

**The Influence of “High-Impact” College Experiences on
Early Career Outcomes**

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Abstract

The study contributes new empirical evidence on the associations between “high-impact” (AAC&U, 2007) college experiences and career outcomes in the years immediately following college graduation, and fills a knowledge gap surrounding the effects of specific college experiences in relation to economic and attitudinal career outcomes. ELS:2002/12 data were utilized to examine a set of high-impact college experiences in relationship to earnings, continued job-related learning and challenge, job satisfaction, job commitment, and working in a supportive environment. The results highlight that specific college experiences differentially influence career outcomes in the years immediately following college, and that major field of study, institutional quality, and major-job congruence exert the most substantial influence on early career outcomes.

THE INFLUENCE OF “HIGH-IMPACT” COLLEGE EXPERIENCES ON EARLY CAREER OUTCOMES

College students’ decisions to obtain a postsecondary education appear, more than ever, to be motivated by occupational factors and the importance of improving the quality of career opportunities. When asked about their reasons for entering college, first year students have for nearly four decades, consistently and increasingly conveyed the importance of getting a “better” job (Eagan, Lozano, Hurtado, & Case, 2013). It stands to reason that students’ concern for fulfilling, satisfying, and well-paying jobs following college has been sharpened by the fact that we are in the midst of recovering from the most severe economic recession the U.S. has faced since the 1930’s. Unemployment rates among bachelor’s degree recipients are hovering around eight percent and range from five to 15 percent depending on college major (Carnevale & Cheah, 2013), and a large majority of students report uncertainty towards how or if their educational choices will enable them to achieve their career goals (HERI, 2014a, 2014b). Within this context, researchers, policymakers, and students each have a stake in acquiring a better understanding of how different facets of the college experience are related to the economic and interpersonal rewards graduates receive once in the work force.

Over the past several decades an extensive body of literature has revealed the relationships between a college education and careers (Brewer, Eide, & Ehrenberg, 1999; Dale & Krueger, 2002; Liu, Thomas, & Zhang, 2010; Rumberger & Thomas, 1993; Weisbrod & Karpoff, 1968; Wise, 1975). A large share of this work has focused on economic outcomes, specifically monetary returns or earnings in relation to college majors and the quality of institution attended (e.g., selectivity or prestige). Alternatively, much less is known about the

effects of college on non-monetary, attitudinal career outcomes. Only a handful of studies have concentrated on the effects of higher education on attitudes towards non-monetary facets of jobs, such as benefits, promotional opportunities, satisfaction, and the nature and conditions of work (Liu, et al., 2010; Locke, 1976; Solmon, 1981; Wolniak & Pascarella, 2005), and a select few have examined economic outcomes of college graduates in relation to experiences other than college major or the quality of institution attended, such as specific activities or forms of engagement (Hu & Wolniak, 2010, 2013).

Accompanying the career and economic effects of institution attended and major field of study is strong empirical evidence that what matters most in student learning and development during the college years are the activities in which students engage (e.g., Astin, 1993; Chickering & Gamson, 1991; Hu & Kuh, 2003; Pascarella & Terenzini, 2005). Synthesizing the extant college impact literature, the 2007 AAC&U report, *College Learning for the New Global Century*, highlighted a set of “high-impact” (p.5) practices understood to be uniquely effective at cultivating the kinds of learning and development students need for success. Included among these practices were undergraduate research, diversity/global opportunities, community-based learning, internships, and culminating senior capstone courses. This collection of college experiences have been found to positively affect learning and development among students (Kuh, 2008), and employers have conveyed the view that college graduates are better prepared for the workplace if they experience such things as collaborative problem-solving, internships, senior projects, and community engagements (Hart Research Associates, 2013). However, given the lack of empirical evidence on the associations between high-impact college experiences and career outcomes, the question remains as to whether the kinds of experiences promoted as

important for students' learning and development and valued by employers, in fact help students realize the kinds of "better" jobs they desire.

The Study

Using 2012 follow-up data from the Education Longitudinal Study (ELS 2002)—the most up to date nationally-representative data on college students' transitions from college to the labor market—we have designed the present study specifically to identify the influence that specific high-impact college activities may have on the early career outcomes of college graduates. In doing so we provide new empirical evidence on the effects of college experiences on early career outcomes of recent college graduates, and contribute to the literature in two important ways. First, we focus on outcomes that cover both monetary (i.e., earnings) and non-monetary (i.e., supportive work environment, sense of learning and challenge, job satisfaction, and commitment) dimensions of individuals' jobs. Second, we examine career outcomes in relation to an expanded set of college experiences that includes, but extends well-beyond, college major and institutional quality. Specifically, the study addresses the following three questions:

1. To what extent does participation in "high-impact" (AAC&U, 2007) experiences during college influence early career outcomes, including earnings, working in a supportive environment, satisfaction with and commitment towards one's job, and opportunities for continued learning and challenge?
2. How do the early career effects of high-impact experiences compare to the effects of major field of study and measures of institutional quality?
3. Focusing on college to career transitions, do high-impact experiences have a larger influence on early career outcomes for graduates employed in jobs closely related to their college major?

Theory and Evidence

Our examination of college student experiences in relation to early career outcomes draws from three areas of research: economic outcomes of college, the effects of college on subsequent job attitudes, and the effects of high-impact college experiences on students. Theory and evidence within each area is summarized below.

