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College Major, Internship Experience, and Employment Opportunities: Estimates from a Résumé Audit

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Abstract

We use experimental data from a résumé-audit study to estimate the impact of particular college majors and internship experience on employment prospects. Our experimental design relies on the randomization of résumé characteristics to identify the causal effects of these attributes on job opportunities. Despite applying exclusively to business-related job openings, we find no evidence that business degrees improve employment prospects. Furthermore, we find no evidence linking particular degrees to interview-request rates. By contrast, internship experience increases the interview-request rate by about 14 percent. In addition, the “returns” to internship experience are larger for non-business majors than for business majors.

JEL categories: J23, J24, J60

Key words: college major, internship, employment, field experiments, correspondence studies, résumé audit

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1 Introduction

The reduction in initial employment opportunities for recent college graduates brought about by the last recession has led many policymakers, researchers, and prospective students to question the value of a college education. Popular internet newsboards regularly feature articles that reference academic research on the projected labor-market demand for and life satisfaction associated with certain undergraduate degrees. However, such information on degree choice might be influenced by those who advertise on the same webpages that feature the articles.¹

A large literature exists on the effects of college attendance, university quality, and degree choice on labor-market outcomes (e.g., Oreopoulos and Petronijevic 2013; Altonji, Blom, and Meghir 2012). However, the literature primarily focuses on life-cycle earnings and human-capital acquisition rather than the effects of degree choice on labor demand (e.g., see Altonji, Blom, and Meghir 2012). These studies also share a common limitation: the choice of academic major could be driven by unobservables that make individuals more or less likely to have success in the labor market.

Our study adds to the literature estimates of firms' demand for job seekers with degrees in particular areas (e.g., business versus non-business). We implement an experimental design that circumvents the identification issues in previous studies by randomly assigning academic majors to fictitious job applicants. Our large-scale field experiment consists of submitting over 9000 randomly-generated résumés to online job openings in banking, finance, management, marketing, insurance and sales. The following academic majors are randomly assigned to job applicants: accounting, biology, economics, english, finance, history, management, marketing, and psychology. We chose these academic majors because they are common degree choices among college students. Because we apply exclusively for jobs in

¹For example, see the article and corresponding advertisements in the find-a-program tabs through the following webpage: http://education.yahoo.net/articles/avoid_these_majors.htm.

business categories, we are particularly interested in whether the business degrees, i.e. accounting, economics, finance, management and marketing, generate better job opportunities than non-business degrees, i.e. biology, english, history, and psychology.²

Another important feature of our experiment is the random assignment of internship experience to a portion of the fictitious job seekers. The National Association of Colleges and Employers' (NACE) 2011 survey indicates that over 50 percent of graduating seniors had worked as interns at some point while completing their degrees.³ To our knowledge, the economics literature has yet to focus on labor-market consequences associated with internship experience.⁴ We believe that the absence of studies aimed at studying the impact of internship experience on labor-market outcomes is due to either the lack of data or the complications associated with identification. In the latter case, it is likely that high-ability students are more likely to obtain internships and would also tend to have greater success in the labor market. As such, a source of exogenous information or a structural model is needed in order to identify the effect of internship experience on employment outcomes. In our experiment, the random assignment of internship experience circumvents this problem, allowing us to identify the causal effect of internship experience on job opportunities.

Despite applying exclusively to business-related job openings, we find no evidence that employers prefer to interview job seekers with business degrees over applicants with non-business degrees. In addition, there is no advantage, in terms of job opportunities, associated with a particular degree; that is, students with particular business degrees (e.g., finance, marketing) fare no better than students with particular non-business degrees (e.g., english, psychology). However, we find strong evidence that internship experience improves em-

²It is not clear how to classify economics degrees, as it is a social science and many economics departments are housed outside of business schools. We check the robustness of our estimates by including economics in the non-business degree category, but the estimates are not sensitive to this reclassification.

³For more details, visit the following webpage: <http://www.schools.com/news/survey-majority-of-internships-done-by-college-class-of-2011-were-paid.html>.

⁴Knouse, Tanner, and Harris (1999) use survey data to estimate the effect of internships on employment outcomes. They find that internships increase employment opportunities for business majors; however, they also find that those who receive internship experience had significantly higher grade point averages, which suggests there may be estimation problems associated with self selection.

employment prospects in economically and statistically significant ways. Applicants who were assigned a three-month internship (Summer 2009) before they graduated with their Bachelor’s degrees (May 2010) receive about 14 percent more interview requests than those who were not assigned internship experience. The “return” to internship experience is quite large for both business and non-business majors, but it is economically larger for non-business-degree holders than that for business-degree holders. To our knowledge, our study provides the first set of estimates based on experimental data regarding the demand for job seekers with particular college degrees and internship experience. More research is needed to better understand the channels through which college degrees and internship experience affect employment prospects.

2 Experimental Design

From January 2013 through the end of July 2013, we submitted approximately 9400 randomly-generated, fictitious résumés to online job openings in the following job categories: banking, finance, insurance, management, marketing and sales. Résumés were submitted in the following cities: Atlanta, GA, Baltimore, MD, Boston, MA, Dallas, TX, Los Angeles, CA, Minneapolis, MN and Portland, OR. The attributes listed on the résumés were randomly assigned to job seekers using the résumé-randomizer developed by Lahey and Beasley (2009).

For each job advertisement, four résumés were submitted. The following characteristics were assigned to the fictitious job seekers: a name, a street address, a university where they completed their Bachelor’s degree,⁵ an academic major, (un)employment status, whether they report their grade point average (GPA), whether the applicant graduated with an Honor’s distinction, the type of work experience the applicant obtained after completing their degree, and whether the applicant obtained internship experience while completing

⁵It is important to point out that the universities that we used for this résumé attribute are likely recognizable to prospective employers, but it is unlikely that the universities would be regarded as prestigious. In our regressions, we find that the interview rates do not vary between the four universities assigned to applicants.

their degree. In the next paragraph, we describe the résumé characteristics that are the focus of this study (i.e. college major and internship experience). The other résumé characteristics mentioned above are described in Appendix B.⁶

The first résumé characteristic that is the focus of this study is college major. Applicants are randomly assigned one of the following majors: accounting, biology, economics, english, finance, history, management, marketing and psychology. Each of these majors are assigned with equal probability. The second résumé characteristic that is the focus of this study is internship experience. In our experiment, 25 percent of applicants are assigned an “in-field” internship that took place for three months during the summer (2009) prior to graduating with their Bachelor’s degrees (May 2010). In our context, “in field” means that the internship matches the job category. For example, internship experience is working as a(n) “Equity Capital Markets Intern” in the banking job category; “Financial Analyst” in the finance job category; “Insurance Intern” in the insurance job category; “Project Management Intern” or “Management Intern” in the management job category; “Marketing Business Analyst Intern” in the marketing job category; and “Sales Intern” or “Sales Future Leader Intern” in the sales job category. Internship experience and college majors are assigned independent of each other.

While the majority of the experiment is generated via the randomization of résumé characteristics, there are some features of the experiment that we had control over. First, all of the fictitious job seekers graduated in May 2010. Second, the fictitious job seekers have one job after graduating from college. Third, we applied to job openings in business-related job categories. Fourth, we only applied to jobs that (a) required the submission of a résumé to be considered for the opening and (b) did not require a certificate or special training.⁷

⁶Appendix B, which provides detailed information on the experiment, is organized as follows. Section B1 provides detailed information on each of the résumés characteristics; Section B2 provides examples of the résumés that were submitted to the job advertisements; and Section B3 details the process through which applications were submitted.

⁷With regard to (a), some job openings require that applicants complete a detailed firm-specific application. We did not submit résumés to these job advertisements for two reasons. First, the detailed application introduces unwanted variation into the experimental design that is difficult to hold constant across applicants. Second, the completion of detailed applications takes considerable time, and our objective was to

We measure employment opportunities by examining whether an applicant receives a request for an interview from a prospective employer, which follows other researchers who use the correspondence-audit framework (Baert et al. 2013; Bertrand and Mullainathan 2004; Carlsson and Rooth 2007; Eriksson and Rooth 2014; Kroft, Lange and Notowidigdo 2013; Lahey 2008; Oreopoulos 2011). We consider contact from a prospective employer an interview request when they call or email to (a) schedule an interview and (b) discuss the job opening in more detail. While the majority of the calls/emails received from employers are classified as interview requests, there are a few instances in which the proper way to code the inquiry from employers was unclear.⁸ However, our estimates are not sensitive to ways in which these questionable calls/emails are treated.

Table 1 presents the interview rates for applicants with all types of degrees (column 1); business degrees (column 2); and non-business degrees (column 3). Table 1 is divided into three panels. Panel A presents the interview rates for applicants with and without internship experience; Panel B presents the interview rates for applicants without internship experience; and Panel C presents the interview rates for applicants with internship experience. From Panel A, the overall interview rate for business and non-business majors is 16.6 percent; the interview rate for business majors is 17.0 percent; and the interview rate for non-business majors is 16.2 percent. As a result, there appears to be little difference in the interview rates between business and non-business majors. Indeed, the interview differential between business and non-business majors is not statistically different from zero. From Panel B, a similar pattern is observed: the interview rates for business majors without internship experience are slightly higher than that of non-business majors without internship experience (16.7 percent versus 15.3 percent). In this case, the differential in interview rates between

generate as many data points as possible at the lowest possible cost.

