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Exploring the Experiences of College Women in Fields with Disparities in Gender Representation

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Abstract

Although women earn over half of all bachelor's degrees in the United States, they are not equally represented across fields of study. Research on gender segregation in higher education has expanded, but this primarily quantitative work tends to neglect the voices of the college women who are experiencing gender-segregated settings firsthand. Our research explores the experiences of women majoring in fields where gender representation is unequal. Sixteen women undergraduates took part in interviews, with half coming from majors classified as women-minority, and half from majors designated as women-majority. Findings demonstrate that women in women-minority majors and women in women-majority majors differ in how they describe their experiences around three themes: relationships with classmates, relationships with professors, and the emotional impact of major demographics. This article concludes by exploring implications for higher education.

Keywords: college women, gender representation, majors, field of study, STEM, humanities

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Exploring the Experiences of College Women in Fields with Disparities in Gender Representation

Although women earn over half of all bachelor's degrees in the United States (Buchmann, 2009), they are not equally represented across fields of study (National Center for Education Statistics, 2019). In response to this imbalance, social scientists have examined the influence of gender on college student major choice (England & Li, 2006; Hamilton, 2014; Quadlin, 2020), and resulting inequalities in career opportunities and earning potential (Gerber & Cheung, 2008; Ochsenfeld, 2014). These studies find evidence that gender segregation by field of study is shaped by myriad factors, including departmental and institutional culture, social interactions, and students' interpretations of majors and their own capacities (Cheryan et al., 2017; Gillis, 2022). While important strides have been made in expanding understanding of gender segregation and the factors that drive it in higher education, this research tends to rely on quantitative datasets from large surveys and institutional enrollment data, neglecting the voices of the college women who experience and navigate gender-segregated academic settings firsthand. A few notable exceptions to this trend focus on women's experiences in science, technology, engineering, and mathematics (STEM) fields (García Villa & González y González, 2014; Rodriguez et al., 2020). However, studies on women's experiences in other kinds of gender-segregated settings are scarce.

The purpose of this research was to investigate and compare the experiences of college women in fields with distinct gender imbalances. This aim was accomplished by interviewing 16 women undergraduates pursuing majors with a high representation of women (women-majority), such as social work, and majors with a low representation of women (women-minority), such as engineering. The following research question guided this study: How do women describe their experiences in women-majority and women-minority fields when reflecting on their choice of a major? By bringing students' voices to conversations about gender segregation, scholars and practitioners have an opportunity to learn more about students' perceptions of the experiential core of higher education (Stevens et al., 2008), creating environments that facilitate student success for college women.

Literature Review

Gender Segregation in Higher Education

The past half century has seen noteworthy shifts in gender representation in U.S. colleges and universities, where women now make up a majority of contemporary enrollments (DiPrete & Buchmann, 2013). Nonetheless, gender segregation in higher education remains pervasive. Though women earn more bachelor's, master's, and doctoral degrees than men do, they are often concentrated in certain fields of study, such as nursing and education (National Center for Education Statistics, 2019). Meanwhile,

women remain underrepresented in fields like computer science, engineering, and physics (Cheryan et al., 2017).[1]

These patterns are significant because of their implications not only for gender inequality in students' experiences within higher education, but also because of their influence on post-college outcomes. Research indicates that gender segregation by field of study is a driving factor in sustaining occupational segregation (Shauman, 2006) and the gender wage gap (Bobbitt-Zeher, 2007; Gerber & Cheung, 2008). Degrees in women-majority fields generally lead to lower-paying careers than those pursued by most men students (Ochsenfeld, 2014), and tend to be devalued as compared to women-minority fields (Bobbitt-Zeher, 2007).

