisions, an important question is what are the gains of diversity to university and college student bodies? That is, one issue that continues to require more information is understanding the potential gains from diversity for those attending colleges and universities with greater diversity.

This paper attempts to provide a partial answer to that question. Our definition of diversity in this paper is "the composition of an institution's student body in terms of race, sex, and ethnicity, where movements away from 100 percent of the student body matching the student's own characteristics is increased diversity."[2] We then ask whether individuals who attend universities and colleges with greater diversity have different educational, labor market,

[2] One might of course think of diversity in broader terms including attitudes, sexual orientation, geographic location, parental status, and life experiences. While all or some of these might be important dimensions that would add to an individual's human capital, we are unable to pursue these with available data and so instead use a narrower definition.

and socioeconomic outcomes as adults than individuals who attend universities and colleges with more limited diversity.

Background Context

The practice of affirmative action by public universities and colleges has shifted from an argument based on civil rights, equal opportunity, or non-discrimination to one focusing more on the advantages of diversity for their student bodies (Lipson, 2008). This has occurred as courts limited the use of affirmative action or "corrective justice," and groups within states moved to create ballot initiatives to ban the use of race or ethnicity for admissions. The newer approach, called utilitarian or diversity based, appeals instead to the gains from attending an institution of higher learning in a global age, where students are expected to gain skills for working in a global environment, calling for interacting with individuals from numerous countries and backgrounds. Indeed major corporations, the Department of Defense, and others who have not been traditional supporters of civil rights-based actions on college admissions have publicly supported diversity in admissions on the basis of utilitarian arguments (Ibid. 692)

Their support is based on arguments of economics and community stability rather than correcting historical discrimination. The idea is that students at universities and colleges with greater diversity will be more successful in the global marketplace and thus enhance the success of corporations who hire them. In economists' terms, a diverse student body can be thought of as a direct argument of the human capital production function. That is, the diversity of the student body of the schools and colleges a person attends would have a positive and significant coefficient within a regression model of the determinants of human capital, perhaps as captured by full-time earnings. Thus it would appear that corporations believe in the positive influence of

diversity, and this belief has led to a legitimation of a goal of diversity as in the self-interest of students matriculating at the university level.

Beyond the implicit evidence provided by corporate behavior on this front, there is only limited empirical evidence of the influence of diversity on the student body, particularly on human capital. After a brief review of the literature, we turn to our own analysis.

Relevant Literature

There are three core approaches that have been used to study the influence of diversity on human capital: experiments, longitudinal studies conducted within a single institution, and analysis of data on students attending a larger though limited set of colleges. Experiments have taken a variety of forms but many are comparisons of outcomes of participation in a small group made up of all Whites or a more diverse group in a single session (Phillips, Mannix, Neale, and Gruenfeld, 2004; Sommers, 2006). The findings from these studies vary with a suggestion of greater creativity in mixed race groups while other studies suggest there is more conflict within diverse groups (De Dreu and Weingart, 2003). Durlauf (2008) reviewed the evidence on experiments, largely based on a review by Sommers (2006), and pointed out several limitations with the current evidence: (1) experiments are of often of short duration and (2) they often include only carefully structured groups with experimenter-determined racial composition. Thus, these groups are often quite different from repeated interactions and naturally forming social networks (Durlauf, 2008).

A second type of study, focusing on the longitudinal analysis of individuals from a single institution or a limited set of selective institutions, also has limitations. Importantly, these studies suffer from selection problems; that is, there is endogeneity both in who applies for

colleges with differing levels of diversity and possibly in the admission process. This may limit the external (and also internal) validity of the findings.

Early studies using the longitudinal approach focus on gains to minority students. For example, Bowen and Bok (1998) found that minorities admitted to elite schools tended to benefit in terms of probability of graduating; Datcher-Loury and Garman (1995) look at future earnings of minorities attending elite colleges. Boisjoly et al. (2006) also use a single institution but one that randomly assigned roommates. These findings suggest a more pro affirmative action viewpoint among those assigned a Black roommate but the outcomes studied are very limited. All of these single university studies suffer from endogeneity or self-selection problems. A newer version of these longitudinal studies is the carefully conducted University of Michigan Study. This study is longitudinal and attempts to measure both actual student contacts and attitudes on a variety of issues including race/ethnicity over time. Unfortunately, however, it is limited to one elite public university and so again suffers from endogeneity (selectivity) issues.

