Theory and Evidence…..

Patterns of Success:

A Study on the Return on Education for Underrepresented Minorities

by

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ABSTRACT

Patterns of Success investigates the return on education for underrepresented minorities from two points of view: (Study 1) at the college level and (Study 2) across multiple degrees. To analyze return on education at the college level, we ran a regression to test if minority status was a significant predictor of salary and/or employer reputation for the NYU Stern School of Business Class of 2013. To analyze return on education across multiple degrees, we used a univariate ANOVA to test if the relationship between Log (Income) and education is significantly different between underrepresented minorities and other ethnicities. Additionally, we used correlations to discover which groups' income was more dependent on degree level. Study 2 used data from the National Longitudinal Survey of Youth. Study 1 showed that minority status was a significant predictor of earnings, but not a significant predictor of employer reputation. Study 2 showed that the relationship between Log (Income) and education was significantly different between minorities and majorities post-recession (2011), but not pre-recession (2007). The income of underrepresented minorities was more dependent on education than majority group members in 2007 and 2011.

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INTRODUCTION

Patterns of Success investigates post-undergraduate salaries and employer desirability of underrepresented ethnic minorities to discover if the big-fish-small-pond effect (BFSPE) causes underrepresented minorities to underperform when placed in an environment based on "special considerations." [1] At its core, this paper investigates if all ability levels are capable of extracting similar value out of a top-tier academic institution, and studies how the emphasis on student diversity in universities helps (or hurts) the careers of underrepresented minority students.

In addition to studying undergraduates, this paper analyzes the differences in the relationship between income and education for underrepresented minorities compared to other ethnic groups to investigate a more generalized trend for returns on education for underrepresented minorities. Our second study may be able to compare the different competency gaps between each degree for minorities and other ethnicities while also exploring discrimination in the workforce. Additionally, given the possibility that many U.S. academic institutions have "special consideration" admissions program, evidence from this study addresses the macro impact of BFSPE.

THEORY AND HYPOTHESES

Researchers have done studies on modeling the factors that contribute to returns on education. Joseph Altonji's research with data from the 1972 cohort of the National Longitudinal Survey of Youth shows a large difference in the return to college (as opposed to a high school degree) and especially to advanced, technical degrees. [2] Altonji's research showed significant (p-value > 0.05) or near significant differences for men and women, technical and nontechnical, and

[1] Special considerations are defined as a policy that promotes the admittance of underrepresented ethnic minorities.
[2] Altonji, Joseph G. "The Demand for and Return to Education When Education Outcomes Are Uncertain." Journal of Labor Economics 11.1 (1993): 48. Web.

college and advanced degrees. The returns for women were higher than that of men for all degree levels, the returns for advanced degrees was higher than returns for college degrees, and the returns for technical degrees was higher than the return for non-technical degrees.

Furthermore, Altonji's research showed that women were less likely to major in technical areas. His research also showed that the return on education for those who only attend college for two out of four years is negative and the college dropout probability for low ability males (more than one standard deviation below the mean) is 90.97% and for high ability males (more than one standard deviation above the mean) the dropout rate is 51.95%. The dichotomy in dropout rates shows that males who do not perform well are substantially more likely to dropout than students who are performing well. However, the dropout rate for males who are performing well is still high.

Particularly, we are curious about the return on education for underrepresented minorities compared to that of other ethnicities at all degree levels. To explore this issue, we decided that two analyses would be relevant. The first would be examining the difference in post-graduate income between underrepresented minorities and other ethnicities for graduates of a single program (thus holding degree and level of education constant) and the second would be investigating the relationship between income and varying degrees. Based on these two analyses we developed our theory and hypotheses for Study 1 and Study 2.

Study 1. The focus of our first study is to compare the post-graduate earnings and jobs of a group of student who study in the same undergraduate college. Research from Seaton, Marsh, and Craven demonstrates that students of all ethnicities who attend high-ability schools show lower academic self-concepts than their equally able counterparts educated in low- and average-

ability environments.[3] This has become known as the big-fish-little-pond effect (BFLPE). The explanation offered for this effect is that students in high ability schools do not gain confidence from the fact that they qualified for attending such a competitive school. Rather, they make localized comparisons and those who attend high ability schools are more likely to suffer in comparison to their local peers while those in lower-ability schools receive reassurance from such comparisons.

BFLPE may be especially concerning for the lowest ability individuals in a group as they face the highest number of higher ability individuals to compare themselves to in their school. Peter Arcidiacono's simulations have shown that removing black advantages in college admissions and in financial aid shows little effect on overall black male earnings, despite blacks having much larger premium to attending college than their white counterparts.[4] Arcidiacono explains that the blacks affected by the "special considerations" policy, specifically, blacks at the margin of attending, are relatively more rewarded in the non-college market and are ones who most likely chose majors with low premiums. Reasons for choosing majors with lower future pay maybe attributable to BFLPE, in which case blacks felt lower self-concepts in high-paying majors and, subsequently, select low-paying majors.

BFLPE and Arcidiacono's simulations sets up the argument that underrepresented minority status could be a predictor of future earnings. If so, then "special considerations" designed to advance underrepresented minorities in society may actually deter them from their highest potential earnings. However, the claim that BFLPE forces "special consideration" candidates to select less desirable and lower-paying majors assume that everyone desires the

[3] Seaton, M., H. W. Marsh, and R. G. Craven. "Big-Fish-Little-Pond Effect: Generalizability and Moderation--Two Sides of the Same Coin." American Educational Research Journal 47.2 (2010): 390-433. Web.
[4] Arcidiacono, Peter. "Affirmative Action in Higher Education: How Do Admission and Financial Aid Rules Affect Future Earnings?" Econometrica 73.5 (2005): 1477-524. Web.

highest paying careers. *Patterns of Success* plans to control for these preferences to reduce the effects of this phenomenon by using quantifiable factors, such as major, industry, and gender.

To test our first argument, we use anonymized post-undergraduate employment data for the Stern Undergraduate Class of 2013 from the Wasserman Career Center at New York University. Our first hypothesis suggests that if admission committees place underrepresented ethnic minorities in a top-ranked educational institution, then they will have a significantly lower post-graduation salary and have a less desirable post-graduate job than other ethnic groups. In relation to our data, the hypothesis is as follows:

Hypothesis 1: Underrepresented minorities obtain significantly lower total salary, base salary, and employer desirability than other graduates.

At least three underlying mechanisms could yield the patterns predicted in Hypothesis 1: (1) recruiting discrimination, (2) lower self-concepts, or (3) schools accepting underrepresented minorities with lower qualifications than other ethnicities. First, with respect to recruiting discrimination, if many firms that participate in on-campus recruiting do not have diversity quotas or a high number of underrepresented minority employees, they may have a bias in favor of hiring majority-group or non-underrepresented minorities to maintain the status quo or due to prejudice against underrepresented minorities. Second, with respect to lower self-concepts, Seaton, Marsh, & Craven's study on BFLPE suggests that underrepresented minorities may have a lower self-concept than other ethnicities because they are more likely to receive negative feedback in their social comparisons with local peers. This may affect underrepresented minorities' confidence in selecting jobs to apply for and interviewing for positions. Third, with respect to differences in qualifications, if NYU Stern emphasizes accepting underrepresented minorities, the school's bias in favor of underrepresented minorities may lead them to accept

students in those groups that have lower qualifications than other ethnicities. If the difference in qualifications persists throughout their educational experience at Stern, then the lower qualifications of underrepresented minorities may be apparent to employers and cause them to have a harder time recruiting for jobs after graduation, thereby, pushing them to accept positions with lower salaries than other ethnicities.

Study 2. The focus of our second study is to generalize our findings beyond the single program and degree in Study 1 by assessing the returns on varying levels of education for underrepresented minorities and other racial/ethnic groups. Many factors could be affecting the return on education for underrepresented racial and ethnic minorities, one of which could be discrimination in the recruitment process. Kevin Duncan's research offers evidence of gender discrimination in that more educated men have greater experience-earnings profiles while more educated women do not, indicating different earnings growth patterns among similarly skilled men and women.[5] Similar discrimination may be present in recruiting for underrepresented ethnic minorities, causing them to have lower salaries and job desirability.

