

Maintaining Inequality: An Analysis of College Pathways among Women at Large Public  
Institutions

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### **Abstract**

Armstrong and Hamilton (2013) proposed a framework of three college pathways – *party*, *professional*, and *mobility* – that lead to economically unequal post-graduation outcomes, and vastly different college experiences for female students. Using data from the National Survey of Student Engagement, we examined the responses from 42,504 women seniors at 183 four-year large public institutions to identify how the potential income of their college major choice relate to the pathways. We found that the economic advantage of major choice is not equally distributed among students: party pathway students selected the least lucrative college majors, professional pathway students selected the most lucrative majors, and first-generation students on all pathways tended to select majors with less potential income than their peers with college-educated parents. Students on the three pathways also engaged differently in three measures of academic engagement – Reflective and Integrative Learning, Learning Strategies, and Student-Faculty Interaction.

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This study is rooted in a recently published book *Paying for the Party: How College Maintains Inequality* by Armstrong and Hamilton (2013). The authors conducted a five-year ethnographic study of the college pathways of 47 female students at a Midwestern flagship public research university (“Midwestern University”, MU). As a result of the study, three college pathways were identified: *party*, *mobility*, and *professional*. Each pathway is a characterization of what students valued in the college experience, and consequently, how they chose to spend their time (for a full description of each pathway, see Table 1).

Other researchers have also attempted to classify students according to their college experience, and/or how they spend their time while in college. Rau and Durand (2000) in their study on “academic ethics” conducted a survey of 310 students at Illinois State University about their time use (among other things), and used the multidimensional scaling algorithm to establish a similarity or dissimilarity of student profiles: there was a clear contrast between students who participated in the “party culture” and those who were serious about academics. Brint and Cantwell (2010) used data of the University of California (UC)’s Undergraduate Experiences Survey (UCUES) to examine characteristics of 6,300 students at eight UC campuses grouped into five categories according to their time use: “scholars”, “actives” (i.e., “socially active”), “scholar actives”, “workers”, and “passives”. They later used another wave of UCUES to describe a “portrait of the disengaged students” (Brint & Cantwell, 2014). Most recently, Yurk Quadlin and Rudel (2015) analyzed the data of the National Longitudinal Survey of Freshmen to examine how student loans affect student time use in college. Using latent class analysis on a sample of 3,439 cases they established three distinct collegiate lifestyles, which they named

“serious students”, “socially engaged”, and “inactive”. Thus, classifying student college experiences according to time use is not a new idea. What sets *Paying for the Party* apart from this line of research, besides it being a longitudinal qualitative study in nature, is that Armstrong and Hamilton (2013) compellingly demonstrated that the three college pathways they describe greatly affect students’ choice of major, and post-graduation economic and professional trajectory.

The purpose of our study is to build on the work of Armstrong and Hamilton (2013) by proposing the use of survey data to identify students on the *party*, *mobility*, and *professional pathways*, and to examine how these pathways are related to student engagement and potential future earnings. Using the 2014 data from the National Survey of Student Engagement (NSSE), we examined how women attending four-year large public institutions tended to divide their time among three weekly activities—preparing for class, working on and off campus for pay, and relaxing and socializing. Additionally, we focused on the paths taken by first-generation seniors and whether or not a path may lead to a quantitative and/or qualitative educational outcome resulting in a social (dis)advantage (Lucas, 2001). The proxy used to measure a quantitative advantage is the potential annual income of an earned bachelor’s degree. The proxy for a qualitative advantage is defined as the academic engagement of three selected effective educational practices (Reflective and Integrative Learning, Learning Strategies, and Student-Faculty Interaction).

### **Conceptual Framework**

Lucas (2001) conjoined ideas from educational transitions and track mobility literature to better understand the effect of social class on student persistence and attainment in American higher education. Lucas (2001) proposed a theory called Effectively Maintained Inequality

(EMI), which distinguishes between quantitative and qualitative advantages that upper socio-economic status (SES) families seek in order to secure for their children a privileged social position. For instance, as institutions become more accessible to the masses, upper SES families may simultaneously look for advantages by pursuing more education (quantitative) particularly at prestigious institutions (qualitative) and in fields of study (qualitative) that yield lucrative career options (quantitative). Lucas argued students from affluent families are able to maintain their social status by applying unmatched human and economic resources to make better-informed educational decisions.

While numerous studies have provided support for the EMI theory, oftentimes the culprits are narrowed down to two significant decisions – where to attend college (Alexander, Holupka, & Pallas, 1987; Davies & Guppy, 1997; Smart & Pascarella, 1986) and major field choice (Goyette & Mullen, 2006; Leppel, Williams, & Waldauer, 2001; Wolniak, Seifert, Reed, & Pascarella, 2008). Armstrong and Hamilton (2013) claim, however, there is more to the story and perhaps the chosen pathway through college may also play an important role.

Armstrong and Hamilton (2013) provide many clues as to why college experiences should be different for students on the three pathways (see Table 1 for college pathway descriptions). Successful students on the professional pathway (*achievers*) often knew right from the start what they wanted to do after graduation (e.g., get into a top dentistry school), and how to get there. They were strategic in their decisions; they knew what extra-curricular and professional experiences they needed to achieve their goals. They did not have to work for pay, so they devoted enough time to studying, and socialized moderately. Many students on the party pathway were also strategic about their time in college but in a different way. Maintaining a “B” average was enough for many of these students, and they chose “easy majors” that did not have

such rigorous entry requirements as language, science, or math. The authors argue that the low-, but not-too-low-effort approach to academics was a conscious choice for many of these students, as it provided continued access to the college party scene. Women on the mobility pathway did not have time to study or socialize due to a significant amount of time they spent working for pay. They also reported receiving poor advising services.

The college pathways, and the choices students make (or, in the case of students who have to support themselves by working for pay, are pressured to make) about how they spend their time in college may be a representation of so-called “temporal capital – the amount of time the student is able to dedicate to scholarly pursuits” (Gardner & Holley, 2011, p. 79). We argue that in this light, a student’s pathway itself is already, potentially, a (loose) manifestation of student’s cultural and/or socio-economic capital. Support for this argument can be found in another equally insightful book on how student’s SES shapes college experience – *Inside College Gates: How Class and Culture Matter in Higher Education* by Stuber (2011), who posits that it is through the process of experiencing college life and qualitative differences of college experiences that social inequality manifests itself, as opposed to quantitative studies of students’ SES. It is the rich descriptions of the differences in academic experiences of the women of *Paying for the Party* that informed our decision to focus on qualitative outcomes (reflective and integrative learning, learning strategies and student-faculty interaction) for women on the three pathways, in addition to examining their college major choice.

### **Relevant Literature**

In this section we present some relevant literature about our main variables of interest – potential college earnings, Reflective and Integrative Learning, Learning Strategies, Student-

Faculty Interaction, and first-generation students. We conclude this section with an argument and evidence from research literature for why gender and institution type are important for our study.