Two papers use multiple universities and these are closer to the work we present here. An unpublished paper by Peter Hinrichs (2010) uses data from the Beginning Postsecondary Students Survey, on White non-Hispanic students who were included in the National Postsecondary Student Aid Study of 1995 to 1996, who were re-interviewed in 1998 and 2001 in an attempt to estimate the influence of attending a more racially diverse college on earnings and civic behavior. Arcidiacono and Vigdor [AV] (2010) use data from 30 colleges (the Mellon Foundation's College and Beyond database) to also estimate the influence of attending a more racially diverse college on earnings. The data for both of these studies are far richer than those for one institution but Hinrichs uses only non-Hispanic Whites who initially attend a 4-year

institution, and data are only for 6 years post the beginning of college, while AV use a data set who attend 30 selective colleges and so is limited as well.

We take a somewhat different approach to exploring the gains from attending a college or university with a diverse student body. We use a nationally representative data set, the National Longitudinal Study of Adolescent Health (Add Health), and follow those individuals who attended college while the third wave was being conducted. Add Health collected the IPEDS number of each college and university and matched these to the racial/ethnic composition of the student body. We use these data, converting them into an index of diversity. We then first address whether there appears to be selection into who attends a more diversified college/university and then move on to study whether attending a more diversified university influences a variety of outcomes approximately seven years later, using a broader set of outcomes than other studies have been able to examine. These include the racial/ethnic composition of friends, whether or not college/university was completed, earnings, and family income. In these estimates we control for factors that appear to influence the selection of one's college or university in terms of its diversity and run these regressions both with and without the diversity of one's high school included in the model.

Conceptual Model

We begin our model by building on the claims of corporations that individuals who are exposed during their college years to persons of varying backgrounds and cultures are likely to be more productive in working for international corporations. Corporations appear to focus on targeted minorities such as African Americans, Hispanics, and certain Asians when making this claim. Thus we expect that going to a university or college that is more diverse should increase employment opportunities and wages. Furthermore, since there is a higher probability of

marrying or partnering with someone who attends the same institution than others, we expect both partners to have higher earnings and so also expect that family income will be higher. But this same explanation leads us to expect a significant change in the probability of graduating from college/university or going on for additional education. In fact one might believe that the higher expected earnings from a four-year degree at a "diverse" college/university might reduce the probability of obtaining additional (post-college) schooling.

Moving beyond these socioeconomic (SES) outcomes, we expect that attending a more diverse institution is likely to lead to greater diversity in friends after completing schooling. We base this simply on opportunities to meet and befriend a more diverse group of individuals. Finally, using this model of gains from diversity we do not expect other differences in outcomes such as probability of marrying earlier (by the fourth wave), voting behavior, or other possible outcomes.

Thus the core of the model is as follows: attending college with a more diverse student body increases productivity in the international or global market but not otherwise; it increases an individual's productivity but only in certain sectors of the economy such as those involved with the global market or where one works with other team members where membership itself is diverse. This leads us to expect higher wages and family income but a lower probability of advanced education beyond a college degree. It also leads us to expect greater diversity among friends.

Data

The data we use are based on Waves 1, 3, and 4 of Add Health. Add Health is a data set that focuses on adolescents and began with an in-school questionnaire administered to a nationally representative sample of students in grades 7 to 12 in 1994/5. Data was also gathered from

parents, siblings, fellow students, and school administrators. Other matched data provide information about neighborhoods and communities.

The Add Health collected two waves of survey data while the respondents were in high school and then followed the students five years later for a third collection in 2000/2001 and eight years later in 2008/9. While we utilize information in the first wave of data to capture family and high school background characteristics, the primary data we focus on is the Wave 3 data, collected when individuals in the sample ranged in age from 18 to 27 years with a mean age of slightly more than 20. This data wave contains the only information indicating colleges attended. Thus, we restrict our sample to those who attended an institution of higher learning in that year. For these individuals, the survey collected an IPEDS identifier for the institution attended that we use to measure the type of institution and 12-month counts by race/ethnicity and gender for all undergraduates at the institution. We use these data to create a Herfindahl index to capture diversity.