In addition to discrimination, widespread special consideration policies may also be contributing to the relatively lower return on education of underrepresented racial and ethnic minorities compared to other groups. Although many admissions institutions do not disclose the use of "special considerations" (including our Study 1 sample), the use of such polices may be clear after looking at the distributions of entry and exit metrics between the two groups and considering universities' diversity statements.

Employer discrimination and relatively high quality non-minority students at each educational institution could lead to a difference in the relationship between income and degree

[5] Duncan, Kevin C. "Gender Differences in the Effect of Education on the Slope of Experience-Earnings Profiles." American Journal of Economics and Sociology 55.4 (1996): 457-71. Web.

level for underrepresented minorities and other ethnicities. Although some may argue that education reduces the variability in earnings between underrepresented minorities and other ethnicities, we consider the possibility that less qualified students and highly qualified students require different methods of teaching. Colloquially, this is referred to as choosing to teach to the "top-of-the-class" or the "bottom-of-the-class." Educational institutions may be pressured to teach to the top-of-the-class in order to boost rankings and/or remain competitive among their peer institutions. Because less qualified students are less likely to take full advantage of classrooms that teach above their skill level, it is possible that this dynamic is responsible for differences in the relationship between income and level of education between underrepresented minorities and other ethnicities.

To test returns on varying levels of education, we used data from the NLSY97 cohort of the National Longitudinal Survey of Youth to evaluate whether the relationship between income and education differed for underrepresented racial and ethnic minorities and other groups. Our second hypothesis proposes that the incremental increase in salary per degree for underrepresented minorities is lower than that for other ethnic groups. In relation to our data, the hypothesis is as follows:

Hypothesis 2: The positive relationship between education and income will be moderated by underrepresented minority status.

STUDY 1 – STERN UNDERGRADUATE CLASS OF 2013

Methods

Sample and Data Collection. We obtained de-identified employment information for the Stern Undergraduate Class of 2013 from the Wasserman Career Center at New York University. Graduating seniors have the opportunity to take a voluntary survey before graduation that

discusses post-graduation job, salary, and other employment metrics. Students are not required to answer all questions. The full list of questions are in Appendix A. 495 students from the graduating class responded to the survey, 240 of them reported their salary, 239 reported their salary and bonus, and 448 of them disclosed their employer.

Grouping and Quantifying Categorical Variables. The data included measures of the following relevant variables: Minority Status, Gender, Post-Graduate Industry, and Major Classification. In order to preserve degrees of freedom, we recoded categorical variables into meaningful binary groups and assigned values of either "1" or "2" to the recoded variables. To determine which variables to include in our model, we analyzed the bivariate correlations of all relevant variables and retained those variables that significantly related to our dependent variables (i.e., employer rating, total salary, and salary). Table 1 shows categorical variables, their groups, recodings, and grouping rationale. Table 2 shows bivariate correlations between categorical independent variables and our dependent variables. To reduce multicollinearity, we removed control variables that were highly correlated with one another (i.e., bivariate correlations above 0.5).

TABLE 1
Independent Variable Classifications and Recodings

Independent Variable	New Categories	Old Categories	Recoding	Grouping Rationale
Minority Status	Minority	Hispanic or Latino	1	Separated underrepresented minorities from majorities for the Stern Undergraduate Class of 2013
		From multiple races		
		Some other race		
		Native Hawaiian or other Pacific Islander		
		Black or African-American		
		American Indian or Alaskan Native		
	Majority	Asian	2	
		White		
Gender	Female	Female	1	Separated due to the tendencies of each group to

	Male	Male	2	select certain positions
Post-Graduate Industry	Other	Consumer Products/Retail	1	Separated Finance / Professional Services industries and Other industries due to the quantitative nature of the former and the qualitative nature of the latter
		Government/Education		
		In School: N/A		
		Media/Entertainment		
		n/a		
		Non-Profit		
		Not Placed: N/A		
		Other		
		Petroleum/Energy		
		Pharma/Biotech/Health		
		Sports/Leisure		
		Technology/Science		
		Transportation		
	Finance / Professional Services	Accounting	2	
		Financial Services		
		Consulting		
		Real Estate		
Major Classification	Quantitative	Finance	1	Separated majors based on quantitative and qualitative classifications due to the tendencies to enter quantitative or qualitative positions after college
		General Accounting		
		Actuarial Science		
		CPA Track		
		Statistics and Operations Research		
		Information Systems		
	Qualitative	Marketing	2	
		Mgt and Organization Behavior		
		Business Economics		
		Business and Political Economy		

TABLE 2
Descriptive Statistics and Pearson Correlation Coefficients

Independent Variable	Mean	s.d.	1	2	3	4	5	6	7
1. Salary	61,594	14,510							
2. Total Salary	66,625	16,155	0.92**						
3. Minority Status	1.68	0.47	0.23**	0.28**					
4. Major Classification	1.24	0.43	-0.34**	-0.34**	-0.05				
5. Gender	1.58	0.49	0.18**	0.23**	0.05	-0.19**			
6. Post-Graduate Industry	1.67	0.47	0.38**	0.47**	0.08	-0.37**	0.16**		
7. Employer Rating	6.39	2.56	0.40**	0.51**	0.03	-0.31**	0.03	0.46**	

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Testing Total Salary (with bonus) and Salary (without bonus). We ran three linear regressions with Total Salary as the dependent variable to test its relationship with our hypothesized predictors. We ran these three regressions to determine the most efficient model.

The three models were as follows:

Model 1) Minority Status, Gender, Post-Graduate Industry

Model 2) Minority Status, Gender, Major Classification

Model 3) Minority Status, Gender, Post-Graduate Industry, Major Classification

In addition, we ran three linear regressions with Salary (without bonus) as the dependent variable with the same three alternative predictive models as above to evaluate whether the patterns were the same on salary even when bonuses were not included. If the Salary (without bonus) linear regressions showed similar results as the Total Salary (with bonus) linear regressions, then we can confidently conclude that bonuses and any characteristics associated with them were not primarily responsible for our pattern of findings.

Testing Employer Desirability. We tested post-graduate firm desirability because organizational status is a desirable outcome in its own right and because firm desirability may be associated with long-term earnings as higher employer status may improve access to desirable and well-compensated future jobs in a participant's career.

We measured firm desirability based on student ratings of the firms from the NYU Stern 2013 Wasserman survey. Raters were all undergraduate business students. These raters were appropriate because they would be most familiar with the context-specific desirability of employers to work for after graduation. Three raters, including myself, assigned a value between one and ten to each firm based on post-graduate desirability. The results from this survey showed

significant inter-rater correlation (Table 3). We used a simple average of the ratings to create the "Employer Rating" for each graduating senior.

Subsequently, we ran the three linear regression models listed above with "Employer Rating" as the dependent variable.

TABLE 3
Employer Ratings Interrater Pearson Correlation Coefficients

Independent Variable	Mean	s.d.	1	2	3
1. Rater #1	5.71	2.77			
2. Rater #2	5.92	2.01	0.60		
3. Rater #3	2.93	2.96	0.50	0.61	

Results

TABLE 4
Results of Linear Regression Models for Total Salary, Salary, and Employer Rating

Independent Variable	Total Salary	Salary	Employer Rating
Gender	0.169*	0.135*	-0.060
	(0.003)	(0.023)	(0.166)
Post-Graduate Industry	0.417*	0.338*	0.469*
	(0.000)	(0.000)	(0.000)
Minority Status	0.191*	0.159*	-0.001
	(0.001)	(0.008)	(0.976)
R Square	0.287	0.190	0.213
Residual Degrees of Freedom	236	237	444

Note: Two-tailed standard errors are in parentheses.
*Significant to the 0.05 two-tailed p-value

Total Salary (with bonus) and Salary (without bonus). We analyzed the predictors of Total Salary and Salary using three linear regression models. In both cases, the variables Major Classification and Post-Graduate Industry were highly correlated and, indeed, when we controlled for Post-Graduate Industry, the relationships between Major Classification and both Total Salary and Salary were no longer significant, consistent with multicollinearity. Post-Graduate industry is likely to be a more proximal predictor of earnings than Major Classification.

