Major Decisions: Motivations for Selecting a Major, Satisfaction, and Belonging

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In this paper, we analyzed the relationship between students' motivations for choosing academic majors and their satisfaction and sense of belonging on campus. Based on a multi-institutional survey of students who attended large, public, research universities in 2009, the results suggest that external extrinsic motivations for selecting a major tend to be negatively associated with students' satisfaction and sense of belonging. Intrinsic motivations and internal extrinsic motivations tend to be positively related to students' satisfaction and sense of belonging.

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Previous scholars have spent considerable time and attention understanding the factors that influence students' choice of college majors; for example, Cebula and Lopes (1982) examined factors influencing students' choice of college major and others have found evidence that the college experience itself exerts an effect on students' choice of majors (Cohen & Hanno, 1993; Mauldin, Crain, & Mounce, 2000). To date, little research has been conducted on whether students' motivations for academic major selection are related to subsequent outcomes; consequently, we investigated the relationship between students' motivations for selecting academic majors and their satisfaction and sense of belonging on campus. Understanding the importance of the decisions surrounding students' choice of major, in addition to the importance of students' satisfaction and sense of belonging on campus, we address the following question: With controls for students' academic and sociodemographic characteristics, perceptions of campus climate, and academic engagement, do existing data show a relationship between students' intrinsic and extrinsic motivations for selecting their academic majors, their satisfaction with their educational experience, and their sense of belonging on campus? We specifically explored the experiences of undergraduates enrolled at large, public research institutions in the United States.

Academic advisors, college administrators, and policymakers have long been interested in students' decision making regarding academic majors and career choices; after all, critical shortages characterize some fields, students' choice of major influences sustainability of degree programs, and poor choice or unavailability of a major may contribute, in part, to student attrition. Academic advisors may anecdotally express understanding of the implicit connections between students' motivations for choosing majors and their level of contentment in the college or university, but little empirical work on these connections currently exists. The constructs explored in this study—sense of belonging and satisfaction—hold importance for countering the overall low retention and graduation rates that remain a concern at colleges and universities; therefore, an examination of the relationship between motivations for selecting a major and satisfaction and belonging outcomes offers important implications for a wide audience of academic advisors, administrators, policymakers, and other higher education professionals.

Motivations for Selecting an Academic Major

Porter and Umbach (2006) noted that "the choice of a college major can be one of the most important decisions a student can make" (p. 429)—indeed, the act of formally declaring a college major can hold longstanding ramifications for individuals. Among student affairs professionals, academic advisors are keenly aware of the importance of choosing an academic major as they often encounter students who fall somewhere along a decision-making continuum from initial major and career exploration to final choice. Students' undergraduate major is significantly correlated with job stability and job satisfaction (U.S. Department of Education, 2001) and the academic major has a significant impact on career opportunities and salaries (Pascarella & Terenzini, 1991); yet, the choice of a college major has implications beyond the individual student—social class disparities may be perpetuated when women and

minority groups choose majors leading to differential earnings (Leslie & Oaxaca, 1998). Additionally, several have noted underrepresentation of women and minorities in several disciplines, including sciences, technology, and engineering (Hagedorn, Nora, & Pascarella, 1996; Leslie & Oaxaca, 1998), thus making the decision-making process of selecting a major important in educational and workforce policies designed to evince parity among underrepresented and underserved populations.

Several researchers have explored the factors underlying college students' decision-making process for choosing their academic majors. Early studies of the determinants underlying major choices focused on economic factors, including earnings differentials, job outlook conditions, and change in earning differentials over time (Cebula & Lopes, 1982). Duru and Mingat (1979) presented an early model that accounted for students' probability of success in selecting a major, suggesting a trade-off between economic returns and the risk of failure. More recent studies have examined the influence of gender on major choice; for example, Dawson-Threat and Huba (1996) found that men were more likely to choose male-dominated majors and women were more likely to choose female-dominated majors. These gender differences in student major choice have been substantiated by others (Jacobs, 1986; Solnick, 1995) who suggested that women tend to select disciplines due to their female gender role orientation (Lackland, 2001). Family educational and occupational backgrounds, in addition to socioeconomic status, were also found by researchers to affect choice of major (Leppel, Williams, & Waldauer, 2001).

Mixed models, such as those advanced by Montmarquette, Cannings, and Mahseredjian (2002), demonstrated that choice of college major depends upon the expected earnings but that differences in the impact of expected earnings vary by gender and race. Kanter's (1993) theory of proportions in social life argues that minority status in an organization may reinforce traditional roles and place constraints on women and minorities; as a result, women and students of color may not select a particular major in which they are one of the few women or minorities enrolled. Recently, Porter and Umbach (2006) found that political views, racial differences, and Holland personality scales were strong predictors of major choice and also noted that academic preparation, family influence, and academic self-efficacy did not hold weight in major choices when personality measures are taken into account. Imparting the importance of the major choice decision, Galotti (1999) concluded that "students see the choice of major as one that both reflects important core characteristics of themselves (including their gender role identification, their interests and values, and their abilities) and has consequential implications for their futures" (p. 379). The aforementioned evidence suggests the complicated nature of major selection yet also impresses the importance of that decision for college students.