Table 1 shows the basic descriptive statistics for our analysis sample. There are 2,844 observations and 46 percent of them are male. Slightly more than 11 percent are Black, about 9 percent are Hispanic, about 5.5 percent report themselves as other, with the remainder White. Most of those in this sample were in earlier grades in Wave 1: about 22 percent were in grade 8 with a similar percent in grade 9; about 16 percent were in grade 10 while about 11 percent were in grade 11; but less than 2 percent were in 12th grade.[3]

Measure of Diversity:

In order to capture the diverse nature of an institution's student body we use a Herfindahl index defined as the share of group *i* in the population where *i* refers to the various possible

[3] Because the Wave 3 (2000–01) data collection occurred five or six years after Wave 1 (when respondents were in grades 7-12), respondents in the older grades at Wave 1 could have completed college by Wave 3 and were not asked information about previous colleges attended.

racial/ethnic groups. The index we use is 1- the sum of squared shares, including shares of those Black, Hispanic, White, other, where the index increases as there is greater diversity. This is adopted from Alesia and La Ferrara (2005), who used such a measure to link ethnic diversity to economic performance. The idea of this measure is to create an "ethnolinguistic fractionalization" or ELF index. The basic idea is to measure the probability that any two randomly drawn students at an institution belong to different racial/ethnic groups. The maximum value of this index equals one, which would indicate that every individual at the institution comes from a unique and different racial/ethnic group.

The average ELF for our sample is .388 with a standard deviation of .141 and a range of 0 to .745. We also estimated a similar measure to capture diversity of the individual's high school. The high school ELF we estimate, using the same formula as for colleges, has a mean of .313–slightly below that of the colleges and universities attended and a greater SD of .231. The range is identical to that we calculate for the college level.

Results

Table 2 reports our first set of results by exploring who attends a college of greater diversity. In these estimates we include background information including parental education, income, age, and parental marital status all at Wave 1, own grade at Wave 1, whether the high school attended was public or private, own race and sex, and the ELF score measuring the high school diversity. Then in additional specifications, we first add in information on academic grades in four subjects as of Wave 1, the Peabody Picture Vocabulary test (a measure of verbal IQ), and responses to a question on college expectations asked at Wave 1; and finally we add in type of college using the Carnegie classification.

There are only a few individual and family-level variables that are significantly tied to the level of ELF at the college attended. We find that those who report themselves as Hispanics are more likely to attend a more diverse college, as are those who report themselves as "other race." In two of the three estimates those who self-report as Black appear less likely to attend a diverse college. Attending a high school that is more diverse appears highly predictive of attending a college that is also more diverse. In terms of type of institution, those who attend a liberal arts college are likely to attend a less diverse institution while those who attend a two-year associates college or "other" are more likely to attend a more diverse institution. Thus diversity of high school attended and own race are the variables that appear to influence "choice" of college diversity rather than own SES background, grades, or public versus private high school.

Now to turn to our main focus—whether attending a more diverse college influences the education an individual obtains, his or her earnings, family income, and diversity of friends as a young adult. In these estimates our focus is on ELF, our measure of diversity. Also included are age at Wave 3, a set of race indicators, sex, parental background including maternal education, and whether parents were married at Wave 1, family income at Wave 1 and parental age at Wave 1. The missing family indicator variable is included as indicator variables for grade at Wave 1 and whether the individual attended a public or private school. We also control for type of college using the Carnegie index. Consistent with our findings in the results reported above, we also control for the diversity of the individual's high school (School ELF). We estimate three models for each outcome where we modify only how we enter ELF: in the first model we enter ELF alone; in the second we enter ELF interacted with a dummy for females (sex); and in the third we interact ELF with race/ethnicity indicator variables.

In Table 3 we present our findings, showing results for all variations of ELF, ELF of high school attended, and whether or not the high school attended was a private school (full results are available from the authors).