Therefore, we dropped Major Classification from our regression model and regressed Total Salary and Salary on Post-Graduate Industry, Gender, and Minority Status.

We ran a regression on Salary (without bonus) to ensure that the results from our Total Salary (with bonus) analysis were not purely based on bonus size, which could differ based on position or industry. The similarity in linear regression results between that of Total Salary and Salary shows that base salary is the major contributor to our regression results and allows us to analyze the results together.

Firstly, our model (Table 4) showed that Post-Graduate Industry was a significant predictor of Total Salary and Salary with standardized beta coefficients of .417 and .338, respectively. These results show that salaries are higher in quantitative industries than in qualitative industries. Furthermore, Post-Graduate Industry serves as an appropriate control variable when testing the relationship between Total Salary (or Salary) and Minority Status.

Secondly, Gender proved to be a significant predictor of Total Salary and Salary with a significant standardized beta coefficients of .169 and .135, respectively, showing that females have a 16.9% lower post-graduate total salary than males. This rate roughly adheres to the United States national disparity between salaries of men and women, which is 21.7%.[6] Ultimately, Gender's significant standardized beta coefficients show that Gender is also an appropriate control variable when testing the relationship between Total Salary and Salary based on Minority Status.

Lastly, and of greater importance, our model showed that Minority Status was a significant predictor of Total Salary and Salary with significant standardized beta coefficients of

[6] As of September 2014, on average, a woman who holds a full-time, year-round job is paid $39,157 per year while a man who holds a full-time, year-round job is paid $50,033 per year (National Partnership for Women and Families).

.191 and .159, respectively. Our linear regression shows that in the Undergraduate Class of 2013 at NYU Stern, underrepresented minorities have a 19.1% lower Total Salary and a 15.9% lower Salary than others; this indicates a significant disparity between the earnings of underrepresented minorities and others in our sample.

Employer Ratings. After reviewing the results from the linear regression in Table 4 (Scenario 1), Minority Status and Gender do not seem to have a significant positive or negative relationship with Employer Rating. Post-Graduate Industry is the sole independent variable that has a significant positive relationship with Employer Rating.

Due to these results, we explored the possibility that an interaction effect may be present, such that underrepresented minorities who accepted high Employer Rating positions are entering lower-paying back office jobs as opposed to front office jobs (labeled Job Status). Therefore, we decided to use peer rater analysis to establish the front or back office nature of each student's job based on Job Title. Furthermore, we ran a bivariate correlation analysis to evaluate the correlation between Job Status and Minority Status. After establishing no significant correlation between Job Status and Minority Status (Appendix B), we ran a logistical regression (Appendix C) with:

Dependent Variable: Job Status

*Independent Variables: Firm Status * Minority Status, Firm Status, Minority Status, Gender, Employer Rating, and Post-Graduate Industry*

The results showed no interaction effect and indicated that Gender and Post-Graduate Industry were the only independent variables significantly associated with Job Status. Therefore, we cannot reject the null hypothesis that high rated firms are not disproportionately assigning

underrepresented minorities to the back office. Table 4 stands to be our most accurate display of the relationship between Minority Status and Employer Rating.

In addition to the Job Status analysis, we also ran an Employer Rating linear regression on income reporters only to see if this group could mirror the Minority Status significance of Salary and Total Salary. If Minority Status proved to be a significant predictor of Employer Rating within those that reported salary, then the individuals who did not report salary may have been the cause for preventing Minority Status from being a significant predictor of Employer Rating for the overall sample. The Employer Rating linear regression can be seen in Table 5.

TABLE 5
Results of Linear Regression Models for Employer Rating (Only for those that Reported Income)

Independent Variable	Employer Rating
Gender	-0.048
	(0.397)
Post-Graduate Industry	0.527*
	(0.000)
Minority Status	-0.010
	(0.862)
R Square	0.277
Residual Degrees of Freedom	227

Note: Two-tailed standard errors are in parentheses.
*Significant to the 0.05 two-tailed p-value

Table 5 shows that even when limiting the sample to those who reported salary, Minority Status is still not a significant predictor of Employer Rating. Table 5 provides more evidence to suggest that Minority Status affects Salary and Employer Rating in different ways.

Discussion

We supported hypothesis 1 based on Total Salary and Salary but not based on employer rating. With controls, minority status explained variance in salary with bonus and salary without bonus, but minority status does not explain variance in post-graduate employer rating. Our model

showed that underrepresented minorities earned less, with and without bonus, than other ethnicities but accepted positions at similarly rated firms. Furthermore, Gender could also explain Total Salary and Salary but not Employer Rating, showing that women earn less than men earn but accept positions at similarly rated firms.

Job preference, hiring discrimination, and lower skill levels for underrepresented minorities and women at the onset of college may explain our findings. Firstly, underrepresented minorities and women may prefer lower-paying jobs than other ethnicities and men for reasons such as team atmosphere and work/life balance. However, we controlled for some of these elements via our independent variables for major, industry, and gender. Since we implemented these controls, preference should not be the main factor explaining our results.

Secondly, hiring discrimination against underrepresented minorities and women could explain the results of our model. Discrimination could lead to lower pay for women and underrepresented minorities in the Stern Undergraduate Class of 2013. Additionally, some employers, especially highly rated employers, have diversity recruiting programs, which emphasize recruiting underrepresented minorities and women. These programs could help explain why no significant relationship exists between Employer Rating and Gender or Minority Status because diversity programs would boost hiring of underrepresented minorities in highly rated firms. Since we did not control for discrimination, it is possible that discrimination is a leading factor to explain Study 1's results.

Thirdly, underrepresented minorities and women's lower skill levels at the onset to college could explain the lower post-graduate salaries and bonuses when compared to other ethnic groups and men. This would provide evidence for an implicit "special consideration" admissions process in which admission committees evaluate certain candidates based on non-

merit factors such as ethnicity and gender. Because we have no college admissions metrics, such as test scores or high school GPA, we cannot discount the possibility that Stern's admission committee accepted underrepresented minorities and women at a lower standard than other ethnic groups and men.

Although it may be possible that underrepresented minorities had lower skill levels than other ethnicities at the onset of college, data shows that women may be more prepared for college than men.[7] Voyer and Voyer, in a 2014 study, showed that females have a small but significant advantage over males in teacher-assigned marks in elementary, junior/middle, high, undergraduate, and graduate levels. Given higher marks received by women, certain factors may be affecting women that cause them to be a different group than underrepresented minorities. Potential factors could be more of a desire to maintain a work-life balance, different value for salary, and/or other job preferences.

Of our three main casual factors, preference, discrimination, and lower skill levels at the entry of college, preference was the only one that we were able to control. Therefore, we suspect that discrimination (for underrepresented minorities and women) and lower skill levels at college entry (for underrepresented minorities only) are the main factors that led to our results.

STUDY 2 – NATIONAL LONGITUDINAL SURVEY OF YOUTH

Methods

Sample and Data Collection. We acquired Study 2 data from the NLSY97 cohort of the United States Bureau of Labor Statistics's National Longitudinal Survey of Youth. NLSY97 consists of a nationally representative sample of approximately 9,000 youths who were 12 to 16 years old as of December 31, 1996. Older data from the NLSY survey has been used in prior

[7] Voyer, Daniel, and Susan D. Voyer. "Gender Differences in Scholastic Achievement: A Meta-Analysis." American Psychological Association 140.4 (2014): 1174-204. Web.

research to explore returns on education by gender and race/ethnicity (Duncan, 1996), enabling us to compare our findings to those obtained in prior research.[8] The group was surveyed about education, income, and other lifestyle metrics each year from 1997-2011. Surveys took place with the youth and one of the youth's parents in hour-long personal interviews. From the NSLY97 survey, we selected those born in 1980 (oldest of the groups) and those not enrolled in educational institutions so that we can get the most accurate measure of full-time earnings. Of this group, we tested education, income, and demographic information as predictors of earnings in 2007 and 2011. We selected those two years to get a measure before and after the abnormal 2008 recession.