Conceptual Framework: Self-determination Theory

While all of the factors we have noted play a role in students' academic major decision making, in this article, we conceptually view students' motivations for choosing their academic majors through the lens of self-determination theory, which defines intrinsic and varied extrinsic sources of motivation (Deci & Ryan, 1985, 2000). Self-determination theory distinguishes between two different types of motivation—intrinsic and extrinsic—based on the reasons or goals that promote an action or behavior (Deci & Ryan, 1985). Some have used self-determination theory in an academic advising context to describe the career decision making of undecided students (Gordon 2007; Guay, Mageau, & Vallerand, 2003). According to Ryan and Deci (2000), *intrinsic motivation* refers to undertaking action because it is inherently interesting or enjoyable while *extrinsic motivation* refers to activity undertaken because it leads to a separable outcome. Whereas intrinsic motivation moves one to act for satisfaction, enjoyment, or personal challenge, extrinsic motivation propels action because it is externally prompted and valued by others to whom one is connected—such as family, peers, or society (Ryan & Deci, 2000).

Intrinsic and extrinsic motivations typically result in different outcomes; for example, Ryan and Deci (2000) noted, within the context of education, that intrinsic motivation usually results in high-quality learning and creativity and is generally highly valued. As a more complex factor, extrinsic motivation, manifested as various types, is traditionally viewed as "impoverished forms of motivation" commonly associated with low student persistence, interest, and involvement (Ryan & Deci, 2000, p. 55); however, Ryan and Deci (2000) also promoted the idea that extrinsic motivation can become an essential strategy for successful teaching as many of the tasks that educators expect

students to perform are not inherently enjoyable or interesting to each individual student. In other words, students can perform extrinsically motivated actions with resentment and resistance, or if they accept the value or utilitarian nature of a task, they perform an action with an attitude of willingness that reflects their inner acceptance (Ryan & Deci, 2000).

According to self-determination theory, extrinsic motivation can vary according to the degree in which these motivations are internally or externally regulated and whether the perceived locus of causality is external or internal (Deci & Ryan, 1985). *External* extrinsic motivations typically include punishments and are associated with compliance whereas *internal* extrinsic motivations are associated with self-endorsement of personal goals and are therefore more independently regulated (Deci & Ryan, 1985). Self-determination theory promotes four types of extrinsic motivations ranging from their external to internal perceived locus of causality: *external regulation*, which satisfies external demands or is used to obtain an externally imposed reward; *introjected regulation*, through which people perform actions due to the pressure of avoiding guilt or anxiety; *identification*, in which a person has identified with the personal importance of a behavior; and *integrated regulation*, which occurs through self-examination and involves an assimilation of regulations into the self (Deci & Ryan, 1985). While extrinsic motivations can reflect external control or true internal self-regulation (Ryan & Deci, 2000), scholars have found greater value with internal variations of extrinsic motivation (Ryan, Kuhl, & Deci, 1997), including greater engagement (Connell & Wellborn, 1990), greater psychological well-being (Sheldon & Kasser, 1995), and increased retention (Vallerand & Bissonnette, 1992).

In the context of selecting academic majors, intrinsic motivation can potentially include selecting a major because students find the field inherently interesting, enjoy the academic tasks associated with it, or want to satisfy their intellectual curiosity. Examples of extrinsic motivations for choosing an academic major can include parental desires or because of potential career opportunities, with the latter constituting a more internal extrinsic motivation than the former. In their conversations with students, academic advisors may frequently hear students recounting common motivations for choosing majors, and the advisors may benefit by conceptualizing these motivations into intrinsic, internal extrinsic, or external extrinsic motivations to understand the students' subsequent actions and behaviors. In this paper, we address the effects these types of intrinsic and extrinsic motivations may exert on students' reported satisfaction and sense of belonging on campus.

Student Satisfaction

Students' experiences in their academic major can certainly impact their satisfaction on campus; after all, students take a large percentage of their credit-bearing courses within their academic majors. Relationships established with peers and faculty members within an academic major can enhance students' retention and increase students' affinity with a specific academic or career field. Scholars have drawn much attention to the concept of students' satisfaction with their collegiate experience; for example, Oliver and DeSarbo (1989) suggested that satisfaction refers to students' subjective evaluations of the various outcomes and experiences associated with education. Satisfaction is shaped continuously by students' repeated interactions and experiences with campus life. Subsequently, it is shaped by myriad factors.

