

“Figuring Out Your Place at a School Like This:” Intersectionality and Sense of Belonging in College

Introduction

Sense of belonging refers to an individual’s feelings of mattering, importance, and “finding one’s place” in a social setting. Sense of belonging in university settings varies by individual background, major, and other social factors, and previous studies demonstrate its importance for college outcomes (Strayhorn 2018). Recent social media campaigns like #ShutDownSTEM and #BlackInTheIvory, however, provide evidence that “belongingness” in academia is not universal (Subbaraman 2020). Research consistently shows that cisgender women, low-income students, and those who identify as Black, Indigenous, and/or People of Color (BIPOC) feel marginalized during college more often than cisgender men, middle to upper-income, and White students, particularly in STEM fields (Hurtado and Carter 1997; Locks et al. 2008; Turner and Bowen 1998). Despite the well-understood links between sense of belonging and persistence, there remain few theoretical or policy interventions effectively confronting the continued inequalities marginalized students face. We argue this is because *intersectional* inequalities impacting sense of belonging go largely unexamined (Griffin 2019; McGee 2020; Posselt 2020; Riegle-Crumb, King, and Irizarry 2019).

We contribute to existing literature on sense of belonging in three ways. First, we assess the potential for *intersectional differences* in college experiences to influence sense of belonging. Specifically, we examine how college satisfaction varies by students’ identities, their intersections, university-specific social factors (e.g., faculty interactions, perceptions of institutional support), and other important characteristics (e.g., paid work; skill development). Interactions with faculty can be crucial for obtaining extended educational opportunities that

position graduates favorably in uncertain job markets (Ovink and Veazey 2011). Given uncertain employment opportunities, perception of skills learned in college is also crucial for students' satisfaction and sense of belonging. Further, paid work is optional for some students, but essential for others, and previous research finds that it can hinder degree progress (Bozick 2007). These and other important aspects of college experiences are shaped by systems of privilege and disadvantage that vary along intersections of gender, ethnoracial identity, and academic major (Jack 2019).

Second, we explore whether intersectional differences affect sense of belonging differently in *STEM and non-STEM majors*. Gendered, racialized, and income inequalities in access, persistence, and outcomes within STEM¹ fields remain an acute problem (National Academy of Sciences 2005). Yet, solutions to inequalities in the STEM pipeline often focus on a single axis of identity. For example, policies to diversify “high earning” STEM majors and improve BIPOC outcomes often overlook how BIPOC students' barriers vary by gender and income (Ong, Smith and Ko 2018; Schneider et al. 2015). Examining how college experiences differ intersectionally is vital for identifying institutional practices that will broaden STEM participation.

Third, we employ a *mixed-methods approach*, employing aspects of Critical Quantitative (QuantCrit) methods and in-depth interviews to further contextualize data collected at Meadow State University (MSU),² a large public research university. Sense of belonging is difficult to assess quantitatively. Survey analyses often cannot tell us *why* or *how* student experiences are

¹STEM stands for Science, Technology, Engineering, and Math. NSF considers the social sciences to be STEM fields; however, disciplines such as Psychology and Biology report fewer inequalities as compared to Physics, Engineering, Math, and Computer Science.

² All names are pseudonyms.

linked to their sense of belonging. Thus, prior explorations provide limited understanding of these complex, *intersectional* factors. We use survey data to explore the potential for intersectional differences in students' college satisfaction. Then, we analyze in-depth interviews at the same university to further contextualize the intersectional variation suggested by survey results. Our mixed-methods approach contributes insights into how and why students' background, individual choices, and institutional practices concurrently—and intersectionally— influence their sense of belonging on campus.

Literature Review

Social connection is a universal human need, facilitating access to resources and emotional support that sustain life (Nagoski and Nagoski 2019). *Sense of belonging*, as a form of social connection, refers to feelings of *mattering* and *importance* in a social setting. In short, sense of belonging acts as a “glue” connecting people to settings. When belongingness is missing, individuals may not receive the same benefits from their experiences as those with a stronger sense of belonging (Strayhorn 2018). Despite an emphasis on the individual level, previous research highlights how belongingness predictably varies due to power dynamics shaping opportunity structures in a given setting.

We synthesize literatures connecting identity, experiences, and sense of belonging at U.S. colleges, because our setting is a U.S. university. However, it is important to note that the very concept of belongingness is burdened by the colonialist, White supremacist, and cisheteropatriarchal underpinnings of U.S. society in general, and the histories of many U.S. universities specifically. The historical residue from near-blanket exclusion of BIPOC mere decades ago still exists at universities that were literally built by enslaved people (Wilder 2014).

Students' college experiences, satisfaction, and sense of belonging remain unequal across multiple axes of differences, including, but not limited to, race/ethnicity (Einarson and Matier 2005), gender (DiPrete and Buchmann 2013), and family income and associated factors, (e.g. paid work; first-generation status) (Chatman 2011). For example, BIPOC students are less likely to express satisfaction and a sense of belonging, and students' campus diversity climate perceptions are a contributing factor (Hurtado and Carter 1997; Maestas, Vaquera, and Zehr 2007). Though women are graduating college at higher percentages than men, academic majors remain gender-segregated, leading to corresponding career pathway differences (Armstrong and Hamilton 2013). We focus on race/ethnicity, gender, family income and associated factors; yet, we acknowledge important sources of inequality that are out of our study's scope (i.e., (dis)ability status, sexuality, citizenship, and age).

Previous research suggests heightened STEM inequities. Historically marginalized populations, including those who identify as BIPOC, low-income, ciswomen, and/or first in their families to attend college (first-generation), are less likely to attain STEM degrees despite comparable or higher aspirations to do so (Chang et al. 2014; Espinosa et al. 2019), a pattern not found in other majors (Riegle-Crumb, King, and Irizarry 2019). Among well-prepared BIPOC high school students, 44% of Black students desired STEM careers; however, just 27% of those interested actually attained STEM bachelor's degrees (Hurtado et al. 2009). This suggests that barriers within the STEM major-to-career pipeline disproportionately redirect marginalized students.

STEM career attainment is a social process, and the "desire of an aspirant is only one factor...An aspiring scientist relies on the judgment and invitation of practicing scientists throughout every phase of the educational and career process" (Lewis 2003:371). That is,

inequities in *belongingness*, including faculty-student interactions, contribute to high attrition rates among historically marginalized populations in STEM. Previous research highlights how underrepresented students were less likely to have mentors like themselves in authoritative STEM positions, and to see themselves as scientists (Carlone and Johnson 2007; McGee 2020). These experiences reflect inadequate strategies to diversify the professoriate and better connect students in STEM programs (Griffin 2020). Positive academic settings foster belongingness, developing a “science identity,” while negative STEM climates effectively “weed out” marginalized students (Park et al. 2020).