We used two different definitions of underrepresented minorities to produce two sets of results. The first data set replicated the analyses conducted by Duncan, 1996, in which Duncan used the NLSY79 cohort from the National Longitudinal Survey of Youth and tested differences between black and white populations. In the NLSY97 cohort, there was no option for respondents to categorize their race as "white," so our two ethnicity populations were Blacks and Non-Blacks / Non-Hispanics. Although some non-whites may be in the Non-Black / Non-Hispanic group, we believe that the populations of other ethnic groups in this classification are not large enough to bias our results substantially. The second data set replicated the minority status definition of Study 1 so that we could compare the results of the two studies. In this case, we defined minorities as Blacks and Hispanics and non-minorities as Non-Blacks / Non-Hispanics. The minority status for this set of data does not exactly match the definition of minority status for Study 1, but we believe that the differences would not lead to significant differences in results as the larger ethnic groups in each definition are the same.

[8] Duncan, Kevin C. "Gender Differences in the Effect of Education on the Slope of Experience-Earnings Profiles." American Journal of Economics and Sociology 55.4 (1996): 457-71. Web.

Interaction analysis with bivariate and partial correlations. We used correlation analysis to explore the incomes and relationships between income and education for each ethnic group. We tested the bivariate correlations of three groups per data set (six total):

2007 Data Set:

- *2007 Blacks*
- *2007 Blacks & Hispanics*
- *2007 Non-Blacks / Non-Hispanics*

2011 Data Set:

- *2011 Blacks*
- *2011 Blacks & Hispanics*
- *2011 Non-Blacks / Non-Hispanics*

In addition to bivariate correlations, we ran partial correlations with the same groups while controlling for Gender. The combined analysis of bivariate and partial correlations allowed us to explore the relationship between Degree and Log (Income) for each ethnicity group in each year.

Univariate general linear model analysis. We used univariate ANOVA models to analyze the means and variances of earnings for each degree, ethnic group (Black, Hispanic, and Non-Black / Non-Hispanic), and year. Our models used Log (Income) as the dependent variable, Degree and Ethnicity as the fixed variables, and Gender as a covariate. We were able to test whether returns on education varied across race/ethnicity by examining the interaction of degree level and ethnic group. The three ethnicity groups that we used were Blacks, Hispanics, and Non-Blacks / Non-Hispanics. The seven degree levels were none, GED, high school diploma, associate / junior college, bachelor's degree, master's degree, and professional degree. PhD was

intentionally excluded to avoid the ambiguity of interpreting the degree's level in relation to a professional degree and to avoid the potential skew in earnings as the participants in the NLSY97 cohort may too young (27 and 31) to realize the earnings benefits of the degree. Study 1 concluded that underrepresented minorities, on average, had a significantly lower post-undergraduate income than other ethnic groups. A univariate ANOVA can show if this was an abnormality for Stern only or for undergraduates only by providing income means and variances for those with undergraduate and other degrees.

Results

Interaction analysis with bivariate and partial correlations. Bivariate and partial correlation analysis of each ethnicity group and year are in Table 6.

TABLE 6
Descriptive Statistics Correlation Coefficients

Independent Variable	Mean	s.d.	Pearson	Partial*
Blacks Only (2007)				
1. Log (Income)	4.22	0.50		
2. Degree	2.80	1.18	0.36	0.39
Blacks and Hispanics (2007)				
1. Log (Income)	4.27	0.46		
2. Degree	2.77	1.18	0.28	0.31
Non-Blacks / Non-Hispanics (2007)				
1. Log (Income)	4.40	0.39		
2. Degree	3.48	1.34	0.30	0.35
Blacks Only (2011)				
1. Log (Income)	4.33	0.42		
2. Degree	2.97	1.25	0.42	0.44
Blacks and Hispanics (2011)				
1. Log (Income)	4.38	0.38		
2. Degree	2.92	1.26	0.32	0.36
Non-Blacks / Non-Hispanics (2011)				
1. Log (Income)	4.51	0.42		
2. Degree	3.70	1.38	0.30	0.33

*Partial correlations control for gender.
**Correlation significant at the 0.01 level (2-tailed).

In our 2007 analysis of the correlation between Log (Income) and Degree, we can see that Blacks Only had the highest correlation, Non-Blacks / Non-Hispanics had the second highest correlation and Blacks and Hispanics had the lowest correlation. Our 2007 results show that Blacks' incomes are most dependent on degree level. When Hispanics are added to the group, the correlation between education and income is lower, signaling that Hispanics' incomes are less dependent on degree level than Blacks' income. Non-Blacks / Non-Hispanics' incomes are also less dependent on degree level than Blacks' incomes. Because Blacks and Hispanics' correlation between Log (Income) and Degree is lower than that of Non-Blacks / Non-Hispanics, the correlation for Hispanics appears to be lower than that of Non-Blacks / Non-Hispanics.

In our 2011 analysis of the correlation between Log (Income) and degree, results were similar to those obtained with the 2007 data in that Blacks' incomes are most dependent on degree level. When Hispanics are added to the group, the correlation reduces, signaling that Hispanics' incomes are less dependent on degree level than Blacks' income and overall, the correlation between Log (Income) and Degree is lower for groups other than Blacks.

When comparing the correlation analysis between 2007 and 2011, we see that the two big changes are that Blacks' incomes are substantially more correlated with degree level and that Blacks and Hispanics changed from being the group with the lowest correlation to the group with the second highest correlation. The substantial increase in correlation for Blacks shows that their incomes became substantially more dependent on degree level as they got older.

To parallel the minority group of Study 1, we created a minority group that contained Blacks and Hispanics. The increased correlation between degree and income for Blacks and Hispanics (as a group) between 2007 and 2011 shows that either (1) Hispanics' incomes are no longer less correlated with degree level than the majorities' incomes or that (2) the increase in correlation between Log (Income) and Degree for Blacks was substantial enough to make the Blacks and Hispanics group's income more correlated to degree level than that of majorities.

Univariate ANOVA analysis. Our univariate ANOVA analysis results for our Blacks only analysis can be viewed in Table 7. Blacks, Hispanics, and Non-Blacks / Non-Hispanics as three separate groups can be viewed in Appendix D.

TABLE 7
Summary of Univariate and Multivariate Results for Income for Blacks Only When Compared to Non-Blacks / Non-Hispanics

Analyses	Log (2007 Income)	Log (2011 Income)
Corrected Model	11.80***	11.85***
Intercept	4750.88***	6476.32***
Gender	46.87***	23.19***
Degree	15.89***	16.38***
Ethnicity	0.05	0.00
	(0.83)	(0.95)
Degree * Ethnicity	1.17	2.48*
	(0.32)	(0.02)
N	636	675

* p < .05
** p < .01
*** p < .001

Table 7 shows that the relationship between education and income is significantly different between the minority group and the majority group in 2011. We can see this as the Degree * Ethnicity is a significant predictor of Log (Income) in 2011. However, Degree * Ethnicity is not a significant predictor of Log (Income) in 2007, meaning that moderating effect of ethnicity on the relationship between education and income grew stronger as our sample aged (and after the 2008 recession).

In looking at the other F values and significance of our ANOVA model, we can see that means of log (income) for both 2007 and 2011 are significantly different based on Gender and Degree. Ethnicity was not a significant predictor of Log (Income) in 2007 or 2011, showing us that the average Blacks' income is not less than that of Non-Blacks / Non-Hispanics. Additionally, because the Ethnicity main effect is not significant in either year and the interaction variable of Degree * Ethnicity is significant in 2011, we know that the form of the interaction of ethnicity and degree on income in 2011 is a crossover interaction. In particular, the

relationship between education and earnings is lower for minorities than others at low levels of education but higher for minorities than others at high levels of education.

Our univariate ANOVA analysis results for Blacks and Hispanics (combined) and Non-Blacks / Non-Hispanics as two separate groups can be viewed in Table 8. This analysis was used for our Blacks and Hispanics analysis.