Satisfaction affects higher education in multiple ways. Elliott and Shin (2002) noted that "studies have shown student satisfaction to have a positive impact on student motivation, student retention, recruiting efforts, and fundraising" (p. 197). Low (2000) described three attributes of successful higher education institutions: "They focus on the needs of their students, they continually improve the quality of the educational experience, and they use student satisfaction data to shape their future directions" (p. 2). Others have found connections between student satisfaction in specific areas and student retention; for example, Light (2001) indicated that student satisfaction with academic advising is an important part of a successful college experience, and corroborating that sentiment, Bailey, Bauman, and Lata (1998) found that nonpersisting students had a significantly lower level of satisfaction with academic advising than did persisting students. Because student retention is linked to satisfaction, efforts to learn more about factors that influence students' satisfaction are therefore critical for higher education institutions seeking to improve retention and graduation rates.

Sense of Belonging

Scholarly research conducted on college student experience and sense of belonging suggests a strong relationship between belonging (i.e.,

academic and social integration into the college or university), student retention, and graduation (Alford, 1998; Tovar, Simon, & Lee, 2009). The greater the sense of belonging to the institution, the more likely the student will remain in college (Hausmann, Schofield, & Woods, 2007; Hausmann, Ye, Schofield, & Woods, 2009; Hoffman, Richmond, Morrow, & Salomone, 2002-2003). Much of this work is built on the early foundational contributions of Astin (1993) and Tinto (1993) and later described in detail by Pascarella and Terenzini (2005). Academic advisors may be able to help students, including those in historically marginalized groups (e.g., students of color as well as immigrant, first-generation, and low-income students), experience a climate of belonging through their interactions with students (Stebleton, 2011).

Much of the early work on sense of belonging issues was conducted with predominately homogeneous, privileged, student groups (White, male student populations). A criticism aimed against Tinto and others is whether these early theories can be easily applied and integrated to underrepresented groups on campus, including students of color (Hurtado & Carter, 1997; Meeuwisse, Severiens, & Born, 2010). In response to this critique, inquiries have been conducted on sense of belonging issues among different racial and ethnic groups; for example, Johnson et al. (2007) examined a sample of 2,967 first-year students of color and found that African American, Hispanic/Latino, and Asian Pacific American students reported a lower sense of belonging than White/Caucasian students. The authors found that factors influencing a sense of belonging included social dimensions such as residence hall and campus racial climates. Additionally, other studies (Strayhorn, 2008, 2010) explored diverse student populations at historically Black colleges and universities and found that strong student–faculty interactions affected satisfaction and sense of belonging measures; student–faculty interactions also predicted students' academic major as well.

Previous scholars have established a connection between students' perception of campus climate and their sense of belonging on campus; for example, Hurtado (1992), a primary researcher on campus racial climates, found that one out of four participants in a study experienced significant racial conflict on their campuses and that students' perception of campus climate was associated with their sense of belonging on campus. This proportion was even higher at large, public, or selective 4-year institutions (Harper & Hurtado, 2007). This finding is especially relevant to our study because of the many students of color included and our focus on college students attending large, research institutions.

Academic advisors contribute to students' sense of belonging on college campuses as they often provide referrals to campus resources, including student associations and organizations (Allen & Smith, 2008), and can help students to become more integrated on campus. Membership in organizations can create a stronger sense of belonging for students; for example, Hurtado and Carter (1997) found membership in religious and social-community organizations was strongly associated with students' sense of belonging. Academic advisors hold the potential to help students make connections with others on campus while also facilitating students' sense of belonging in one-on-one advising relationships. By gaining a greater understanding of the factors influencing students' satisfaction and sense of belonging on campus—including the role that major selection can play in this process—academic advisors will be placed in a better position to help students connect to their institutions.

Method

Instrument

The Student Experience in the Research University (SERU) survey project is based at the Center for Studies of Higher Education, University of California–Berkeley. The SERU Consortium is a collaborative project of faculty and institutional researchers with the intent of creating data sources geared toward policy-relevant analyses of the undergraduate experience within major research universities. It also promotes a culture of institutional self-improvement. Each SERU Consortium member administers the SERU survey as an environmental census scan of undergraduates at their institution.