⁸Seventeen calls/emails, in particular, were difficult to classify in the “interview” or “non-interview” categories. These unclear “callbacks” consisted of employers asking whether the applicants were interested in other positions; requesting salary requirements; asking whether the applicants were interested in part- or full-time work; and inquiring about location preferences. In addition, there were 108 “callbacks” in which all four applicants that were submitted to an advertisement received an call/email from employers. These 108 cases could be due to an automated response, or such callbacks could be non-discriminatory. Our estimates are not sensitive to the ways in which these 125 employer responses are coded.

business and non-business majors is larger, but it is not statistically significant. From Panel C, the overall interview rate for business and non-business majors with internship experience is 18.4 percent, and non-business majors with internship experience have an interview rate of 19 percent compared with 17.9 percent for business majors with internship experience. In this case, the interview rate for non-business majors with internship experience is economically larger than that for business-majors, but, again, the difference between the two is not statistically different from zero.

3 Results

The results section is divided into three subsections. Section 3.1 examines the impact of college major on job opportunities; Section 3.2 examines the impact of internship experience on job opportunities; and Section 3.3 examines whether there are interaction effects between college major and internship experience.

3.1 College Majors and Job Opportunities

In this subsection, we investigate the impact of college major on job opportunities. We begin by estimating the following regression model:⁹

$$interview_{imcfj} = \beta_0 + \beta_1 bus_i + \theta \mathbf{X}_i + \phi_m + \phi_c + \phi_f + \phi_j + u_{imcfj}. \quad (1)$$

The subscripts i , m , c , f , and j index applicants, month of application, the city where the application was submitted, the job category/field in which the application was submitted and the job for which the application was submitted, respectively. The variable *interview* is a zero-one indicator that equals one when an applicant receives an interview request and zero

⁹All regression models are estimated using linear probability models. However, we check the robustness of the marginal effects by estimating logit/probit specifications, finding similar results. In addition, standard errors are clustered at the job-advertisement level in all model specifications.

otherwise; *bus* is a zero-one indicator that equals one when an applicant is assigned a business degree (i.e. accounting, economics, finance, management or marketing) and zero otherwise;¹⁰ \mathbf{X} is a vector of résumé characteristics that are randomly assigned to applicants;¹¹ ϕ_m , ϕ_c , ϕ_f and ϕ_j represent dummy variables for the month the résumé was submitted, the city where the résumé was submitted, the job category that describes the job opening (i.e. banking, finance, insurance, management, marketing and sales), and the job advertisement, respectively. The β_0 , β_1 and θ are parameters to be estimated. We are particularly interested in the parameter β_1 , which gives the average difference in the interview rate between applicants with business degrees and applicants with non-business degrees.

Table 2 shows the estimates for β_1 from equation 1. There are six columns of estimates presented in Table 2, which vary based on the control variables that are included in the regression models. The estimates in column 1 include no control variables; the estimates in column 2 condition on \mathbf{X} ; the estimates in column 3 condition on \mathbf{X} and ϕ_m ; the estimates in column 4 condition on \mathbf{X} , ϕ_m and ϕ_c ; the estimates in column 5 condition on \mathbf{X} , ϕ_m , ϕ_c and ϕ_f ; and the estimates in column 6 condition on \mathbf{X} , ϕ_m , ϕ_c , ϕ_f and ϕ_j . The estimates for β_1 are remarkably stable as control variables are successively added to the regression models. We find no evidence of a statistically significant link between business degrees and interview rates. Furthermore, the practical size of the estimated differential is small and (likely) economically insignificant.

The estimates presented in Table 2 suggest that business degrees do not materially affect employment prospects, despite applying exclusively for business-related jobs. However, it is possible that particular business degrees yield better job opportunities than particular non-business degrees. Our next specification examines this possibility. Formally, we estimate the

¹⁰As a robustness check, we estimate equation 1 with economics included in the non-business degree, given that many economics departments are housed outside of business schools. However, in the majority of cases, economics departments service business schools by teaching courses in the business curriculum. It is also possible (perhaps likely) that the prospective employers in our sample view economics as a business-related degree. In any case, the estimates are not sensitive to this alternative coding of the *bus* variable.

¹¹Detailed information on the résumé attributes is provided in Section 2 and Appendix Section B1.

following regression equation:

$$\begin{aligned}
\text{interview}_{imcfj} = & \beta_0 + \beta_1 \text{bio}_i + \beta_2 \text{eng}_i + \beta_3 \text{hist}_i + \beta_4 \text{psych}_i \\
& + \gamma_1 \text{actg}_i + \gamma_2 \text{fin}_i + \gamma_3 \text{mgt}_i + \gamma_4 \text{mkt}_i \\
& + \theta \mathbf{X}_i + \phi_m + \phi_c + \phi_f + \phi_j + u_{imcfj}.
\end{aligned} \tag{2}$$

The subscripts i , m , c , f and j and the variables interview , \mathbf{X} , ϕ_m , ϕ_c , ϕ_f , ϕ_j and u are defined above. The variable bio is a zero-one indicator that equals one when an applicant is assigned a degree in biology and zero otherwise; eng is a zero-one indicator that equals one when an applicant is assigned a degree in english and zero otherwise; hist is a zero-one indicator that equals one when an applicant is assigned a degree in history and zero otherwise; psych is a zero-one indicator that equals one when an applicant is assigned a degree in psychology and zero otherwise; actg is a zero-one indicator that equals one when an applicant is assigned a degree in accounting and zero otherwise; fin is a zero-one indicator that equals one when an applicant is assigned a degree in finance and zero otherwise; mgt is a zero-one indicator that equals one when an applicant is assigned a degree in management and zero otherwise; and mkt is a zero-one indicator that equals one when an applicant is assigned a degree in marketing and zero otherwise. The base category in equation 2 is *econ*, which is a zero-one indicator that equals one when an applicant is assigned a degree in economics and zero otherwise. Because we are interested in creating an exhaustive set of comparisons between applicants with particular business degrees and applicants with particular non-business degrees, we can use the parameter estimates from equation 2 to construct linear combinations of parameters with standard errors computed using the delta method.¹² For example, the average difference in the interview rate between applicants with history degrees relative to applicants with management degrees is $\beta_3 - \gamma_3$. As another example, the average difference in the interview rate between applicants with psychology degrees and applicants

¹²In particular, we obtain the estimates for the linear combinations using the `lincom` command in STATA.

with finance degrees is $\beta_4 - \gamma_2$.¹³

Table 3 presents the estimated interview differentials between each non-business degree and each business degree.¹⁴ Equation 2 and the linear combinations of parameters described above and in Appendix Table A1 are used to produce the estimates in Table 3. Rather than comment on each of the estimates, it is sufficient to note that none of the academic majors give job seekers an advantage in terms of job opportunities; that is, none of the estimated interview differentials between the particular non-business and business degrees are statistically significant.¹⁵ The size of the estimated interview differentials vary depending on the comparison being made. For the most part, the estimated differentials are unlikely to be economically significant, as the majority of the estimates are less than 1.5 percentage points (in absolute value). But there are a few exceptions.

Given that we apply to jobs across six different categories, it is possible that the “match” between degree and job category matters. Our strategy to investigate this possibility is to create a new variable that captures this idea. In particular, we estimate the following regression model:

$$interview_{imcfj} = \beta_0 + \beta_1 match_i + \theta \mathbf{X}_i + \phi_m + \phi_c + \phi_f + \phi_j + u_{imcfj}. \quad (3)$$

The subscripts i , m , c , f and j and the variables *interview*, \mathbf{X} , ϕ_m , ϕ_c , ϕ_f , ϕ_j and u are defined above. The variable *match* is a zero-one dummy variable that equals one when the applicant’s degree matches the job category. We use four different codings of the variable

¹³Table A1 presents the remainder of the parameters and linear combinations of parameters of interest. The parameters and linear combinations of parameters presented in Table A1 correspond to the estimates presented in Table 3. Equivalently, we could change the base category and re-estimate equation 2 so that an exhaustive set of comparisons could be made.

¹⁴The comparisons between particular business degrees (e.g., marketing versus finance) are presented in Appendix Table A2, while the comparisons between particular non-business degrees (e.g., history versus psychology) are presented in Appendix Table A3. The estimates presented in Tables A2 and A3 indicate no statistical differences in the interview rates between the particular degrees.