TABLE 8
Summary of Univariate and Multivariate Results for Income for Blacks and Hispanics When Compared to Non-Blacks / Non-Hispanics

Analyses	Log (2007 Income)	Log (2011 Income)
Corrected Model	11.59***	13.18***
Intercept	5561.87***	8624.64***
Gender	53.52***	40.54***
Degree	16.31***	19.01***
Ethnicity	0.57	0.19
	(0.45)	(0.66)
Degree * Ethnicity	0.98	2.32*
	(0.44)	(0.03)
N	806	865

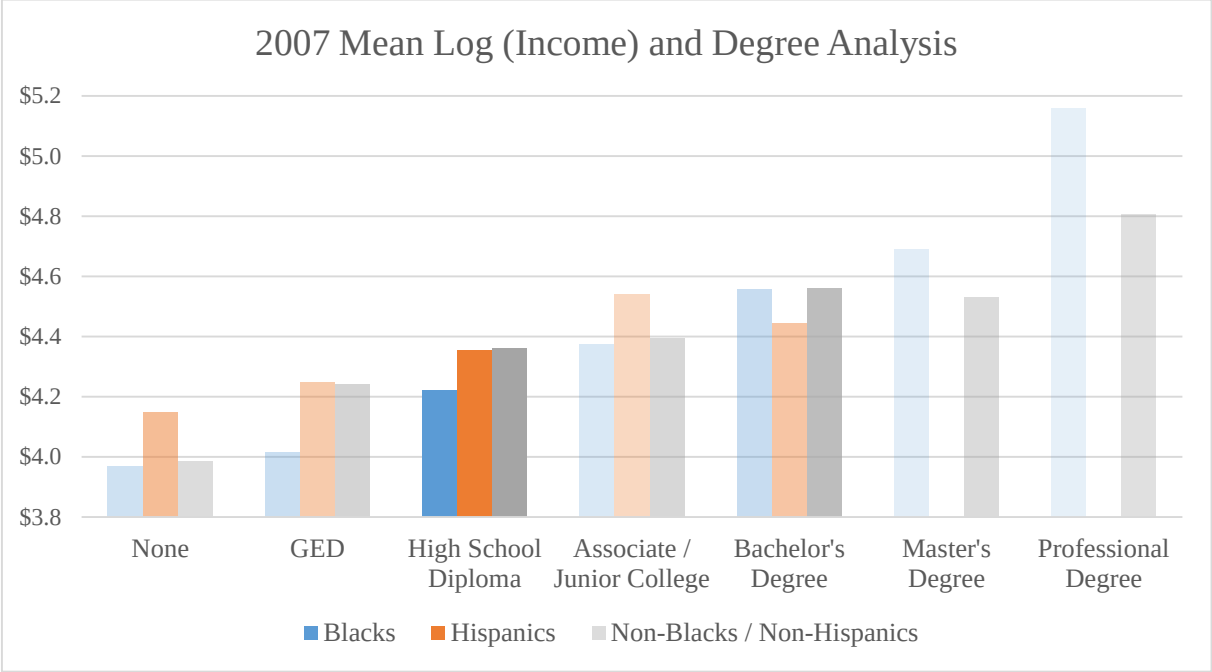
* $p < .05$
** $p < .01$
*** $p < .001$

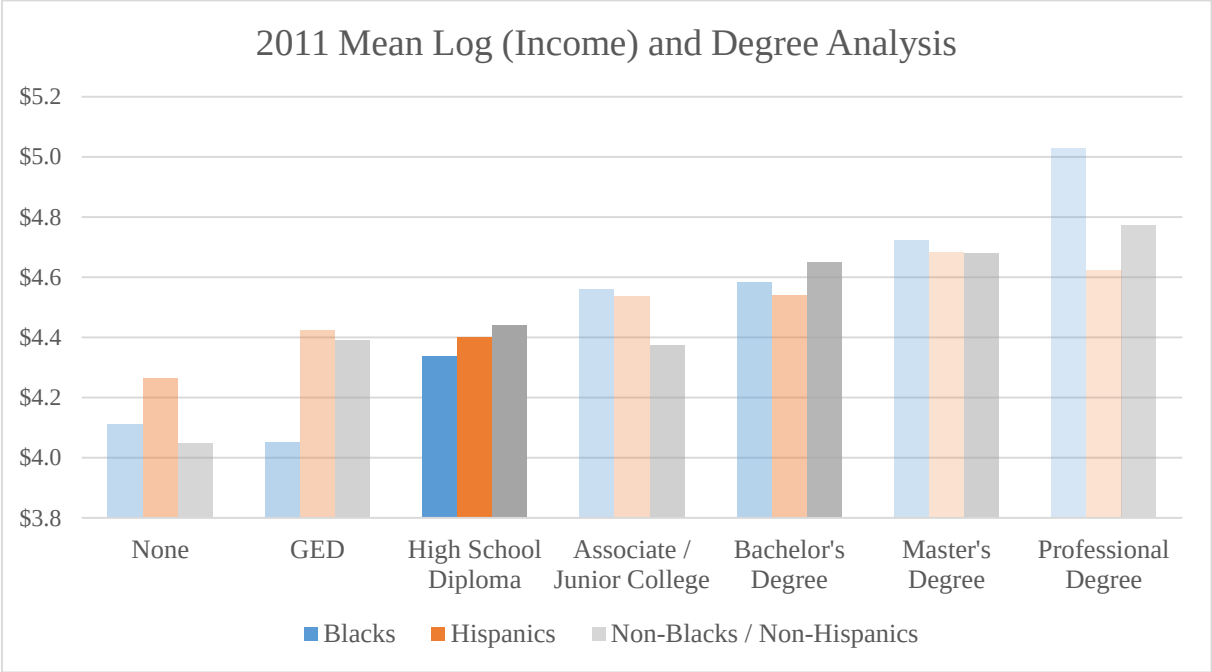
The results shown in Table 8, for the Blacks and Hispanics (combined) minority group, are very similar to the results for the Blacks only minority group. Table 8 shows that the relationship between education and income is significantly different between the minority group and the majority group in 2011. Specifically, Degree * Ethnicity is a significant predictor of Log (Income) in 2011. However, Degree * Ethnicity is not a significant predictor of Log (Income) in 2007, meaning that the difference in the relationship between education and income for minorities and majorities emerged over time.

In looking at the other F values of our ANOVA model, we can see that means of Log (Income) for both 2007 and 2011 are significantly different based on Gender and Degree. As in our analyses using Blacks only as the minority group, our results suggest a crossover interaction of Ethnicity * Degree on Log (Income) in 2011.

A further analysis of Degree and Ethnicity's effect on Log (Income) can be seen in Figure 1 (Blacks and Hispanics as two groups) and Figure 2 (Blacks and Hispanics as one group) below.

FIGURE 1





In Figure 1, visually, Blacks (blue) seem to have a steeper trend than Non-Blacks / Non-Hispanics (grey), suggesting that Blacks gain more return (in the form of income) from each degree level. This relationship is most evident in 2007 and still present in 2011. Since

participants were 27 in 2007 and 31 in 2011, the weaker trend could be evidence of more people obtaining higher degrees, thus making the mean Log (Income) converge between Blacks and Non-Blacks / Non-Hispanics.

In Figure 1, the darkness of each bar represents the percentage of each ethnic group at each education level. We can see that the highest percentage of each group have High School Diplomas. Furthermore, a higher percentage of Non-Blacks / Non-Hispanics have Bachelor's Degrees and a higher percentage of Blacks have High School Diplomas as their highest degree.