Education: Our results suggest that attending an institution that is more diverse is not associated with the probability of completing a four-year college degree. The coefficients on ELF and its interactions are generally small and not statistically significant. The exception is an interaction with Hispanic that suggests that for Hispanics, attending a more diverse college is significantly tied to a higher probability of completing a four-year degree. To give a sense of the importance of diversity, we use the coefficient on Hispanic times ELF with the SD of ELF. Doing this suggests that for Hispanics, going to a more diverse institution would increase the probability of graduation by about 7 percentage points.

Turning to the probability of getting additional education beyond a bachelor's degree, the results suggest a slightly lower probability among those attending a more diverse college that is concentrated among females. Again Hispanics show a different pattern, with a higher probability of graduate school attendance if they attended a more diverse college. Interestingly the results also suggest that those who attended a private high school are less likely to attend graduate school and that those who attended a more diverse high school are somewhat more likely to go to some form of graduate school. Thus our expectation that those who attend a more diverse college would be somewhat less likely to attend graduate school (of any form) is only modestly borne out in our estimates. In contrast for persons who report they are Hispanics, greater college diversity appears linked to an increased probability of additional education beyond a four-year degree; again using the SD of ELF, an increase of 8.5 percentage points.

In terms of additional variables in these models, males appear less likely to graduate or to go on for additional post-baccalaureate schooling; those with a mother with more schooling themselves appear to obtain more schooling, as do those from families with higher incomes (measured at Wave 1); and there is some suggestion that Black students have a modestly lower probability of graduating with a bachelor's degree. The type of institution also appears to matter; compared with students attending Doctoral/Research I universities, students attending Master's level universities/college, Associates-level colleges, or colleges where no IPEDS information is available to classify college-type have negative and statistically significant coefficients throughout. No other control variables appear systematically tied to the probability of completing a bachelor's degree or going on for additional education beyond four years of college.

We conduct one further test; we limit our analysis to those who attended a four-year college and add a control for college quality in order to eliminate this additional source of variance that might be tied to the outcomes we are studying. The sample is reduced by about one-third in doing this. When we do this, the results on ELF for graduating from college and attending graduate school are generally consistent with those for the entire sample; that is, they show no significant tie but the sign of the coefficients on ELF are mostly negative. For this subset, we do not find that Hispanics who attend a more diverse institution are significantly more likely to graduate or attend graduate school though the coefficients are positive. This change could be tied to the smaller sample size. (Results available from authors.)

Earnings: Our results on earnings, which are measured at Wave 4 when these individuals were 24 to 32 years old, finds, as predicted, that those who attended a more diverse college have statistically and significantly higher earnings. The coefficient on ELF is slightly more than $13,000 dollars. Again using the SD of ELF, we calculate that attending a more diverse college

(as measured by a one SD increase in ELF) is expected to increase earnings by about $1,900 or slightly more than 5 percent. None of the terms interacted with ELF are statistically significant at traditional levels, though the suggested pattern is one where the gain to men is greater than that to women, and the gain to Whites is greater that that for Blacks or Hispanics. An alternative specification using log earnings has similar findings including the insignificant findings of the interaction terms. The results using only those who attended a four-year institution and which includes an additional selectivity measure in the equation again shows that attending a more diverse college is tied to higher earnings. In this case, as reported in Appendix Table 2, we see that the coefficient on ELF is 11,148, suggesting an increase of about $1,600 or nearly 4.5 percent. The coefficient on selectivity is positive and significant in this specification. In this case the interaction between ELF and Black is negative and significant but of about the same magnitude as in the full sample equation. No other interaction terms are significant at standard levels.

Income: Consistent with our findings on earnings and our predictions, there is a positive tie between attending a more diverse college and family income. Family income is also measured at ages 24 to 32. In this case, the statistically significant coefficient is about $17,000, which when taken times our SD of ELF, yields an approximate increase in family income of nearly $2,500 or about 3.5 percent. In the case of family income, no ELF interaction terms are at all significant though they are all positive in sign.

In terms of other control variables that influence family earnings, these include sex where males have higher incomes; race where Blacks have lower incomes; mother's education, which suggests having a mother with higher education is tied to own family income and family income at Wave 1 (parent's income), which is also positively associated with own family income at

Wave 4. The pattern for earnings is again very similar to that for income. And in both cases, having attended an Associates Level college is tied to lower income and earnings, compared to a Doctoral/Research university.