¹⁵When comparing the interview rates between applicants with specific degrees, the sizes of those cells are quite a bit smaller than those for the business versus non-business degree comparisons. However, given that each degree was assigned with a 1/9 probability, there are over 1000 observations for each degree. Thus, it is unlikely that the lack of statistical significance of the estimated differentials in Table 3 is due to small sample sizes.

match in an attempt to gauge the sensitivity of the estimates. The first measure codes *match* equal to one when the applicant’s degree is finance or economics in the banking and finance job categories; when the applicant’s degree is management in the management job category; and when the applicant’s degree is marketing in the marketing and sales job categories. The second measure codes *match* equal to one when the applicant’s degree is finance or economics in the banking, finance and insurance job categories; when the applicant’s degree is management in the management job category; and when the applicant’s degree is marketing in the marketing and sales job categories. The third measure codes *match* equal to one when the applicant’s degree is finance or economics in the banking and finance job categories; when the applicant’s degree is management in the management job category; and when the applicant’s degree is marketing in the marketing job category. The fourth measure codes *match* equal to one when the applicant’s degree is finance or economics in the banking, finance and insurance job categories; when the applicant’s degree is management in the management job category; and when the applicant’s degree is marketing in the marketing job category. The estimate for β_1 gives the average difference in the interview rate for applicants whose degrees match the job category and applicants whose degrees do not match the job category.

Table 4 presents the estimates from equation 3. Column (1) presents the estimates using the first definition of the *match* variable; column (2) presents the estimates using the second definition of the *match* variable; column (3) presents the estimates using the third definition of the *match* variable; and column (4) presents the estimates using the fourth definition of the *match* variable. While the size of the parameter estimates varies depending on the definition of the *match* variable, none of the estimated interview differentials are statistically different from zero. Similar to the estimates presented in Table 3, it is also difficult to argue that the size of the estimated interview differentials based on the *match* variable are practically important (i.e. less than 1.5 percentage points in absolute value).

3.2 Internship Experience and Job Opportunities

In this subsection, we analyze the impact of internship experience while completing one’s degree on employment opportunities. Our baseline regression model is

$$interview_{imcfj} = \beta_0 + \beta_1 intern_i + \theta \mathbf{X}_i + \phi_m + \phi_c + \phi_f + \phi_j + u_{imcfj}. \quad (4)$$

The subscripts i , m , c , f and j and variables $interview$, \mathbf{X} , ϕ_m , ϕ_c , ϕ_f , ϕ_j and u are defined above. The variable $intern$ is a zero-one indicator that equals one when an applicant has internship experience and zero otherwise. The parameter β_1 gives the average difference in the interview rate between applicants with internship experience and applicants without internship experience.

There are six columns of results presented in Table 5, which vary based on the control variables that are held constant. In particular, we begin with a simple bivariate model that includes no controls (column 1), add résumé-specific controls (\mathbf{X}) (column 2), add the month-of-application dummy variables (ϕ_m) (column 3), add the city-of-application dummy variables (ϕ_c) (column 4), add the job-category dummy variables (ϕ_f) (column 5), and add the job-advertisement dummy variables (ϕ_j) (column 6). We find strong evidence that internship experience improves employment opportunities: applicants with internship experience have interview-request rates that are 14 percent (about 2.2 percentage points) higher than that for applicants without internship experience. The estimated impact of internship experience on employment opportunities is quite stable as control variables are successively added to the regression equation. The estimates in each of the six columns are statistically significant at the 0.1 percent level.

In Table 6, we present estimates for the impact of internship experience on job opportunities based on a variant of equation 4 which includes an interaction between $intern$ and the

job category (ϕ_f). Formally, we estimate the following regression equation:

$$\begin{aligned} interview_{imcfj} = & \beta_0 + \beta_1 intern_i + \sum_f \lambda_f intern_i \times \phi_f \\ & + \theta \mathbf{X}_i + \phi_m + \phi_c + \phi_f + \phi_j + u_{imcfj}. \end{aligned} \quad (5)$$

The subscripts i , m , c , f and j and variables $interview$, $intern$, \mathbf{X} , ϕ_m , ϕ_c , ϕ_f , ϕ_j and u are defined above. The parameter β_1 gives the average difference in the interview rate between applicants with and without internship experience in the job category not included in ϕ_f , while the linear combination of parameters $\beta_1 + \lambda_f$ gives the average difference in the interview rate between applicants with and without internship experience in the non-omitted job categories.¹⁶ The estimates for β_1 and the linear combinations $\beta_1 + \lambda_f$ are presented in Table 6. For the most part, we find evidence of better job opportunities for applicants with internship experience across all job categories, except in the banking and marketing job categories (columns 1 and 5).¹⁷ Applicants with internship experience have a 2.9 percentage point higher interview rate in the finance job category (column 2); a 2.8 percentage point higher interview rate in the insurance job category (column 3); a 3.0 percentage point higher interview rate in the management job category (column 4); and a 2.6 percentage point higher interview rate in the sales job category (column 6). The estimates in columns (2), (3), and (6) are statistically significant at the 10-, one-, and 10-percent levels, respectively. Although estimated differential in column (4) is not statistically significant, internship experience has the largest economic impact in this job category.

¹⁶Our specification of equation 5 treats job openings in insurance as the omitted category. Thus, β_1 gives the average difference in the interview rate between job seekers with and without internship experience in the insurance job category. The linear combinations $\beta_1 + \lambda_f$ capture the effects of internship experience in the remaining five job categories (i.e. banking, finance, management, marketing and sales).

¹⁷In the banking and marketing job categories, the lack of finding statistical evidence of interview differentials between applicants with and without internship experience does not appear to reflect small sample sizes, as the coefficient estimates do not appear to be important in an economic sense (0.001 in banking and -0.002 in marketing).

3.3 College Majors, Internships and Job Opportunities

3.3.1 Business Degrees, Non-Business Degrees and Internships

In this subsection, we examine interactions between particular college degrees and internship experience. We begin by estimating the following regression model:

$$\begin{aligned} interview_{imcfj} = & \beta_0 + \beta_1 bus_i + \beta_2 intern_i + \beta_3 bus_i \times intern_i \\ & + \theta \mathbf{X}_i + \phi_m + \phi_c + \phi_f + \phi_j + u_{imcfj}. \end{aligned} \tag{6}$$

The subscripts i , m , c , f and j and variables $interview$, bus , $intern$, \mathbf{X} , ϕ_m , ϕ_c , ϕ_f , ϕ_j and u are defined above. We are primarily interested in the parameter β_2 , the linear combination of parameters $\beta_2 + \beta_3$, and the difference-in-differences estimator β_3 . The parameter β_2 gives the average difference in the interview rate between applicants with and without internship experience who have non-business degrees; the parameter combination $\beta_2 + \beta_3$ gives the average difference in the interview rate between applicants with and without internship experience who have business degrees; and the parameter β_3 gives the estimated gap in employment opportunities between business majors with and without internship experience and non-business majors with and without internship experience. The aforementioned estimates are presented in Table 7. Column (1) presents the estimates for β_2 ; column (2) presents the estimates for $\beta_2 + \beta_3$; and column (3) presents the estimates for β_3 . Non-business degree majors with internship experience have a 20 percent (about 3.2 percentage points) higher interview rate than their non-business-degree counterparts without internship experience (column 1). Business majors with internship experience have an 8 percent (about 1.4 percentage points) higher interview rate than business majors without internships experience (column 2). The estimated interview differential based on internship status is about 11-12 percent (about 1.8 percentage points) larger for non-business majors than that for business majors, but it is not statistically different from zero (column 3).

3.3.2 Specific Degrees and Internships

Because there could be differences in the “return” to internships based on particular college majors, we estimate a regression model that interacts the particular academic degrees with internships experience. In order to investigate this, we estimate the following regression equation:

$$\begin{aligned}
interview_{imcfj} = & \beta_0 + \beta_1 bio_i + \beta_2 eng_i + \beta_3 hist_i + \beta_4 psych_i \\
& + \gamma_1 actg_i + \gamma_2 fin_i + \gamma_3 mgt_i + \gamma_4 mkt_i \\
& + \lambda_1 bio_i \times intern_i + \lambda_2 eng_i \times intern_i \\
& + \lambda_3 hist_i \times intern_i + \lambda_4 psych_i \times intern_i \\
& + \delta_1 actg_i \times intern_i + \delta_2 fin_i \times intern_i \\
& + \delta_3 mgt_i \times intern_i + \delta_4 mkt_i \times intern_i \\
& + \theta \mathbf{X}_i + \phi_m + \phi_c + \phi_f + \phi_j + u_{imcfj}.
\end{aligned} \tag{7}$$

The subscripts i , m , c , f and j and variables $interview$, $actg$, bio , eng , fin , $hist$, mgt , mkt , $psych$, $intern$, \mathbf{X} , ϕ_m , ϕ_c , ϕ_f , ϕ_j and u are defined above.¹⁸ As in equation 3, the base category is job seekers with economics degrees (i.e. *econ*). Using equation 7, we are interested in determining whether internship experience generates a larger “return” for each of the non-business degrees (i.e. biology, english, history and psychology) relative to each of the business degrees (accounting, economics, finance, management and marketing).

The estimates for the exhaustive set of business versus non-business degree comparisons for applicants with internship experience are presented in Table 8.¹⁹ It is important to point out that the standard errors for each of the estimated interview differentials are quite large. The inflated standard errors are due to the small numbers of observations in the cells of interest. We have slightly over 1000 observations for each major. Because internship experience was randomly assigned at a rate of 25 percent, we have roughly 250 applicants

¹⁸Note that the variable *intern* is included in \mathbf{X} instead of being explicitly written out in equation 7.