### **Potential college earnings**

One of the reasons students attend college is the expectation of making more money and securing a good job after graduation (Astin, 1993). Higher education literature generally supports this expectation by comparing the level of income of college graduates to that of high school graduates and by estimating the “college earnings premium” – that is, the difference between college and high school levels of income (e.g., Baum, Ma, & Payea, 2013; Pascarella & Terenzini, 2005; Perna, 2005). However, a more nuanced approach to examining college graduate earnings reveals that there are significant differences between post-college levels of income depending on many factors, such as, gender, race, socio-economic background, academic ability and preparation, educational aspirations, and type of institution attended (Baum, Ma, & Payea, 2013; Corcoran, 1995; Davis & Guppy, 1997; Pascarella & Terenzini, 2005; Perna, 2005; Wilson & Boldizar, 1990).

Another key factor that leads to different levels of income among college graduates is an individual’s college major/field of study, with the difference ranging between 25 to 35 percent depending on an individual’s major (Pascarella & Terenzini, 2005). A field of study in some cases can even “trump” educational attainment in terms of earnings; for example, a college degree in humanities or education generally pays less than an associate degree in business or health for women, and an associate’s degree in engineering, public service, or vocational fields for men (Pascarella & Terenzini, 2005). In one study the difference between earnings of a male who majored in electrical engineering versus a male whose major was general education was estimated to be approximately equal to the “college earnings premium”, that is, the difference in

income levels for these two majors was roughly equal to the difference between a college degree and a high school diploma (Altonij, Blom, & Meghir, 2012).

The highest-paid fields of study tend to have a well-defined body of content knowledge, often with an emphasis on quantitative skills, and a direct link to functional/applied occupations (Pascarella & Terenzini, 2005). Several studies have found that STEM or vocational majors are the highest or among the highest paid fields, with education and/or humanities & arts – among the lowest (Goyette & Mullen, 2006; Ma, 2009; Staniec, 2004; Wolniak et al., 2008).

One significant drawback of many of the studies of the relationship between major and income is that they tend to group individual majors into larger categories, which does not allow for a more refined analysis of the effects of a particular major on earnings and career outcomes. For example, in a study by Turner and Bowen (1999), the authors argued that grouping economics with the rest of “social sciences” could obscure important differences for women’s enrollment in these fields. Likewise, fields of finance and accounting can pay significantly more than other majors within the “business” group of majors (Carnevale, Strohl, & Melton, 2011).

### **Reflective and Integrative Learning**

The NSSE “Reflective and Integrative Learning” scale was originally part of the “Deep Approaches to Learning” scale in the NSSE survey (Nelson Laird, Shoup, & Kuh, 2005), developed on the basis of previous research on “deep” and “surface” learning (Biggs, 1989; Marton & Säljö, 1976). Deep learning originates from a student’s desire to understand the material, as opposed to surface learning, where the student’s intention is to pursue a utilitarian goal, such as to pass an exam (Marton & Säljö, 1976). The two types of learning (deep and surface) are characterized by different approaches to processing information (Biggs, 1989): deep learning is associated with higher achievement (Biggs, 1989; Van Rossum & Schenk, 1984) and



with a higher quality of learning outcomes (Watkins, 1983; Van Rossum & Schenk, 1984), whereas surface learning is associated with lower achievement (Diseth, 2002) and lower quality of learning outcomes (Watkins, 1983).

Rogers (2001) examined several theoretical approaches to the reflective process, and found four common elements: reflection as a cognitive activity “(1) requires active engagement on the part of the individual; (2) is triggered by an unusual or perplexing situation or experience; (3) involves examining one’s responses, beliefs, and premises in light of the situation at hand; and (4) results in integration of the new understanding into one’s experience” (p. 41). Rogers (2001) also synthesized what was known about the benefits of reflective thinking. Virtually all authors Rogers (2001) studied either stated or implied that reflective thought results in “learning”. Reflection also promotes cognitive flexibility, innovation, and creativity (Langer, 1989; Mezirow, 1991); leads to a different conceptual perspective on an issue or experience (Boud, Keogh, & Walker, 1985; Boyd & Fales, 1983); and is important for improving learners’ ability to acquire new information and skills (Zimmerman, 1998). Besides facilitating a variety of educational benefits, reflective learning can be valued as a benefit of its own right: John Dewey (1933) stated that reflection “enriches things with meaning” (p. 18-19).

Integrative learning is defined broadly as “an umbrella term for structures, strategies, and activities, that bridge numerous divides, such as high school and college, general education and the major, introductory and advanced levels, experiences inside and outside the classroom, theory and practices, and disciplines and fields” (Klein, 2005, p. 8). Integrative learning is widely recognized as a valuable learning outcome in and of itself (Huber, Hutchings, & Gale, 2005). It is also argued to promote more potent learning environments (Newell, 1999), and to prepare college graduates to tackle unscripted problems of the “real world” (Leskes, 2004).

## Learning Strategies

In general, being strategic about studying involves effective time-management, finding conditions and materials conducive to effective studying, and understanding course requirements and assessment criteria (Entwistle, McCune, & Walker, 2001). Thus, from a bird's eye-view of the general learning process, a learning strategy is defined as the way “a student *chooses* to deal with a specific learning task in the light of its perceived demands” (Entwistle, Hanley, & Hounsell, 1979, p. 368, emphasis in the original).

Learning strategies have been defined as “any thoughts, behaviors, beliefs or emotions that facilitate the acquisition, understanding or later transfer of new knowledge and skills” (Weinstein, Husman, & Dierking, 2000, p. 727), or simply as “activities that students use to best approach new information [...]” (Liu, Jackson & Ling, 2008, p. 1). Learning strategies impact the way a student “selects, acquires, organizes or integrates new knowledge” (Weinstein & Mayer, 1983, p. 3), and thus help students “manage their information processing burdens” (Peeverly & Sumowski, 2012, p. 104) – although Peeverly and Sumowski referred here to the function of notetaking, it is an appropriate generalization of the goal of all learning strategies.

Learning strategies, such as identifying key points in a text, notetaking, review of notes, and summarizing, significantly improve recall, factual learning, retention of information, and academic performance (Armbruster, 2009; Benton, Kiewra, Whitfill, & Dennison, 1993; Bretzing & Kulhavy, 1981; Cano, 2006; Fisher & Harris, 1973; Hadwin, Kirby, & Woodhouse, 1999; Kiewra, 1983, 1985a, 1985b, 1985c, 1985d; Kiewra & Benton, 1988; Kiewra, Benton, Kim, Risch, & Christensen, 1995; Kiewra, Benton, & Lewis, 1987; Kiewra, DuBois, Christensen, Kim, & Lindberg, 1989; Kiewra, DuBois, Christian, & McShane, 1988; Kiewra & Fletcher, 1984; Kiewra et al., 1991; King, 1992; Knight & McKelvie, 1986; Mayer, 1984;

Peverly et al., 2007; Rickards & August, 1975; Rickards & Friedman, 1978; Slotte & Lonka, 1999; Williams & Worth, 2002).

### **Student-Faculty Interaction**

The higher education literature overwhelmingly supports the positive impact student-faculty interaction (SFI) can have on student development. Decades of research have documented a vast variety of benefits of SFI on student academic achievement, persistence, intellectual and personal development, satisfaction with college, and career and educational aspirations (Anaya & Cole, 2001; Astin, 1993; Bjorklund, Parente, & Sathianathan, 2004; Dika, 2012; Endo & Harpel, 1982; Kim & Sax, 2009; Kuh & Hu, 2001; Lampton, 1993; Pascarella & Terenzini, 1978; Pascarella & Terenzini, 1979; Schreiner, Noel, Anderson, & Cantwell, 2011; Terenzini & Pascarella, 1980).