When we limit our analysis to those who attended a four-year institution and add a selectivity measure for that institution, we find a larger influence of diversity on income. In this case the coefficient is 27,523 or nearly $4,000 or about 5.5 percent. In this case, the interaction between ELF and Hispanic is significant and positive, suggesting an additional increment to income of nearly $6,000 for a total increase of nearly $10,000 per annum to Hispanics who attended a more diverse college as captured by a one SD of ELF.

Friendship patterns: We expect individuals who attend a more diverse institution to have a more diverse set of friends, and that is what we find; although the overall effect is only statistically significant in some specifications and then only at the 10 percent level. However, when we interact the ELF measure with the race indicator variables we find that, while the positive association holds for Whites, it does not hold for Hispanics who appear to have a less diverse set of friends if they attended a more diverse college. We find this surprising. In contrast to the results for diversity of college, we find that having attended a high school with a more diverse student body is positively and significantly predictive of having a diverse set of friends. Other variables that are significantly tied are own race, where other race, Hispanics, and Blacks (in that order) are more likely to have a more diverse set of friends, and students with older parents are somewhat more likely to have a diverse set of friends. The results over only those who attended a four-year college are fully consistent with the larger sample.

We also explored if individuals who attended a more diverse college are more likely to vote. The results suggest no and a possible tie to a lower probability of voting than those attending college with a less diverse student body. The results for the four-year college attendees are consistent with those for the overall sample.

Discussion and Caveats

This paper explored whether there is a tie between attending a college with a more diverse student body versus a less diverse one and a set of adult socioeconomic outcomes. The only individuals in this study are those who both attended a college, broadly defined, and did so at a particular point in time. For most individuals in this sample, this means attending college immediately following high school but for some, starting with a slight delay or taking more than four years to complete a degree.

We found that attending a college with a more diverse student body does not appear tied to the probability of completing a four-year college degree, except for Hispanics, who do appear somewhat more likely to get a bachelor's degree if their institution is more diverse. We also found a slight reduction in the probability of continuing on in school beyond a bachelor's degree for those who attend a more diverse college, again with an exception for Hispanics. In contrast, and consistent with the productivity model, we find that students who attend a more diverse college both have significantly higher earnings and higher family incomes. Whether this is a true productivity effect or only a signal to employers that fit their own views of a productivity effect is not clear, but the size of the coefficient suggests that the effect is large. Our results are somewhat stronger in terms of additional earnings and income when we limit our analysis to only those who attended a four-year college, and for this group we find that Hispanics in particular have higher family incomes. We did not find attending a more diverse college to be

tied to having a more diverse set of friends, though our findings were heterogeneous and suggest an increase in diversity of friends for White individuals and a decrease for Black and Hispanic individuals.

Overall, we see these as strong results suggesting that among those who attend college, broadly defined, productivity as captured by earnings is higher for those who attended an institution with a more diverse student body. And family income is higher as well. These results are consistent with a model that suggests that the experience of diversity is likely to make an individual more comfortable with, and more productive, in a global setting, making them more productive workers for international firms. As expected, when we add a measure of college selectivity and focus only on those who attend a four-year college, we find that institutional selectivity is positively tied to higher earnings selectivity but the results for greater diversity remain strong.

Several caveats are relevant here. The results we report are only for those who attended postsecondary schools at a particular point in time and they include only those who acquire more schooling after high school. Second, while the original Add Health sample was nationally representative, this is only a subset. However, compared to others who have attempted to address the question of gains from diversity, we see this as an important contribution as it is national in scope, includes all types of postsecondary institutions, and uses a set of longer-term outcomes as our measure of gains.[4]

There are several main findings from our study. First, using a broad set of institutions of higher learning, including two-year colleges and four-year colleges that range from small liberal

[4] Other panel data sets that could be useful are the Michigan Panel Study of Income Dynamics or the National Longitudinal Survey of Youth. Our initial exploration with them suggests that the sample of individuals in college at any point in time is too small and we think there are clear advantages to both a large sample in college at the same period of time and a recent time period.

arts colleges to major research institutions, we find evidence of positive ties between attending an institution of higher learning that is more racially diverse in terms of earnings nearly a decade after graduation and also higher family income. Higher family income results suggested this held across all racial/ethnic groups while the earnings pattern may exist primarily for Whites and Hispanics. Second, at the same time as we find gains in earnings and income, we find little effect on a larger set of outcomes, suggesting little trade-off in terms of other outcomes that might offset, in part, these positive ties to earnings and income. The findings also suggest that legal limits to the ability of an institution of higher learning to attain a diverse student body may well be productivity reducing, at least for Whites and Hispanics, and income reducing for all who attend a higher education institution after high school.