Effects of College on Earnings

Research on the economic outcomes of college is framed conceptually by the human capital theory-based assumptions that on average, 1) the labor market rewards productive workers with wage rates or salary levels, and 2) students rationally make educational decisions according to perceived costs and anticipated returns (Becker 1964; Paulsen 2001). From this line of inquiry we know that college graduates' earnings are significantly and positively associated with the quality of institution attended; typically based on metrics that incorporate aspects of an institution's selectivity and control (Brewer et al. 1999; Dale & Krueger, 2002; Black & Smith, 2006; Zang, 2005, 2008). For example, Zang's (2008) analysis of data from the Baccalaureate & Beyond Longitudinal Study (B&B:93/97/03) indicated that among individuals who completed a college degree between June 1992 and July 1993, those who graduated from public or private high quality institution (based on Barron's Profiles of American Colleges) earned significantly more than graduates from low quality public institutions and the magnitude of the differences increased over time. One year after college, graduates from high quality institutions earned 6-8% more than their low-quality public counterparts, which increased to 13-15% four years after graduation and 17-19% ten years after graduation (Zang, 2008).

In addition to the earnings advantages accompanying graduating from higher quality institutions, sizable earnings differences result from majoring in fields that accompany a

relatively specific and well-defined body of content knowledge and focus on methods of inquiry that are generally quantitative or rooted in scientific knowledge, such as science, technology, engineering and mathematics (STEM) or certain health-related fields (Melguizo & Wolniak, 2012; Rumberger & Thomas, 1993; Thomas 2000; Wolniak, Seifert, Reed, & Pascarella, 2008; Zang, 2005, 2008). Across studies based on a range of different datasets, it appears that majoring in a STEM-related field yields as high as 35% greater earnings within the first few years following college graduation, relative to fields such as education and humanities (Melguizo & Wolniak, 2012; Zang, 2008). Closely related to the earnings effects of college major is the economic benefit associated with working in a job closely related to one's major field of study. Among college graduates who reported working in a job congruent to their majors, Melguizo and Wolniak (2012) found an approximate 20% average earnings effect early in the careers of high-achieving, low-income students of color, whereas Wolniak and Pascarella (2005) reported a smaller but still significant 8% average earnings effect among a sample of graduates 10 to 30 years after college.

Finally, a pair of recent studies tested the early career earnings effects of students' levels of social and academic engagement during college. Controlling for factors concerning student backgrounds, college characteristics, and majors, Hu and Wolniak (2010, 2013) examined the relationships between earnings and students' engagement in academic and social or community activities among a unique sample of high-achieving low-income students of color. Modest but significantly positive earnings effects were found in relation to social engagement, which appeared most pronounced among STEM majors and to be conditional on gender, race/ethnicity, and academic achievement at college entry. And while academic engagement did not have a

significant general effect on earnings, significant effects were found among males, and varied by racial/ethnic group and academic background.

Effects of College on Job Attitudes

A second area of research concentrates on the effects of college on individuals' attitudes towards their jobs. No single theoretical or conceptual framework encompasses the full range of attitudinal career outcomes. As such, we must generalize across well-defined models of specific outcomes in the affective realm. For example, Holland's (1997) theory of vocational behavior has provided insights into the formation of individuals' personalities, and the effects this has on vocational involvement, decision-making, and job attitudes. Holland's theory is one of personality development in which educational experiences have a central role, where individuals, their interests, values, and aspirations interact with different environmental contexts (such as college major and the congruence between majors and jobs) that ultimately shape job attitudes. Holland's work has been widely utilized to inform research focused on college majors and major-job field congruence, where the alignment between individuals' interests and environments affect the degree of continuity in their occupational decisions, which in-turn influences success and satisfaction on the job (Holland, 1997).

Staw and colleagues further contributed a dispositional theory of job attitudes (Staw, Bell, & Clausen, 1986; Staw & Ross, 1985), where "people's affective dispositions can be thought of as general tendencies toward positive or negative evaluation of life stimuli – tendencies that should influence the way people perceive work environments during their lives" (Staw, et al., 1986, p.61). Dispositions are important in recognizing the tendencies that may lead a worker to report a level of satisfaction (or dissatisfaction) that remains stable over time and across different employment relationships or work tasks. The satisfaction that employees gain

from their jobs is an important determinant of a quality work experience and a quality life experience (e.g., Judge & Watanabe, 1993; Mirvis & Lawler, 1984).

Among the handful of studies that have examined the effects of college experiences on students' non-monetary career outcomes, the large majority have focused on the determinants of job satisfaction. For example, Liu, et al. (2010) estimated the effects of institutional quality and control on a set of job satisfaction measures representing both monetary and non-monetary dimensions. Relying on B&B data roughly ten years after college graduation and controlling for majors as well as a host of socioeconomic, demographic, and labor market variables, the few significant differences Liu et al. found indicated that graduates from high quality private institutions (versus graduates from low quality publics) were less satisfied with monetary and non-monetary aspects of their jobs, and earnings yielded a positive indirect effect on job satisfaction. Wolniak and Pascarella (2005) similarly contributed evidence of significant effects of college major on dimensions of job satisfaction. Controlling for a host of socioeconomic, demographic, and academic characteristics, as well as college control, selectivity and employment characteristics, Wolniak and Pascarella tested a causal model in which earnings mediates the relationship between majors, major-job field congruence, and job satisfaction. Self-reported perceptions of congruence were found to have a positive and significant effect on dimensions of job satisfaction, net of earnings. From these studies, it appears that college major is relatively more influential in determining subsequent job satisfaction than the type of institution attended, and that the congruence between majors has an important influence. What's more, earnings tends to have a significant positive influence on job satisfaction, but the influence diminishes as education attainment and labor market conditions are held constant.