Although the benefits of SFI are numerous and significant, students do not always take advantage of interacting with faculty. In a qualitative study by Cotten and Wilson (2006) students expressed that they felt reluctant to initiate contact with faculty because the students were busy, or felt insecure, and sometimes did not want to be perceived as a “kiss-up” by their peers. Students who initiate contact with faculty more often tend to be more academically successful (Kuh & Hu, 2001), and thus this relationship may be circular in nature: “high achievers interact more, and high interactors achieve more” (Mook, 2002, p. 159).

### **First-generation students**

Armstrong and Hamilton (2013) demonstrate that SES, class background, and cultural capital of the students in the sample of *Paying in the Party* play a critical role in shaping students' experiences while at MU and beyond. Having highly educated parents provided a significant competitive advantage to students on the professional pathway; students on the party

pathway were expected to be financially supported by their parents in order to maintain the party lifestyle; while students on the mobility pathway had to compensate for lack of family resources by working for pay, which took their time and attention away from academics and forming relationships with peers.

In our study, we use first-generation student status as a proxy for student SES and cultural capital, as first-generation status and SES are closely related (Terenzini, Spinger, Yaeger, Pascarella, & Nora, 1996). In their review of the literature on first-generation students, Pascarella, Pierson, Wolniak, and Terenzini (2004) reported that first-generation students differ from their non-first-generation peers in a number of significant ways: they are handicapped in their knowledge about higher education, family income and support, educational degree aspirations, and high school preparation characteristics; they experience greater social and cultural barriers in transitioning from high school to college life; they are much less likely to live on campus and participate in extracurricular activities; finally, their academic achievement and educational attainment are lower than that of their non-first-generation peers – they are more likely to drop out or delay graduation, and less likely to pursue a graduate or professional degree. Students of low SES background display similar patterns of outcomes with regards to persistence, educational degree aspirations, and achievement (Walpole, 2003). Importantly, Walpole's longitudinal study of college experiences and outcomes also found that low SES students have lower earnings nine years after college entry, compared to their high SES counterparts.

Findings of Pascarella et al.'s (2004) own research study indicated that first-generation students tend to work more hours per week compare to students with parents with a high level of education, which may explain the fact that they had lower grades, on average, than their peers

with highly educated parents, *despite* having lighter academic workloads. It appears that first-generation students particularly benefit from contact with peers, which impacts their educational degree plans, among other outcomes (Pascarella et al., 2004). Similarly, first-generation students were found to experience stronger effects from academic activities, such as studying, reading and writing, on their intellectual and personal development, compared to students whose parents had a moderate or high level of education (Pascarella et al., 2004). First-generation students engaged less in student-faculty interaction (Kim & Sax, 2009), and a qualitative study by Collier and Morgan (2008) described particularly telling illustrations of how the lack of cultural capital and of implicit understanding of faculty roles and expectations impedes first-generation students' academic progress (for example, not understanding the purpose of faculty office hours or being intimidated by faculty's vocabulary and speaking styles).

However, some disadvantages first-generation students experience in college may not necessarily be due to the lack of cultural resources. For example, Pike and Kuh (2005) found that even though first-generation students tend to have lower engagement levels overall, this effect appears to be due to their lower educational aspirations and living situations (i.e., not living on-campus), rather than a lower level of parental education per se. Similarly, Ribera (2013) found that engagement in deep approaches to learning did not differ much between first-generation and non-first-generation students, but was rather influenced by students' major and educational aspirations. It is, of course, entirely possible (and plausible) that these students' educational aspirations, major choice, and living situations are a result of their status as first-generation students. Thus, even though the link between the first-generation status and student outcomes may not be direct, it still may be a significant, albeit non-obvious, factor.

## **Gender**

Armstrong and Hamilton (2013) focused on women students. They noted that many affluent students on the party pathway were not expected to reproduce their parents' success but were rather oriented towards a successful marriage. According to Hamilton (2014), who conducted a parallel study interviewing parents of most of the students in the sample of *Paying for the Party*, this is a manifestation of *gender complementarity*: a traditional view of gender roles, with women economically depending on men. Hamilton further argued that institutions may unintentionally support gender complementarity through maintaining sororities and a visible party scene, and thus catering to a peer culture where traditional femininity is encouraged and valued. Hamilton described a typical female student in a top sorority as “attentive to appearance, concerned with appealing to men, ever the fun companion, but not especially career-oriented” (p. 249), echoing earlier findings of a similar peer culture at Duke University (2013):

“[Female] Undergraduates described a social environment characterized by what one sophomore called “effortless perfection”: the expectation that one would be smart, accomplished, fit, beautiful, and popular, and that all this would happen without visible effort. This environment enforces fairly stringent norms on undergraduate women, who feel pressure to wear fashionable (and often impractical) clothes and shoes, to diet and exercise excessively, and to hide their intelligence in order to succeed with their male peers. Being “cute” trumps being smart for women in the social environment. Men too noted pressure to wear certain kinds of clothes and adapt their bodies to certain ideals, but they felt more freedom to resist these pressures without consequences. Women who do flout the norms often remove themselves from the social mainstream, whether voluntarily or not. Sororities and fraternities play a prominent role in enforcing these norms” (p. 12).

Sons from comparable families may be oriented to college and professional success differently, thus possibly changing the entire three-pathway framework of *Paying for the Party*. In fact, indirect evidence of this thesis can be found in a study by Ma (2009), who found that women of lower SES do not differ from men of the same background in choosing a lucrative college major, whereas women from higher SES opt for majors with lower earnings than men of similar SES. Earlier studies have also found that the effect of SES on college major choice is more pronounced for women than men (Leppel, Williams, & Waldauer, 2001; Trusty, Robinson,

Plata, & Ng, 2000). As discussed above, income levels can vary quite considerably depending on one's college major; the highest levels of income tend to be offered in the fields traditionally dominated by men, and men tend to be overrepresented in those majors, while the opposite is true for women (Pascarella & Terenzini, 2005). These facts can significantly change the three-pathway framework of *Paying for the Party* if applied to male students. In addition, a recent study found that women, including undergraduate students, tend to have more diverse life goals than men, and are less interested in obtaining a position of power in a professional setting than men (Gino, Wilmoth, & Brooks, 2015), which can also result in differing attitudes towards major choice and college success among men and women.

### **Institutional setting**

Armstrong and Hamilton (2013) made a convincing case for why an institutional setting was a significant factor for the emergence of these three college pathways. At a large institution the professional pathway is highly competitive and, effectively, zero-sum in nature, where only the most capable and best-prepared students with appropriate aspirations can take advantage of the rewards this pathway offers (e.g., high-paying jobs, or admission to graduate and professional school), while all others on this pathway are left behind. Public institutions also rely on the tuition and fees brought by the affluent students, and are thus compelled to service students, both socially and academically: partying, socializing, and college athletics events make the party pathway highly visible on campus, and the availability of undemanding academic majors helps students maintain the party pathway. Further, women on the mobility pathway often felt alienated by the campus culture, and with inadequate academic advising services were left on their own to figure out how to navigate academic life.