All undergraduates enrolled in Spring 2009 and who had been enrolled through the end of the prior term receive access to the web-based questionnaire, with most communication undertaken by e-mail. The SERU survey features nearly 600 individual items. Each student answered a set of core questions and is randomly assigned one of four modules containing items focused specifically on a research theme. The core questions focus on time use, evaluation of a student's major, campus climate, and satisfaction, serving to highlight four thematic research areas: academic engagement, community and civic engagement,

Table 1. Frequency of demographic variables

Characteristic Variable	*n*	%
Gender		
Male	22,973	41.5
Female	32,383	58.5
Race and Ethnicity		
American Indian or Alaskan Native	269	0.5
African American	3,217	5.8
Chicano-Latino	4,504	8.1
Asian	9,993	18.0
White	33,259	60.0
Other/Unknown	2,773	5.0
International	1,383	2.5
Social Class		
Low Income or Poor	3,105	5.7
Working Class	9,758	18.0
Middle Class	23,009	42.4
Upper-Middle or Professional Middle	17,064	31.4
Wealthy	1,332	2.5

global knowledge and skills, and student life and development.

Participants

The survey was administered in the spring of 2009 to 145,150 students across six large, public universities classified by the Carnegie Foundation as having very high research activity. The institutional level response rates varied from 26 to 69%, for an overall response rate of 39.97% (N = 58,017). Table 1 represents the demographic information associated with the entire group of students in our original sample, which is relatively diverse. Additionally, the majority of our sample is female (58.5%) and the majority of respondents self-identified their social class as middle class or higher (76.3%).

Variables

To learn about how they choose their academic majors, students were asked "Were the following factors very important to you in deciding on your major?" They could select *yes* or *no* for each factor. Table 2 illustrates the frequency with which students selected each of the factors in deciding upon a major. Students were most likely to indicate that having an interest in the subject area, intellectual curiosity, and preparation for a fulfilling career were major motivations for deciding upon a major and they were least likely to indicate parental desires, easy requirements, and not getting into their first major choice as influences. We imposed a categorization scheme related to the degree of intrinsic motivation, internal extrinsic motivation, and external extrinsic motivation associated with students' reasons for choosing majors (Table 2).

In our study, intrinsic motivators include students' interest in the subject area and their intellectual curiosity—interestingly, these are also the top two motivations students in this study cited for choosing their academic majors. Additional extrinsic motivations considered relatively more internally regulated and autonomous include choosing a major because it leads to a high paying job, prepares students for fulfilling careers, complements a desire to study abroad, allows time for other activities, provides international opportunities, and prepares students for graduate/professional school; the motivations for these actions emanate from the self and not necessarily from others. Survey participants selected these internal extrinsic motivations at a moderate frequency compared to other intrinsic or external extrinsic motivations.

The variables categorized as external extrinsic motivations for pursuing a major include choosing a major because students could not get into their first choice of major, because of easy requirements, parental desires, and the prestige associated with the major. Except for prestige, these motivations were the least frequently chosen reasons for selecting a college major. We surmised that the relative prestige of an academic major is a socially constructed value, and so considered this motivation as somewhat distant on the external continuum from perceived locus of causality; that is, although one can personally reap the benefits of the socially constructed value of prestige, external pressure to earn a prestigious degree serves as the motivation. Similarly, although easy requirements personally benefit students, we considered them akin to an extrinsic reward/punishment system—easy degree requirements are chosen to obtain an externally imposed reward contingency: easier or quicker graduation.

In our study, we controlled for several variables noted in previous literature as influences on students' major choice: gender, race/ethnicity, ACT and SAT scores, and socioeconomic status (measured in our study by students' self-identified social class). All sociodemographic variables were dummy-coded (female = 1, male = 0; underrepresented minority = 1, all other students

Table 2. Frequency and categorization of motivations for choosing academic majors based on the question, "Were the following factors very important to you in deciding on your major?"

		Yes		No	
Factor	**Motivation Type**	***n***	**%**	***n***	**%**
Interest in Subject Area	Intrinsic	32,746	96.6	1,154	3.4
Intellectual Curiosity	Intrinsic	31,147	91.7	2,810	8.3
Prepares Me for a Fulfilling Career	Internal Extrinsic	29,130	85.9	4,771	14.1
Prepares Me for Graduate/Professional School	Internal Extrinsic	23,287	69.0	10,483	31.0
Prestige	External Extrinsic	16,683	49.4	17,113	50.6
Leads to a High Paying Job	Internal Extrinsic	15,373	45.4	18,485	54.6
Provides International Opportunities	Internal Extrinsic	14,695	43.4	19,129	56.6
Allows Time for Other Activities	Internal Extrinsic	10,377	30.7	23,431	69.3
Complements My Desire to Study Abroad	Internal Extrinsic	9,429	27.9	24,401	72.1
Parental Desires	External Extrinsic	5,758	17.0	28,053	83.0
Easy Requirements	External Extrinsic	4,727	14.0	29,094	86.0
Could Not Get Into My First Choice of Major	External Extrinsic	2,444	7.3	31,253	92.7