Table 1 – Descriptive Statistics
Add Health Wave 3 Sample of Respondents Enrolled in College

Outcome	Obs	Mean	Std Dev	Min	Max
Years of Schooling	2844	15.642	1.669	8	21
College Graduate	2844	0.618	0.486	0	1
College Graduate +	2844	0.232	0.422	0	1
Household Income at Wave 4 (1000s)	2726	69.915	38.112	5	150
Earnings at Wave 4	2767	37214	34228	0	900000
Percentage Different Race Friends	2813	19.924	26.278	0	100
Categories of Different Race Friends	2813	2.332	1.519	1	7
Vote Frequency at Wave 4	2842	2.525	1.126	1	4
ELF	2768	0.388	0.141	0	0.745
Age at Wave 3	2844	20.826	1.484	18	27
Male	2844	0.462	0.499	0	1
Black	2844	0.112	0.316	0	1
Hispanic	2844	0.091	0.288	0	1
Other Race	2844	0.054	0.226	0	1
Maternal Education	2844	13.872	2.178	0	17
Parents Married at Wave 1	2844	0.788	0.386	0	1
Family Income at Wave 1 (10,000s)	2844	5.468	4.088	0	80
Parent Age at Wave 1	2844	41.523	5.481	24	77
Missing Family Information Indicator	2844	0.224	0.417	0	1
Grade = 8 at Wave 1	2825	0.220	0.414	0	1
Grade = 9 at Wave 1	2825	0.230	0.421	0	1
Grade = 10 at Wave 1	2825	0.159	0.366	0	1
Grade = 11 at Wave 1	2825	0.107	0.309	0	1
Grade = 12 at Wave 1	2825	0.017	0.131	0	1
High School Level Maternal Education	2844	13.862	0.826	10.5	15.8
High School Level ELF (0-1)	2844	0.313	0.231	0	0.74
Private High School	2843	0.090	0.286	0	1
Peabody Picture Vocabulary Test Score	2844	106.220	12.850	17	138
College Expectations at Wave 1	2844	4.568	0.777	1	5
English Grade at Wave 1	2844	3.203	0.833	1	4
Science Grade at Wave 1	2844	3.216	0.837	1	4
History Grade at Wave 1	2844	3.304	0.775	1	4
Missing GPA Information	2844	0.165	0.371	0	1

Table 2 – Determinants of College Diversity (ELF)

Outcome	ELF (0-100)	ELF (0-100)	ELF (0-100)
Age at Wave 3	-0.389	-0.685	-0.986*
	(0.573)	(0.584)	(0.520)
Male	-0.358	-0.646	-0.269
	(0.512)	(0.524)	(0.514)
Black	-2.434	-3.720**	-2.712*
	(1.561)	(1.558)	(1.419)
Hispanic	6.052***	5.147***	4.848***
	(1.486)	(1.456)	(1.437)
Other Race	5.399**	5.076**	5.524***
	(2.350)	(2.188)	(2.042)
Maternal Education	-0.168	0.000	0.101
	(0.145)	(0.155)	(0.150)
Parents Married at Wave 1	-1.686*	-1.333	-1.122
	(0.954)	(0.940)	(0.908)
Family Income at Wave 1	0.007	0.022	0.044
	(0.087)	(0.084)	(0.079)
Parent Age at Wave 1	-0.049	-0.047	-0.024
	(0.065)	(0.063)	(0.059)
Grade = 8 at Wave 1	-0.007	0.479	1.160
	(1.010)	(1.038)	(0.978)
Grade = 9 at Wave 1	-1.560	-1.301	0.443
	(1.601)	(1.553)	(1.506)
Grade = 10 at Wave 1	0.521	0.992	3.049
	(2.229)	(2.179)	(2.099)
Grade = 11 at Wave 1	2.666	3.542	5.530**
	(2.815)	(2.803)	(2.633)
Grade = 12 at Wave 1	4.447	4.436	6.429
	(4.121)	(4.167)	(4.028)
High School Level Maternal Education	-1.334*	-1.183	-1.037
	(0.800)	(0.770)	(0.743)
High School Level ELF (0-1)+A5	23.896***	23.314***	23.319***
	(3.022)	(2.974)	(2.783)
Private High School	0.441	0.421	0.359
	(4.236)	(4.080)	(3.950)
Peabody Picture Vocabulary Test Score		-0.093***	-0.066***
		(0.027)	(0.025)
College Expectations at Wave 1		-0.554	-0.141
		(0.393)	(0.382)
English Grade at Wave 1		-1.009*	-0.411
		(0.513)	(0.445)
Science Grade at Wave 1		0.071	0.628*
		(0.412)	(0.372)
History Grade at Wave 1		-0.647	-0.431
		(0.568)	(0.490)
College is Masters College			-0.433
			(1.221)