We uncovered no previous study examining aspects of the college experience on other work-related attitudes following college. While past studies on the effects of college on job satisfaction can guide our approach to studying other attitudinal outcomes, caution should be applied in generalizing findings from job satisfaction studies to other career outcomes.

High-Impact College Experiences

The third area of research informing this study explores the effects of high-impact college experiences in relation to a variety of student outcomes. As introduced above, the AAC&U has defined high-impact experiences as uniquely effective at cultivating the kinds of learning and development students need for success and builds on a decade's worth of scholarship on the learning and developmental effects of the organizational or structural characteristics of the institution attended and students' academic and non-academic experiences. Models frequently used in the higher education literature to explain undergraduate experiences in college and outcomes from college include Astin (1993), Pascarella (1985), and Weidman (1989). At the center of these models is students' participation in college activities, depicted as an environment factor in the Astin's model and the "quality of effort" measure in the Pascarella's model. What is considered "interactions with agents of socialization" in Pascarella's (1985) model of student learning and development is closely related to academic and social experiences that comprise the normative context in Weidman's (1989) model of undergraduate socialization, in which career choices include one of the key socialization outcomes of college.

Following AAC&U's (2007) report promoting the importance of high-impact practices, Kuh (2008) demonstrated a high degree of correlation between students' participation in high-impact practices and key outcomes of high-quality learning captured through students' self-reports on the National Survey of Student Engagement (NSSE). Among college seniors, study

abroad, student-faculty research, service learning, and a senior culminating experience were positively and significantly correlated with self-reported gains in several dimensions of learning (Kuh, 2008).

For all of the attention student engagement has received in the higher education literature, there is little evidence documenting its economic effects. As reviewed above, a pair of studies by Hu and Wolniak (2010, 2013) examined early career earnings in relation to student engagement. While other research has shown that internships and other work-based experiences, for example, have positive effects on outcomes such as persistence and educational attainment (Anderson, 1981; DesJardins, Ahlburg, & McCall, 1999; Luzzo, McWhirter, & Hutchenson, 1997; Velez, 1985), none of those studies were extended to include post-college, career or economic outcomes. Importantly, a positive relationship between high-impact experiences and subsequent career outcomes would provide evidence of economic or intrinsic value tied to specific student behaviors, and a rationale for promoting the kinds of educational programs and academic structures that facilitate such involvement among students. Given the evidence suggesting positive academic effects of student engagement generally (Carini, Kuh, & Klein, 2006; Hu & Kuh, 2003; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008) and high-impact practices in particular (Kuh, 2008; Kuh & O'Donnell, 2013), it is reasonable to expect that high-impact practices may be related to earnings (an indirect measure of productivity) and other aspects of career success.

Conceptual Framework

Building on the evidence and theory reviewed above, our examination of high-impact practices and early career outcomes situates the earnings and job attitudes of college graduates within the larger economic and social context, in which aspects of the college experience are defined according to college majors and engagement in a collection of high-impact practices, and

where the college experience leads to career outcomes by way of securing a job that is more or less congruent with one's major field of study during college and any subsequent graduate education. To isolate the effects of college experiences on career outcomes, given the confounding influence of students' self-selecting into majors and institutions (Heckman 1979), it is critical to control for a variety of individuals demographic characteristics, as well as their pre-college socioeconomic and academic backgrounds. Figure 1 presents our conceptual model for examining the effects of high-impact college experiences on early career outcomes.

[Insert Figure 1 here]

Methods

Instrument and Sample

This study used ELS 2002 data, collected as part of a survey research project funded by U.S. Department of Education designed to explore students' transitions from secondary school into postsecondary education and subsequently into the workforce. The ELS study incorporates multiple respondent pools, including students, parents, teachers, librarians, and school principals. The third follow-up of the ELS was conducted in 2012, when the average age of the sample population was 26, and included items that assessed participants' undergraduate college experiences, labor market outcomes, including earnings, and other aspects of their family composition and living arrangements.

The analytic sample for this study was comprised of students who participated in the first follow-up in 2004 (G12COHRT=1) through the third follow-up in 2012 (WEIGHT=F3F1PNLWT). Additionally, given our focus on labor market outcomes, we only selected those students who had completed at least a baccalaureate degree and indicated they were full-time employed at the time of the third follow-up survey. The resultant sample included

3,630 students (rounded to the nearest ten per NCES Restricted data guidelines) and a weighted sample of 810, 849 participants. Approximately 54% of the sample was female and 75% of the sample was White, with Students of Color representing 6% Asian, 8% Black, 8% Hispanic, and 3% multi-racial. The average SAT score of the sample was 1078. In terms of undergraduate colleges, 30% attended private schools, 65% attended public schools, and 4% attended a for-profit institution. Based on the Carnegie Classification of schools, 33% attended a highly selective institution, 44% attended a moderately selective school, 11% attended an inclusive school, and the remaining 12% were unknown. Students majored in a variety of different fields, including 24% in STEM related majors (National Science Board, 2014), 14% in Business, 10% in Social Sciences, 8% in Arts and Humanities, 8% in Education, 5% in Applied Arts & Humanities fields (fields rooted in the Arts & Humanities but applied in the service of professions, such as architecture, journalism and legal profession), and other smaller percentages in selected majors (see Table 1 for a full descriptive overview of population statistics and Appendix Table A-1 for the list of specific majors within each category).