= 0; Asian = 1, all other students = 0; low-income = 1, all other social classes = 0; working-class = 1, all other social classes = 0). Within the dummy-coded race/ethnicity variables, we excluded other/unknown and international students. We also measured students' precollege academic performance by converting students' SAT composite scores to ACT composite scores using ACT's concordance tables. In instances where students had both SAT and ACT scores, ACT scores were used. Prior research has demonstrated that students' perception of campus climate and their academic engagement are associated with their satisfaction and sense of belonging on campus (Harper & Hurtado, 2007; Johnson, Wardlow, & Graham, 2009). Therefore, in addition to controlling for sociodemographic factors, we also controlled for the effects of students' academic engagement and their perceptions of campus climate.

We also included two factors—satisfaction with educational experience and sense of belonging—as dependent variables in our analysis. Satisfaction with educational experience included survey items related to students' satisfaction with their academic/social experience, quality of courses, access to courses, and other factors. Sense of belonging was measured by items that prompted students to consider whether they would reenroll at their campus and whether they felt as though they belonged on campus.

To obtain our control and outcome variables, we conducted a principal component analysis (PCA) on 22 items with oblique rotation (promax). The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis (KMO = .89). Bartlett's test of sphericity, χ^2 (276) = 374,781.34, $p < .001$, indicated that correlations between items were sufficiently large for PCA. We conducted an initial analysis to obtain eigenvalues for each component in the data; four components had an eigenvalue over Kaiser's criterion of 1 and explained 60.04% of the variance. Because of the large sample size, Kaiser's criteria components, and the convergence of a scree plot that showed inflexions that justify retaining four components, the final analysis retained the following factors: satisfaction, campus climate, academic engagement, and sense of belonging. Table 3 shows the factor loadings after rotation in a pattern matrix; factor loadings greater than .40 appear in bold. Each factor had a high reliability, with Cronbach's $\alpha > .80$. The factor scores were computed using the regression method and saved as standardized scores with a mean of 0 and a standard deviation of 1.

Analysis

We conducted ordinary least squares regression analyses. The sample was reduced due to listwise deletion of missing variables and because we elected to only examine students who had a declared major (as opposed to undeclared majors). We controlled for the effects of precollege characteristics, including gender, race, and self-identified social class, grade-point average, academic engagement, and campus climate. We examined assumptions of multicollinearity, homoscedasticity, linearity, and independent/normal errors. The analyses suggested multicollinearity

Table 3. Summary of exploratory factor analysis results for the Student Experience in the Research University survey ($N = 31{,}035$)

Question/Item	Satisfaction[a] ($\alpha = .85$)	Campus Climate[b] ($\alpha = .89$)	Academic Engagement[c] ($\alpha = .88$)	Sense of Belonging[d] ($\alpha = .85$)
Availability of courses for general education or breadth requirements	**.763**	.023	−.029	−.088
Variety of courses available in your major	**.747**	−.008	−.056	−.035
Quality of upper-division courses in your major	**.735**	−.034	.016	.024
Availability of courses needed for graduation	**.716**	.001	−.031	−.042
Quality of faculty instruction	**.687**	−.036	.081	.071
Quality of lower-division courses in your major	**.686**	.019	−.059	−.014
Quality of teaching by graduate student instructors	**.628**	−.007	.005	−.039
Opportunities for research experience or to produce creative products	**.565**	.027	.056	.042
Educational enrichment	**.552**	.043	.047	.032
Students are respected here regardless of their race or ethnicity	−.008	**.855**	.004	.019
Students are respected here regardless of their religious beliefs	−.009	**.845**	.004	−.011
Students are respected here regardless of their gender	.011	**.795**	−.015	.027
Students are respected here regardless of their sexual orientation	.036	**.790**	.043	−.088
Students are respected here regardless of their economic or social class	.007	**.783**	−.029	.058
Students are respected here regardless of their political beliefs	−.019	**.754**	−.003	.003
Asked an insightful question in class	−.028	−.005	**.920**	−.024
Brought up ideas or concepts from different courses during class discussions	−.025	−.014	**.903**	−.014
Contributed to a class discussion	−.018	.000	**.892**	.010
Interacted with faculty during lecture class sessions	−.004	.024	**.794**	.016
Found a course so interesting that you did more work than was required	.087	.000	**.651**	−.008
I feel that I belong at this campus	−.075	.026	−.009	**.923**
Knowing what I know now, I would still choose to enroll at this campus	.027	−.020	−.047	**.857**
Overall social experience	−.083	.001	.012	**.848**
Overall academic experience	.295	−.013	.051	**.596**

Note. Factor loadings > .40 are in boldface.