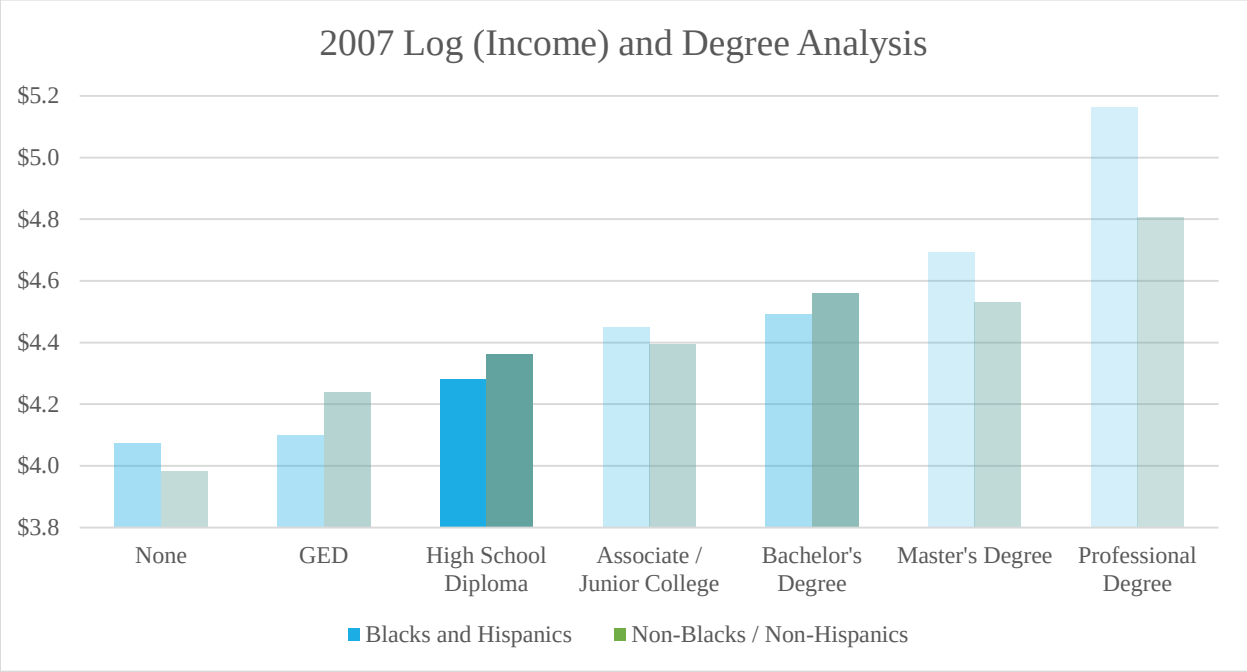
In 2007, Blacks have lower means than Non-Blacks / Non-Hispanics at all lower degrees until the Bachelor's Degree, for which the means for Blacks and Non-Blacks / Non-Hispanics are similar. Log (Income) for Blacks is higher than Non-Blacks / Non-Hispanics for Master's Degree and Professional Degree. However, the difference in means between Blacks and Non-Blacks / Non-Hispanics becomes more mixed in 2011. In 2011, Blacks have higher mean Log (Incomes) for None, Associate / Junior College, Master's Degree, and Professional Degree.

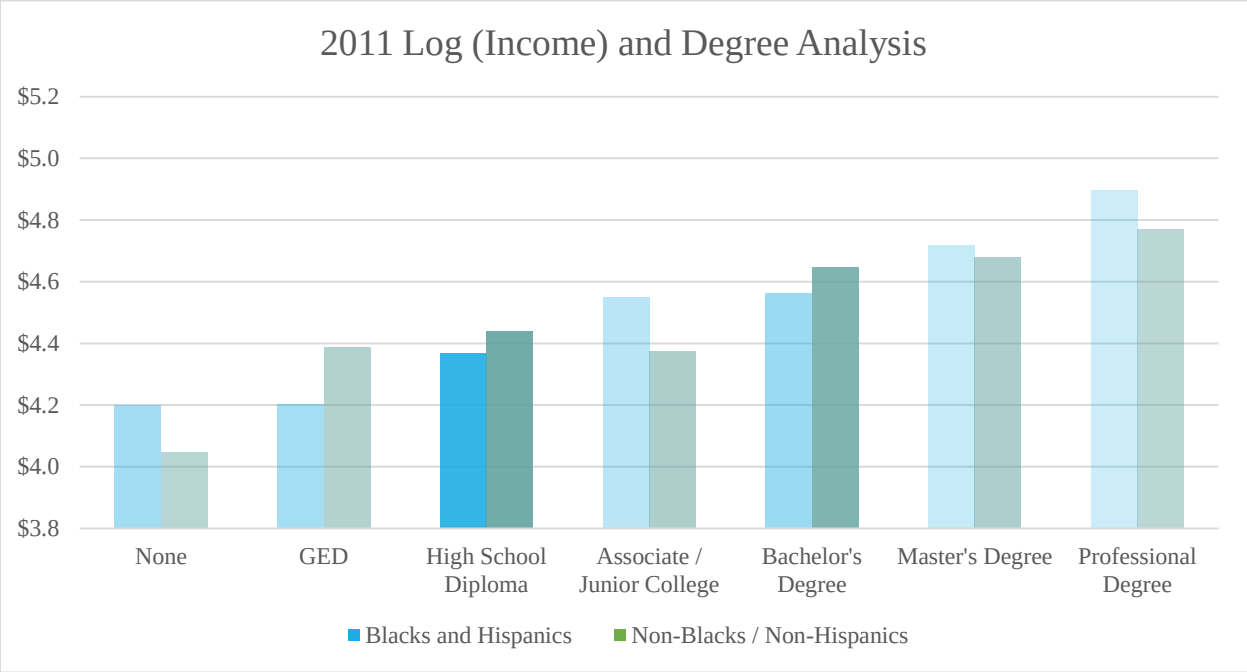
Hispanics appear to have the lowest slope, with relatively higher mean Log (Income) in low degree levels and relatively lower Log (Income) in higher degree levels. The slope also became even lower as time progresses from 2007 to 2011.

The mean comparison between Hispanics and Non-Blacks / Non-Hispanics is very different from that between Blacks and Non-Blacks / Non-Hispanics. Generally, Hispanics' mean Log (Income) surpassed that of Non-Blacks / Non-Hispanics for lower degree levels and was surpassed by Non-Blacks / Non-Hispanics for higher degree levels.

Figure 2 shows the mean differences between Blacks and Hispanics (combined) and Non-Blacks / Non-Hispanics.

FIGURE 2





In Figure 2, when analyzing the mean differences between Blacks and Hispanics and Non-Blacks / Non-Hispanics in 2007 and 2011, we see that Blacks and Hispanics have Log (Incomes) above that of Non-Blacks / Non-Hispanics for No education, Associate / Junior

College, Master's Degree and Professional Degree. Unlike the analysis for Blacks and Hispanics separately, this analysis shows that the minority status group has higher mean Log (Incomes) for the same education levels for both years. In other words, the trends are the same for both years.

However, there are a few key differences between the two years. Firstly, the amount for which Blacks and Hispanics' mean Log (Income) for no education is higher than Non-Blacks / Non-Hispanics increases from 2007 to 2011. Secondly, the income gap for which Blacks and Hispanics are greater than Non-Blacks / Non-Hispanics widens for Associate / Junior College degree. Lastly, the amount for which Blacks and Hispanics have higher mean Log (Incomes) at Master's and Professional Degrees moderates in 2011 when compared to 2007.

In Figure 2, the darkness of each bar represents the percentage of each ethnic group at each education level. We can see that the highest percentage of each group have High School Diplomas. Furthermore, a higher percentage of Non-Blacks / Non-Hispanics have Bachelor's Degrees and a higher percentage of Blacks and Hispanics have High School Diplomas as their highest degree.

Discussion

Blacks only analysis. Our analysis with Blacks Only as the minority group and Non-Blacks / Non-Hispanics as the comparison group fails to support Hypothesis 2. Although we found that the relationship between income and degree level was different for Blacks and Non-Blacks / Non-Hispanics, Non-Blacks / Non-Hispanics (i.e., Whites and Asians) had the more modest or attenuated relationship between education and earnings.

In our first univariate ANOVA analysis (Table 7) with an interaction variable, we showed that Blacks and Non-Blacks / Non-Hispanics had significantly different slopes between Log (Income) and Degree in 2011 and not in 2007. This signals that Blacks and Non-Blacks / Non-

Hispanics may have different returns on education for each education level and that this difference expanded from 2007 to 2011. To further analyze the value of each slope, we ran correlations between Log (Income) and Degree for each ethnicity group and found that the slope is much greater (indicating higher return on education) for Blacks in both years.

Greater "benefits of ethnic differentiation" between degrees for Blacks than Non-Blacks / Non-Hispanics could have caused Blacks to have a higher correlation between income and education than the majority group, while crossing over at some point. "Benefits of ethnic differentiation" will be hereafter defined as the additional upside in job recruiting when one is in the ethnic minority for the respective degree level. For example, since a higher percentage of underrepresented minorities have lower level degrees, then majorities with lower level degrees (i.e. Whites, Asians) may have an advantage of ethnic differentiation when searching for jobs because they are more differentiable. The majority group members' ability to stand out may lead to stronger demand for these candidates and, thus, higher earnings than their underrepresented minority counterparts.