There are numerous explanations for the persistence of gender segregation. These explanations tend to focus on factors that inform initial major selection, as well as factors that influence major departure. Studies indicate that both of these processes are important in shaping the contours of gender representation today. In their recent review of this literature, Cheryan and colleagues (2017) identified three primary factors that explain unequal gender representation in computer science, engineering, and physics. Specifically, they pointed to: (a) the prevalence of "masculine cultures" that facilitate a sense of belonging for men, while undermining belonging for women, (b) gender inequality in early educational experiences with these fields, and (c) gender inequality in students' sense of self-efficacy (Cheryan et al., 2017). As Gillis (2022, p. 4) noted, the major a student ultimately declares "is not an individual choice;" rather, institutional cultures, social interactions, and identity processes come together to shape the distribution of students into fields of study.

Field-specific cultures and their impact on gender segregation have been widely studied in survey research. From the vantage points of students selecting majors, perceptions of these fields of study, their cultures, and their associations with femininity and masculinity emerge as important variables (England & Li, 2006; García Villa & González y González, 2014; Gillis & Ryberg, 2021; Turner, 2022). Drawing from survey data across 44 countries, Charles and Bradley (2009) showed how gender essentialism and norms surrounding self-presentation inform individuals' tendencies to choose majors that correspond with notions of their gendered selves. In other words, assumptions and beliefs about gender impact the ways individuals understand and seek to express themselves as they look toward future careers (Charles & Bradley, 2009; Quadlin, 2020), encouraging women to participate in majors that allow them "to invest in gendered dispositions," such as leveraging their appearance and social skills, while gaining fewer

1 Discussions about gender segregation in various fields of study often lump together STEM fields. However, fields like biology and chemistry tend to have more even gender representation nationally (Cheryan et al., 2017). Meanwhile, there is little consensus about whether fields like nursing are classified as STEM fields (Hedgecock, 2016). For these reasons, in this article we focus on gender representation, rather than comparing STEM versus non-STEM fields.

of the skills or credentials that will be rewarded in the labor market (Hamilton, 2014, p. 247). Furthermore, even when men and women express similar goals and values, they frequently end up in different majors (Quadlin, 2020).

Cultural influences are likewise significant in students' decisions to leave majors. Social scientists have determined that the "chilly" academic climates of certain fields are one explanation for women's departure from majors where they have been historically underrepresented. Lee and McCabe (2021) describe chilly academic climates as environments in which women students face "overt and subtle forms of discrimination" in the classroom (p. 32). Researchers have found the climates of some STEM fields at universities to be chilly and uninviting for women (Jensen & Deemer, 2019; Šaras et al., 2018), and sexual harassment can be prevalent (Leaper & Starr, 2019). Studies have also determined that stereotype threat, the fear that one will reinforce stereotypes about one's social group, negatively impacts women's academic performances in women-minority fields (Shapiro & Williams, 2012; Spencer et al., 2016). Moreover, research shows that women are more likely to switch majors after receiving low grades in women-minority fields than after receiving low grades in women-majority fields (Kugler et al., 2017).

Research indicates that the roots of gender segregation begin early in life, with childhood educational experiences proving highly influential (Cheryan et al., 2017), and stereotypes that link gender to math and science ability emerging even in elementary school settings (Cvencek et al., 2011; Reinking & Martin, 2018). Šimunović and Babarović (2020) found that the gender-role socialization of children by parents, and whether children receive encouragement to pursue certain careers, can have a crucial impact on girls' interest in STEM fields. These patterns persist through high school where boys are more likely to take optional courses in engineering, computer science, and physics (Cheryan et al., 2017; Nord et al., 2011). These patterns have been linked to broader self-efficacy and performance in college-level courses (Cech et al., 2011; Correll, 2001), where women report having less prior experience with these types of classes (Kost-Smith et al., 2010).