[a]Satisfaction and two sense of belonging items (overall social/academic experience) began with "How satisfied are you with each of the following aspects of your educational experience in your major" and were scaled 1 (*very dissatisfied*) to 6 (*very satisfied*).

[b]Campus climate items began with "Indicate how strongly you agree or disagree with each of the following statements" and were scaled 1 (*strongly disagree*) to 6 (*strongly agree*).

[c]Academic engagement items began with "During the academic year, how often have you done each of the following" and were scaled 1 (*never*) to 6 (*very often*).

[d]The remaining two sense of belonging items began with "Please rate your level of agreement with the following statements" and were scaled 1 (*strongly disagree*) to 6 (*strongly agree*).

Table 4. Results of regression models predicting satisfaction and sense of belonging

	Satisfaction (n = 23,431)		Sense of Belonging (n = 24,149)	
Predictor	**B**	**SE**	**B**	**SE**
Intercept	−.77***	.06	−1.03***	.06
Female	.06***	.01	.08***	.01
Asian	−.23***	.02	−.13***	.02
Underrepresented Minority	.02	.02	.04*	.02
Low Income	−.23***	.03	−.04	.03
Working Class	−.16***	.02	−.04*	.02
ACT	.01***	.00	.01***	.00
Campus Climate	.28***	.01	.29***	.01
Academic Engagement	.15***	.01	.13***	.01
Intellectual Curiosity	−.01	.02	.21***	.02
Interest in Subject Area	.23***	.03	.37***	.04
Allows Time for Other Activities	.16***	.01	.10***	.01
Complements My Desire to Study Abroad	−.06***	.02	.03*	.02
Leads to a High Paying Job	−.01	.01	−.13***	.01
Prepares Me for a Fulfilling Career	.18***	.02	.15***	.02
Prepares Me for Graduate/Professional School	.09***	.01	.17***	.01
Provides International Opportunities	.05**	.01	.03*	.01
Could Not Get Into My First Choice of Major	−.19***	.02	−.15***	.02
Easy Requirements	−.15***	.02	−.08***	.02
Parental Desires	−.12***	.02	−.14***	.02
Prestige	.12***	.01	.07***	.01
R^2	17.2%		17.1%	

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

assumptions were not violated (tolerance statistics and variance inflation factors were within acceptable ranges). In testing homoscedasticity, the results suggested random scatter and variability in scatterplots of standardized residuals against the standardized predicted values. Histograms of standardized residuals and normal probability plots that compared the distribution of standardized residuals to a normal distribution provided evidence for normality. Examinations of matrix scatterplots suggested the relationships between the predictor and outcome variables were relatively linear. Residual errors were consistently independent across the models.

Results

We sought to determine the relationships between students' intrinsic and extrinsic motivations with choosing a major, satisfaction with educational experience, and sense of belonging. Our first model predicting satisfaction was statistically significant, $F(20, 23411) = 243.95$, $p < .001$, and the predictors explained 17.2% of the variation in satisfaction with educational experience (Table 4). The data suggest that students who selected their majors because of intrinsic motivations (interest in the subject area) were more likely to be satisfied with their university experiences. Internal extrinsic motivations positively associated with satisfaction include students' motivation to choose a major because the selected option allows time for other activities, prepares students for a fulfilling career, prepares students for graduate/professional school, and provides international opportunities. One internal extrinsic motivation—choosing a major because it complements students' desire to study abroad—was negatively associated with students' satisfaction.

Additionally, students who had external extrinsic motivations for choosing a major—because of denial of their first choice of college major, easy requirements, and parental desires for choice of major—are negatively associated with students' satisfaction. The data also suggest that one external extrinsic motivation—choosing a major because of its prestige—is positively associated with students'

satisfaction. The factor of prestige—which is derived from external, socially constructed pressures —also offers personal benefits to students such that the positive relationship with satisfaction is relatively unsurprising.

Our model predicting students' satisfaction also suggests that female students reported higher satisfaction while Asian, low income, and working class students had a lower satisfaction on campus. Additionally, ACT scores are positively associated with students' satisfaction. Finally, campus climate and academic engagement are also positively associated with students' satisfaction on campus (Table 4).

Our second model predicting sense of belong-ing was statistically significant, $F(20, 24149) = 241.33$, $p < .001$, and the predictors account for 17.1% of the variation in sense of belonging on campus (Table 4). The data suggest that the two intrinsic motivations for selecting a major—because of intellectual curiosity and interest in the subject area —are positively associated with students' sense of belonging. All internal extrinsic motivations for selecting a major are positively related to sense of belonging, except for choosing a major because it leads to a high paying job, which is negatively associated with students' sense of belonging.