Other institutional settings may present a different framework of student pathways altogether. As Armstrong and Hamilton (2013) demonstrate, regional campuses of MU turned out to be a better fit for some students, because of the absence of a robust party scene. Mullen (2014) explored how female and male students select majors at a private liberal arts college and found that because all students developed strong personal identification with bodies of knowledge (as opposed to pre-professional fields), it became important for male students not to select a major considered too “feminine”. A student body composition at institutions of other types may present some different social and academic life patterns. For example, Martin (2012) in a study of college experience at Duke University and a sample of other private highly selective institutions differentiates between the “executive” and “professional” social classes of students. Combined together students from these groups represented more than 40 percent of the entire student body at both Duke and a sample of similar institutions (Martin, 2012). Large public institutions, such as MU, serve a different student population. In addition, Porter (2006) found that several institution-level factors – among them institution size, selectivity, and a research orientation of the institution – are impactful in producing different results of student engagement. Thus, the type of institution may be a significant feature of the three-pathway framework proposed by Armstrong and Hamilton (2013).

### **Purpose**

Our study aims to test these findings on a broader scale by examining the college experiences of women at over 180 four-year large public institutions. In particular, we focus on the college pathways of women in the senior year and the impact of their chosen pathway on a quantitative educational outcome, future potential earnings of an earned bachelor’s degree, and qualitative education outcomes, three forms of effective educational practices – learning



strategies, student-faculty interaction, and reflective and integrative learning. We also examine the college pathways of first-generation students and students with college-educated parents to determine to what extent, if at all, students may experience a quantitative and/or qualitative advantage.

Guided by the rich descriptions of women's academic experiences in *Paying for the Party*, this study applies students' estimated time spent on three activities—socializing with friends, studying and preparing for class, and working for pay—as proxies for three distinct college pathways. For example, it is possible that students who spend a significant amount of time socializing and relaxing with friends (party pathway) are less engaged in effective educational practices but tend to seek advantage by majoring in fields with higher potential income. Students who spend a significant amount of time working (mobility pathway) may have less time to engage in effective educational practices and tend to choose majors in fields with lower potential earnings. Students who do not have heavy working responsibilities and spend a significant amount of time studying (professional pathway) may engage in effective educational practices more and choose a major leading to lucrative career. Using how students structure their time as a measure of college pathway, we may gain additional insights as to if these college pathways are advantageous for students from lower-SES backgrounds, such as first-generation students. Alternatively, we may also better understand the mechanisms in which non-first-generation students maintain their social status; by choosing majors leading to lucrative incomes while also gaining qualitatively better educational experience through their engagement with effective educational practices such as learning strategies, interacting with faculty, and reflective and integrative learning. The specific research questions guiding this study are:

1. To what extent do students' college pathways affect quantitative educational outcomes measured by future potential earnings of a bachelor's degree?
2. To what extent do students' college pathways affect qualitative educational outcomes as measured by their level of engagement with three effective educational practices—learning strategies, student-faculty interaction, and reflective and integrative learning?
3. To what extent does the effect of college pathways on the educational outcomes of interests vary by parental education?

## Methods

### Data and Sample

Using data from the 2014 administration of the National Survey of Student Engagement (NSSE), we examined the responses from 42,504 women seniors enrolled full-time at 183 four-year large public institutions. Slightly less than half (47%) of the sample were first-generation students, and nearly three-quarters (71%) expected to earn a graduate degree. About two in five (18%) were majoring in STEM (science, technology, engineering, and mathematics) fields. Around half (51%) earned mostly A grades at their current institution with slightly less than half (44%) earning mostly B grades. Three-quarters of the sample (75%) were of traditional age (23 years old or younger). Over two-thirds of the sample identified as White (65%) with smaller proportions identifying as Asian (7%), Black or African American (8%), Hispanic or Latino (9%), multiracial (6%), another race (2%), or preferred not to respond to race (3%). For more details about the sample, see Table 2.

### Measures

**College pathways.** The survey asks students a series of questions about how they chose to spend their time during a typical 7-day week. Response options ranged from 'zero' to 'more

than 30 hours per week'. Students who spent over 20 hours per week relaxing and socializing and less than 11 hours per week working for pay or preparing for class were coded as being on the *party pathway*. Students who spent over 20 hours per week working for pay and less than 11 hours per week on socializing activities and preparing for class were coded as being on the *mobility pathway*. Students who spent over 20 hours per week on class preparation and less than 11 hours per week working or socializing were identified as being on the *professional pathway*. Students who balanced their time among all three activities were coded as being on the *balanced pathway*, a pathway we created to capture those students who did not meet the criteria for the other pathways. The majority of the sample (80%) were on a balanced pathway with smaller proportions in the professional pathway (13%), mobility pathway (5%), and the party pathway (2%).

To check if the trends found by Armstrong and Hamilton (2013) are represented by our proposed coding scheme, a frequency crosstab was calculated by select demographics and academic variables. Table 3 shows a higher proportion of first-generation students were represented by the mobility pathway. Students who were expecting to earn a graduate degree were more likely to be on the professional pathway while a smaller proportion fell on the party pathway. Students who majored in a STEM field and earned mostly A's in college were more likely to be on the professional pathway.

**First-generation student status.** The status of first-generation student serves as one of independent variables of interests. Students were asked the highest level of education completed by their parents or others who raised them. Seven categories were presented ranging from 'Did not finish high school' to 'Doctoral or professional degree'. Responses to this item were dichotomized into two categories – first-generation and non-first-generation students. Students

who selected an educational level of an associate's degree or lower were identified as first-generation. Students who selected an educational level of a bachelor's degree or above were classified as non-first-generation.

**Other demographic and academic characteristics.** Several other demographics and academic characteristics were included in the analyses as control variables. Racial or ethnic identity and age were added to control for students' background characteristics. Expectation of earning a graduate degree, self-reported college grades, and major choice as defined by majoring in a STEM or non-STEM were also included in the analyses as independent variables.

**Future earning potential.** Future earning income of an earned bachelor's degree serves as one of the dependent measures. These data came from the report on college major earnings *What's it Worth?: The Economic Value of College Majors* by Carnevale et al. (2011), who used the 2009 data of the American Community Survey to provide median earnings for 171 undergraduate majors, based on 319,018 responses (Georgetown University Center on Education and the Workforce, n. d.). We matched all NSSE majors with those of the *What's it Worth?* report. A potential annual income was assigned to each of the 138 major choices on the NSSE survey. The vast majority of NSSE majors were easily matched. In some instances a perfect match between the majors was not possible, so in such cases we used our best judgment to arrive at either a match between the majors. For example, for specific majors that were unmatched, we applied the average potential income of a related subcategory (i.e., fine and applied arts major was given the average income of all art majors). For multi/interdisciplinary majors, we assigned the rounded average of two median incomes of the two multidisciplinary majors listed in the *What's It Worth?* Report.

**Reflective and Integrative Learning.** Reflective and Integrative Learning is a subscale measuring students' uses of Deep Approaches to Learning (Nelson Laird et al., 2005). This scale consists of seven survey items asking students how often they connect ideas to societal problems or issues and from prior knowledge; combine ideas from different courses; examine strengths and weaknesses of their own viewpoints as well as try to better understand someone else's point of view; and include diverse perspectives in their course discussions or assignments (for details, see Appendix). Students provide responses to these items from a four-point scale ranging from 'very often' to 'never.' The internal consistency of this measure is deemed acceptable for research (Cronbach's  $\alpha=.89$ ).