[Insert Table 1 here]

Measures

Dependent Variables. We used five dependent variables in the study to examine the effects of different high-impact practices on early career outcomes. First, we examined graduates' self-reported earnings (using a log transformation) at the time of the third wave of the ELS. Second, we examined a set of nine Likert-type variables (each measured on a five-point agreement scale) that measured different facets of graduates' attitudes towards their jobs. Subsequent factor analyses revealed three distinct factors, each consisting of three items, that measured a "Supportive Work Environment" ($\alpha = .826$), "Job Satisfaction" ($\alpha = .915$), and "Job

Commitment” ($\alpha = .910$). Finally, we included one additional scale that we developed through factor analytic procedures that consisted of three Likert-type items (each measured on a five point scale from “definitely not an aspect of the job” to “very much an aspect of the job”) that measured “Continued Learning and Challenge” in one’s place of employment ($\alpha = .760$).

Specific item wording for all of the factor scales can be found in Table 2.

[Insert Table 2 here]

Independent Variables. Our primary independent variables included five high-impact variables (all binary yes/no variables) to assess whether students were involved in the following educational practices during their undergraduate experience: 1) internships, co-ops, and field/teaching/clinical experiences; 2) out of class research projects; 3) study abroad; 4) community-based projects; and 5) culminating senior experience or capstone. In addition to high-impact variables, we included a set of seven dummy-coded variables indicating college major categories as well as a missing category indicator (see Table A-1), using the STEM category as the referent group. We also examined students’ college to career transitions through two single-item binary variables that measured whether one’s major related to their current job and whether they had attained a graduate-level degree.

Covariates. We incorporated controls for sex, race, SES, and high school academics to account for confounding influences associated with students’ pre-college characteristics. Both sex and race were categorical variables that were dummy-coded; the male and White categories were used as referent groups. The SES measure was a standardized, composite index computed by NCES that includes parental occupation, parental income, and parental educational attainment. For academics, we utilized the highest standardized score between a student’s ACT

or SAT (using a concordance table to transform ACT scores to SAT scores) and then we divided the scores by 100 to ease in the interpretation of model coefficients.

In addition, we included family characteristics (marital status and dependents) known to influence occupational outcomes (Alon, Donahoe, & Tienda, 2001; Becker, 1974) and region of employment given that local labor markets confound earnings. Two single-item, binary variables were used to indicate whether a participant was married or had living dependents. Additionally, we included a set of dummy variables to capture the region of employment for each of the participants, using the Northwest region as the referent group.

Finally, we accounted for the institutional context through two sets of categorical, dummy-coded variables. Three institutional type measures captured the control of graduates' undergraduate college (i.e., public, private, or for-profit) and four additional measures represented selectivity (highly selective, moderate, inclusive, unknown). Public and highly selective schools served as the referent groups.

Analyses

In order to answer the study's research questions, we used a number of different descriptive and multivariate techniques to understand the effects of different high-impact experiences on the study's five dependent variables. We began by conditioning the data, examining the frequencies and means of all categorical and continuous variables, respectively, and transforming those variables that were not normally distributed. In particular, we used a log linear transformation on the earnings dependent variable and then transformed many of our categorical variables into sets of dummy variables. A log-linear form of earnings corrects for the measure's positively skewed distributions and allows unstandardized regression coefficients to

approximate percent differences, or proportional changes, in earnings due to incremental changes in predictor variables (Björklund & Kjellström, 2002).

For the different scales incorporated in the study, we first utilized principal axis factoring with a Varimax rotation to identify different factors and then subsequently ran a reliability analysis; all factor loadings were above 0.40 and all reliabilities were above 0.70. Although missing data was not a major concern (e.g., less than 10% for any one variable), we employed a multiple imputation technique for missing data based on a fully conditional specification procedure that utilizes the Markov chain Monte Carlo (MCMC) iterative method (Li et al. 1991; Schafer 1997). We ran a total of five imputations and used the pooled results when reporting on multivariate analyses.

To answer the study's research questions, we utilized an OLS blocked regression method in which we entered our independent variables in two blocks: The first block included all of the independent variables listed above, including socio-demographic and academic background characteristics; undergraduate institution; major field of study; high-impact experiences; college to career transitions; and family and employment characteristics following college. The second block included a series of interaction terms in which we crossed the high impact practices by the major related to current job variable (i.e., High Impact Practices X Major Related to Current Job). We examined the interactions to answer our third question about whether the effect of different high impact practices was moderated by the congruence between one's major and job.

Limitations

Despite the richness of the ELS dataset, the study was limited to those high-impact experiences included in the ELS student survey and demonstrated conceptual relevance to the study of early career outcomes. We recognize that other college experiences or additional high-

impact practices that were not measured may also be important to include in future studies. Further, the earnings information and other data used in the study were based upon students' self-reported accounts, and therefore the veracity of the findings has not been adjudicated with data from employers or other external sources. Finally, we also recognize that future models would benefit from additional undergraduate controls, particularly students' college grade point averages and course patterns (scheduled for release by NCES in 2016), and job field.

Results

Effects of High-Impact Experiences

We begin our discussion of results by answering our first research question about the relationship between high-impact experiences and early career outcomes. As shown in Table 3, the Learning and Challenge model explained 16% of the model variance—the highest amount of explained variance across the different outcomes. The remaining models were all associated with *R-sq* values under 10%, with Job Satisfaction at 9.5%, Log Earnings at 8.1%, Job Commitment at 7.6%, and Supportive Work Environment at 6.2%. These levels of explained variance are consistent with past studies of early career earnings (e.g., Hu & Wolniak, 2010; Zhang, 2008) and job satisfaction (e.g., Liu, et al, 2010;), and indicates that more than 90% of the variance across these outcomes is attributed to variables not contained in the model.