As in the first model predicting satisfaction, we found external extrinsic motivations for selecting a major (denial into first choice of academic major, easy requirements, and parental desires) were negatively associated with students' sense of belonging. Additionally, selecting a major because of prestige is positively predictive of students' sense of belonging. Again, because prestige is derived from external, socially constructed pressures, yet can also personally benefit students, its positive association with students' sense of belonging is unsurprising.

Our model predicting students' sense of belonging also suggests that female students and under-represented minority students reported a higher sense of belonging while Asian students and working class students had a lower sense of belonging than their referent groups. Additionally, ACT scores were positively associated with students' sense of belonging. Finally, campus climate and academic engagement were positively associated with students' sense of belonging (Table 4).

Discussion

We found that, when controlling for sociodemographic and academic factors, several persistent relationships emerged between students' motivations for choosing a major and the outcome variables. For instance, negative relationships were more frequently observed between external extrinsic motivations for selecting a major and students' satisfaction and sense of belonging, although intrinsic motivations and internal extrinsic motivations tended to be positively associated with satisfaction and sense of belonging. In summation, intrinsic and internal extrinsic motivations are generally more positively associated with students' satisfaction and sense of belonging on campus, whereas external extrinsic motivations are generally negatively associated with these outcomes.

The data also suggest that three internal and external extrinsic motivations did not neatly follow these patterns; for example, the external extrinsic motivation of choosing a major due to its prestige was positively associated with students' satisfaction and sense of belonging. As prestige exerts an external pressure but can also benefit students associated it, we find the positive benefits of choosing a major due to prestige makes reasonable sense. Additionally, the internal extrinsic motivation of choosing a major because it complements desires to study abroad is negatively associated with satisfaction while the internal extrinsic motivation of choosing a major because it leads to a high paying job is negatively associated with sense of belonging. These two findings counter the majority of findings that suggest that internal extrinsic motivations have positive outcomes.

Implications

We point to several implications and strategies for academic advisors based on the results of this study. The results of this study suggested that students generally feel a greater sense of belonging and satisfaction when they make decisions about major and career based on internal, self-regulated, and intrinsic motivations (Duffy & Sedlacek, 2010; Murtagh, Lopes, & Lyons, 2011). Students may benefit more in terms of personal satisfaction and belonging when they select a major that is more intrinsically fulfilling rather than one based on a prescribed choice culminated from external opinions, or directions, of parents or greater society. Academic advisors can coach students to reflect and explore the rationale for deciding on certain major choices over others. Ultimately, students select their majors; however, advisors can help advisees unpack the socially derived messages that they receive about certain major and career choices. Advisors can also encourage students to

consider the variety of reasons and potential benefits for choosing a major based on nonexternal factors such as intellectual curiosity, time allowed for other activities, personal interest in the topic area, and so forth. For students selecting a major based on projected pay, advisors might offer the reminder that money does not typically buy happiness.

Many students will aim to seek out high paying careers in majors that are extremely competitive (e.g., health care professions, engineering, etc.). Based on the results of our study, one can surmise that students who do not get into their first choice of major express lack of satisfaction. Advisors may not be able to prevent the frustrations or disappointments of not being admitted into a preferred college, but they help facilitate the planning around alternative choices that students might find fulfilling. This process might include incorporating intentional career exploration activities into the advising relationship to help students uncover lesser known occupational options that students might find as interesting and rewarding as their original choice (e.g., medical technology and phlebotomy for those interested in medical sciences).

In addition to specific career exploration, academic and faculty advisors can encourage students to seek out structured avenues for engaging in the life–career planning process. For example, they can suggest that students enroll in a credit-bearing career exploration course (Fouad, Cotter, & Kantamneni, 2009; Osborn, Howard, & Leierer, 2007). Such career courses likely help students make thoughtful decisions about majors and careers such that they find intrinsic motivation for pursuing their academic majors and career. Career or major planning courses can have numerous benefits for students that extend beyond helping them choose a career (Grier-Reed & Skaar, 2010).

Some evidence in the student development literature shows students eager to explore issues of spiritual development and purpose as part of their undergraduate experiences (Astin, Astin, & Lindholm, 2011; Nash & Murray, 2010). Advisors comfortable exploring these highly meaningful and relevant issues might venture into discussions of this nature with students—especially as they relate to life–career planning issues (Duffy & Dik, 2009). Evidence from the annual *American Freshman* survey based out of the University of California–Los Angeles (Pryor, Hurtado, DeAngelo, Palucki Blake, & Tran, 2010) suggests that today's students are looking to make a positive difference in the world. Record numbers participate in extracurricular activities including volunteer and service opportunities; many seek out high-impact majors and related occupations where they hope to both make a prosperous living and positively influence the lives of others.