College is Liberal Arts			-5.069***
			(1.825)
College is Associates College			6.565***
			(1.221)
College is Other			4.545*
			(2.493)
Constant	63.056***	81.740***	71.115***
	(15.392)	(15.395)	(14.254)
Observations	2,748	2,748	2,721
R-squared	0.245	0.267	0.331

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Note: Additional controls include—indicator for missing family data at Wave 1, indicator variable for missing GPA information.

Table 3A – The Effects of College Diversity on Educational Outcomes

Outcomes	College Graduation	College Graduation	College Graduation	College Grad +	College Grad +	College Grad +
ELF	-0.013	-0.068	-0.069	-0.143*	-0.007	-0.208**
	(0.094)	(0.130)	(0.111)	(0.084)	(0.122)	(0.103)
ELF X Female		0.095			-0.234*	
		(0.130)			(0.136)	
ELF X Black			0.004			-0.011
			(0.176)			(0.144)
ELF X Hispanic			0.508*			0.607**
			(0.262)			(0.260)
School ELF	-0.037	-0.035	-0.031	0.098**	0.093*	0.105**
	(0.054)	(0.054)	(0.054)	(0.049)	(0.048)	(0.050)
Private School	-0.006	-0.006	-0.005	-0.079***	-0.079***	-0.078***
	(0.034)	(0.034)	(0.034)	(0.027)	(0.027)	(0.028)
Observations	2,721	2,721	2,721	2,721	2,721	2,721
R-squared	0.361	0.361	0.363	0.151	0.153	0.154

Controls: Age at Wave 3, Race, Gender, Maternal Education, Parents Married at Wave 1, Family Income at Wave 1, Parent Age at Wave 1, Missing Family information indicator, Grade Level At Wave 1 Dummies, Carnegie Indicators for College Institution, High School Level Average Maternal Education

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3B – The Effects of College Diversity on Income Outcomes

Outcome	Earnings Wave 4	Earnings Wave 4	Earnings Wave 4	Income Wave 4	Income Wave 4	Income Wave 4
ELF	13,347.256**	20,978.989	17,545.247**	17.217**	13.992	13.399
	(6,106.583)	(12,971.274)	(8,368.423)	(7.906)	(11.197)	(9.486)
ELF X Female		-12,959.164			5.456	
		(14,520.783)			(14.157)	
ELF X Black			-20,361.162			2.413
			(14,690.934)			(17.293)
ELF X Hispanic			-3,697.995			31.081
			(14,129.940)			(19.849)
School ELF	2,594.993	2,301.549	2,057.456	5.966	6.071	6.344
	(4,027.594)	(3,939.112)	(3,961.733)	(5.633)	(5.624)	(5.611)
Private School	143.890	175.922	148.877	0.081	0.084	0.148
	(3,170.055)	(3,152.924)	(3,137.478)	(4.299)	(4.309)	(4.264)
Observations	2,645	2,645	2,645	2,606	2,606	2,606
R-squared	0.061	0.062	0.062	0.045	0.045	0.046