Similarity, the "benefits of ethnic differentiation" also appear for higher degree levels as we see that underrepresented minorities are paid more than their majority counterparts for Master's and Professional Degrees. Since a higher percentage of majority group members have higher-level degrees, underrepresented minorities with higher-level degrees may have an advantage of ethnic differentiation when searching for jobs. Similarly, the underrepresented minorities' ability to stand out may lead to stronger demand for these candidates and, thus, higher earnings than their majority counterparts.

Further analysis of the correlations in 2007 and 2011 showed us that the correlation between degree and income for Blacks significantly increased, while the correlation for Non-

Blacks / Non-Hispanics had almost no change. The two biggest changes between the two years were (1) that participants aged from 27 to 31 and (2) the 2008 recession took place. In relation to the benefits of ethnic differentiation at each degree level, it is possible that the benefits of ethnic differentiation increased for from 2007 to 2011.

The increase in the benefits of ethnic differentiation for each degree level for both minorities and majorities could have been catalyzed by either the age difference or the 2008 recession. This means that as the NLSY97 cohort got older, individuals had more upside when mostly competing with other ethnicities than when mostly competing with his or her own ethnicity. Additionally, the 2008 recession may have exaggerated the benefits of ethnic differentiation as tough economic times enable recruiters to be more selective, which allows them to differentiate employees more.

In analyzing the mean differences between Blacks and Non-Blacks / Non-Hispanics, we see that there is no significant difference, signaling that the relationship between Log (Income) and degree for Blacks crosses over that of Non-Blacks / Non-Hispanics. Visually (Figure 1), we can see that a few education levels have a relatively large gap between the two groups, and that these gaps become more moderated in 2011 when compared to 2007.

In 2007, we generally see Blacks having lower salaries than Non-Blacks / Non-Hispanics in none, GED and high school education level, the lower end of the degree spectrum (Figure 1). We see Blacks having higher salaries than in Master's and Professional Degree education levels, the upper end of the degree spectrum. This cross of slopes suggests that Blacks may have a higher incentive to obtain higher degree levels than Non-Blacks / Non-Hispanics.

Blacks and Hispanics analysis. Our analysis with Blacks and Hispanics as the minority group and Non-Blacks / Non-Hispanics as the comparison group failed to support Hypothesis 2.

Similar to our results for Blacks Only, although our results for Blacks and Hispanics showed that the relationship between income and degree level was different for Blacks and Hispanics (as a group) and Non-Blacks / Non-Hispanics, Non-Blacks / Non-Hispanics had the more modest or attenuated relationship between education and earnings.

In our second Univariate ANOVA (Table 8) with an interaction variable, we showed that Blacks and Hispanics (combined) and Non-Blacks / Non-Hispanics exhibited significantly different relationships between Log (Income) and Degree in 2011 but not in 2007. This signals that Blacks and Hispanics and Non-Blacks / Non-Hispanics may have different returns on education for each education level and that this difference expanded from 2007 to 2011. To further analyze the value of each slope, we ran correlations between Log (Income) and Degree for each ethnicity group and found that the slope is much greater for Blacks and Hispanics in 2011, but not in 2007.

Given the addition of Hispanics to the minority group in our correlation analysis, the reduction in returns on education for underrepresented minorities suggests that returns on education for Hispanics must be more similar to Non-Blacks / Non-Hispanics than Blacks. In terms of the potential explanation that we offered for our Blacks Only analysis, our results with Blacks and Hispanics shows that Hispanics' benefits of ethnic differentiation may be more moderated than that between Non-Blacks / Non-Hispanics and Blacks. The difference in the relationship between income and degree between Hispanics and Blacks shows that the two groups may need to be analyzed separately in order to fully understand the trends within Blacks and Hispanics.

In addition to the differences between the Blacks Only and Blacks and Hispanics (combined), our correlation analysis between Log (Income) and Degree showed some interesting

effects. Firstly, our minority group's correlation had a similar effect as in our Blacks Only analysis between 2007 and 2011 as it increased (but less than in our Blacks Only analysis). Secondly, Blacks and Hispanics' correlation went from being slightly less correlated than Non-Blacks / Non-Hispanics in 2007 to being slightly more correlated than Non-Blacks / Non-Hispanics in 2011.

Like our Blacks Only analysis above, the two biggest external events that changed in this period are (1) the aging of our participants from 27 to 31 and (2) the 2008 recession. Because Blacks and Hispanics' increase in the relationship between income and degree was more moderate between 2007 and 2011 than in our Blacks Only analysis, Hispanics must have had less of an increase than Blacks (acting more like Non-Blacks / Non-Hispanics). Thus, Blacks' increase in the relationship between income and degree must have created the increase effect for the entire minority group. Furthermore, since the Blacks and Hispanics group had a lower correlation than Non-Blacks / Non-Hispanics in 2007, Hispanics, by themselves, may have had a correlation that was even lower than Non-Blacks / Non-Hispanics in 2007. This could signal that Hispanics' income was less dependent on degree than Blacks or Non-Blacks / Non-Hispanics in 2007.

In analyzing the mean differences between Blacks and Hispanics and Non-Blacks / Non-Hispanics, we see that there is no significant difference, consistent with our linear regression analysis. Visually, we can see that a few education levels have a relatively large gap between the two groups. In both years, Blacks and Hispanics have greater Log (Income) for None, Associate / Junior College, Master's Degree and Professional Degree. Non-Blacks / Non-Hispanics have substantially higher Log (Income) for the GED education level. These results suggest that, on the lower end of the education spectrum, Blacks and Hispanics may be incentivized to have either

None or a High School Diploma because a GED yields a low return on education both in absolute terms and relative to Non-Blacks / Non-Hispanics.

GENERAL DISCUSSION

When we combine the results of our two studies, we find a few similarities, but more discrepancies. From Study 1, we showed that at NYU Stern Minority Status was a predictor of significantly lower earnings after graduation. However, Study 2 showed that, in the NLSY, Blacks have more incremental return on education level than Non-Blacks / Non-Hispanics and that when Blacks and Hispanics are combined into a single minority group, there is no significant difference in their relationship between Log (Income) and Degree when compared to that of Non-Blacks / Non-Hispanics.

We believe that much of this discrepancy can be attributable to the noise in our NLSY sample. Whereas in the NYU Stern sample, we controlled for major, industry, and gender, we could not control for many preference related items in our NLSY sample. The students represented in this sample consisted of all majors, industries, schools, geographies within the United States, and socio-economic backgrounds.

Contrary to our wide NLSY sample size, our NYU Stern sample was narrowed so that we could view the effect of minority status more precisely. Not only did we control for major, industry, and gender, but we were also able to control for other preferences by taking a sample from a specific school. By taking a sample for NYU Stern, we control for business majors, rough socio-economic background (as they would need to have a certain profile to attend the school), and university preference. Additionally, by testing for post-graduation employment information, we avoided analyzing undergraduate business students who did not receive a job offer or chose to not work full-time after graduation.

Based on our results and discrepancies, we believe that much more research can be done on the return on education for underrepresented minorities in order to see minority status's effect on future earnings.

Research Implications

Because Study 1 concluded two potential causes (recruiting discrimination and skills gap) for why minority status was a significant predictor of Salary, we believe that a future research study may be appropriate to distinguish the effects of these two causes. To do this, a future study could seek similar data from NYU Stern or another school and control for college entry variables, such as SAT score or high school GPA. If these variables are controlled for and Minority Status remains a significant predictor of post-graduate earnings, then it is more possible that recruiting discrimination is the primary cause of the gap in earnings. If college entry variables are controlled for and Minority Status is then no longer a significant predictor of post-graduate earnings, then it is more possible that a skills gap exists between underrepresented minorities and other ethnicities at the sampled institution. By controlling for college entry variables, a study could determine if the earnings gap was caused by recruiting discrimination or a skills gap between underrepresented minorities and other ethnicities.