**Learning Strategies.** Learning Strategies scale on NSSE consists of three items related to how students approach studying (Appendix A). Students were asked how often they engaged in identifying key information from reading assignments, reviewing notes after class, and summarizing what they learned in class or from course material. Four-point response options ranging from 'very often' to 'never' were presented to students. The internal consistency of this scale indicates properties of a reliable measure (Cronbach's  $\alpha=0.79$ ).

**Student-Faculty Interaction.** Student-Faculty Interaction (SFI) is a reliable measure (Cronbach's  $\alpha=.86$ ) composed of four survey items, asking students how often they had discussions and conversations with faculty members on academic, extracurricular or career-related topics (for details, see Appendix A). The 4-point response options ranged from 'very often' to 'never'. It is worth noting that this measure of SFI does not include a social contact between students and faculty, but rather focuses on substantive topics, such as course ideas and concepts, students' career plans or students' academic performance. Research has shown that a

student-faculty social contact alone may not necessarily significantly impact students (Lundberg & Schreiner, 2004; Pascarella & Terenzini, 1991).

### **Analysis**

An ordinary least squares hierarchical (OLS) multiple regression technique was used to examine the unique influence of parental education and selected college pathway on students' potential annual income. Four blocks of variables were entered into the model. The first block included socio-demographic characteristics; specifically, parental education, age, and race-ethnicity. The second block added the four college pathways (with the reference group being the mobility pathway). The third block introduced major choice as measured by STEM or non-STEM and an estimate of academic performance as defined by self-reported college grades. The final model introduced interaction terms to test for significant gaps in potential income between first and non-first-generation students on each of the four pathways. All the independent variables were grand-mean centered prior to entering the model.

To examine the unique effect of parental education and the four college pathways on students' engagement effective educational practices, three OLS regression models were run applying the same independent variables as controls. The dependent variables measuring aspects of academic engagement were Learning Strategies, Student-Faculty Interaction, and Reflective and Integrative Learning. The dependent variables were standardized prior to entering the models, and all the independent variables were grand-mean centered.

### **Results**

**Future potential earnings.** Table 4 shows that first-generation students were likely to earn less even after controlling for other demographics and academic characteristics. Specifically, first-generation students were likely to earn \$1,407 less per year than non-first-

generation students controlling for degree expectations, age, and racial ethnic background (Model 1). The gap was reduced slightly (by \$81) after accounting for students' college pathway in Model 2. Adding controls for majoring in STEM and college grades (Model 3), first-generation students continued to experience a gap in potential earnings compared to non-first-generation students, though the difference was reduced to \$935 per year<sup>1</sup>.

Degree expectations also had a significant impact on potential annual income. Controlling for parental education, age, and race-ethnicity, Model 1 shows students who expected to earn a graduate degree had a \$1,433 lower earning potential than students who expected to earn a bachelor's degree. The negative gap widened to more than \$1,545 after their college pathway, majoring in STEM, and college grades were introduced in Model 3. Race-ethnicity was also found to be a significant predictor of students' earning potential. Compared to White students, students of color who identified as Asian, African American, and Hispanic or Latino had a significantly higher earning potential when controlling for parental education, age, and degree expectations. Model 1 indicates Asian students had the highest earning potential (more by \$4,891) compared to White students. The potential income gap between Asian and White students decreased slightly by approximately \$137 when college pathways were accounted for, and by about \$1,350 after majoring in STEM and college grades were considered. Students of color who identified as Hispanic or Latino had an \$818 higher earning potential than White students when controlling for other demographics in Model 1. The difference increased slightly (to \$858) in Model 2 after college pathways were taken into consideration. However, Model 3 indicates the gap between Hispanic and White students was reduced to \$512 when majoring in STEM and college grades were considered. A similar trend was found among

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<sup>1</sup> From this point forward, all dollar values should be assumed to be "per year".

African American students compared to White students. Model 1 reveals African American students had a higher earning potential than White students (by \$617). When college pathways were accounted for in Model 2, the gap increased slightly by about \$97. However, Model 3 shows the difference between African American and White students' earning potential was reduced to \$444 after majoring in STEM and college grades were considered. Students who identified as multiracial or 'preferred not to respond' had similar potential annual income as White students. Students who identified with a race-ethnicity other than Asian, African American, and Hispanic/Latino, had a slightly lower earning potential (by \$622) than White students when demographics, college pathways, majoring in STEM, and college grades were considered.

Model 3 reveals majoring in STEM had the most impact on students' potential annual income. Controlling for demographic background, college pathways, and grades, students majoring in STEM had the potential to earn \$9,874 more than students majoring in a non-STEM field. Model 3 also indicates a negative relationship with grades. That is, students who earned higher grades tended to have lower potential income than students who earned mostly C's or lower.

Table 4 also reveals the impact of college pathways on students' potential annual income. According to Model 2, students who were on the professional pathway had a significantly higher potential income (by \$2,864) than students on the mobility path. When majoring in STEM and college grades were entered into Model 3, the potential income gap decreased slightly to \$1,551. We also found students on the party pathway had a lower potential annual income than students on the mobility pathways after majoring in STEM and college grades were taken into



consideration in Model 3. Students on the balanced pathway had similar potential income as their peers on the mobility pathway.

The final model, Model 4, introduced the parental education and college pathways interaction term. Table 5 summarizes the results from the interaction terms. First-generation students on the professional track are likely to earn \$1,012 less than students whose parents are college graduates. Unlike the professional track, the parental education gap among the party and mobility tracks were not found to be statistically different from on the balanced pathway. However, it appears the negative relationship with first-generation status is still present. First-generation students on the party track are likely to earn \$879 less than non-first-generation students on the same party track. And, the mobility track, although had the smallest parental education gap (\$496), first-generation students were still likely to earn less per year than non-first generation students.

**Effective educational practices.** Table 6 indicates to what extent students' academic engagement in learning strategies, student-faculty interaction, and reflective and integrative learning were affected by demographic background characteristics, majoring in STEM, college grades as well as their chosen college pathway. Parental education and college pathway interaction terms were also included in the models to determine if the difference between first-generation and non-first-generation students varied by their chosen college pathway.

*Reflective and Integrative Learning.* Results suggest first-generation students ( $B=.017$ ) were slightly more engaged in Reflective and Integrative Learning than non-first generation students. Students who expected to earn a graduate degree used reflective and integrative learning one-quarter of a standard deviation more than those who were expected to earn to a bachelor's degree. College grades ( $B_{\text{mostlyAs}} = .335$ ;  $B_{\text{mostlyBs}} = .205$ ) were also positively related

to reflective and integrative learning. We also found a difference in Reflective and Integrative Learning by race-ethnicity. Compared to White students, African American ( $B=.16$ ), Hispanic/Latino ( $B=.052$ ), multiracial students ( $B=.144$ ), and students who identified with another race or ethnic group ( $B=.151$ ), all tended to engage in reflective and integrative learning more often. Asian students ( $B=-.118$ ) were slightly less engaged in reflective and integrative learning than White students.

We also found a difference in Reflective and Integrative Learning by students' chosen pathway through college. That is, students on the party pathway were nearly one-quarter of a standard deviation less engaged in Reflective and Integrative Learning than students on the mobility pathway. When evaluating results from the interactions terms we found, compared to the relative difference of Reflective and Integrative Learning among first-generation and non-first-generation students on the mobility pathway, the gap by parental education widened significantly for students on the professional ( $B=.140$ ) and balanced ( $B=.098$ ) pathways. In both instances, first-generation students on the professional and balanced pathways were slightly more engaged in reflective and integrative learning than non-first-generation students.