The shaded area of Table 3 highlights the net effects of the five different high impact practices on the early career outcomes, controlling for all other background characteristics, college to career transitions variables, and family and employment characteristics. The Learning and Challenge model was associated with the strongest, positive effects among the different high-impact experiences, with significant effects found in relation to internships ($\beta = 0.106, p < 0.01$) and community-based projects ($\beta = 0.115, p < 0.01$). This suggests that students who

participate in both internships and community-based projects report having more opportunities to learn new things, face new challenges, and find their work to be more useful for society than those students who do not participate in these high-impact experiences.

[Insert Table 3 here]

In addition to the effects on Learning and Challenge, we found a positive, significant relationship between participating in a senior capstone experience and being employed in a Supportive Work Environment ($\beta = 0.071, p < 0.01$). Students who participated in an outside research project, however, were associated with significantly negative effects in relation to both Log Earnings ($\beta = -0.106, p < 0.01$) and being in a Supportive Work Environment ($\beta = -0.068, p < 0.01$). We found no significant effects for students who participated in a study abroad experience and no relationships were uncovered for any of the high-impact experiences and Job Satisfaction or Job Commitment. Given the high value placed on these practices, the lack of significant findings is an important and noteworthy result.

Effects of College Majors and Institutional Quality

In answering our second research question, we examined the comparative effects among the high-impact experience, measures of institutional quality, and college major. Both college selectivity and college major produced larger effects on Log Earnings in comparison to the smaller, negative effect noted above in relation to an outside research project. Consistent with our expectation, students who attended moderate ($\beta = -0.183, p < 0.001$), inclusive ($\beta = -0.164, p < 0.01$), or unknown ($\beta = -0.216, p < 0.001$) selectivity school were all associated with significantly lower Log Earnings compared to students attending highly selective colleges and universities. As evident by the coefficient, the earnings benefit of attending a selective institution ranged from 16% to nearly 22%, roughly mirroring the magnitude of effects reported

in previous studies of early career earnings based on nationally representative data (e.g., Zang, 2008). The effects of college selectivity, however, were only found in relation to Log Earnings, whereas we found effects for college major on all of the early career outcomes with the exception of a Supportive Work Environment.

In terms of college major, majoring in a STEM field (the excluded comparison group in the Table 3) leads to significantly better early career outcomes across earnings and non-monetary, attitudinal measures of one's job. With only two notable exceptions, students majoring in non-STEM fields were associated with significantly lower outcomes compared to students majoring in the STEM fields. Only students in Education (versus STEM) were associated with significantly higher Job Satisfaction ($\beta = 0.246, p < 0.001$) and Job Commitment ($\beta = 0.266, p < 0.01$), which runs counter to the roughly 20% lower earnings among Education (versus STEM) majors ($\beta = -0.203, p < 0.001$). Therefore, among Education majors, their relatively high levels of satisfaction and commitment towards their jobs may serve to offset some of the economic disadvantages commonly associated with a degree in Education.

Furthermore, the effects of college major were generally stronger and more consistent than those associated with the high-impact experiences. With the exception of the Business and Other major categories, all of the college majors were associated with smaller, average Log Earnings than students in the STEM fields. Likewise, with the exception of Education and Social Science majors, all other majors were associated with lower levels of Learning and Challenge compared to students majoring in the STEM disciplines. Students in Business ($\beta = -0.146, p < 0.01$) and Social Science ($\beta = -0.146, p < 0.05$) majors also reported significantly lower levels of Job Satisfaction compared to their counterparts who had majored in STEM fields.

Overall, we found stronger effects on Log Earnings within the institutional quality and major categories compared to the effects of high-impact experiences. However, the effects of college major were much more pronounced across all of the early career outcomes with the exception of a Supportive Work Environment, where we only found effects related to the high-impact experiences. Finally, across all early career outcomes, college selectivity had a significant effect only on Log Earnings; none of the attitudinal career outcomes were influenced by the selectivity of institution attended.

The Influence of College to Career Transitions

The final research question examined more closely the effects related to college to career transitions in relation to the five different high-impact college experiences. Students who indicated congruence between their college major and current job were associated with highly significant effects across each of the early career outcomes, with the strongest effect found on Learning and Challenge ($\beta = 0.695, p < 0.001$), followed by Job Satisfaction ($\beta = 0.531, p < 0.001$) and Job Commitment ($\beta = 0.487, p < 0.001$). In terms of earnings, students who reported working in a job related to their college major enjoyed roughly 16% higher earnings than their counterparts who reported not working in a related field ($\beta = 0.158, p < 0.001$). Similar effects, though smaller and less consistent, were found in relation to graduate degree attainment. Students with a graduate degree were associated with highly significant and positive effects in relation to Learning and Challenge ($\beta = 0.225, p < 0.001$), Job Satisfaction ($\beta = 0.221, p < 0.001$), and Job Commitment ($\beta = 0.270, p < 0.001$), although the size of these effects were smaller in comparison to the major-job congruence indicator. Interestingly, having completed a graduate degree led to significantly and substantially (nearly 25%) lower Log Earnings ($\beta = -0.247, p < 0.001$). This seemingly counterintuitive result is likely due to the fact that, in the years

immediately following college graduation, students who invested in a graduate degree did so at the expense of work experience. If our sample was a few more years beyond college, this effect would likely not appear.