STEM-focused ameliorative programs intended to promote sense of belonging are often underutilized by women, BIPOC, and other marginalized populations, leading to differential academic outcomes (Carlone and Johnson 2007; Lane 2019; McGee 2020). This is in part because BIPOC and first-generation students are more likely to support family members or work (Chang et al. 2014; Hurtado et al. 2009; Riegler-Crumb et al. 2019). Hurtado et al. (2009) document that while ameliorative efforts may help individuals, students participating in BIPOC-identified programming face social stigma because these programs do little to alter university cultures that assume White, male, affluent scientists are the norm. Thus, such programs may become a target for stereotypes from majority-group students, activating stereotype threat in participants (O’Brien et al. 2015).

In sum, the extant literature demonstrates that women, BIPOC, and low-income college students face barriers to equitable outcomes with men, White, and affluent students, and these problems are exacerbated in STEM fields where the latter groups remain overrepresented (Fox, Sonnert, and Nikiforova 2009; McGee 2020; Riegler-Crumb et al. 2019). Many previous studies focus on one group at a time, or investigate facets of students’ identities as additive variables (cf.

Hurtado and Carter 1997). A QuantCrit and intersectional framework allows us to examine how individual beliefs (meanings) and institutional practices (policies and programs) affect students' sense of belonging across categories of difference, acknowledging the simultaneity of race-gender-class identities (Collins 2008; Garcia, Lopez, and Velez 2018; Ovink 2014). Individuals cannot add or subtract facets of their identities in life; therefore, an additive approach misses important nuances of human experiences. Hence, both sense of belonging and intersectional differences are difficult to assess quantitatively. Qualitative interviews can explore meaning and processes, but may lack generalizability. Mixed methods research promises to alleviate some of these concerns (Johnson and Onwuegbuzie 2004).

Utilizing survey data assessing student *satisfaction*, and in-depth interviews exploring *sense of belonging*, we build on this literature to investigate: (1) How satisfaction varies by student identity, including race/ethnicity, gender, and their intersections; (2) How students' satisfaction is influenced by faculty interactions, perceptions of institutional support for student growth and development, and other student characteristics such as working for pay, first-generation status, and perceptions of skills learned; (3) How college major (STEM/non-STEM) affects associations between race/ethnicity, gender, their intersections, and satisfaction; and (4) What qualitative interviews reveal about *why* satisfaction, factors influential for satisfaction, and sense of belonging vary by race/ethnicity, gender, family income and associated factors, major, and their intersections. Answering these questions advances our understanding of how, when, why, and for whom sense of belonging develops at MSU. Our findings point toward avenues for reducing campus inequalities by increasing equity in students' belongingness.

Data and Methods

Our mixed-methods approach begins with quantitatively exploring variations in a reflective consequence of sense of belonging—students’ willingness to return to the same university (a proximate measure for student satisfaction)—using survey data collected at Meadow State, a large, public research university with a STEM emphasis. Then, we analyze in-depth interviews conducted between 2014–2016 with students attending the same institution to explore *how* and *why* satisfaction and sense of belonging vary, accounting for students’ complex experiences.

Our quantitative analyses use four years of data from the National Survey of Student Engagement (NSSE), an institutional survey asking students to evaluate their undergraduate institution, because NSSE’s questions align with our qualitative interviews. Data represent MSU students enrolled during the 2007–2008 (n=1,572), 2010–2011 (n=1,622), 2013–2014 (n=1,864), and 2016–2017 (n=1,528) academic years. Pooled together, these data allow for an intersectional examination across academic majors given the small sample sizes of BIPOC students each survey year. Pooled data contained 6,586 undergraduate students, with 4,075 (61.9%) enrolled in STEM majors and 2,511 (38.1%) in non-STEM majors. The racial/ethnic composition of the sample was: 437 (6.6%) Asian or Pacific Islander, 198 (2.6%) Black, 134 (2.0%) Latinx, 4,859 (73.8%) White, 988 (15.0%) Multiracial/ethnic or other race.³ Unfortunately, we are unable to examine Native American student experiences specifically, due to institutional aggregation of these students within the “multiracial/ethnic or other race” category available to researchers. The

³ Our institutional data limit us to utilizing the *college* students’ major is housed in to indicate STEM or non-STEM affiliation. Thus, both Psychology and Biology majors are defined as STEM, because at MSU, both are housed in the College of Science.

gender breakdown was nearly evenly split with 3,315 (50.3%) women and 3,271 (49.7%) men.⁴ Student composition by race and gender was: 2,442 (37.1%) White women, 2,417 (36.7%) White men, 206 (3.1%) Asian/Pacific Islander women, 231 (3.5%) Asian/Pacific Islander men, 89 (1.4%) Black women, 79 (1.2%) Black men, 66 (1.0%) Latinx women, 68 (1.0%) Latinx men, 512 (7.8%) Multiracial/ethnic or other race women, and 476 (7.2%) Multiracial/ethnic or other-race men. Lastly, we used multiple imputation with chained equations (MICE) to impute 10 sets of missing values based on specific demographic characteristics (e.g., gender, race/ethnicity, and STEM major) to adjust for missing data on key student experience and engagement variables before estimating our models (see Von Hippel 2007; White et al. 2011).

Measures

Students were asked whether, if they could start their undergraduate studies over, would they attend the same institution again (1=definitely no; 4=definitely yes). We utilize this as our dependent variable, referring to it as “willingness to return.” This measure likely captures institutional *satisfaction* and *affinity*. The extent to which students of differing backgrounds, identities, and majors express a willingness to return signals whether the institution is perceived as supportive and inclusive. Disparities in cultivating satisfaction—and, potentially, belonging—reveal for whom the institution falls short. However, students could also interpret the question as a cost/benefit analysis. Thus, relying solely on surveys could lead us to miss important nuances of belongingness. Our mixed methods approach mobilizes in-depth interviews to address this limitation, allowing us to explore whether students’ willingness to return is predicated on

⁴ NSSE did not provide a question to distinguish transgender and cisgender prior to 2013, nor does it include nonbinary options. Data for 2014 and 2017 included too few valid cases for analysis.

feelings of belongingness not captured by available survey questions.

Perceptions of how institutions support students can contribute to whether students would willingly return. We included five measures related to students' perceptions of how much their institution supported student growth and development (1=very little; 4=very much): whether MSU offered or emphasized support to (1) thrive academically; (2) thrive socially; (3) cope with nonacademic responsibilities; (4) attend campus events and activities; and (5) experience diverse social interactions. We created a scale measuring perceptions of *institutional support for students* ($\alpha=.810$).

Previous research notes the influence of faculty interactions on student outcomes, including satisfaction and belonging. A series of measures examine *faculty engagement frequency* (1=never; 4=very often). Students were asked how frequently they (1) discussed grades or assignments with instructors; (2) talked about career plans with faculty or advisors; (3) discussed ideas from readings or classes with faculty outside of class; and (4) received prompt written or oral feedback from faculty on their academic performance. We created a scale from these four items ($\alpha=.755$). Students reported their experiences working on a research project with faculty outside of course or program requirements (1=plan to or had participated; 0=do not plan to participate). Students rated their overall relationships with faculty from “unavailable, unhelpful, unsympathetic” (1) to “available, helpful, sympathetic” (7). Lastly, students were asked how much they “acquir[ed] job or work-related knowledge and skills” from their classes (1=very little; 4=very much).