*Learning Strategies.* We found that being a first-generation student ( $B=.057$ ), expecting to earn a graduate degree ( $B=.206$ ), and earning higher grades ( $B_{\text{mostlyAs}} = .295$ ;  $B_{\text{mostlyBs}} = .172$ ) were significantly positively related to students' level of engagement in Learning Strategies. We also found that African-American students ( $B=.185$ ) and Hispanic/Latino students ( $B=.044$ ) used Learning Strategies slightly more than White students. However, compared to White students, Asian students ( $B=-.072$ ) tended to engage in Learning Strategies to a lesser degree.

Differences in Learning Strategies were also found by students' chosen pathway through college. Compared to students on the mobility pathway, Model 1 shows party pathway students

engaged in Learning Strategies significantly less – about 45% of a standard deviation less than mobility pathway students. Those on the professional pathway, however, engaged in Learning Strategies over a quarter of a standard deviation more than students on the mobility pathway. Non-significant results among the interaction terms suggests the positive effect of first-generation status on learning strategies did not significantly fluctuate by their chosen college pathways.

*Student-Faculty Interaction.* Results from Model 2 indicate first-generation students ( $B = -.023$ ) were slightly less engaged with faculty than non-first-generation students, controlling for other socio-demographics, college pathways, majoring in STEM, and college grades. Compared to White students, Asian students ( $B = -.085$ ) were also slightly less engaged with faculty, and African American students were significantly more involved with faculty ( $B = .241$ ). Students who identified with a racial-ethnic group other than Asian, African American, or Hispanic/Latino ( $B = .096$ ) were also slightly more engaged with faculty than White students. Students who expected to earn a graduate degree were also one-fifth of a standard deviation more engaged with faculty than students who expected to earn a four-year degree. Additionally, we found college grades were positively related to Student-Faculty Interaction. Compared to students who earned mostly Cs or lower grades, students who earned mostly As engaged two-fifths of a standard deviation more with faculty and those who earned mostly Bs engaged about one-fifth of standard deviation more with faculty.

Similar to Learning Strategies, students on the party pathway ( $B = -.313$ ) were significantly less engaged with faculty, and students on the professional pathway ( $B = .109$ ) were slightly more engaged with faculty, compared to mobility pathway students. Results from the interaction terms suggest the difference between first-generation students and non-first-

generation on the party pathway significantly widened, compared to first-generation and non-first generation students on the mobility pathway. Interestingly, first-generation students on the party pathway engaged with faculty more than non-first-generation students on the same pathway.

### **Discussion**

Our study makes an important contribution to the research on higher education stratification by treating college major choice as a quantitative advantage (rather than qualitative), and by corroborating the findings of the study by Armstrong and Hamilton (2013) on a broader scale. College major choice as an economic advantage is not equally distributed among female seniors at large four-year institutions – a finding that supports the EMI theory: students on the professional pathway tend to choose the most lucrative careers, even when controlling for majoring in STEM fields and grades than students on all other pathways, and students on the party pathway tend to choose majors with the lowest levels of potential yearly income.

Moreover, first-generation students on all pathways tend to choose lower-paying majors than their peers with college-educated parents. Thus, the finding by Walpole (2003) that low SES students were making less money than high SES students nine years after college entry can be perhaps (at least partially) explained by the choices of major that these disadvantaged students tend to make. However, the question remains: Why do first-generation students tend to choose less lucrative careers compared to their non-first generation students on all three pathways? A number of explanations can be offered, all of them related to the lack of cultural capital.

First, it is possible that because first-generation students have poorer high school preparation (Pascarella et al., 2004), they may not be able to meet the requirements of more

rigorous majors that tend to lead to higher paying jobs. Armstrong and Hamilton (2013) do report that many of the low SES students had to take remedial courses, and experienced poor quality teaching in those classes. Second, such students are simply inadequately informed about the consequences of their college major choices (Armstrong & Hamilton, 2013). Further evidence of this argument comes from England, where Greenbank (2009) conducted thirty in-depth interviews with working-class students about how they made career-related decisions, and found that they were reluctant to use information from formal sources, such as university career services, which appeared to prevent these students from forming a better understanding of how post-graduation labor markets worked. Third, as the lack of sense of belonging for low SES students (Ostrove & Long, 2007; Soria & Bultmann, 2014) is a factor that can significantly affect their college experience and educational decisions (Ostrove & Long, 2007), and given the impact of sub-environments in student academic and social life in college (Pascarella & Terenzini, 2005), it is possible that not feeling like one “belongs” may enable students from low SES backgrounds to seek out a less lucrative major.

Three interesting, even somewhat puzzling, findings about majors and potential annual income have emerged from our analyses, and are worth discussing, even though they are not directly related to our stated research questions. The first one is that students who planned to seek a graduate degree tended to have majors with lower earning potential, than did students who planned to only earn a bachelor’s degree. This finding could be explained by several possibilities. First, students who expect to earn more have a higher opportunity cost if they forego the higher earnings and focus on a graduate degree, i.e., high-paying jobs provide less incentive to attend graduate school. Conversely, students who expect lower earnings may wish to compensate for the deficit in potential earnings by acquiring more educational credentials. There

is evidence that attending graduate school may have different effects on earnings for different fields of study: Wolniak et al. (2008) found that years of schooling had a noticeable effect on earnings for education and social sciences majors, whereas for the STEM majors the effect of years of schooling was not important, so perhaps students majoring in those fields are aware of this. Finally, according to Walpole (2003), students who attend graduate school tend to be motivated intrinsically, e.g., by having an intrinsic interest in a field of study, versus students who seek extrinsically-motivated careers, i.e., high income and prestige of the occupation.

The second noteworthy finding about majors and potential earnings relates to minority students (Asian, African American, and Hispanic/Latino), who tend to major in fields with significantly higher earning potential than White students. This finding may seem counterintuitive at first, but it in fact confirms some earlier studies: there is evidence that controlling for SES, Asian-American students choose the most lucrative majors among all racial groups or when compared to White students (Goyette & Mullen, 2006; Ma, 2009; Staniec, 2004), and that Asian female students, specifically, choose the most financially rewarding majors compared to White female students, also after controlling for SES (Song & Glick, 2004); controlling for SES, African American students of both sexes are likelier to major in STEM fields than White students (Ma, 2009; Staniec, 2004), and life/health and business fields – majors that also offer higher earnings (Ma, 2009); African American and Hispanic students tend choose more financially rewarding vocational majors than White students, also controlling for SES (Goyette & Mullen, 2006). However, the reasons for why this is the case are not completely clear, and warrant further research.

Finally, the third interesting finding related to majors and potential earnings is that students with higher grades tend to major in lower paying fields, than students who earned

mostly C's or lower. This may suggest that majors with higher potential income tend to be "harder" or more competitive, and/or have lower levels of grade inflation. In fact, the highest paying majors in our analysis are found in the STEM cluster, consisting of fields that according to Johnson (2003) have the lowest levels of grade inflation.