¹⁹We summarize the parameters and linear combinations of parameters used to produce the estimates presented in Table 8 in Appendix Table A4.

who have a given academic major with internship experience. Thus, when comparing two majors with internship experience, we have roughly 500 observations with which to conduct our empirical tests, which is about one-fourth the sample size when not factoring in whether applicants have internship experience or not. Due to the relatively smaller sample sizes within these cells, we emphasize that the estimates presented in Table 8 should be used as a way to gauge economic significance, not statistical significance.

Table 8 shows the interview differentials between applicants with non-business and business degrees who also have internship experience that is specific to the six job categories (i.e. banking, finance, insurance, management, marketing and sales). The columns of Table 8 vary based on the business degree used as the comparison group; that is, we compare the interview rates of biology, english, history and psychology majors with internship experience separately to those who have degrees in accounting, economics, finance, management and marketing with internship experience. Positive (Negative) coefficients indicate that the particular non-business degree generates a higher (lower) interview-request rate than the particular business degree chosen as the comparison. Rather than comment on each estimate, it is sufficient to note that it is generally the case that history and psychology, two degrees in the social sciences, generate economically larger interview rates than each of the business degrees. The only exception is finance, in which case the point estimate is positive but not large in a practical sense. As a result, the larger “return” to non-business majors with internship experience over that of business majors with internship experience (See Table 7) appears to be driven by the larger benefits conferred on psychology and history majors (not biology and english majors).²⁰

²⁰Appendix Tables A5 and A6 present the estimated interview differentials between particular-business-degree holders (e.g., finance versus accounting) with internship experience and particular-non-business-degree holders (e.g., english versus biology) with internship experience, respectively.

4 Conclusions

We conduct a resume-audit designed to study the impact of college majors and internship experience on job opportunities, which is measured via a request for an interview from prospective employers. Despite applying exclusively to business-related jobs, we find no evidence linking business degrees in general or particular business degrees to better job opportunities. However, we find strong evidence that internship experience has a large, positive effect on employment opportunities. Job seekers with internship experience, obtained while completing one's college degree, have interview rates approximately 14 percent higher than those without internship experience. The positive effects of internship experience are greater for those who obtain non-business degrees. These results suggest that the current literature on degree choice (e.g., Altonji, Blom, and Meghir 2004) should also consider work experience during college and other extra-curricular activities.²¹ It is important to note that we apply for and receive interview requests between three and four years after the applicants' college degrees were received and between four and five years since the applicants worked as interns in Summer 2009.

Our data suggest that college majors, assuming they have an immediate effect on initial placement for the industries that we targeted, no longer have an impact of interview-request rates three to four years after graduation. This is not the case for internship experience. We identify an economically important effect four to five years after the internship ended. These are interesting findings, but more research is needed to better understand the channels through which particular college majors and internship experience affect employment opportunities. The key question regarding the findings for internship experience is whether that attribute serves as a signal of ability or expected productivity or if it actually improves the productivity of workers. The internship could also serve as an indicator of a high-quality match between a firm and a job seeker (e.g., the applicant has worked in a bank as an intern

²¹Oreopoulos (2011), however, finds no evidence that extra-curricular activities have an impact on subsequent employment prospects.

and he/she has indicated a preference to continue working in the banking sector by applying years after the internship). One key estimation problem to overcome for future research is to control for the heterogeneity of internships, as in the literature on apprenticeships (e.g., Adda, Dustman, Meghir, and Robin. 2013; Fersterer, Pischke, Winter-Ebmer 2008). There are likely important interaction effects between degree choice, internship experience, and other extra-curricular activities that could be captured in future studies.

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Table 1: Summary Statistics

	Business and Non-business Degrees	Business Degrees	Non-business Degrees
	(1)	(2)	(3)
<i>Panel A: Overall</i>			
Interview Rate	16.6%	17.0%	16.2%
Observations	9396	5189	4207
<i>Panel B: Without Internships</i>			
Interview Rate	16.1%	16.7%	15.3%
Observations	7061	3875	3186
<i>Panel C: With Internships</i>			
Interview Rate	18.4%	17.9%	19.0%
Observations	2335	1314	1021

Table 2: Difference Between Business and Non-Business Degrees

	(1)	(2)	(3)	(4)	(5)	(6)
Business Degree	0.007 (0.008)	0.008 (0.008)	0.008 (0.008)	0.007 (0.008)	0.007 (0.008)	0.004 (0.007)
<i>Controls:</i>						
Résumé	No	Yes	Yes	Yes	Yes	Yes
Month	No	No	Yes	Yes	Yes	Yes
City	No	No	No	Yes	Yes	Yes
Category	No	No	No	No	Yes	Yes
Advertisement	No	No	No	No	No	Yes
R^2	0.001	0.006	0.008	0.019	0.045	0.724
Observations	9396	9396	9396	9396	9396	9396

Notes: Estimates are marginal effects from linear probability models. Standard errors clustered at the job-advertisement level are in parentheses. Columns (1)-(6) differ based on the control variables that are held constant. In column (1), we estimate a bivariate regression model that include no control variables; column (2) adds controls for the 'Résumé' characteristics; column (3) adds controls for the month in which the applications were submitted; column (4) adds controls for the city in which the applications were submitted; column (5) adds controls for the job category that describes the opening; and column (6) adds controls for the job advertisement.

Table 3: Differences Between Particular Business and Non-Business Degrees

	Base Category				
	Accounting	Economics	Finance	Management	Marketing
	(1)	(2)	(3)	(4)	(5)
Biology	-0.005 (0.013)	-0.018 (0.014)	-0.019 (0.013)	-0.010 (0.013)	-0.003 (0.014)
English	0.009 (0.013)	-0.004 (0.014)	-0.005 (0.013)	0.004 (0.013)	0.014 (0.014)
History	-0.008 (0.014)	-0.021 (0.014)	-0.023 (0.014)	-0.013 (0.014)	-0.000 (0.014)
Psychology	0.013 (0.013)	-0.004 (0.014)	-0.002 (0.014)	0.008 (0.013)	0.017 (0.014)
R^2	0.724	0.724	0.724	0.724	0.724
Observations	9396	9396	9396	9396	9396

Notes: Estimates are marginal effects from linear probability models. Standard errors clustered at the job-advertisement level are in parentheses. Columns (1)-(5) differ based on the college major that is used as the comparison group. Each column of estimates uses the full set of control variables (i.e. the résumé characteristics and the dummy variables for the month, city, job category and job advertisement).

Table 4: Impact of Degrees that Match the Job Category

	(1)	(2)	(3)	(4)
Match	0.005 (0.009)	0.013 (0.009)	0.003 (0.010)	0.014 (0.009)
R^2	0.724	0.724	0.724	0.724
Observations	9396	9396	9396	9396

Notes: Estimates are marginal effects from linear probability models. Standard errors clustered at the job-advertisement level are in parentheses. Columns (1)-(4) differ based on the definition of the "match" variable, which is discussed in the text. Each column of estimates uses the full set of control variables (i.e. the résumé characteristics and the dummy variables for the month, city, job category and job advertisement).

Table 5: Impact of Internship Experience

	(1)	(2)	(3)	(4)	(5)	(6)
Internship	0.023*** (0.006)	0.023*** (0.006)	0.023*** (0.006)	0.023*** (0.006)	0.023*** (0.006)	0.022*** (0.006)
<i>Controls:</i>						
Résumé	No	Yes	Yes	Yes	Yes	Yes
Month	No	No	Yes	Yes	Yes	Yes
City	No	No	No	Yes	Yes	Yes
Category	No	No	No	No	Yes	Yes
Advertisement	No	No	No	No	No	Yes
R^2	0.001	0.006	0.008	0.019	0.045	0.724
Observations	9396	9396	9396	9396	9396	9396

Notes: Estimates are marginal effects from linear probability models. Standard errors clustered at the job-advertisement level are in parentheses. *** indicates statistical significance at the 0.1 percent level. Columns (1)-(6) differ based on the control variables that are held constant. In column (1), we estimate a bivariate regression model that include no control variables; column (2) adds controls for the 'Résumé' characteristics; column (3) adds controls for the month in which the applications were submitted; column (4) adds controls for the city in which the applications were submitted; column (5) adds controls for the job category that describes the opening; and column (6) adds controls for the job advertisement.

Table 6: Impact of Internship Experience by Job Category

	Job Category					
	Banking	Finance	Insurance	Management	Marketing	Sales
	(1)	(2)	(3)	(4)	(5)	(6)
Internship	0.001 (0.016)	0.029+ (0.015)	0.028** (0.010)	0.030 (0.020)	-0.002 (0.023)	0.026+ (0.016)
R^2	0.724	0.724	0.724	0.724	0.724	0.724
Observations	9396	9396	9396	9396	9396	9396

Notes: Estimates are marginal effects from linear probability models. Standard errors clustered at the job-advertisement level are in parentheses. + and ** indicate statistical significance at the 10- and one-percent levels, respectively. Column (1) presents the difference in the interview between applicants with internship experience and applicants without internship experience without internships experience in the banking job category; column (2) presents the difference in the interview between applicants with internship experience and applicants without internship experience without internships experience in the finance job category; column (3) presents the difference in the interview between applicants with internship experience and applicants without internship experience in the insurance job category; column (4) presents the difference in the interview between applicants with internship experience and applicants without internship experience without internships experience in the management job category; column (5) presents the difference in the interview between applicants with internship experience and applicants without internship experience without internships experience in the marketing job category; and column (6) presents the difference in the interview between applicants with internship experience and applicants without internship experience without internships experience in the sales job category. Each column of estimates uses the full set of control variables (i.e. the résumé characteristics and the dummy variables for the month, city, job category and job advertisement).