Academic characteristics could additionally influence willingness to return. We included class level (1=freshman; 2=sophomore; 3=junior; 4=senior). Unclassified students were omitted. Self-reported average grades (1=C- or lower; 8=A) were also included. Students reported how

often they come to class unprepared (1=never; 4=very often), and the average time each week spent on preparing for class (1=0 hours; 8=30+ hours). Students rated the degree to which their experiences on campus contributed to receiving job or work-related knowledge and skills (1=very little; 4=very much). In some analyses, we examine STEM (1) and non-STEM majors (0) separately.

Finally, we assessed *student characteristics* that relate to willingness to return. Students were identified with the following ethnoracial groups: Black, Asian or Pacific Islander, Latinx, Multiracial/ethnic or other race (White was the reference category). Gender was identified as women (1) and men (0). Students were identified as being a transfer student (1=yes; 0=no). Available measures associated with family income included first-generation status (1=yes; 0=no) and students' average weekly hours worked for pay on and/or off campus (1=0 hours; 8=30+ hours). Lastly, we control for the year the NSSE was administered (1=2007-2008; 2=2010-2011; 3=2013-14; 4=2016-17). Table 1 reports descriptive statistics for the MSU NSSE sample.

[Table 1]

Analyses

Our analyses of NSSE data seek to answer our first three research questions, documenting variation in willingness to return to MSU; how faculty interactions and other student experiences affected willingness to return; and how major (STEM/non-STEM) influences associations between student experiences and willingness to return. We conducted ordinal logistic regression analyses to examine changes in students' willingness to return to MSU in relation to key academic experiences and student characteristics. The baseline model included STEM majors identified by the dichotomous measure and students' academic and background characteristics. In order to explore intersectional experiences for students in STEM and non-

STEM fields with our survey data, we included race-gender groupings instead of separate race and gender variables (White men were the reference category). The second model included the faculty interaction and perceived institutional support measures. The final model included interaction terms for each race-gender grouping and whether they were in STEM or non-STEM academic programs. Next, we estimated marginal effects for each race-gender-academic major grouping for comparison. This approach allows us to create saturated models by including all combinations of ethnoracial and gender groupings and embed them within their academic programming (24 social locations) in our analyses. Through this analytic approach, we can explore inter- and intracategorical intersectionality or the between-group differences in students' willingness to return to MSU, and further examine the qualitative differences between students in STEM and non-STEM majors (Lopez et al. 2018; McCall 2005). It is important to note that available survey data does not provide a direct measure of individuals' social interactions; hence, we focus primarily on academic activities and interactions.

Qualitative Methods

In 2014, we began recruiting MSU undergraduate students for a longitudinal study of intersectional differences in college-to-career trajectories. We utilized email, flyers, in-person presentations across majors, and word of mouth. To increase BIPOC participation, we contacted organizations such as the Black Student Union and “Latinx in STEM.” These efforts resulted in 113 first-wave interviews, completed between 2014–2016. Respondents included 54 men (47.8%) and 59 women (52.2%). Forty (35.4%) identified as BIPOC, and 55 (55.6%) were STEM majors.⁵ Following Patton (1990), our team, including graduate and undergraduate

⁵ Our sample also included two STEM-STEM double majors, and five STEM-Non-STEM double majors.

researchers, utilized the logic of theory-driven purposeful sampling to select 37 “information-rich cases for study in depth” (p. 168). In selecting cases, we sought representation among four ethnoracial identities: White, Black, Asian and Pacific Islander, and Latinx, in order to explore ethnoracial/gender intersections. Twenty identified as men (54.1%), 17 as women (45.9%). Eight (21.6%) identified as White, 12 (32.4%) as Black, 4 (10.8%) as Latinx, 12 (32.4%) as Asian/API, and one as multiracial. Interviewees also estimated their family’s income range. Based on observed patterns in qualitative responses, we report these as “low-income” (<\$50,000; 19%) and “middle/high-income” (>\$50,000; 81%). Over half were STEM majors (22; 59.5%), reflecting its predominance at MSU. Table 2 compares the study samples and MSU population.

[Table 2]

Interviews ranged from 30 minutes to over two hours. Transcriptions of our 37 illustrative cases were coded using Dedoose software. Utilizing an iterative process and multiple coders to enhance reliability, we completed two rounds of coding. Open coding resulted in preliminary, *descriptive* coding exploring the scope of students’ experiences. For example, we coded for “educational decisions,” developing a typology of motivations (“economic returns;” “financial cost”) from interviewee responses. Second-round coding included a more focused examination in order to develop *thematic* codes related to our *sensitizing concepts* (Blumer 1969). Our analysis proceeded with attention to themes salient to students’ satisfaction and sense of belonging; how interactions with faculty, academic characteristics, and other social factors relate to belongingness; and evidence of intersectional differences therein. For example, thematic coding families such as “getting to know professors” helped us identify intersectional differences in how, when, and why students interact with or avoid professors. In analyzing our 37 illustrative cases, we sought to answer our final research question: *why* satisfaction, and factors influential

for satisfaction, vary by race/ethnicity, gender, income, major, and their intersections.

Ultimately, students' responses to our open-ended "willingness to return" interview question indicated *sense of belonging* as a prominent explanation.

Results

Quantitative Data

Willingness to Return to MSU

Table 3 examines MSU students' willingness to return when taking interactions with faculty and perceptions of institutional support into account. Given space limitations, we focus on race-gender student group differences and those among STEM and non-STEM majors to explore how students' willingness to return to the institution, as a reflection of broader sense of belonging at MSU, reflects their navigation of differing contexts (STEM and non-STEM) on an unequal campus. In the initial model that did not include faculty interaction and perceived institutional support variables, White women had increased likelihoods of being in a higher agreement level regarding their willingness to return to MSU ($b = .296, p < .001$), while each racially marginalized and minoritized student group had decreased likelihoods of being in higher agreement levels. Results for Latinx women and multiracial/ethnic and other race women did not reach statistical significance. Black men had the lowest likelihood of being in a higher agreement level that they would be willing to return to MSU ($b = -.402, p < .01$), followed by Asian and Pacific Islander men ($b = -.506, p < .001$), Latinx men ($b = -.467, p < .1$), Black women ($b = -.434, p < .01$), multiracial/ethnic and other race men ($b = -.314, p < .01$), and Asian and Pacific Islander women ($b = -.280, p < .05$). STEM majors were also found to have increased likelihoods of being in a higher agreement level compared to non-STEM majors ($b = .195, p < .001$).