As for qualitative outcomes, students on the party pathway were the least engaged in reflective and integrative learning, learning strategies, and student-faculty interaction. These findings, coupled with the fact that students on the party pathway choose the least lucrative, and presumably, the "easiest" majors can indicate that either these students are extremely passive, disengaged, and in need of an intervention, or, consistent with Hamilton's (2014) argument, represent a peer culture of highly prized femininity and gender complementarity, where women prepare themselves for traditional gender-based roles.

Students on the professional pathway, as expected, engaged in learning strategies and interactions with faculty more than other students, while students on the mobility and balanced pathways did not differ significantly on any of these outcomes. Although students on the mobility pathway (e.g., students who work for pay 20 hours or more per week) resemble students on the balanced pathway in both potential income of their major and qualitative outcomes, the number of hours that students on the mobility pathway spend on working for pay does seem to result in worse academic performance and lower enrollment in STEM majors for students on the mobility pathway (see Table 3); this is perhaps one of the most salient and regrettable manifestations of time as a form of capital in this study, as the number of hours spent on working for pay does seem to hinder academic achievement and enrollment in the most lucrative majors for women on the mobility track.

As for first-generation students, somewhat surprisingly they engage in reflective and integrative learning and use learning strategies more often, and consistent with previous research they engage less in student-faculty interaction than students on the other pathways. One possible explanation for their higher levels of engagement in reflective and integrative learning is that reflective thought is triggered by a puzzling or bewildering situation (Rogers, 2001), of which first-generation students should experience plenty when attending college. In other words, first-generation students are probably more likely to have unusual experiences and encounters in college than students with college-educated parents. For example, Armstrong and Hamilton (2013) describe instances when students from small rural towns have overwhelming experiences with diversity at MU, specifically religious and sexual orientation diversity. Large public institutions may be particularly conducive environments for having eye-opening experiences with diversity. As for more frequent use of learning strategies (selecting main ideas, reviewing notes, and summarizing texts or lectures) by first-generation students than non-first-generation students, a possible explanation could be that because all students in our sample are seniors, it might mean that it is the most academically successful, best-prepared and best-equipped of the first-generation students who have survived at least three years in an often tough and challenging environment that is college for first-generation students. Their possibly habitual high engagement in learning strategies may be precisely what made the difference for them in making it to the senior year. However, lower levels of engagement in student-faculty interaction by their senior year may indicate that despite employing effective approaches to learning and studying, first-generation students may not yet have become as comfortable or as confident in their interactions with faculty as non-first-generation students.

### **Conclusion**



Overall, the findings of our study support the EMI theory (Lucas, 2001), and provide further validation for the three-pathway framework proposed by Armstrong and Hamilton (2013). We explored a relatively novel way to treat college major choice with the help of the *What's It Worth?* report by Carnevale et al., (2011), when virtually every individual major was assigned a dollar value of potential annual income, and it thus acquired properties of a quantitative measure – an attractive avenue for future research on college major choice. Findings of the study may also shed light on additional ways institutions of higher education cultivate social inequality rather than helping to close the gap. Besides making a contribution to the research on higher education stratification and gender studies, the findings of this study can also help higher education practitioners advise women students about their choices and the implication of those choices for post-graduation economic success. University career centers, advising services in general, especially at large public institutions, as well as individual faculty, may need to become more attentive and responsive to the needs of students who may not be able to rely on their own cultural capital, or on the social networks around them, in navigating college life and developing advantageous career and/or educational aspirations.

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Table 1. *Characteristics of Students by College Pathways*

	<i>Party Pathway</i>		<i>Mobility Pathway</i>		<i>Professional Pathway</i>	
Descriptors	<i>Socialites:</i> students with economic and cultural resources	<i>Wannabes:</i> students lacking economic and cultural resources	<i>Creamed:</i> in a small support program for promising disadvantaged students	<i>Blocked:</i> students from disadvantaged backgrounds	<i>Achievers:</i> students with economic and cultural resources	<i>Underachievers:</i> students lacking economic and/or cultural resources
Class background	Upper or upper-middle class	Upper-middle or middle class	Lower-middle class	Lower-middle or working class	Upper class or upper-middle class	Upper, upper-middle, middle, or lower-middle class
Academics	Low effort, “easy” majors	Diversion from pragmatic to “easy” majors	Scholarships reduce need to work; challenging classes; faculty attention	Work cuts into study time; remedial classes; inadequate advising	Clear goals; selective majors; career-building extracurricular activities	Poor fit between goals, major, and abilities; few, irrelevant extra-curriculars
Social	Privilege confers status and fun; overrides deficits	Rely on raw beauty and savvy; struggle to measure up	Opportunities to network with other less privileged peers	Isolated; no ties to other students; overwhelmed by diversity	Balanced approach: moderate partying declining over time; networked with ambitious peers	Over involvement in partying or social isolation; ties to non-college peers
Academic performance	Moderate performance; graduate on time	Performance varies; risk of delayed graduation	3.8 GPA; demanding humanities major	If stayed at MU <sup>2</sup> , diverted to <i>socialite</i> majors; low to moderate performance; risk of delayed graduation. If transferred to a regional campus, pragmatic majors; good performance; delayed graduation	Reasonable GPA in respectable major	Low GPA in major with limited entry-level job prospects
Career prospects	Parents’ connections secure “glamorous” jobs in major cities	Limited credentials; unemployment; more schooling	Failed to get into a funded grad program; secured a full-time job; continued to aspire to get an advanced degree	If stayed at MU, struggle to secure job requiring BA; record not enough for graduate school. If transferred to a regional campus, enter into well-paying occupations related to degree	Rapid entry into professional job or grad program; parental assistance for relocation	Un- or underemployment; GPA limits access to graduate school; continued dependence on parents

Note: Adapted from Armstrong and Hamilton (2013).

<sup>2</sup> “Midwestern University”, a fictional name of the research site.

Table 2. *Descriptive Statistics of Independent Variables (N=42,504)*

	Minimum	Maximum	Mean	Standard Deviation
First generation	.00	1.00	.471	.499
Graduate degree expectations	.00	1.00	.707	.455
Majoring in STEM	.00	1.00	.176	.381
College grades				
Mostly As	.00	1.00	.506	.500
Mostly Bs	.00	1.00	.442	.497
Mostly Cs or lower	.00	1.00	.052	.222
Traditional age (23 or younger)	.00	1.00	.749	.434
Race or ethnicity				
Asian	.00	1.00	.066	.248
African American or Black	.00	1.00	.079	.270
Hispanic or Latino	.00	1.00	.089	.284
Multiracial	.00	1.00	.066	.249
Other race	.00	1.00	.019	.136
Prefer not to respond	.00	1.00	.031	.172
White	.00	1.00	.651	.477
College pathways				
Party	.00	1.00	.020	.139
Mobility	.00	1.00	.049	.215
Professional	.00	1.00	.131	.338
Balanced	.00	1.00	.800	.400

Table 3. *Student and Academic Characteristics by College Pathways*

	Party n=836	Mobility n=2,071	Professional n=5,585	Balanced n=34,012
	% of n	% of n	% of n	% of n
First-generation	35	60	42	48
Graduate degree expectations	62	69	75	70
Majoring in STEM	15	11	28	16
College grades				
Mostly As	45	43	59	50
Mostly Bs	49	48	37	45
Mostly Cs or lower	6	9	4	5