Table 7: Impact of Internship Experience for Business and Non-Business Majors

	Non-Business Degree (1)	Business Degree (2)	Business Degree Relative to Non-Business Degree (3)
Internship	0.032** (0.011)	0.014+ (0.009)	-0.018 (0.015)
R^2	0.725	0.725	0.725
Observations	9396	9396	9396

Notes: Estimates are marginal effects from linear probability models. Standard errors clustered at the job-advertisement level are in parentheses. + and ** indicate statistical significance at the 10- and one-percent levels, respectively. Column (1) gives the estimated difference in the interview rate between non-business majors with internship experience and non-business majors without internship experience; column (2) gives the estimated difference in the interview rate between business majors with internship experience and business majors without internship experience; and column (3) gives the difference in interview rates between non-business majors with and without internship experience and business majors with and without internships experience. The estimate in column (3) is, in effect, a difference-in-differences estimator. The estimates in columns (1)-(3) are based on the same regression model, which uses the full set of control variables (i.e. the résumé characteristics and the dummy variables for the month, city, job category and job advertisement).

Table 8: Impact of Particular Business and Non-Business Degrees with Internships

	Business Degree Used As Comparison Group				
	Accounting	Economics	Finance	Management	Marketing
	(1)	(2)	(3)	(4)	(5)
Biology	0.006 (0.029)	-0.006 (0.029)	-0.022 (0.029)	-0.010 (0.029)	0.024 (0.030)
English	0.012 (0.033)	-0.000 (0.033)	-0.016 (0.032)	-0.004 (0.033)	0.029 (0.033)
History	0.038 (0.032)	0.026 (0.032)	0.009 (0.032)	0.021 (0.032)	0.056+ (0.033)
Psychology	0.032 (0.031)	0.032 (0.031)	0.003 (0.031)	0.016 (0.031)	0.050 (0.031)
R^2	0.725	0.725	0.725	0.725	0.725
Observations	9396	9396	9396	9396	9396

Notes: Estimates are marginal effects from linear probability models. Standard errors clustered at the job-advertisement level are in parentheses. + indicates statistical significance at the 10-percent level. Each column of estimates uses a different business degree as the base category (e.g., column 1 uses Accounting as the basis for comparison). The estimates in columns (1)-(5) are based on the same regression model, which uses the full set of control variables (i.e. the résumé characteristics and the dummy variables for the month, city, job category and job advertisement.)

For Review Purposes Only

Appendix A: Supplementary Tables

Table A1: Parameters and Linear Combinations of Parameters for Table 3

	Degree Used As Comparison Group				
	Accounting	Economics	Finance	Management	Marketing
	(1)	(2)	(5)	(7)	(8)
Biology	$\beta_1 - \gamma_1$	β_1	$\beta_1 - \gamma_2$	$\beta_1 - \gamma_3$	$\beta_1 - \gamma_4$
English	$\beta_2 - \gamma_1$	β_2	$\beta_2 - \gamma_2$	$\beta_2 - \gamma_3$	$\beta_2 - \gamma_4$
History	$\beta_3 - \gamma_1$	β_3	$\beta_3 - \gamma_2$	$\beta_3 - \gamma_3$	$\beta_3 - \gamma_4$
Psychology	$\beta_4 - \gamma_1$	β_4	$\beta_4 - \gamma_2$	$\beta_4 - \gamma_3$	$\beta_4 - \gamma_4$

Table A2: Differences Between Particular Business Degrees

	Degree Used As Comparison Group			
	Accounting	Economics	Finance	Management
	(1)	(2)	(3)	(4)
Economics	0.014 (0.013)	—	—	—
Finance	0.014 (0.013)	0.001 (0.013)	—	—
Management	0.005 (0.013)	-0.008 (0.013)	-0.010 (0.013)	—
Marketing	-0.005 (0.013)	-0.018 (0.014)	-0.019 (0.014)	-0.009 (0.013)
R^2	0.724	0.724	0.724	0.724
Observations	9396	9396	9396	9396

Table A3: Differences Between Particular Non-Business Degrees

	Degree Used As Comparison Group		
	Biology	English	History
	(1)	(2)	(3)
English	0.014 (0.013)	—	—
History	-0.003 (0.014)	-0.017 (0.014)	—
Psychology	0.013 (0.013)	0.004 (0.013)	0.020 (0.014)
R^2	0.724	0.724	0.724
Observations	9396	9396	9396

Table A4: Parameters and Linear Combinations of Parameters for Table 7

	Business Degree Used As Comparison Group				
	Accounting	Economics	Finance	Management	Marketing
	(1)	(2)	(3)	(4)	(5)
Biology	$\beta_1 + \lambda_1$ $-(\gamma_1 + \delta_1)$	$\beta_1 + \lambda_1$	$\beta_1 + \lambda_1$ $-(\gamma_2 + \delta_2)$	$\beta_1 + \lambda_1$ $-(\gamma_3 + \delta_3)$	$\beta_1 + \lambda_1$ $-(\gamma_4 + \delta_4)$
English	$\beta_2 + \lambda_2$ $-(\gamma_1 + \delta_1)$	$\beta_2 + \lambda_2$	$\beta_2 + \lambda_2$ $-(\gamma_2 + \delta_2)$	$\beta_2 + \lambda_2$ $-(\gamma_3 + \delta_3)$	$\beta_2 + \lambda_2$ $-(\gamma_4 + \delta_4)$
History	$\beta_3 + \lambda_3$ $-(\gamma_1 + \delta_1)$	$\beta_3 + \lambda_3$	$\beta_3 + \lambda_3$ $-(\gamma_2 + \delta_2)$	$\beta_3 + \lambda_3$ $-(\gamma_3 + \delta_3)$	$\beta_3 + \lambda_3$ $-(\gamma_4 + \delta_4)$
Psychology	$\beta_4 + \lambda_4$ $-(\gamma_1 + \delta_1)$	$\beta_4 + \lambda_4$	$\beta_4 + \lambda_4$ $-(\gamma_2 + \delta_2)$	$\beta_4 + \lambda_4$ $-(\gamma_3 + \delta_3)$	$\beta_4 + \lambda_4$ $-(\gamma_4 + \delta_4)$

Table A5: Differences Between Particular Business Degrees
for Applicants with Internship Experience

	Degree Used As Comparison Group			
	Accounting	Economics	Finance	Management
	(1)	(2)	(3)	(4)
Economics	0.012 (0.026)	—	—	—
Finance	0.028 (0.025)	0.016 (0.026)	—	—
Management	0.016 (0.025)	0.004 (0.025)	-0.012 (0.024)	—
Marketing	-0.018 (0.027)	-0.030 (0.027)	-0.046+ (0.027)	-0.034 (0.026)
R^2	0.724	0.724	0.724	0.724
Observations	9396	9396	9396	9396

Table A6: Differences Between Particular Non-Business Degrees
for Applicants with Internship Experience

	Degree Used As Comparison Group		
	Biology	English	History
	(1)	(2)	(3)
English	0.006 (0.028)	—	—
History	0.032 (0.028)	0.026 (0.031)	—
Psychology	0.026 (0.027)	0.020 (0.030)	0.016 (0.031)
R^2	0.724	0.724	0.724
Observations	9396	9396	9396

Appendix B: Data Appendix

B1 Résumé Characteristics

While details on the résumé characteristics are provided in what follows, Table B1 summarizes the variable names, definitions and provides the means of the variables. Some of the variables are omitted from Table B1 (e.g., university that the applicant graduated from) per our agreement with our respective institution review boards.

Applicant Names

Following the work of other correspondence studies (e.g., Bertrand and Mullainathan 2004; Carlsson and Rooth 2007; Nunley et al. 2011), we randomly assign names to applicants that are distinct to a particular racial group. For our purposes, we chose eight names: Claire Kruger, Amy Rasumussen, Ebony Booker, Aaliyah Jackson, Cody Baker, Jake Kelly, DeShawn Jefferson, and DeAndre Washington. Claire Kruger and Amy Rasmussen are distinctively white female names; Ebony Booker and Aaliyah Jackson are distinctively black female names; Cody Baker and Jake Kelly are distinctively white male names; and DeShawn Jefferson and DeAndre Washington are distinctively black male names. The first names and surnames were taken from various websites that list the most female/male and the blackest/whitest names. The Census breaks down the most common surnames by race, and we chose our surnames based on these rankings.¹ The whitest and blackest first names, which are also broken down by gender come from the following website: <http://abcnews.go.com/2020/story?id=2470131&page=1>. The whitest and blackest first names for males and females are corroborated by numerous other websites and the baby name data from the Social Security Administration.