[Table 3]

The second model include variables related to students' faculty interactions and perceptions of institutional support. Students who had better overall faculty interactions ($b = .300$, $p < .001$), felt they gained work-related knowledge and skills in their classes ($b = .389$, $p < .001$), and perceived their institution as being supportive of their academic and social development ($b = .775$, $p < .001$) had increased likelihoods of being in higher agreement levels regarding their willingness to return to MSU. However, students who had participated or were planning to participate in research opportunities had decreased likelihoods of being in a higher agreement level that they would be willing to return to MSU ($b = -.264$, $p < .001$). Again, among our race-gender student groups, White women had increased likelihoods of being in a higher agreement level on their willingness to return to MSU ($b = .230$, $p < .01$). Black men ($b = -.939$, $p < .001$) had the lowest likelihoods of being in a higher agreement level, followed by Latinx men ($b = -.726$, $p < .01$), Black women ($b = -.529$, $p < .05$), Asian and Pacific Islander men ($b = -.462$, $p < .01$), Asian and Pacific Islander women ($b = -.364$, $p < .05$), and multiracial/ethnic and other race men ($b = -.313$, $p < .01$). The slight change in ordering among race-gender student groups with the addition of the faculty interaction and perceptions of institutional support variables is notable; this finding suggests the importance of considering students' social location in relation to the broader educational contexts they are experiencing on campus. Similar to our first model, STEM majors had increased likelihoods of being in a higher agreement level regarding their willingness to return, as compared to non-STEM majors ($b = .270$, $p < .001$).

Our final model added interaction terms between each of the race-gender student groups and whether they were in STEM programs or not. Better overall faculty interactions ($b = .302$, $p < .001$), feeling that they gained work-related knowledge and skills in their classes ($b = .389$, $p < .001$), and perceiving their institution as being supportive of their academic and social

development ($b = .778, p < .001$) corresponded to students having increased likelihoods of being in a higher agreement level in their willingness to return to MSU. Once again, students who had participated or were planning to participate in research opportunities had decreased likelihoods of being in a higher agreement level that they would be willing to return to MSU ($b = -.264, p < .001$). White women continued to have increased likelihoods of being in a higher agreement level regarding their willingness to return to MSU ($b = .228, p < .05$), while Black men ($b = -.940, p < .01$), Asian and Pacific Islander men ($b = -.577, p < .05$), multiracial/ethnic and other race men ($b = -.532, p < .01$), and Asian and Pacific Islander women ($b = -.474, p < .01$) had decreased likelihoods of being in a higher agreement level. Despite significance levels, racially marginalized and minoritized students, with the exception of Latinx women in the second model and Latinx men in the third model, trended toward decreased likelihoods of being in a higher agreement level that they would be willing to return to MSU.

The interaction terms between race-gender groups and pursuing a STEM degree found a mix of trends among students, with some leaning toward increased likelihoods of being in a higher agreement level that they would be willing to return (Asian and Pacific Islander women and men, Latinx women, and multiracial/ethnic and other race men), while other groups leaned toward decreased likelihoods of being in a higher agreement level when majoring in STEM (White women, Black women and men, Latinx men, and multiracial/ethnic and other race women). Only Latinx men's decreased likelihood of being in a higher agreement level on their willingness to return to MSU met statistical significance ($b = -1.505, p < .05$). Similar to our previous models, STEM majors still maintained increased likelihoods of being in a higher agreement level regarding their willingness to return compared to non-STEM majors ($b = .255, p < .001$).

For comparison, we provide marginal effects for the social locations of students by race, gender, and academic major in Table 4. We find that White women in both STEM and non-STEM programs were similarly more likely to agree they would return to MSU, with an approximate 23 percentage point increase from the mean in comparison to White men in those majors (STEM: $ME = .227, p < .01$; non-STEM: $ME = .228, p < .05$). However, while STEM Latinx women and non-STEM Latinx men trended toward agreeing that they would be willing to return, similar patterns do not hold for other student groups; in fact, we found much variation. Among students in STEM programs, Asian and Pacific Islander men had a 42 percentage point decrease from the mean of being in higher levels of agreement they would be willing to return ($ME = -.421, p < .01$), but these decreases were larger for Black women and men at 71 percentage points and 94 percentage points, respectively (Black women: $ME = -.706, p < .01$; Black men: $ME = -.943, p < .01$), and were largest for Latinx men with an over 100 percentage point decrease from the mean ($ME = -1.076, p < .001$). Turning to non-STEM students, Asian and Pacific Islander women had a 47 percentage point decrease from the mean of being in a higher level of agreement regarding their willingness to return to MSU ($ME = -.474, p < .05$), while multiracial/ethnic and other race men ($ME = -.532, p < .01$) and Asian and Pacific Islander men had a similar percentage point decrease ($ME = -.577, p < .05$), and Black men had the largest percentage point decrease among non-STEM students ($ME = -.940, p < .001$).

While there are small numbers of students in some of these groups, warranting caution in our interpretations, it is important to recall that these patterns of marginal effects represent meaningful differences in student experiences that take into account faculty-student interactions and institutional support. Moreover, both racially minoritized women and men demonstrated lower likelihoods of being in higher agreement levels that they would be willing to return, with

some of the greatest disparities evident among men. Thus, rather than assume additive interpretations, our analyses highlight how students are differentially experiencing STEM and non-STEM programs at MSU in ways that present a complex picture of inter- and intracategorical intersectionality (Lopez et al. 2018; McCall 2005).

Our analytic strategy uses points raised by QuantCrit methodologists to identify several interesting patterns that warrant further investigation. Regardless of major, students who had high-quality faculty interactions, gained work-related knowledge and skills in their courses, and felt MSU supported their growth and development were consistently more willing to return. Our analyses point to racialized and gendered academic experiences in different majors that do not support additive interpretations. These differences may be countered by positive faculty interactions and perceptions of institutional support to increase students' willingness to return. However, participating or planning to participate in a research project decreased support for returning. Taken together, our quantitative findings signal that satisfaction with MSU varies intersectionally by gender, race/ethnicity and major. These findings are helpful for identifying intersecting disparities in students' willingness to return and, tentatively, the importance of faculty interactions and perceptions of institutional support. Though our analyses do not capture a statistically significant direct effect of paid work hours on willingness to return to MSU, prior research suggests that working for pay can intersect with race/ethnicity, gender and major in ways that our quantitative analyses were unable to capture. Investigating *how* and *why* navigating campus from differing social positions matters and influences students' degree pathways requires turning to our qualitative data. Next, we examine in greater depth, in their own words, how students make sense of campus opportunities, feel supported by faculty and the institution, and how social factors such as paid work and peer interactions affect their ability to develop a sense

of belonging.

Qualitative Data

We use 37 in-depth interviews drawn from the same institution as our survey data to triangulate these patterns, exploring *how* and *why* observed quantitative patterns might occur. We utilize interviewees' stories to investigate the relationships between gender, ethnoracial identity, major, and satisfaction. Then, we examine how student identity and major further inflect experiential factors suggested by prior research and our survey data to affect willingness to return: faculty interactions, institutional support, and working for pay. Our dual aims are to add (1) *depth* to our quantitative examination of group differences and influential social factors; and, (2) *nuance* by exploring factors not available in NSSE, such as a direct measure of family income. We find that intersectional differences in *sense of belonging*—or lack thereof—was a prominent explanation for respondents' willingness to return.

Qualitative Insights: Initial Group Differences

Eight interviewees (21.6%) would not return to MSU if they could choose again. Some patterns identified in survey data surfaced in interviews, such as more men (n=5) unwilling to return than women (n=3). Non-STEM majors were again the majority among students unwilling to return (n=5: two Black men; one Black woman; and two White men, one of whom was first-generation). All STEM majors unwilling to return identified as BIPOC (n=3: one Black woman, also a transfer student; one Asian woman; and one Latinx man).