Gender Inequality in the Experiential Core

Much of the literature on gender segregation by field of study focuses on the distribution of students across majors and on quantitative analyses of the prevalence of stereotypes, harassment, and bias (Cheryan et al., 2017). Meanwhile, less attention is paid to how students describe their social and emotional experiences in gender-segregated settings. This neglect is surprising given that extensive research demonstrates that interactions with faculty, relationships with peers, and the emotional experiences resulting from these interactions are important for student success (Arum et al., 2018; Roksa et al., 2022). These insights have emerged from recent research on the experiential core of college life (Stevens et al., 2008), where studies demonstrate that the types of social and emotional experience students have can influence their social networks (McCabe, 2016; Stuber, 2009), feelings of belonging (Nunn, 2021; Silver 2020b), broader growth

and development (Mayhew et al., 2016; Miller, 2017), and persistence to degree completion (Braxton et al., 2013; Gayles & Ampaw, 2014).

Gender inequality in the experiential core is shaped in profound ways by the daily interactions that individuals have with their classmates and professors (Gillis, 2022). While we know little about how students perceive these interactions in majors with varying gender representation, scholars have analyzed women's experiences with sexism in higher education more broadly (Crimmins, 2019; Edwards, 2017). These studies have documented women's firsthand accounts of confronting sexist remarks by faculty (Maldonado & Draeger, 2017), and pressures to enact feminine gender performances in order to fit in with peers (Fox, 2021; Silver, 2020a).

Though these studies have made progress toward including the voices of women students in understanding gendered experiences in higher education, scholars have yet to examine how students' descriptions of their experiences may vary in settings with unequal gender representation. Research shows that gender beliefs and stereotypes perpetuating gender inequality are especially prevalent in environments where gender composition is unequal, making gender identity especially salient (Ridgeway & Correll, 2004). This insight emerged early in Kanter's (1977) research on women's experiences in professional or academic settings, which she found were informed by sexist stereotypes linked to representation. This work pointed to the existence of thresholds of representation, suggesting that once women are represented at a certain level, they may experience less discrimination (Kanter, 1977). While recent research has found evidence supporting this notion in universities' academic departments (Lester et al., 2017; Pifer, 2018), such work has yet to be extended to students' experiences.

Research Question

This study provides a comparative investigation of the ways women describe their experiences in women-majority and women-minority fields, with specific attention to their relationships with classmates, their interactions with professors, and the emotional impact of their major demographics. A comparative approach is necessary for answering our research question, which asks: How do women describe their experiences in women-majority and women-minority fields when reflecting on their choice of a major?

Methods

This research was designed to explore the college experiences of women majoring in women-majority and women-minority fields through a basic interpretative qualitative study, which aims to understand how individuals make meaning of lived experiences (Merriam & Grenier, 2019). Interpretive qualitative studies typically involve analysis

of data "to identify the recurring patterns" and provide a "descriptive account of the findings" (Merriam & Grenier, 2019, p. 7).

Setting and Recruitment

State University is a public, four-year university in the mid-Atlantic region of the United States with an undergraduate student population of approximately 26,000. Approximately half of these students identify as women. The university offers 78 undergraduate degrees with a variety of concentrations. According to Kanter (1977), once an underrepresented group maintains about 35% of representation in a group, they can form coalitions and affect the culture of the group as a whole, and are more likely to be perceived as individuals, rather than tokens. Institutional research data was used to identify degrees where women comprised more than 70% or less than 30% of undergraduate students enrolled. We used these criteria to determine which majors qualified as women-majority and women-minority, respectively, for the purposes of this research. Though many degrees had a moderate gender imbalance, this project aimed to explore women's experiences in majors with distinct gender inequalities in enrollment. Of the 28 degrees matching these criteria, 13 were women-minority, and 15 were women-majority.

After receiving Institutional Review Board approval, State University students in their second year and beyond who identified as women and were enrolled in women-minority or women-majority majors were invited to participate in the study. Recruitment messages were sent to department email lists and to faculty and academic advisors to share with students. The first author also employed snowball sampling, sharing the call for participants with peers who qualified for the study or knew others who qualified.