The names listed above are randomly assigned with equal probability. Once a name has been randomly assigned within a four-applicant group (i.e. the number of résumés we submit

¹Here is the link to the most common surnames in the U.S.: <http://www.census.gov/genealogy/www/data/2000surnames/index.html>.

per job advertisement), that name can no longer be assigned to the other applicants in the four-applicant pool. That is, there can be no duplicate names within a four-applicant pool.

We created an email address and a phone number for each name, which were all created through <http://gmail.com>. Each applicant name had an email address and phone number that is specific to each city where we applied for jobs. As an example, DeAndre Washington had seven different phone numbers and seven different email addresses. For each city, we had the emails and phone calls to applicants within a particular city routed to an aggregated Google account, which was used to code the interview requests.

Street Address

Four street addresses were created for each city. The addresses are created by examining house prices in and around the city in which the applications are submitted. Two of these addresses are in high-socioeconomic-status areas, while the other two are in low-socioeconomic-status areas. High-socioeconomic-status addresses are in areas where house prices on the street are in excess of \$750,000, while those in low-socioeconomic-status addresses are in areas where house prices on the street are less than \$120,000. We obtained house price information from <http://trulia.com>. Each applicant is assigned one of the four possible street addresses within each city. Applicants are assigned high- and low-socioeconomic-status addresses with equal probability, i.e. 50 percent. The table below shows the high- and low-socioeconomic street addresses used for each city.

Addresses				
	High Socio-Economic 1	High Socio-Economic 2	Low Socio-Economic 1	Low Socio-Economic 2
Atlanta	4164 Paran Pines Dr Nw Atlanta, GA 30327	908 Kings Ct Ne Atlanta, GA 30306	698 Moreland Ave Se Atlanta, GA 30316	4300 Rosewell Rd Atlanta, GA 30342
Baltimore	207 Club Rd Baltimore, MD 21210	2303 Essex St Baltimore, MD 21224	2998 Sollers Point Rd Baltimore, MD 21222	2803 Roselawn Ave Baltimore, MD 21214
Boston	590 E 8Th St Boston, MA 02127	71 School St Boston, MA 02129	38 Messinger St Boston, MA 02126	1409 River St Apt 37 Boston, Ma 02136
Dallas	3443 Normandy Ave Dallas, TX 75205	7360 Paldao Dr Dallas, TX 75240	3906 Antigua Dr Dallas, TX 75244	18211 Muir Cir Dallas, TX 75287
Los Angeles	6970 La Presa Dr Los Angeles, CA 90068	181 S Gardner St Los Angeles, CA 90036	10738 Gorman Ave Los Angeles, CA 90059	5608 Fortuna St Los Angeles, CA 90011
Minneapolis	1832 Kenwood Pkwy Minneapolis, MN 55405	4628 W Lake Harriet Pkwy Minneapolis, MN 55410	2526 Ulysses Ne St Minneapolis, MN 55418	4301 14th S Ave Minneapolis, MN 55407
Portland	5472 Sw Champion Pl Portland, OR 97225	3239 Sw 55Th Dr Portland, OR 97221	5715 Se 83Rd Ave Portland, OR 97266	309 N Bridgeton Rd Portland, OR 97217

Universities

The fictitious applicants were randomly assigned one of four possible universities. The universities are likely recognizable by prospective employers, but they are unlikely to be regarded as prestigious; thus, we can reasonably conclude that “name recognition” of the school plays little role as a determinant of receiving an interview from a prospective employer. In addition, each of the applicants is randomly assigned each of these four universities at some point during the collection of the data. While the university one attends likely matters, our data suggest that the universities that we randomly assigned to applicants do not give an advantage to our fictitious applicants. That is, there is no difference in the interview rates between the four possible universities.

Academic Major

The following majors were randomly assigned to our fictitious job applicants with equal probability: accounting, biology, economics, english, finance, history, management, marketing, and psychology. We chose these majors because they are commonly selected majors by college students. In fact, the Princeton Review² rates business-related majors as the most selected by college students; psychology is ranked second; biology is ranked fourth; english is ranked sixth; and economics is ranked seventh.

Grade Point Average and Honor’s Distinction

Twenty-five percent of our fictitious applicants are randomly assigned an résumé attribute that lists their GPA. When an applicant is randomly assigned this résumé attribute, a GPA of 3.9 is listed. Twenty-five percent of the fictitious applicants were randomly assigned an Honor’s distinction for their academic major. Note that applicants were not randomly assigned both of these attributes; that is, applicants receive one of the two or neither. Below is an example of how the “Honor’s” (left) and “GPA” (right) traits were signaled on the résumés.³

²Visit the following webpage: <http://www.princetonreview.com/college/top-ten-majors.aspx>.

³The university name was replaced with XYZ to conform to the terms of the agreement with our institutional review boards.

Education

Bachelor of Science, May 2010
University of XYZ|
English (Honors)

Education

University of XYZ|
Bachelor of Science, May 2010
English
GPA 3.9

(Un)Employment Status

Applicants were randomly assigned one of the following (un)employment statuses: employed at the date of application with no gap in work history, unemployed for three months at the date of application, unemployed for six months at the date of application, unemployed for 12 months at the date of application, unemployed for three months immediately following their graduation date but currently employed, unemployed for six months immediately following their graduation date but currently employed, and unemployed for 12 months immediately following their graduation date but currently employed. Applicants receive no gap in their work history at a 25 percent rate, while the different unemployment spells are randomly assigned with equal probability (12.5 percent). The (un)employment statuses are not mutually exclusive. It is possible for two workers in a four-applicant pool to be randomly assigned, for example, a three-month current unemployment spell. The unemployment spells were signaled on the résumés via gaps in work history, either in the past or currently.

In-Field, Out-of-Field, Internship and College Work Experience

For each job category (i.e. banking, finance, management, marketing, insurance and sales), applicants were randomly assigned “in-field” or “out-of-field” work experience. “In-field” work experience is specific to the job category that the applicant is applying. “Out-of-field” experience is either currently working or having previously worked as a sales person in retail sales. Ultimately, out-of-field experience represents a form of “underemployment,” as a college degree is not a requirement for these types of jobs. Fifty percent of applicants are randomly assigned “in-field” experience, and the remaining 50 percent of applicants are randomly assigned “out-of-field” experience. Twenty-five percent of the applicants were randomly assigned internship experience during the summer 2009, which is the summer before

they completed their Bachelor's degree. The internship experience is specific to the job category. All of the applicants were assigned work experience while completing their college degree, which consisted of working as a barista, tutor, customer service representative and sales associate. The following series of tables provide detailed information on each type of work experience by job category:

Banking		
	Job Title	Resume Description
Infield 1	Bank Branch Assistant Manager	<ul style="list-style-type: none"> •Evaluate present market conditions to decide resource allocation to different products and services •Design employee schedules, appointed temporary workforce for a busy seasons, and interview and hire all new employees •Kept in depth records of all industry activities to attain the regulatory needs •Focus on process flow improvement by examining sales relationships and visit several company locations frequently to ensure smooth processes •Produce thorough budgets for the number of operations, tracked the actual expenditures and reviews exceptions •Train and handle a number of employees and build operational principles •Manage branch employees with a focus on branch compliance
Infield 2	Bank Branch Assistant Manager	<ul style="list-style-type: none"> •Trained 30 new employees and attained significant improvements in their productivity over time •Visited several company locations frequently to ensure smooth processes •Maintain records of cash limits, checks, deposits, fund transfer, money orders, debit cards issued and other banking activities •Suggested new methods for business, developing services for business clients and reducing wait for the personal account clients •Overhauled accounting systems, bookkeeping operations, and interview processes •Provide support in all clerical responsibilities and other daily tasks within the bank
Internship 1	Equity Capital Markets Intern	<ul style="list-style-type: none"> •Created analytical models and spreadsheets •Assessed market capacity for equity products •Analyzing cost of capital of various financing options
Internship 2	Capital Markets Intern	<ul style="list-style-type: none"> •Created statistical models to capture and present quantitative data •Generated reports and prepared presentations to assist senior managers •Used Excel and Access to perform analysis and conduct research

Finance		
	Job Title	Resume Description
Infield 1	Accounts Payable	<ul style="list-style-type: none"> •Prepare and analyze fund statements, balance sheets and salary schedules for firm and her subsidiaries •Responsible for supporting program managers in the development and analysis of financial reports, and spending plans •Review all invoices for appropriate documentation and approval prior to payment •Responds to questions and makes calls regarding billing problems; acts as a liaison between department and vendors
Infield 2	Financial Advisor	<ul style="list-style-type: none"> •Conduct in-depth reviews of clients' financial circumstances and prepared plans best suited to their requirements •Design detailed financial strategies and explained reports to cliental •Contact clients with news of new financial products or changes to legislation that may affect their savings and investments •Meet all regulatory aspects of the role, e.g. requirements for disclosure, and costs of services provided •Responsible for preparing and maintaining financial statements and invoices in an accurate manner
Internship 1	Financial Analyst Intern	<ul style="list-style-type: none"> •Conducted financial and business analysis to generate insights that influenced cross-functional decision-making •Led process innovation to drive efficiency and deliver insightful perspective on key business drivers •Leveraged data and information systems to forecast performance and articulate key drivers of change
Internship 2	Financial Analyst Intern	<ul style="list-style-type: none"> •Conducted financial and business analysis to generate insights that influenced cross-functional decision-making •Led process innovation to drive efficiency and deliver insightful perspective on key business drivers •Leveraged data and information systems to forecast performance and articulate key drivers of change