Non-STEM majors unwilling to return perceived less prestige in, and support for, non-STEM subjects at MSU. Ryan, a low-income White man and first-generation scholar who switched from Engineering to English, felt stigmatized: "I have been embarrassed to tell people what my major is." English suited Ryan's career goals, but he lamented that "people often

assume that like, ‘Oh you shifted to English because you were too stupid to do the other thing,’ or because, like, you are impractical or lazy.’ Kyle, a Black English major, wished he had instead attended MSU’s rival institution, because of its superior liberal arts reputation.

A commonality among non-STEM BIPOC unwillingness to return was MSU’s lack of diversity. Hayden, a Black Sociology major, reported that the “White-centric focus” at MSU caused problems. He resented that “the way people tend to go about it is to try to make it the responsibility of the Black student to fix the problems with race on this campus. I came here to get a degree; who came here to fix the problems on this campus? I don’t get paid for that!” Non-STEM BIPOC students experienced interlocking disadvantages when they felt coerced to help “fix” hostile environments.⁶

Though no STEM majors reported pressure to “fix the problems with race” at MSU, and were happier with the level of academic support, STEM programs did not protect marginalized students from regularly experiencing microaggressions. Rachel, a Black woman in Engineering, participated in several programs supporting Black students. Yet, some White peers enviously pointed out her “permanent tan,” while others denigrated her “gross” haircare routine. She tired of her “uncomfortable” MSU life: “It does affect me personally...I’m trying to find myself and be true to who I am, but at the same time it really takes a toll on your self-confidence.” Rachel thought, “nobody would find me attractive.” Rachel disavowed gender as influencing her experiences (“I have no problems being a woman...I am Black first, then a woman”); yet, the microaggressions she reported mainly concerned beauty standards that are simultaneously

⁶ Respondents had strong opinions about MSU’s social ecology, which BIPOC students viewed as White-centric. A thorough examination of MSU’s social life is out of scope; our future work will address this topic in greater depth.

gendered *and* racialized. Rachel appreciated MSU's academic opportunities, but regretted not choosing another college.

Sharlyne, a Black woman, was satisfied with her Nutrition major, but not the “forced community” of MSU's social environment. Asked what it takes to “fit in,” she responded: “I would say if somebody wanted to fit in at Meadow State, they'd be White. They'd have money. They'd probably be in a sorority or fraternity...I wouldn't even say it has anything to do with academic major.” Like Rachel, Sharlyne participated in programs for “minorities” in STEM, but this did not engender belongingness:

It's hard being a minority here, especially my freshman year, sometimes I just felt like I was the only one...I came from a very diverse place, so, like being submerged into an old way, a culture that has...roots from 1870 or whatever—it can be really challenging figuring out your place at a school like this.

Black students constituted ~3% of undergraduates, inviting stereotype threat. As Sharlyne said, “some people might think, you know, African American students are here because [of] affirmative action.” Sharlyne reported, “I don't really think about being female here. I think more about race...your race can kinda like shape your experience.” Though Rachel and Sharlyne disavowed gender as salient to their belongingness, we observe intersectional differences in the negative experiences Black students reported.⁷ The experiences of STEM-focused Black women who were unwilling to return demonstrate how a hostile social context decreased their sense of belonging to such an extent that satisfaction with academics could not make up the difference.

⁷ In 2016, few organizations at MSU highlighted intersectional identities. MSU's comparatively highly visible Black-identified resources (e.g., the Black Student Union) could explain why students like Sharlyne viewed their ethnoracial identity as the primary force shaping their college experiences.

Qualitative Insights: Faculty Interactions and Institutional Support

Supporting survey results that high-quality faculty interactions, gains in knowledge and skills, and perceived institutional support increases satisfaction, interviews reveal the nuanced ways students assessed factors that influence satisfaction. We identify intersectional differences in *sense of belonging* as a prominent explanation for willingness to return.

Students mentioned enjoying their majors more following advanced classes, which facilitated increased skills and “getting to know” professors. Mary, a Latinx woman in Engineering, rarely attended office hours her first year. But sophomore year, interactions with professors facilitated belongingness: “I’m really starting to get to know [my professors] and it’s like I go to them if I ever need help and I feel like that’s had a really positive effect on me.” Mary bemoaned her “bad GPA” (2.6), but satisfaction with professors, the support she received, and the skills she gained balanced out dissatisfaction with her grades. In contrast, Neil, a White man in Finance, found his classes disappointing and low-quality. Not having to work hard, nor feeling he gained useful skills, motivated Neil’s regret in choosing MSU.

Addie, a first-generation Marketing major from Vietnam, was satisfied with MSU’s quality and reputation, but reported that “you have to get [a] good relationship with your professor” because networking was crucial for success. However, she saw herself at a disadvantage: “I feel like, students like me, I don’t get help from professor[s] that much...getting attention from people is hard, and, in my major, it’s very important to make the professors and companies to know you, remember you. So I think it’s a challenge...” An international and transfer student, Addie found professors less likely to reach out to someone like her; “It’s up to myself.” Rachel, the Black Engineering major profiled previously, reported similar feelings of stereotype threat: “my teacher in math is White...I feel like sometimes [professors] might think

I'm automatically stupid." Rachel attributed her fears to MSU's "social environment:" specifically, low faculty and student diversity raised prospects for unequal treatment.

Antonio, a Latinx man in Engineering, experienced such negative faculty interactions that he considered transferring. Antonio received the typical advice to attend professors' office hours to establish rapport. During one visit, however, the professor greeted Antonio, then audibly complained to a colleague, "Ugh, he's always here!" Antonio was shocked; "I was just like, ooh, I, I just felt like that hurt." Thinking he could not simply leave, Antonio went through the motions: "I asked her a question or whatever, got over the question and then I kinda just picked my stuff up and left." Afterward, he changed concentrations within Engineering, and abandoned office hours: "I just stopped going...I completely blocked it off." Despite joining programs for Latinx engineers—including being president of one such organization—he cited the need for better community and support systems. Antonio worried he would lack strong letters of recommendation for graduate school because his relationships with professors were underdeveloped. If he could choose again, Antonio would pick a university "that is a little bit more, I guess, open to Hispanics." Antonio's negative faculty interactions outweighed his major and skill-development satisfaction, leading to worries about his post-college trajectory.

Survey data indicate students who had or planned to participate in research were less willing to return. Interviews shed light on why this might be. Undergraduate research opportunities were typically unpaid, and undertaken only when internships—often highly competitive—could not be secured. Mary, the Latinx Engineering major, applied for internships "left and right," but companies "turned me away because my GPA was bad." Mary found an unpaid research position through a faculty connection: "I'm kind of like one of his favorite students." Mary was excited about doing research, but disappointed not to have applied

internship experience, which Engineering respondents universally valued highly. Mary acknowledged that having her parents' financial support made accepting a research opportunity feasible. Ricky, an Asian-American, first-generation Food Science major, dismissed his research experience; he had not "scratched the surface enough...need some job experience. 'Cause even though I've done research, I need to do stuff outside the field." Ricky did not think research directly applied to his plans: working for a food industry conglomerate, while saving to open a restaurant. Mary's and Ricky's experiences suggest that undergraduate research, though a résumé-builder, was less valued than internships.