For a closer look at importance of working in a job that is related to one's college major, we examined the interaction between major-job congruence and the five high impact practices included in the study to examine if the influence of high-impact college experiences on early career outcomes may operate by way of a closer articulation between students' majors and their subsequent job fields (see Table 4). Controlling for all other model covariates, as well as the main effects of both major-job congruence and high-impact experiences, we found only four significant effects, three of which were in relation to Learning and Challenge. Specifically, students who participated in internships ($\beta = 0.163, p < 0.05$) and senior capstone ($\beta = 0.222, p < 0.05$) projects while also reporting congruence between their college major and current job were associated with positive, significant effects in relation to their current job's level of Learning and Challenge. However, we found a negative interaction effect for study abroad ($\beta = -0.254, p < 0.05$) in relation to Learning and Challenge, suggesting that internships and capstone experience, which are often more aligned with one's major, are stronger predictors of Learning and Challenge than participating in study abroad programs *if* students secure a job closely related to their major. The only other significant interaction effect we uncovered was in relation to outside research projects ($\beta = -0.215, p < 0.05$) and Log Earnings, suggesting again that students who engaged in an outside research project during college and who were working in jobs aligned with their major earn lower earnings, on average, than those who either did not participate in an outside research project, did not report major-job congruence, or did not report either of these events.

[Insert Table 4 here]

Discussion and Conclusions

The study investigated the influence that high-impact college activities have on the early career outcomes of graduates. Utilizing nationally representative data on college students' transitions from college to the labor market, we provide new information on the effects of college major and institutional selectivity on early career earnings and non-monetary outcomes, and extend past research by investigating the unique influence of high-impact college experiences. In answering our first research question, we addressed whether or not participating in "high-impact" (AAC&U, 2007) experiences during college influenced early career outcomes. We chose to explore the effects of high-impact experiences given their positive influence on aspects of college student learning and development (Kuh, 2008; Kuh & O'Donnell, 2013), and the lack of evidence on the effects of such experiences following college. With our second research question we sought to understand how the early career effects of high-impact college experiences compare to major field of study and measures of institutional quality, which are known to influence career outcomes and are more thoroughly researched than other college experiences. With our third and final research question, we focused on college to career transitions by examining if the effects of high-impact college experiences on early career outcomes differ for students working in jobs closely related to their college major field of study. The findings point to at least four conclusions.

First, the relationship between high-impact experiences and early career outcomes presents a complex yet informative picture where high-impact experiences exert a relatively small and generally inconsistent influence on career outcomes in the years immediately following college graduation, and where specific experiences seem only to predict a single career

outcome, rather than multiple outcomes. This finding appeared amidst a host of statistical controls for demographic, socioeconomic, and academic characteristics at college entry, differences in the types of institution attended, major fields of study, and college to career transition measures, as well as family and employment characteristics following college. For example, having an internship during college appears to lead students into jobs that offer new challenges, opportunities for continued learning, and serve a social purpose. However, internships do not significantly predict working in a supportive environment, satisfaction, commitment, or higher earnings. Alternatively, an outside research project negatively affects both earnings (particularly for students who worked in a job related to their college major) and working in a supportive environment. Though not included in the above results, we ran additional analyses to identify that, in fact, students who participated in research projects were significantly more likely to have completed a graduate degree, thus limiting their work experience, and therefore earnings, immediately after college. Alternatively, the reasons why students who worked on research projects in college are less likely to report working in supportive environments remains a question for further research.

Given the evidence suggesting positive academic effects of participating in high-impact practices during college (Kuh, 2008; Kuh & O'Donnell, 2013), along with the broader literature on the importance of different facets of student engagement (Carini, Kuh, & Klein, 2006; Hu & Kuh, 2003; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008), we had anticipated finding more consistent and stronger evidence that high-impact practices exert a positive influence on earnings and other aspects of career success. Given the nature of our outcome measures and the large amount of unexplained variance, these results should not be used to call into question the importance of high-impact college experiences in terms of college student learning and

development. The results do, however, highlight the modest influence that any one experience has on career trajectories, and that such influence is overshadowed by field of study and securing jobs closely related to majors. The results also suggest that caution should be applied before suggesting that the positive influence high-impact experiences have on learning will translate to career gains; as previously suggested in relation to broader notions of student engagement (Kuh, 2008).

Second, consistent with past research, attending a more selective institution substantially improves earnings in the years immediately following college. Attending a selective rather than moderate or inclusive institution leads to 16-18% higher earnings within the first few years of college graduation. Interestingly, attending a more selective institution has no effect on non-monetary, attitudinal-based rewards, a somewhat consistent finding with Liu et al.'s (2010) study, which showed institutional selectivity has only marginal influence on different dimensions of job satisfaction, particularly non-monetary dimensions.

Third, also consistent with past research, college majors have a significant and strong effect on early career earnings *and* job attitudes, generally favoring majoring in STEM fields. Interestingly, business majors and education majors provide an informative basis for comparison. While business majors enjoy comparable earnings benefits as STEM majors, they report significantly lower levels of learning and challenge on the job, as well as lower satisfaction, whereas education majors earn substantially less than STEM majors, but are more satisfied and committed to their jobs. The only outcome college majors appear not to influence is working in a support environment.

The fourth and final conclusion is the large and significant effects on both monetary and non-monetary career outcomes of college to career transitions, including working in a field

closely related to one's major and attaining a graduate degree. In fact, major-job congruence exerted the largest effect of any variable in the model across the four attitudinal measures. In terms of earnings, students who work in jobs closely related to their major report, on average, more than 15% higher earnings. Attaining a graduate degree, while having a negative effect on early career earnings, significantly improves an individual's prospects for working in a challenging, learning-orientated job, and leads to greater job satisfaction and commitment. These findings suggest that to earn more *and* enjoy the kinds of attitudinal outcomes we have examined, students will benefit from additional support in securing jobs related to their majors. More intentionality around career counseling services for college students could enable graduates to better reap the monetary and non-monetary benefits associated with securing a job in a field related to their college majors.