Study Participants

Sixteen women met the criteria and participated in the study after giving voluntary informed consent. Participants ranged in age from 18 to 27 and consisted of 15 cis women and one trans woman. The education of their parents ranged from high school or less to graduate and professional degrees. The women-majority majors included in this study were English, social work, human development, psychology, and dance. The women-minority majors were cyber security engineering, information technology, and mechanical engineering. Table 1 presents a summary of participant characteristics. Though additional students volunteered to take part in the study, the researchers concluded interviews following these 16 participants due to funding constraints. While the level of data saturation achieved allowed us to speak to broad patterns in women's experiences in women-majority and women-minority majors (Lofland et al., 2022), we were unable to hone in further on specific majors. Our sample is not representative of all women-majority and women-minority majors, a limitation we examine in the Discussion section.

Table 1. Interview Participant Characteristics

Sociodemographic Characteristic	n	%
Race/ethnicity		
Asian/Pacific Islander	3	18.75%
Black/African American	2	12.50%
Hispanic/Latina	3	18.75%
White	5	31.25%
Multiracial/other	3	18.75%
Total	16	100%
Women-majority majors		
English	3	18.75%
Social Work	2	12.50%
Human Development	1	6.25%
Psychology	1	6.25%
Dance	1	6.25%
Total	8	100%
Women-minority majors		
Cyber Security Engineering	4	25%
Information Technology	3	18.75%
Mechanical Engineering	1	6.25%
Total	8	100%

Data Collection and Analysis

Semi-structured interviews were conducted by the first author to explore participants' gendered experiences in women-majority and women-minority majors (Weiss, 1994). Given that this research took place during the COVID-19 pandemic, all interviews were conducted virtually. Following the recommendations of Seidman (2006), we relied on "primarily, open-ended questions," in order "to build upon and explore participants' responses to those questions" and "have the participant reconstruct his or her experience within the topic under study" (p. 15). Gender and gender representation were central to the interview protocol. Questions covered topics such as how participants chose their major, their typical interactions with peers and professors, and moments when their gender was salient in academic settings. The interview began with broad questions about students' academic experiences. For example, early questions included, "Can you tell me about a class you really enjoyed in your major? And a class you disliked? Why did you feel that way?"; "Overall, do you feel like your peers and professors respect you? Why or why not?" Later questions moved into topics that focused more directly on gendered experiences, such as "Could you share an example

of a time when you thought about your gender in one of your classes?" Each interview concluded with the question "How does it feel to be one of the few women in your major?" for participants in women-minority majors and "How does it feel to be among primarily women within your major?" for those in women-majority disciplines. We designed the interview guide to encourage participants to recount their experiences as women within their fields in order to elicit participants' interpretations of their gendered experiences in fields with gender disparities in representation.

Recordings of the interviews were transcribed for analysis. The transcripts were reviewed through an inductive process of open coding, and analytical memos were used to explore similarities and differences in the themes that emerged (Corbin & Strauss, 2008; Lofland et al., 2022). The first author engaged in axial coding, "relating minor concepts to broader level concepts" and showing "the relationships between two or more concepts" (Corbin & Strauss, 2008, pp. 38, 27). Myriad themes emerged from this broad, inductive process, many of which spoke to important elements of participants' academic experiences. Our guiding research question helped us to identify the three primary themes presented in this paper, which emerged as the most prominent ways participants described their experiences in relation to gender representation in their field of study.

Trustworthiness and Positionality

Strategies were used to support the trustworthiness of this research. Throughout the design, interview, and writing processes, we employed peer debriefing (Arminio & Hultgren, 2002). We likewise considered our positionality and how our identities, including our race, gender, socioeconomic status, age, and roles on campus, informed our connections to study participants and their perspectives. Notably, the first author was an undergraduate student in a women-majority field at the time the interviews were conducted and has since transitioned to graduate school. As a result of her insider status as a college woman, she brought unique insight to these interviews and was able to build rapport with participants. The second author is a faculty member in a women-majority field who studies college student experiences. These roles were important in informing our perspectives on the research question, data collection, and interpretation of the findings. For that reason, we remained cognizant of the ways our perspectives and experiences differed from the study participants. Finally, verbatim quotes are presented throughout the Findings section to assist readers in making their own judgements regarding our interpretations of the data.