The experiences of Addie, Rachel, Mary and Antonio demonstrate why interactions with faculty and perceptions of institutional support mattered for students' satisfaction with MSU, implicating *belongingness* as an underlying explanation. Addie, Rachel and Antonio felt disregarded by faculty due to one or more historically marginalized identities. Mary's connection with a professor garnered an unpaid research opportunity, which her family income status made feasible. Race/ethnicity, family income, and other student characteristics influenced faculty interactions and institutional experiences in complex ways, offering additional reasons why intersectional identities differentially affected sense of belonging.

Qualitative Insights: Working for Pay and Family Income Status

Interviews explored students' paid work and family income status, following prior research finding that paid work can significantly slow down students' progress. In-depth questioning on this topic also serves to supplement our survey findings suggesting a negative trend in satisfaction as paid work hours increased. Interviewees broadly agreed (68%) that family income is a "factor increasing chances of success," influencing "doing well in college" and "getting ahead in society." Seventeen interviewees (46%) worked for pay and seven (19%)

reported family incomes of \$50,000 or less. Of those above-mentioned students, eight were unwilling to return to MSU, and four—half—reported family incomes of \$50,000 or less. Qualitatively examining family income and paid work experiences demonstrates how and why these associated factors influence satisfaction and belongingness.

Luis, Kyle, and Hayden, all Black men, related struggles due to low-income status, and their experiences implicated intersectional inequalities. Luis (Business), slowed down: “I took a semester off to work...I realized, crap, I can’t pay for this semester, I got to take this off.” Kyle (English) had financial difficulties despite his scholarship, loans, and paid work: “I actually had to cancel my meal plan ’cause we didn’t have enough money.” Hayden (Sociology) reported that “good” unpaid internships were “interested in me,” but inaccessible:

[Income matters] just in terms of being able to afford to do things that others can’t. Like when I brought up the unpaid internship thing; some of these opportunities will look great on my résumé...one I saw was an unpaid internship for the White House...Even if they look great on our resumés, and open doors for us, and help us make connections, we [can’t]—there’s no way for us to take that opportunity.

Hayden additionally felt unwelcome in some social spaces:

...there are things [activities] that before I’m even thinking of joining, I have to think about, first of all, let’s say the class [status] of who’s being there. Like, I’ll want to know if my experiences would let me fit into that group, and sometimes I feel like with different groups they look at me and *they just think that I wouldn’t want to be there*, because of either my race or my [class] background; *I never know what it is.* (italics added)

Hayden could not know definitively whether his intersecting identities affected his

belongingness, but sensed “something” inhibiting his inclusion. Hayden’s reciprocal hesitancy led him to question whether his experiences would “let me fit into that group;” that is, if others would perceive a low-income Black man as a valued contributor.

Interviewees also linked family income to the ability to access high-impact educational practices. Shane, a White man in Engineering, spoke dismissively of a classmate’s expensive study abroad, deeming it academically frivolous. Yet, Shane reflected, perhaps “the study abroad, like, ‘looks good’ [on a résumé]...having the ability to go out there and explore a little bit more...having money not be an issue.” Thus, family income status led to differential access to signature college experiences that “look good” to others, enriching belongingness.

Moreover, interviewees connected family income security, and associated freedom from the *necessity* for paid work, to lower stress, which also facilitated success. Hannah, a Multiracial woman in Engineering, expressed confidence: “[H]onestly, I know I’m going to make it through. I mean, I don’t really worry too much...I’m fortunate ’cause my parents are paying for my school... So, I just gotta make sure I pass all my classes.” None of the six STEM-focused women interviewees with jobs worked more than 12 hours per week. Three specifically mentioned valuing “flexible” jobs, where they could cut back whenever school became “crazy busy.” Women interviewees who were STEM majors agreed: STEM success was incompatible with high employment hours.

Though survey results suggested that students were less willing to return to MSU as paid work hours increased, these findings did not achieve statistical significance. Our interviews with STEM-focused women add intersectional nuance to this negative trend, suggesting that gender, race/ethnicity and major may intersect with family income status and paid work experiences in hidden ways that differentially affect satisfaction and sense of belonging in college. While Kyle

worried about his scholarship's GPA requirement and Luis had to take a semester off, Hannah's parents paid tuition and rent, reducing stress and making work optional. Thus, income security helped compensate for factors often negatively associated with college satisfaction and belongingness, such as being a BIPOC woman in STEM.

Hannah's serenity sharply contrasts the stress inflecting the experiences of low-income students like Kyle and Luis. Hayden noted, "people who are financially well-off...that gives you greater agency...like we all come here, we all make mistakes, but some of us can't come back from those mistakes like others can." Higher-income status smoothed academic pathways, facilitated high-impact educational practices, improved mental health, and eased demanding STEM schedules. Low-income status inhibited academic, co-curricular, and social opportunities. These limitations were exacerbated at the intersections of marginalized identities, differentially affecting students' sense of belonging.

Discussion

While prior research documents disparities in students' satisfaction and outcomes, our mixed methods approach illuminates a range of challenges affecting undergraduates' sense of belonging, as measured by expressed desire to return to MSU if given a chance to "do it all over again." We found differences at the intersections of race/ethnicity, gender, major, and family income and associated factors, indeed matter for students' satisfaction. We also found that satisfaction and belonging are influenced by faculty-student interactions, perceptions of institutional support, and the STEM/non-STEM divide, and that the extent to which these factors affected outcomes additionally varied by identity and other background factors. Our QuantCrit approach acknowledges intersectional student experiences, using dichotomous race-gender

measures and estimating within and across major differences, while eschewing separate race and gender analyses. Our mixed methods approach contributes depth and nuance, extending quantitative patterns to provide qualitative insight on the experiences of marginalized students, demonstrating *how* and *why* sense of belonging varied intersectionally. We uncover significant gaps remaining in the ongoing goal of providing equitable outcomes at a public U.S. research university.

When assessing student satisfaction and sense of belonging, context and intersectional experiences mattered. Although STEM majors reported higher satisfaction per their willingness to return, this finding did not hold across all groups. BIPOC students reported less satisfaction, while women were more willing to return to MSU. Specifically, BIPOC men were less willing to choose MSU again, and White women more willing to return. Initial analyses also revealed greater willingness to return among STEM majors compared to non-STEM peers. However, our major-specific models highlight the complexity of gendered and racialized satisfaction—and by extension, belongingness—among STEM majors. Black, Latinx, Asian and Pacific Islander, and multiracial/ethnic and other-race STEM men were notably less willing to return. While BIPOC STEM women were not found to differ from White men in their willingness to return, preliminary analyses suggested less willingness to return compared to White women. These results highlight the contributions of our mixed methods approach: survey data provide the broader contours of campus inequalities, while qualitative inquiries plumb the depths of how and why ethnoracial-gender intersections mattered to sense of belonging—most poignantly, in interviews with Black men and women.