Controls: Age at Wave 3, Race, Gender, Maternal Education, Parents Married at Wave 1, Family Income at Wave 1, Parent Age at Wave 1, Missing Family information indicator, Grade Level At Wave 1 Dummies, Carnegie Indicators for College Institution, High School Level Average Maternal Education
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3C – The Effects of College Diversity on Friendship and Voting Outcomes

Outcomes	%Different Race Friends	%Different Race Friends	%Different Race Friends	Vote Wave 4	Vote Wave 4	Vote Wave 4
ELF	7.815	4.643	15.572***	-0.507**	-1.108***	-0.442
	(5.099)	(8.645)	(5.274)	(0.221)	(0.326)	(0.296)
ELF X Female		5.407			1.030***	
		(11.165)			(0.374)	
ELF X Black			-6.387			-0.021
			(11.736)			(0.535)
ELF X Hispanic			-59.390***			-0.547
			(20.404)			(0.756)
School ELF	24.556***	24.675***	23.704***	-0.123	-0.101	-0.131
	(3.150)	(3.156)	(3.158)	(0.148)	(0.146)	(0.150)
Private School	1.380	1.381	1.270	0.179**	0.179**	0.178**
	(1.688)	(1.690)	(1.542)	(0.077)	(0.077)	(0.075)
Observations	2,690	2,690	2,690	2,719	2,719	2,719
R-squared	0.219	0.219	0.227	0.045	0.049	0.045

Controls: Age at Wave 3, Race, Gender, Maternal Education, Parents Married at Wave 1, Family Income at Wave 1, Parent Age at Wave 1, Missing Family information indicator, Grade Level At Wave 1 Dummies, Carnegie Indicators for College Institution, High School Level Average Maternal Education
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix

A-1 Table Listing Carnegie Categories and Average Unweighted ELF for Each Category.

Variable	Obs	Mean	Std Dev	Min	Max
PhD/Research					
ELF	1262	0.39	0.11	0.10	0.65
HS ELF	1260	0.36	0.23	0.00	0.74
Masters					
ELF	952	0.39	0.17	0.09	0.72
HS ELF	952	0.35	0.25	0.00	0.74
Bachelors					
ELF	328	0.30	0.14	0.00	0.69
HS ELF	327	0.32	0.23	0.00	0.74
Associates					
ELF	1367	0.49	0.16	0.00	0.75
HS ELF	1366	0.38	0.24	0.00	0.74
Specialized Schools (engineering, business)					
ELF	71	0.46	0.17	0.18	0.73
HS ELF	71	0.40	0.27	0.00	0.74
Specialized Schools (art, other)					
ELF	31	0.40	0.16	0.10	0.72
HS ELF	31	0.35	0.26	0.00	0.73
Missing Carnegie Information					
ELF	48	0.44	0.18	0.18	0.73
HS ELF	48	0.39	0.25	0.00	0.71

Appendix Table A-2 Results on Income and Earnings for Those Who Attended a 4-year Institution, Controlling for Quality of the Institution.

Outcome	Earnings Wave 4	Earnings Wave 4	Earnings Wave 4	Income Wave 4	Income Wave 4	Income Wave 4
ELF	11,148*	20,978.989	17,545.247**	27.52**	13.992	13.399
	(6,684)	(12,971.274)	(8,368.423)	(10.90)	(11.197)	(9.486)
ELF X Female		-12,959.164			5.456	
		(14,520.783)			(14.157)	
ELF X Black			-20,361.162			2.413
			(14,690.934)			(17.293)
ELF X Hispanic			-3,697.995			31.081
			(14,129.940)			(19.849)
School ELF	4249	2,301.549	2,057.456	5.966	6.071	6.344
	(4549)	(3,939.112)	(3,961.733)	(5.633)	(5.624)	(5.611)
Private School	-1,831	175.922	148.877	0.081	0.084	0.148
	(3,583)	(3,152.924)	(3,137.478)	(4.299)	(4.309)	(4.264)
Selectivity						
Observations	1,793	2,645	2,645	2,606	2,606	2,606
R-squared	0.061	0.062	0.062	0.045	0.045	0.046

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