Insurance		
	Job Title	Resume Description
Infield 1	Insurance Sales Agent	<ul style="list-style-type: none"> •Customize insurance programs to suit individual customers, often covering a variety of risks •Develop marketing strategies to compete with other individuals or companies who sell insurance •Seek out new clients and develop clientele by networking to find new customers and generate lists of prospective clients •Prepared activity reports with the interpretation, implementation and enforce company policies, strategies and procedures •Monitor insurance claims to ensure they are settled equitably for both the client and the insurer •Inspect property, examining its general condition, type of construction, age, and other characteristics, to decide if it is a good insurance risk •Resolved clients' claim issues in assistance of manager
Infield 2	Insurance Sales Agent	<ul style="list-style-type: none"> •Sell various types of insurance policies to businesses and individuals on behalf of insurance companies, including automobile, fire, life, property, medical and dental insurance or specialized policies such as marine, farm/crop, and medical malpractice •Strive to achieve optimum customer satisfaction and access coverage, liability and damage •Responsible for appointing a legal representative for the court cases and communicating with the agents to resolve the issues •Ensure that policy requirements are fulfilled, including any necessary medical examinations and the completion of appropriate forms •Calculate premiums and establish payment method
Internship 1	Intern	<ul style="list-style-type: none"> •Asked probing and challenging questions to uncover a prospective clients needs •Identified and understood a prospect's needs to help create solutions •Handled objections and effectively built relationships
Internship 2	Intern	<ul style="list-style-type: none"> •Asked probing and challenging questions to uncover a prospective clients needs •Identified and understood a prospect's needs to help create solutions •Handled objections and effectively built relationships

Marketing		
	Job Title	Resume Description
Infield 1	Marketing Specialist	<ul style="list-style-type: none"> •Conducted qualitative and quantitative research to help guide new creative efforts •Evaluated all potential sponsorship/partnership opportunities •Researched multi-channel marketing efforts of five key advertisers to prepare comprehensive report on how to target consumers for agency-wide project •Directed and manage 4 internal staff and network of 3 external local-market agencies/consultants •Developed, sold, moderated, and interpreted results for more than 100 qualitative focus groups and one-on-one sessions for firm •Evaluated target markets and proposed marketing strategies •Turned 17% sales decline into 20% increase in two years by overhauling entire marketing effort and launching company's first-ever national advertising campaign
Infield 2	Marketing Specialist	<ul style="list-style-type: none"> •Analyzed regular corporate retail sales reports and tailor each local marketing profit-plan with retail leadership •Programs increased average store traffic 21% and sales averaging 12%, contributing to unprecedented growth •Explored multi-cultural trends and developed volumetric sales analysis to convince firm to address diverse "non-traditional" audiences across all brands •Created 5 integrated and multi-tiered new store opening programs in domestic & international locations •Designed, developed and implemented marketing and sales campaigns, fundraisers, employee incentive programs and contests •Introduced planning discipline and mass advertising techniques to entertainment retailer with more than ten million in sales •Managed all phases of direct mail projects; monitored production teams; recruited and guided vendors; oversaw print operations and coordinated mailing process
Internship 1	Marketing Business Analyst Intern	<ul style="list-style-type: none"> •Analyzed the divisional business to identify problems, opportunities, and trends •Executed elements of the marketing plan, including price promotions •Managed multiple projects
Internship 2	Marketing Business Analyst Intern	<ul style="list-style-type: none"> •Analyzed the divisional business to identify problems, opportunities, and trends •Executed elements of the marketing plan, including price promotions •Managed multiple projects

Sales		
	Job Title	Resume Description
Infield 1	Sales Representative	<ul style="list-style-type: none"> •Sold and marketed packaging products to manufacturers in a two-state territory •Managed account base of 70 which is an increase of 14 accounts over from previous year •Assigned responsibility to mentor/develop three inside salespeople for promotion to outside sales positions •Recaptured 4 lost accounts during first year of employment •Developed strong referral system which provides continuous leads for new business development •Exceptional leadership, organizational, oral/written communication, interpersonal, analytical, and problem resolution skills •Named "Salesman of the Month" four times during work tenure
Infield 2	Sales Consultant	<ul style="list-style-type: none"> •Proactive leader with refined business acumen and exemplary people skills. Facilitate a team approach to achieve organizational objectives, increase productivity and enhance employee morale •Helped develop an expansive plan to increase sales by over 30% over the next five years •Conduct new product training for the sales force and dealer network including providing test units to region managers and key dealers for use in demonstrations. •Quick study, with an ability to easily grasp and put into application new ideas, concepts, methods and technologies •Dedicated, innovative and self-motivated team player/builder •Thrive in both independent and collaborative work environments •Review product pricing and gross margin goals for existing products annually
Internship 1	Sales Intern	<ul style="list-style-type: none"> •Assisted sales representatives, who sold Auto, Home, Life, and other insurance products •Spent time out of the office observing and assisting with sales events •Worked with Sales Reps to identify prospective customers using established lead methods
Internship 2	Sales Future Leader Intern	<ul style="list-style-type: none"> •Utilized analytical and fact-based selling skills to grow volume, revenue, and profitability goals for the assigned territory •Activated local and national marketplace initiatives and promotions through merchandising products and building creative displays •Performed at a fast pace in a self-motivated position

Out-of-Field & College		
	Job Title	Resume Description
Outfield 1	Sales Associate ¹	<ul style="list-style-type: none"> •Team leader in sales for two consecutive months •Greet patrons at door and assisted them in locating their desired purchases •Manage sales desk while assisting customers with purchase •Promote company brands whenever possible •Communicate to manager any possible areas of improving the customer service experience •Restock items on sales floor as needed •Handle customer complaints and problems in the most efficient way possible
Outfield 2	Retail Associate	<ul style="list-style-type: none"> •Open and close cash registers, performing tasks such as counting money, separating charge slips, coupons, and vouchers, balancing cash drawers, and making deposits •Recommend, select, and help locate or obtain merchandise based on customer needs and desires •Describe merchandise and explain use, operation, and care of merchandise to customers •Place special orders or call other stores to find desired items
College 1	Barista	<ul style="list-style-type: none"> •Ensured counters, customer areas are neat, clean and presentable •Maintained sanitized and polished counters, steam tables, and other cooking equipment, and clean glasses, dishes, and fountain equipment •Served food, beverages, or desserts to customers in a fast paced environment •Followed cash handling procedures and cash register policies
College 2	Tutor ²	<ul style="list-style-type: none"> •Worked with students to help them better understand _____³ concepts •Identified the preferred communication style of the students and adjusted tutorial sessions accordingly •Taught tailored large-group review sessions before exams
College 3	Customer Service Representative	<ul style="list-style-type: none"> •Served as a resource by providing accurate and current information regarding recreation and university-related programs and facilities •Maintained current certifications in first aid, CPR, and AED. •Counseled peers on personal, academic, and career concerns •Assist with data entry of fitness and intramural participants into Access database and IMTrack
College 4	Sales Associate	<ul style="list-style-type: none"> •Asked lifestyle questions to thoroughly understand customer needs, offers relevant services, solutions, and accessories so customer can make informed decision to complete their purchase •Leveraged on-line resources, tools, and peer knowledge to self-train •Utilized all relevant sales tools to drive profitable growth

Notes:

1. For jobs within the 'Sales' field, this job title was changed to Retail Associate.

2. The candidate was a tutor for their specific major. For example, if candidate A was a finance major, he/she would be a finance tutor)

3. The first bullet point within the resume description had a tailored line for each major but followed the same outline (e.g., Economics tutor - •Worked with students to help them better understand **economic** concepts)

B2 Sample Résumés

In this section, we present a few résumés that capture the essence of our résumé-audit study. The names of schools and companies where the applicants attended and worked have been removed per our agreement with our respective institutional review boards.