Our analyses suggest faculty interactions and high impact practices like internships play an important role in influencing students' satisfaction and sense of belonging, particularly in

STEM programs. Perceiving better interactions with faculty increased belongingness. Interviews linked feeling ignored or disrespected by faculty with decreased belongingness, in some cases leading students to change majors. Conversely, feeling that MSU supported students' growth and development, including job-related skills acquisition, *increased* satisfaction and belongingness.

Quantitative analyses highlight how positive faculty interactions and institutional support can increase satisfaction among students, sometimes offsetting intersectional disparities in willingness to return. Nevertheless, interviews demonstrate that, particularly for BIPOC students and those with intersecting marginalized identities, satisfaction with academics did not always outweigh deficiencies in other areas of campus life shaping belongingness.

A concerning—and seemingly contradictory—finding existed: students who planned or had worked on a research project with faculty were less willing to return to MSU. We investigated the extent to which these findings may be attributed to student experiences by race/ethnicity and gender, but our main results held. Previous research documents that historically marginalized students face barriers to research opportunities, or fail to fully benefit from them because of discriminatory experiences (Carlone and Johnson 2007; Chang et al. 2014; Hurtado et al. 2011; Park et al. 2020). Interviewees identified microaggressions they experienced, including with faculty, leading to disengagement for some. Our qualitative data also suggest another component of this finding: that research experiences are undertaken only when more preferable options (e.g., paid internships) cannot be secured. Universities should assess the distribution and funding of internships and research opportunities, in conjunction with the quality of faculty-student interactions across student groups. Targeted funding for students—and training for faculty—could be strategic options for reducing disparities and increasing belongingness.

Our quantitative results suggest that willingness to return to MSU decreases as paid work hours increase. Though failing to reach statistical significance in our models, the suggested negative trend is consistent with prior research on working for pay while pursuing higher education. This finding is concerning because university costs continue to outpace inflation, despite many universities eagerly recruiting first-generation and low-income students. Despite uneven connections between willingness to return to MSU, first-generation status and paid work hours in survey results, our interviews confirmed family income and associated factors as important for students' college trajectories, with STEM-focused women most adamant that working for pay more than 12 hours per week was incompatible with STEM success. Furthermore, income and ethnoracial identity intersected to additionally shape belongingness. Our interviews with low-income Black men signal multiple ways intersections of marginalized identities link to more troubling experiences, less opportunity to participate in co-curricular activities, and a weaker sense of belonging. Universities serious about welcoming increasing numbers of BIPOC, low-income and first-generation students, particularly in STEM majors, should initiate visible, institution-level efforts to protect students from microaggressions and stereotyping, and support broad access to high-impact educational experiences such as study abroad regardless of income status.

Limitations and Future Directions

Using available NSSE data hindered a full exploration of the intersectional differences in students' satisfaction and sense of belonging. Smaller samples for some groups limited our ability to construct models that were race-gender specific (i.e., Black women, Latinx men). Though we utilized some QuantCrit methodological approaches, additional data could assist with elucidating how satisfaction and sense of belonging differences reflect students' complex

intersectional experiences, particularly in STEM (Garcia, Lopez, and Velez 2018; Lopez et al. 2018).

Data limitations prevented us from fully examining differences among STEM majors. Women and BIPOC remain underrepresented in PEMC majors (Physics, Engineering, Mathematics, Computer Science), yet parity or a gap reversal has occurred in STEM fields like biology and psychology (Nix, Perez-Felkner, and Thomas 2015). Concerns for protection of human subjects forced us to group STEM-identified majors by college. Thus, our results group students across science-focused colleges (e.g., biology, physics, math, and psychology are all housed in the same college at MSU) which might explain why some ethnoracial-gender outcomes observed in Table 3 (full sample) exhibit different patterns in Table 4 (STEM and non-STEM subsamples).

Our only quantitative measures related to family income were first-generation status and paid work hours, limiting our ability to comprehensively explore the expected relationship between income status, satisfaction, sense of belonging, and other important social factors. Pairing our QuantCrit modeling strategy with interviews conducted on the same campus allowed us to further explore intersectional differences in family income and associated factors. Future work will examine longitudinal interview data gathered from the full sample of 113 MSU students.

We know that policies designed to encourage achievement and persistence have varied effects, inflected by student identity and major (Lane 2019; McGee 2020). Future research must continue to examine these factors intersectionally, using mixed methods and longitudinal data following students' progress over time. Examining college pathways at the intersection of two or more structures illuminates how systems of oppression are linked (Collins 2008), thereby

revealing the (re)production of beliefs, attitudes, and behaviors that are simultaneously gendered, racialized, and classed (Ovink 2014). Our research supports a growing body of evidence that institutions must actively build models of inclusion for historically marginalized groups to effectively support the next generation of women and BIPOC scholars (Griffin 2020; Jack 2019; Park et al 2020). Our mixed methods approach reveals how and why multiple factors related to college satisfaction influence students' sense of belonging. Academic leaders would do well to pay closer attention to how satisfaction with academic supports may not outweigh dissatisfaction with faculty, interpersonal relations, and/or access to high-impact experiences, contributing to inequalities in belongingness along intersections of race/ethnicity, gender, and income.

Research Ethics Statement

Research protocol was approved by the Institutional Review Board at the first author's institution. All human subjects gave informed consent prior to participating in our research, and adequate steps were taken to protect participants' confidentiality.

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Table 1. Descriptive statistics: NSSE students at Meadow State

Variable	Mean	SD
<i>Sense of belonging</i>		
Select same institution to pursue degree again	3.54	.71
<i>Faculty interactions</i>		
Faculty engagement scale (1=never; 4=very often)	2.19	.63
Worked or plan to work on research project (1=yes)	.46	.50
Overall quality of faculty interactions (1="unavailable, unhelpful, unsympathetic"; 7="available, helpful, sympathetic")	5.40	1.27
Gains in work-related knowledge and skills (1=very little; 4=very much)	3.00	.91
<i>Perceived institutional support</i>		

Supportive of students scale (1=very little; 4=very much)	2.78	.68
<i>Academics</i>		
STEM major (1=yes)	.62	.49
Class level (1=freshman; 4=senior)	2.65	1.41
Grades (1=C- or lower; 8=A)	5.94	1.64
Come to class unprepared (1=never; 4=very often)	2.79	.89
Time preparing for class (1=0 hours/week; 8=30 or more hours/week)	4.74	1.78
<i>Student characteristics</i>		
Female (1=woman)	.51	.50
White	.74	.44
Black	.03	.16
Asian or Pacific Islander	.07	.25
Latino	.02	.14
Multi/other	.15	.36
First generation (1=yes)	.16	.36

Transfer (1=yes)	.13	.34
Time working for pay (1=0 hours/week; 8=30 or more hours/week)	1.92	1.10