Advisors should continue to focus on strong developmental advising approaches, meeting students where they are on their individual journeys (Baxter Magolda, 2002; Jordan, 2000; O'Banion, 1972/1994/2009). Based on the results, one sees that different groups of students experience the various aspects of college differently; therefore, a one-sized approach to delivering academic advising services should be avoided. Instead, advisors would do well to be mindful of the diverse student populations with whom they work (e.g., students of color; students with disabilities; veterans; and immigrant, LGBTA, and returning adult students, among others). Based on the survey responses, several groups of students tended to report lower levels of satisfaction and sense of belonging on campus and the extent to which these factors are exacerbated due to students' intrinsic or extrinsic motivations for choosing majors can be explored in a developmental advising relationship. Overall, advisors are encouraged to better understand the lived experiences of students of color, international students, and students from lower-social class backgrounds to facilitate their sense of belonging on campus (Soria, 2012; Soria, Stebleton, & Huesman, 2013-2014).

Through developmental advising approaches, students can be encouraged to develop intrinsic or internal extrinsic motivations for selecting majors—factors that can positively benefit their satisfaction and sense of belonging in college. Winston (1994) argued that developmental advising exerts its greatest impact through "supporting and challenging students to take advantage of the multitude of learning opportunities outside of their formal classes and to use the human and programmatic resources designed to promote development of their talents and broaden their cultural awareness" (p. 114). Developmental advising approaches can also help students to achieve their educational, career, and personal goals through the utilization of the full range of institutional and community resources; academic advisors who recognize that students are selecting majors based on external extrinsic motivations can talk to students about taking advantage of a wide array of resources and services (e.g., personality

inventories, career exploration courses, general education courses) to stimulate their personal interests and foster their enthusiasm for new academic fields.

Academic advisors must show cognizance about potential underlying issues when working with students from underrepresented and historically marginalized student populations. For example, first-generation students often lack familiarity with the advisor–student relationship and may rely on peer networks or family members for academic information, and those from poor or working class families may face unique financial situations. Due to the changing demographics of higher education contexts, a solid knowledge and understanding of diverse cultures and the complexity of student populations provide insights to students' motivations for choosing their majors, as many students may rely upon family expectations when pursuing college or defer to parental choices regarding their futures. This study shows the potential for these extrinsic motivators to lower satisfaction and sense of belonging on campus; consequently, advisors working with underrepresented populations may wish to help students negotiate the balance between familial and cultural expectations and their own interests.

Zafar (2010) suggested that students with double majors take into account parents' approval as well as the level to which they will enjoy studying in both majors and working in a field that uses both degrees. While some may argue that double majors may decrease students' ability to engage in an array of extracurricular activities and elective classes traditionally viewed as essential for a balanced undergraduate education, other studies have shown benefits to double majors, including a relationship between graduating with two majors and higher returns in the labor market (Del Rossi & Hersch, 2008). Not all students can pursue double majors, but the pursuit of minor fields of study or certificates also fulfills students' interests in academic subjects without the commitment to the pursuit of an entire major.

Limitations and Future Research

At least three limitations characterize our study. First, Peterson and Wilson (1992) revealed that measurements of customer satisfaction exhibit tendencies of confounding and methodological contamination. They argued that issues such as response rate bias, the manner in which questions are asked, and other factors can affect the results of satisfaction surveys.

Second, the survey participants attended large research universities, limiting the scope of potential generalization to other campus communities. Readers should exercise caution when generalizing results to other students who attend other types of institutions (e.g., small, private liberal arts colleges). At many large research institutions, faculty members do not carry significant advising responsibilities and instead professional academic advisors carry out these duties.

Third, this study is not longitudinal. We are relying on student responses at one point in time. We urge scholars to consider engaging in longitudinal studies where data are collected at multiple points over the students' undergraduate careers (see Porter, 2009). Additionally, qualitative interviews capture the lived experiences of students, including historically underserved student populations. Examples of techniques that might enhance our study include narrative research, phenomenology, and grounded study inquiries (see Creswell, 2007). We fully support future opportunities to discover the myriad ways in which students' reasons for selecting majors affect their overall university experience.

Conclusion

Academic advisors play vital roles in meeting the diverse needs and concerns of an increasingly diverse college student population. College students often receive mixed messages about how to make choices related to major and career exploration; however, we found that these decisions hold the potential to affect important elements of students' experiences on campus, including sense of belonging and satisfaction. The results of this study suggest that students' external extrinsic motivations for selecting their majors can often negatively influence their experiences on campus, although intrinsic and internal extrinsic motivations can positively influence students' satisfaction and sense of belonging. We encourage academic advisors to initiate conversations with students to seek information regarding students' motivations for selecting a major, as intrinsic or extrinsic motivations could exert an impact on students' educational satisfaction and sense of belonging in the campus community.

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