Table 4. *OLS Hierarchical Multiple Regression Modeling Potential Annual Income*<sup>1</sup>

	Model I			Model II			Model III			Model IV		
	Unstd.	Std.		Unstd.	Std.		Unstd.	Std.		Unstd.	Std.	
	Coef. B	Error		Coef. B	Error		Coef. B	Error		Coef. B	Error	
Constant	50926.20	46.61 ***		50926.18	46.41 ***		50926.10	42.56 ***		50917.67	42.69 ***	
First-generation	-1406.54	97.10 ***		-1325.45	96.92 ***		-934.46	89.16 ***		-938.35	89.17 ***	
Degree exp.- graduate	-1433.26	102.93 ***		-1517.38	102.65 ***		-1544.55	95.26 ***		-1548.07	95.27 ***	
Age (23 or younger)	-125.57	110.74		-17.07	110.66		-613.20	101.74 ***		-623.71	101.81 ***	
Race or ethnicity <sup>2</sup>												
Asian	4891.96	190.66 ***		4754.86	190.06 ***		3542.97	174.84 ***		3543.21	174.84 ***	
Afr. Amer./ Black	617.03	176.78 ***		713.92	176.15 ***		444.30	163.53 **		441.73	163.54 **	
Hispanic or Latino	818.34	169.78 ***		857.55	169.14 ***		512.21	155.67 **		507.87	155.67 **	
Multiracial	273.96	190.36		296.02	189.60		-44.77	174.07		-46.22	174.06	
Other race	-245.84	344.99		-239.68	343.60		-622.38	315.20 *		-612.70	315.20	
Prefer not to respond	167.59	273.49		116.82	272.39		-50.01	249.84		-50.53	249.83	
College pathways <sup>3</sup>												
Party				-640.58	393.78		-790.08	361.04 *		-751.11	371.88 *	
Professional				2863.95	247.16 ***		1551.26	227.73 ***		1583.07	232.90 ***	
Balanced				368.48	217.22		26.82	199.33		94.48	205.13	
Majoring in STEM							9874.22	113.94 ***		9864.65	113.99 ***	
College grades <sup>4</sup>												
Mostly As							-2074.82	200.44 ***		-2077.08	200.43 ***	
Mostly Bs							-858.78	198.73 ***		-860.96	198.72 ***	
Interaction terms <sup>5</sup>												
Firstgen*Party										-740.50	747.82	
Firstgen*Prof.										-1122.55	459.92 *	
Firstgen*Balance										-439.60	404.51	
Adjusted-R <sup>2</sup>	0.024			0.031			0.186			0.186		
Adjusted-R <sup>2</sup> change	0.024			0.008			0.154			0.00		
F-change	114.94***			116.64***			2687.21***			2.98*		

Note: All IVs were grand-mean centered prior to entry of the models.

\*\*\*p < .001; \*\*p < .01; \*p < .05

<sup>1</sup> Potential annual income is based on Carnevale, Strohl, and Melton (2011).

<sup>2</sup> Reference group: White

<sup>3</sup> Reference group: Mobility pathway

<sup>4</sup> Reference group: Mostly Cs or lower

<sup>5</sup> Reference group: Firstgen\*Mobility

Table 5. *Adjusted Potential Annual Income by College Pathway and Parental Education*

	First-generation	Non-first-generation	Difference
Party	\$49,302	\$50,181	-\$879
Mobility	\$50,422	\$50,918	-\$496
Professional	\$51,281	\$52,293	-\$1,012
Balanced	\$50,394	\$50,937	-\$543

Table 6. *OLS Multiple Regression Modeling Three Forms of Academic Engagement*

	Reflective and Integrative Learning		Learning Strategies			Student-Faculty Interaction	
	Model III		Model I			Model II	
	Unstd. Coef. B	Std. Error	Unstd. Coef. B	Std. Error	Unstd. Coef. B	Std. Error	
Constant	0.001	0.005	0.001	0.005	0.001	0.005	
First generation	0.017	0.01 ***	0.057	0.01 ***	-0.023	0.01 *	
Degree exp.-graduate	0.252	0.011 ***	0.206	0.011 ***	0.209	0.011 ***	
Age (23 or younger)	-0.054	0.011 ***	-0.297	0.011 ***	0.229	0.011 ***	
Race or ethnicity <sup>1</sup>							
Asian	-0.118	0.019 ***	-0.072	0.019 ***	-0.085	0.019 ***	
Afr. Amer. or Black	0.161	0.018 ***	0.185	0.018 ***	0.241	0.018 ***	
Hispanic or Latino	0.052	0.017 **	0.044	0.017 **	0.011	0.017	
Multiracial	0.144	0.019 ***	0.01	0.019	0.007	0.019	
Other race	0.151	0.035 ***	0.028	0.035	0.096	0.035 **	
Prefer not to respond	0.123	0.028	-0.008	0.028	-0.047	0.028	
College pathways <sup>2</sup>							
Party	-0.225	0.041 ***	-0.451	0.041 ***	-0.313	0.041 ***	
Professional	0.042	0.026	0.266	0.026 ***	0.109	0.026 ***	
Balanced	-0.022	0.023	0.016	0.023	0.042	0.023	
Majoring in STEM	-0.416	0.013 ***	-0.064	0.013 ***	-0.003	0.013	
College grades <sup>3</sup>							
Mostly As	0.335	0.022 ***	0.295	0.022 ***	0.398	0.022 ***	
Mostly Bs	0.205	0.022 ***	0.172	0.022 ***	0.224	0.022 ***	
Interaction terms <sup>4</sup>							
Firstgen*Party	0.151	0.083	0.054	0.083	0.174	0.083 *	
Firstgen*Prof.	0.14	0.051 **	0.079	0.051	0.07	0.051	
Firstgen*Balance	0.098	0.045 *	0.052	0.045	0.084	0.045	
Adjusted-R <sup>2</sup>	0.057		0.053			0.043	
F-statistic	143.28***		132.70***			106.93***	

Note: All IVs were grand-mean centered and DVs were standardized prior to entry of the models.

\*\*\*p < .001; \*\*p < .01; \*p < .05

<sup>1</sup> Reference group: White

<sup>2</sup> Reference group: Mobility pathway

<sup>3</sup> Reference group: Mostly Cs or lower

<sup>4</sup> Reference group: Firstgen\*Mobility

## Appendix

### Scales and Component Items of Engagement Indicators

#### **Learning Strategies** ( $\alpha=.79$ )

During the current school year, how often have you:

- Identified key information from reading assignments
- Reviewed your notes after class
- Summarized what you learned in class or from course materials

#### **Reflective and Integrative Learning** ( $\alpha=.89$ )

During the current school year, how often have you:

- Combined ideas from different courses when completing assignments
- Connected your learning to societal problems or issues
- Included diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments
- Examined the strengths and weaknesses of your own views on a topic or issue
- Tried to better understand someone else's views by imagining how an issue looks from his or her perspective
- Learned something that changed the way you understand an issue or concept
- Connected ideas from your courses to your prior experiences and knowledge

#### **Student-Faculty Interaction.** ( $\alpha=.86$ )

During the current school year, how often have you:

- Talked about career plans with a faculty member
- Worked with a faculty member on activities other than coursework (committees, student groups, etc.)
- Discussed course topics, ideas, or concepts with a faculty member outside of class
- Discussed your academic performance with a faculty member