Table 2. Demographic Comparisons¹

Demographics ¹	Wave 1 Analytical Sample (n=37)	Wave 1 (n=113)	NSSE Sample (n=9,054)	Meadow State ² (n=24,179)
<i>Race</i>				
White	21.6% (8)	38.9%	73.2%	69.6%
Black	32.4% (12)	16.8%	2.8%	3.6%
Latinx	10.8% (4)	9.7%	2.0%	5.3%
Asian	32.4% (12)	25.7%	6.1%	9.2%
Multiracial/Other	2.7% (1)	8.8%	16.0%	12.4%
<i>Gender</i>				
Men	54.1%	47.8%	49.7%	41.9%
Women	45.9%	52.2%	50.3%	58.1%
<i>Major³</i>				
STEM	59.5%	55.6%	45.8%	56.6%
Non-STEM	40.5%	44.4%	54.2%	43.4%
<i>Income status</i>				
Low-income	19%	17.7%	----	17.6%
First-generation	19%	25.7%	16.3%	23.8%

1. Wave 1 2014–2016; NSSE pooled data AY 2008–09, 2010–11, 2013–14, 2016–17; MSU data AY 2014–2015.

2. Data from MSU’s Office of Institutional Research.

3. Excludes double majors.

Table 3. Influence of faculty interactions and institutional emphases on willingness to return to MSU with race-gender groupings

Variable	Model 1		Model 2		Model 3	
	<i>b</i>	CI	<i>b</i>	CI	<i>b</i>	CI
<i>Faculty interactions</i>						
Faculty engagement frequency	----	----	-.063 (.056)	-.172 – .046	-.063 (.056)	-.172 – .046
Worked or plan to work on research project	----	----	-.264*** (.059)	-.380 – -.148	-.264*** (.059)	-.380 – -.148
Overall quality of faculty interactions	----	----	.300*** (.026)	.250 – .351	.302*** (.026)	.252 – .353
Gains in work-related knowledge and skills	----	----	.389*** (.034)	.323 – .455	.389*** (.034)	.323 – .455
<i>Supportive institution</i>						
Support of students scale	----	----	.775*** (.050)	.677 – .872	.778*** (.050)	.680 – .875
<i>Academics</i>						
STEM major	.195** (.056)	.085 – .305	.270*** (.062)	.150 – .391	.255* (.104)	.052 – .458
Class level	.019 (.019)	-.018 – .056	.041† (.021)	-.000 – .082	.044* (.021)	.003 – .086
Grades	.113*** (.016)	.080 – .145	.050** (.017)	.016 – .084	.049** (.017)	.015 – .083
Come to class unprepared	-.063* (.030)	-.122 – -.003	-.020 (.033)	-.085 – .044	-.020 (.033)	-.084 – .045
Time preparing for class	.038* (.016)	.007 – .068	.027 (.017)	-.006 – .060	.026 (.017)	-.006 – .059
<i>Other student characteristics</i>						
Transfer	-.237** (.081)	-.396 – -.079	-.144† (.084)	-.309 – .021	-.146† (.084)	-.311 – .020
First-generation	.125† (.074)	-.020 – .270	.122 (.080)	-.035 – .279	.123 (.080)	-.035 – .280
Time spent working for pay	.030 (.027)	-.022 – .083	-.016 (.029)	-.071 – .040	-.018 (.029)	-.074 – .038
NSSE Year	-.130*** (.026)	-.181 – -.080	-.165*** (.028)	-.220 – -.111	-.165*** (.028)	-.220 – -.111

Race-Gender groups

White women	.296*** (.063)	.173 – .419	.230** (.067)	.099 – .361	.228* (.110)	.013 – .443
Black women	-.434* (.188)	-.802 – -.066	-.529* (.208)	-.935 – -.124	-.272 (.324)	-.907 – .363
Black men	-.702** (.224)	-1.142 – -.262	-.939*** (.238)	-1.406 – -.472	-.940** (.316)	-1.56 – -.320
Asian and Pacific Islander women	-.280* (.140)	-.555 – -.005	-.364* (.151)	-.660 – -.068	-.474* (.230)	-.925 – -.024
Asian and Pacific Islander men	-.506*** (.125)	-.750 – -.262	-.462** (.137)	-.731 – -.193	-.577* (.288)	-1.142 – -.012
Latinx women	.128 (.276)	-.413 – .669	.185 (.304)	-.412 – .782	-.168 (.396)	-.944 – .607
Latinx men	-.467† (.252)	-.960 – .026	-.726** (.271)	-1.257 – -.194	.429 (.574)	-.696 – 1.554
Multiracial/ethnic and other race women	-.005 (.106)	-.213 – .203	-.079 (.114)	-.303 – .145	-.029 (.168)	-.358 – .301
Multiracial/ethnic and other race men	-.314** (.100)	-.510 – -.118	-.313** (.102)	-.513 – -.113	-.532** (.183)	-.890 – -.173

Race-Gender x STEM interaction

White women	----	----	----	----	-.001 (.137)	-.270 – .268
Black women	----	----	----	----	-.434 (.418)	-1.253 – .385
Black men	----	----	----	----	-.003 (.459)	-.903 – .897
Asian and Pacific Islander women	----	----	----	----	.186 (.304)	-.410 – .782
Asian and Pacific Islander men	----	----	----	----	.156 (.324)	-.478 – .791
Latinx women	----	----	----	----	.762 (.612)	-.439 – 1.962
Latinx men	----	----	----	----	-1.505* (.647)	-2.773 – -.237
Multiracial/ethnic and other race women	----	----	----	----	-.105 (.230)	-.555 – .345

Multiracial/ethnic and other race men	----	----	----	----	.331 (.221)	-.101 – .764
F	11.88***		46.03***		33.50***	

Note: Analyses used imputed data and contained 6,586 cases each. Robust standard errors reported in parentheses. Confidence interval ranges are reported in the second column for each model.

† $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4. Marginal effects of willingness to return to MSU by intersectional groupings and academic major groups

Student group	Marginal Effect	SE	Cases
STEM White men (reference)	----	----	1685
Non-STEM White men (reference)	----	----	732
STEM White women	.227**	.084	1311
Non-STEM White women	.228*	.110	1131
STEM Black women	-.706**	.266	54
Non-STEM Black women	-.272	.324	35
STEM Black men	-.943**	.335	50
Non-STEM Black men	-.940**	.316	29
STEM Asian and Pacific Islander women	-.288	.201	128
Non-STEM Asian and Pacific Islander women	-.474*	.230	78
STEM Asian and Pacific Islander men	-.421**	.154	174
Non-STEM Asian and Pacific Islander men	-.577*	.288	57
STEM Latinx women	.593	.469	33
Non-STEM Latinx women	-.168	.396	33
STEM Latinx men	-1.076***	.302	50
Non-STEM Latinx men	.429	.574	18
STEM Multiracial/ethnic and other race women	-.134	.157	268
Non-STEM Multiracial/ethnic and other race women	-.029	.168	244
STEM Multiracial/ethnic and other race men	-.200	.123	322
Non-STEM Multiracial/ethnic and other race men	-.532**	.183	154

Note: Analyses used imputed data and contained 6,586 cases each.

† $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.