Our results from Study 2 showed us that Hispanics' relationship between Log (Income) and Degree sometimes act more similar to Non-Blacks / Non-Hispanics than Blacks, signaling that the two underrepresented minorities may need to be analyzed separately. More specifically, whereas we showed that Blacks' correlation between Log (Income) and Degree was significantly higher than that of Non-Blacks / Non-Hispanics in 2007 and 2011, the combined Blacks and Hispanics correlation between Log (Income) and Degree was lower than that of Non-Blacks / Non-Hispanics in 2007. Further research could examine the relationships between Log (Income)

and Degree for different underrepresented ethnicities that are usually grouped in the "underrepresented minority" group. Significant differences in this relationship within the minority group could justify splitting the group into components when analyzing its differences compared to other ethnicities. By splitting the underrepresented minority group, studies could avoid missing effects that do not appear when combining all underrepresented minorities into one group.

In addition to research that could help us further understand the results from Study 1 and Study 2 individually, we believe that further research could also help explain the discrepancies between the two studies. Because our NYU Stern data was, theoretically, a subset of the NLSY data, it would be helpful to gather more information to divide the NLSY data into micro samples. Micro samples would help us determine the trends within specific majors, schools, industries, and other preferences so that we can analyze how return on education for underrepresented minorities differs among subsets.

Practical Implications

For the individual underrepresented minority, *Patterns of Success* provides insight into future earnings expectations for each degree level. Underrepresented minorities may be able to use our results from the NYU Stern data to gain awareness of the discrepancies between underrepresented minorities and other ethnicities in post-graduate earnings when choosing which college to attend. Furthermore, our results from Study 2 could provide insight into expected earnings for each degree level. Study 2 provide evidence to support the pursuit of Master's or Professional Degrees as the return on these levels of education for underrepresented minorities are relatively higher than that for other ethnicities.

For employers, *Patterns of Success* may provide insight on how certain ethnicities are underpaid or overpaid in the job market for each degree level. For example, from our Study 2 results, we discovered that Blacks with lower education may be paid less than comparable Non-Blacks / Non-Hispanics but those with higher education may be paid more than comparable Non-Blacks / Non-Hispanics. Recruiters are concerned with return on investment for each employee, but they can be constrained by the market wage. Therefore, recruiters may get a higher return on investment by hiring minority group members for positions that require lower education levels, and hiring majority group members for positions that require higher education levels. By analyzing how others have been paying employees, recruiters may be able to distribute payroll more efficiently.

Given the post-graduate earnings trend between Blacks and Non-Blacks / Non-Hispanics, we acknowledge that other factors may be involved, making it unwise to hire based on degree and ethnicity alone. For example, certain socio-economic, skill sets, preference, and academic performance factors may cause or partially cause the separate earnings trends between Blacks and Non-Blacks / Non-Hispanics. Therefore, we would advise our return on education trends to be only partially involved when making hiring decisions.

In additional to employer implications, we believe that educational institutions, especially colleges, may gain the most insight from the findings we present here. Because Study 1 shows that underrepresented minorities may not be earning as much after attending NYU Stern as other ethnic groups, the school should consider providing these earnings statistics to applicants (given that many only supply median information), if further research suggests that colleges uses "special considerations" admission policies. Additional statistics about how underrepresented

minorities perform would provide a more accurate picture of what an underrepresented minority student should expect when attending that educational institution.

In addition to providing more earnings statistics, NYU Stern could consider providing programs that focus on helping students who perform towards the bottom of the class, allowing all students to have an equal opportunity when pursuing post-graduation jobs. Due to the low teacher-student ratio in lectures, often times, professors can only teach the top of the class or the bottom of the class, leaving out one group of students. Study 1 results may be an example of NYU Stern teaching to the top of the class, leaving underrepresented minorities behind and preventing them from reaping the full benefits of NYU Stern. Programs that aid students who perform towards the bottom of the class may lower the variance in post-graduate earnings between underrepresented minorities and other ethnicities.

If further research shows that minority status can predict post-graduation earnings at other colleges or educational institutions, then the implications for NYU Stern may be relevant for other colleges or educational institutions. Other schools may also consider providing earnings statistics for underrepresented minorities and other ethnicities and implementing programs to help students who perform toward the bottom of the class.

Ultimately, *Patterns of Success* aspires to show that one form of education may not be best for all students and that some schools' emphasis on ethnically diverse student bodies may not benefit all groups of students the same way. Given that schools may admit underrepresented minorities of lower competencies to fit diversity quotas, an emphasis on diversity may actually lower underrepresented minorities' full earnings potential. Furthermore, median earnings statistics of these schools may be deceptive to underrepresented minorities as schools may not have the ability to well equip underrepresented minorities to reach their earnings benchmarks. By

realizing the earnings dichotomy between underrepresented minorities and other ethnicities, educational institutions may be able to better prepare underrepresented minorities for the workforce and the start of their careers.

APPENDIX

Appendix A – Stern Undergraduate Class of 2013 Survey Questions

1) Placement YES/NO
2) Major
3) Used Wasserman as Student YES/NO
4) Post-graduation, I am (placement detail)
5) Are you currently seeking full-time employment?
6) Which of the following best describes your situation?
7) STATUS: Seeking, Not Seeking, Placed
8) Job Title
9) Job Function
10) Industry
11) Which best describes your organization?
12) When did you accept this position?
13) Did/will you receive a signing bonus and/or money for relocation?
14) Bonus Amount
15) Salary
16) Is this your country of origin/home country?
17) How did you finally secure your current job?
18) How many job offers, including this one, did you receive before accepting this position?
19) When did you RECEIVE your FIRST offer
20) Graduate/post-bac program: Program Name
    a. Enrolled full-time or part-time

b. Field of Study

21) Are you planning on attending graduate school or a post-bachelor program in the next five years?

a. What do you plan to study?

22) Gender

23) Citizenship

24) Hispanic or Latino

25) Ethnicity

Appendix B – Bivariate Correlations with Office Status

APPENDIX B

Descriptive Statistics and Pearson Correlation Coefficients

Independent Variable	Mean	s.d.	1	2	3	4	5	6	7
1. Salary	61,594	14,510							
2. Total Salary	66,625	16,155	0.92*						
3. Minority Status	1.68	0.47	0.23*	0.28*					
4. Major Classification	1.24	0.43	-0.34*	-0.34*	-0.05				
5. Gender	1.58	0.49	0.18*	0.23*	0.05	-0.19*			
6. Post-Graduate Industry	1.67	0.47	0.38*	0.47*	0.08	-0.37*	0.16*		
7. Employer Rating	6.39	2.56	0.40*	0.51*	0.03	-0.31*	0.03	0.46*	
8. Job Status	1.61	0.49	0.35*	0.36*	0.03	-0.26*	0.19*	0.38*	0.29*

* Correlation is significant at the 0.01 level (2-tailed).

Office Status Coding: Back Office = 1; Front Office = 2

Appendix C – Logistic Regression Testing for Office Status Interaction

APPENDIX C
Results of Logistical Regression Models for Job Status

Independent Variable	Job Status
Constant	-2.565
	(0.068)
Gender	0.556*
	(0.045)
Post-Graduate Industry	1.186*
	(0.000)
Employer Rating	0.024
	(0.906)
Minority Status	-0.414
	(0.596)
Employer Rating * Minority Status	0.071
	(0.540)
Residual Degrees of Freedom	236

Note: Two-tailed standard errors are in parentheses.
*Significant to the 0.05 two-tailed p-value

Appendix D – Summary of Univariate and Multivariate Results for Income (Blacks, Hispanics, and Non-Blacks / Non-Hispanics as three separate ethnicity categories)

APPENDIX D
Summary of Univariate and Multivariate Results for Income

Analyses	Log (2007 Income)	Log (2011 Income)
Corrected Model	9.39*	9.63*
Intercept	5897.42*	7256.91*
Gender	51.29*	37.44*
Degree	15.55*	14.72*
Ethnicity	1.55	0.03
	(0.21)	(0.97)
Degree * Ethnicity	1.20	2.08
	(0.29)	(0.02)
N	806	865

* $p < .0001$

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