Ultimately, our results highlight the numerous ways that students' experiences during college influence their career development, and provide evidence suggesting that a more complete, but also more complex understanding of how college influences career outcomes comes from studying college experiences that extend beyond broad indicators of type of institution attended and major field of study, to include the kinds of experiences that receive attention for being important determinants of learning and development. As students continue to highlight their desire to achieve "better" jobs as a primary motivation for entering college, our results provide evidence on the combination of factors that promote monetary and non-monetary job rewards among graduates. And as many states and institutions now emphasize career development and employment-based outcomes after graduation as key indicators of the postsecondary "quality", partially in response to the proposed College Scorecard (USDOE, 2014) and performance-based funding strategies in several states, institutions will benefit from a

clearer understating of the importance of helping students secure jobs related to their majors, over and above the influence of high-impact college experiences. Altogether, the study adds important nuance to our understanding of the influence specific college experiences have on career trajectories and dispositions in the years immediately following college graduation.

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Table 1. Descriptive Statistics

	Min	Max	Mean	SD
Socio-Demographic & Academic Background Characteristics				
Male	0.00	1.00	.464	.499
Female	0.00	1.00	.536	.499
Asian	0.00	1.00	.061	.239
Black	0.00	1.00	.081	.273
Hispanic	0.00	1.00	.081	.272
White	0.00	1.00	.748	.434
Multiracial / Other	0.00	1.00	.029	.169
SES	-1.86	1.87	.376	.656
SAT composite	4.20	16.00	10.775	1.773
Undergraduate Institution				
College type: Private	0.00	1.00	.299	.458
College type: For-profit	0.00	1.00	.042	.201
College type: Public	0.00	1.00	.653	.476
College selectivity: Selective	0.00	1.00	.327	.469
College selectivity: Moderate	0.00	1.00	.435	.496
College selectivity: Inclusive	0.00	1.00	.106	.308
College selectivity: Other / Unknown	0.00	1.00	.124	.330
Major Field of Study				
Arts & Humanities	0.00	1.00	.081	.273
Business	0.00	1.00	.144	.351
Education	0.00	1.00	.081	.272
Social Science	0.00	1.00	.104	.305
STEMe	0.00	1.00	.236	.425
Applied Arts & Humanities	0.00	1.00	.054	.226
Other	0.00	1.00	.063	.243
Missing	0.00	1.00	.237	.425
High-Impact College Experiences				
Internship / Field work / Clinical Experience	0.00	1.00	.629	.483
Outside Research Project	0.00	1.00	.169	.375
Study Abroad	0.00	1.00	.160	.367
Community-based Project	0.00	1.00	.259	.438
Senior Capstone	0.00	1.00	.454	.498
College to Career Transitions				
Major Related to Current Job	0.00	1.00	.786	.410
Graduate Degree Attainment	0.00	1.00	.206	.404

Table 1. Continued

	Min	Max	Mean	SD
Family & Employment Characteristics Following College				
Married	0.00	1.00	.284	.451
Dependents	0.00	1.00	.124	.330
Region: Northwest	0.00	1.00	.216	.412
Region: Midwest	0.00	1.00	.224	.417
Region: South	0.00	1.00	.342	.474
Region: West	0.00	1.00	.207	.405
Region: Other	0.00	1.00	.011	.105
Early Career Outcomes¹				
Annual Earnings	3.09	13.30	10.346	.772
Supportive Work Environment	1.00	5.00	4.383	.651
Job Satisfaction	1.00	5.00	3.749	.993
Job Commitment	1.00	5.00	3.582	1.172
Continued Learning & Challenge	1.00	5.00	3.936	.956

$N = 3,630$

$N (weighted) = 810,849$

SOURCE: ELS 2002 Restricted Dataset; sample sizes were rounded to nearest tenth per ELS restricted data guidelines. NOTES: ¹ Scaled measures with inter-item reliability as follows: Supportive Work Environment (3 items, $\alpha = 0.826$), Job Satisfaction (3 items, $\alpha = 0.915$); Job Commitment (3 items, $\alpha = 0.910$); Continued Learning & Challenge (3 items, $\alpha = 0.760$).

Table 2. Constituent items for Early Career Outcome Scales

Supportive Work Environment ($\alpha = 0.826$)

Item 1: Most people at work are pretty supportive

Item 2: There are people to learn from at work

Item 3: There are people to help in solving a work problem

Job Satisfaction ($\alpha = 0.915$)

Item 1: Feels fairly well satisfied with current job

Item 2: Enthusiastic about work on most days

Item 3: Finds real enjoyment in work

Job Commitment ($\alpha = 0.910$)

Item 1: Plans to remain in current job over the next year

Item 2: Usually doesn't think about leaving current job

Item 3: Feels pretty strongly committed to keeping current job

Continued Learning & Challenge ($\alpha = 0.760$)

Item 1: Opportunities to learn new things

Item 2: New challenges

Item 3: Useful for society

SOURCE: ELS 2002 Restricted Dataset.