Ebony Booker

ebonybooker231@gmail.com
(678) 753-5139
908 Kings CtNe
Atlanta, GA 30306

Education

ABC University

Bachelor of Science, May 2010
Management

Work Experience

May 2010 - July 2012

Administrative Assistant
XYZ Company

- Communicated with managers and coordinated the financial reporting of five locations to consolidate financial data
- Decentralized accounts payable to facilitate transition from cost centers to profit centers, and trained employees in the new system
- Recognized for efforts to identify new processes to improve quality, reduce costs, and increase margin
- Coordinated the administration of product orders, understood customer needs and guaranteed delivery of company's commitment
- Accustomed to working in fast-paced environments with the ability to think quickly and successfully handle difficult clients
- Excellent interpersonal skills, ability to work well with others, in both supervisory and support staff roles
- Developed strong relationships with established accounts while acquiring new accounts

September 2006 - May 2010

Sales Associate
DEF Company

- Asked lifestyle questions to thoroughly understand customer needs, offers relevant services, solutions, and accessories so customer can make informed decision to complete their purchase
- Leveraged on-line resources, tools, and peer knowledge to self-train
- Utilized all relevant sales tools to drive profitable growth

Cody Baker

codybaker589@gmail.com
(404) 913-4459
4300 Rosewell Rd
Atlanta, GA 30342

Education

University of ABC
Bachelor of Science, May 2010
Psychology
GPA 3.9

Work Experience

Sales Associate

May 2010 - Present
XYZ Company

- Team leader in sales for two consecutive months
- Greet patrons at door and assisted them in locating their desired purchases
- Manage sales desk while assisting customers with purchase
- Promote company brands whenever possible
- Communicate to manager any possible areas of improving the customer service experience
- Restock items on sales floor as needed
- Handle customer complaints and problems in the most efficient way possible

Customer Service Representative

September 2006 - May 2010
University of ABC Recreation Center

- Served as a resource by providing accurate and current information regarding recreation and university-related programs and facilities
- Maintained current certifications in first aid, CPR, and AED.
- Counseled peers on personal, academic, and career concerns
- Assist with data entry of fitness and intramural participants into Access database and IMTrack

DeShawn Jefferson

d2jefferson@gmail.com
(678) 653-0550
698 Moreland Ave Se
Atlanta, GA 30316

Education

Bachelor of Science, May 2010
University of ABC
Management

Work Experience

XYZ Company
May 2010 - Present
Distribution Assistant Manager

- Responsible and accountable for the coordinated management of multiple related projects directed toward strategic business and other organizational objectives
- Build credibility, establish rapport, and maintain communication with stakeholders at multiple levels, including those external to the organization
- Maintain continuous alignment of program scope with strategic business objectives, and make recommendations to modify the program to enhance effectiveness toward the business result or strategic intent
- Fostered customer loyalty by ensuring that our customers fully utilize the value of our solutions and services
- Direct the coordination of all implementation tasks involving third party vendors as well as provide consultation to clients on system implementation
- Coach, mentor and lead personnel within a fast paced environment

DEF Company
May 2009 – September 2009
Project Management Intern

- Implemented a program to reduce operation costs
- Designed a new program to increase employee moral
- Handled multiple projects simultaneously and effectively built relationships

GHI Company
September 2006 - May 2010
Barista

- Ensured counters, customer areas are neat, clean and presentable
- Maintained sanitized and polished counters, steam tables, and other cooking equipment, and clean glasses, dishes, and fountain equipment
- Served food, beverages, or desserts to customers in a fast paced environment
- Followed cash handling procedures and cash register policies

DeAndre Washington
deandre.washington129@gmail.com
(971) 225-0374

309 N Bridgeton Rd Sliph
Portland, OR 97217

Education

Bachelor of Science, May 2010
University of Colorado at ABC
Accounting

Work Experience

May 2010 - Present
Sales Representative
XYZ Company

- Sold and marketed packaging products to manufacturers in a two-state territory
- Managed account base of 70 which is an increase of 14 accounts over from previous year
- Assigned responsibility to mentor/develop three inside salespeople for promotion to outside sales positions
- Recaptured 4 lost accounts during first year of employment
- Developed strong referral system which provides continuous leads for new business development
- Exceptional leadership, organizational, oral/written communication, interpersonal, analytical, and problem resolution skills
- Named "Salesman of the Month" four times during work tenure

Sales Future Leader Intern, May 2009 – September 2009
DEF Company

- Utilized analytical and fact-based selling skills to grow volume, revenue, and profitability goals for the assigned territory
- Activated local and national marketplace initiatives and promotions through merchandising products and building creative displays
- Performed at a fast pace in a self-motivated position

GHI Company, September 2006 - May 2010
Barista

- Ensured counters, customer areas are neat, clean and presentable
- Maintained sanitized and polished counters, steam tables, and other cooking equipment, and clean glasses, dishes, and fountain equipment
- Served food, beverages, or desserts to customers in a fast paced environment
- Followed cash handling procedures and cash register policies

Aaliyah Jackson
Aaliyah.Jackson321@gmail.com
(971) 225-0726
309 N Bridgeton Rd Slipb
Portland, OR 97217

Education

Bachelor of Science, May 2010
University of ABC
Finance (Honors)

Work Experience

XYZ Company (May 2010 - December 2012)
Retail Associate

- Open and close cash registers, performing tasks such as counting money, separating charge slips, coupons, and vouchers, balancing cash drawers, and making deposits
- Recommend, select, and help locate or obtain merchandise based on customer needs and desires
- Describe merchandise and explain use, operation, and care of merchandise to customers
- Place special orders or call other stores to find desired items.

DEF Company (September 2006 - May 2010)
Barista

- Ensured counters, customer areas are neat, clean and presentable
- Maintained sanitized and polished counters, steam tables, and other cooking equipment, and clean glasses, dishes, and fountain equipment
- Served food, beverages, or desserts to customers in a fast paced environment
- Followed cash handling procedures and cash register policies

B3 The Application Process

We applied to online postings for job openings in six categories: banking, finance, insurance, management, marketing and sales. To obtain an list of openings, we chose specific search criteria through the online job posting websites to find the appropriate jobs within each of the aforementioned job categories. We further constrained the search by applying only to jobs that had been posted in the last seven days within 30 miles of the city center.

Job openings would be applied to if they had a “simple” application process. An application process was deemed “simple” if it only required a résumé to be submitted or if the information to populate the mandatory fields could be obtained from the résumé (e.g., a candidate’s name or phone number). Jobs that required a detailed application were discarded for two reasons. First and foremost, we wanted to avoid introducing variation in the application process that could affect the reliability of our results. A detailed application specific to a particular firm might include variation that is difficult to hold constant across applicants and firms. Second, detailed applications take significant time, and our goal was to submit a large number of résumés to increase the power of our statistical tests. Job openings were discarded from our sample if any of the following were specified as minimum qualifications: five or more years of experience, an education level greater than a bachelor’s degree, unpaid or internship positions, or specific certifications (e.g., CPA or CFA).

We used the résumé-randomizer from Lahey and Beasley (2009) to generate four résumés to submit to each job advertisement. Templates were created for each job category (i.e. banking, finance, insurance, management, marketing and sales) to incorporate in-field experience. After the résumés were generated, we then formatted the résumés to look presentable to prospective employers (e.g., convert Courier to Times New Roman font; make the applicant’s name appear in boldface font, etc.). We then uploaded the résumés and filled out required personal information, which included the applicant’s name, the applicant’s location, the applicant’s desire to obtain an entry-level position, the applicant’s educational attainment (i.e. Bachelor’s), and whether the applicant is authorized to work in the U.S. All job advertisement identifiers and candidate information was recorded. Upon receiving a interview request, we promptly notified the firm that the applicant was no longer seeking employment to minimize the cost incurred by firms.

Table B1: Résumé Characteristics, Definitions, and Means

Variable Name	Variable Definitions	Mean
<i>black</i>	=1 if applicant has a distinctively black name	0.497
<i>female</i>	=1 if applicant has a distinctively female name	0.499
<i>econ</i>	=1 if applicant has a Bachelor's degree in Economics	0.115
<i>finance</i>	=1 if applicant has a Bachelor's degree in Finance	0.101
<i>acctg</i>	=1 if applicant has a Bachelor's degree in Accounting	0.112
<i>mgt</i>	=1 if applicant has a Bachelor's degree in Management	0.114
<i>mkt</i>	=1 if applicant has a Bachelor's degree in Marketing	0.111
<i>eng</i>	=1 if applicant has a Bachelor's degree in English	0.110
<i>psych</i>	=1 if applicant has a Bachelor's degree in Psychology	0.114
<i>bio</i>	=1 if applicant has a Bachelor's degree in Biology	0.116
<i>hist</i>	=1 if applicant has a Bachelor's degree in History	0.108
<i>nogap</i>	=1 if applicant has a no gap in their work history	0.255
<i>front3</i>	=1 if applicant has a 3-month gap in their work history after finishing degree	0.125
<i>front6</i>	=1 if applicant has a 6-month gap in their work history after finishing degree	0.121
<i>front12</i>	=1 if applicant has a 12-month gap in their work history after finishing degree	0.125
<i>back3</i>	=1 if applicant has a current 3-month gap in their work history	0.124
<i>back6</i>	=1 if applicant has a current 6-month gap in their work history	0.123
<i>back12</i>	=1 if applicant has a current 12-month gap in their work history	0.127
<i>intern</i>	=1 if applicant worked as an intern while completing their degree	0.248
<i>infield</i>	=1 if applicant worked in the field for which they are applying for a job	0.500
<i>highses</i>	=1 if applicant has an address in a high-socioeconomic-status area	0.499
<i>honors</i>	=1 if applicant reports completing their degree with an Honor's distinction	0.248
<i>gpa</i>	=1 if applicant reports a grade point average (GPA) of 3.9 on their résumé	0.249
<i>exp</i>	Number of months that applicant has worked since completing their degree	30.02