Table 3. Estimated Effects (Unstandardized coefficients) on Early Career Earnings among Full-time Employed College Graduates (*N*=810,849)

	Log Earnings	Learning & Challenge	Supportive Work Environment	Job Satisfaction	Job Commitment
Socio-Demographic & Academic Background Characteristics¹					
Female	-0.028	0.024	-0.001	-0.018	-0.074
Asian	0.084	-0.128	-0.124 **	-0.109	-0.149
Black	-0.001	-0.055	-0.092 *	-0.238 **	-0.312 ***
Hispanic	-0.072	-0.126 *	0.062	0.087	0.096
Multiracial / Other	0.070	-0.216 *	-0.091	-0.155	-0.069
SES	-0.010	0.074 *	0.056 **	0.079 **	0.084 *
SAT composite	0.028 *	-0.015	0.004	-0.018	0.008
Undergraduate Institution²					
College type: Private	0.049	-0.048	-0.021	-0.030	-0.069
College type: For-profit	0.061	0.039	0.000	0.067	-0.125
College selectivity: Moderate	-0.183 ***	-0.022	-0.038	-0.032	0.043
College selectivity: Inclusive	-0.164 **	-0.086	-0.020	-0.082	0.006
College selectivity: Other	-0.216 ***	0.020	-0.040	-0.059	0.011
Major Field of Study³					
Arts & Humanities	-0.333 **	-0.142 *	0.001	-0.077	-0.082
Business	0.039	-0.287 ***	-0.052	-0.146 **	-0.082
Education	-0.203 ***	0.084	0.009	0.246 ***	0.266 **
Social Science	-0.165 ***	-0.103	0.007	-0.146 *	-0.082
Applied Arts & Humanities	-0.185 **	-0.265 ***	-0.026	0.021	-0.019
Other	-0.062	-0.197 **	-0.043	-0.035	-0.179 *
Missing	-0.229 ***	-0.154 **	-0.035	-0.104*	-0.162**
High-Impact College Experiences					
Internship	0.061	0.106 **	0.031	-0.007	-0.010
Outside Research Project	-0.106 **	0.063	-0.068 *	0.050	0.048
Study Abroad	0.004	0.028	0.009	0.009	-0.050
Community-based Project	-0.030	0.115 **	-0.014	0.068	0.016
Senior Capstone	0.045	0.027	0.071 **	-0.026	0.007
College to Career Transitions					
Major Related to Current Job	0.158 ***	0.695 ***	0.284 ***	0.531 ***	0.487 ***
Graduate Degree Attainment	-0.247 ***	0.225 ***	0.053	0.221 ***	0.270 ***

Table 3. Continued

	Log Earnings	Learning & Challenge	Supportive Work Environment	Job Satisfaction	Job Commitment
Family & Employment Characteristics Following College⁴					
Married	0.178***	0.139***	0.016	0.133**	0.207***
Dependents	-0.004	-0.031	-0.033	0.119*	0.102
Region: Midwest	-0.065	0.046	0.045	0.083	0.114
Region: South	-0.041	0.045	0.042	0.062	0.042
Region: West	-0.015	0.231***	0.147***	0.236***	0.162**
Region: Other	-0.223	-0.184	-0.410*	-0.178	-0.189
<i>Adj. Model R-sq⁵</i>	0.081	0.163	0.062	0.095	0.076

SOURCE: ELS 2002 Restricted Dataset. NOTES: ¹ Racial/Ethnic comparison group: White. ² College type comparison group: Public, Non-profit; College selectivity comparison group includes Highly Selective. ³ Undergraduate Major Field of Study comparison group: STEM. ⁴ Region comparison group = Northeast. ⁵ *Adj. Model R-sq* is based on the average across the 5 imputed models.

* $p < 0.05$, ** $p < 0.01$; *** $p < 0.001$.

Table 4. Estimated Interaction Effects (Unstandardized coefficients) on Early Career Earnings among Full-time Employed College Graduates (N=810,849)

Interaction effects	Log Earnings	Learning & Challenge	Supportive Work Environment	Job Satisfaction	Job Commitment
Major Related to Current Job <i>x</i>					
Internship	0.062	0.163*	0.001	0.094	0.067
Outside Research Project	-0.215*	-0.104	-0.055	-0.001	-0.032
Study Abroad	-0.109	-0.254*	-0.119	-0.114	-0.150
Community-based Project	0.097	0.099	-0.029	0.126	0.122
Senior Capstone	0.126	0.222*	0.045	0.019	-0.001

SOURCE: ELS 2002 Restricted Dataset. NOTES: The models included the full set of variables, as defined in Table 3.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Appendix

Table A-1. List of College Majors by Major Category

Arts & Humanities

- 4 Art—visual and performing
- 12 English language and literature/letters
- 14 Foreign language/literature/linguistics
- 24 Philosophy, religion, theology
- 33 Liberal Arts/sci, general studies/humanities

Applied Arts & Humanities

- 2 Architecture and related services
- 7 Communication/journalism/comm tech
- 16 Legal professions and studies

Business

- 6 Business/management/marketing/related

Education

- 10 Education

Social Science

- 26 Psychology
- 30 Social sciences (except Psychology)

STEM

- 1 Agriculture/natural resources/related
- 5 Biology and biomedical sciences
- 8 Computer/ info sciences/support tech
- 11 Engineering technologies/technicians
- 15 Health professions/clinical sciences
- 18 Mathematics and statistics
- 25 Physical sciences

Other

- 13 Family/consumer sciences, human sciences
 - 21 Parks/recreation/leisure/fitness studies
 - 23 Personal and culinary services
 - 27 Public administration/social services
 - 29 Security and protective services
 - 32 Other
-

SOURCE: ELS 2002 Restricted Dataset

Figure 1. Conceptual Model for Examining the Effects of College Experiences on Career and Economic Outcomes