Findings

Participants in women-minority and women-majority majors at State University described markedly different experiences. In response to our guiding research question, three primary themes emerged from the data. These themes, which encompassed

the range of participant responses, included: relationships with classmates, relationships with professors, and the emotional impact of major demographics. The findings presented below compare the experiences of women in women-minority and women-majority fields in relation to each of these themes.

Relationships with Classmates

Participants often connected their gendered experiences to relationships with their peers. Specifically, there were discrepancies between women in women-majority majors and women in women-minority majors with regard to how they interacted with their classmates. The participants in women-minority fields described social isolation and often mentioned at least one instance of sexism, whereas those in women-majority fields experienced a greater sense of inclusion, support, and camaraderie.

Mackenzie,[2] a cyber security engineering student, said "sometimes it's lonely . . . Sometimes I'll talk to guys about stuff and I can't relate to some of the things that they say. I just don't have the shared experience that they seem to have." The problem of relating to men's experiences appeared in several interviews, as women-minority participants reported difficulties bonding with other students in the major, but also feeling out of place within the men-dominated friend groups that some of them had formed. Moreover, some participants noted issues relating to how the gender imbalance of certain majors could inhibit friendships between men and women. Zara, another cyber security engineering major, noted:

> I think some of the guys . . . don't know how to approach girls to talk to them. But they don't have to. It's really me that needs to approach the guys. So it's like kind of a barrier when you need to work to make them comfortable . . . Because for men, they don't really need to talk to us. They have each other. Especially since they come in bunches with classes.

As Zara articulated, women in women-minority fields felt responsible for approaching men in order to socialize with their peers. Men, however, were not required to make the same kinds of connections across gender due to the multitude of other men in their disciplines. When women did not make these efforts, there were sometimes social consequences. Tristan, a mechanical engineering major, explained:

> With all of the guys in most of my classes, it's been that sort of like they're all friends with each other . . . The class that I was the only girl in for a solid two weeks, I had a one seat buffer all the way around me in that classroom.

Based on Tristan's example, there appeared to be a responsibility imposed on the women students to socialize with their men peers. If they did not, they risked being socially, and even spatially, isolated in their classes.

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2 All participant names are pseudonyms.

Furthermore, participants in women-minority majors mentioned instances of sexism. These incidents took three main forms: mansplaining, unwanted advances, and purposeful exclusion. Rachel, an information technology major, explained that she "had male students try to explain things to me that I already knew and that was literally just said," noting that "it happens a lot more often than" she was "comfortable with," and that it only seemed to happen to women. Two participants also mentioned having to deal with unwanted sexual advances in women-minority settings. Zara mentioned that "every once in a while, I get sexualized rather than being seen as a peer," occurrences that tended to happen when she was studying with her classmates. Similarly, Rachel explained that "I don't befriend too many people in my classes . . . I've been hit on too many times by guys in IT [information technology]." She explained that these situations made her much more wary of sharing her phone number or agreeing to study with peers.

Some participants in women-minority majors reported that group projects and collaborative class work involved incidents in which their peers intentionally excluded them from participating. Rachel explained that peers who identified as men purposefully delegated "the easy parts" of a group project to her because of a "lack of trust" that "seems to stem from [her] being a woman." She went on to state that she had "talked to other women who have had the same thing" happen. Maya, an information technology major, gave an example of a time when partners excluded her from a project altogether. She speculated that the reason she was not included was because "they didn't want to take a girl serious, or what I had to say seriously." Furthermore, this affected her confidence in class, and "for probably a month or two after that, I was . . . sort of mute in my classes."

Conversely, participants in women-majority fields described bonding with classmates and befriending their peers. Beth, a social work major, explained that:

> We have group chats for our classes, so we can discuss different assignments or help each other out, if you were confused about something . . . People are very supportive, and occasionally I'll message individual peers about, "Hey, how's this assignment going?" Or just getting to know people kind of a thing.

Colleen, an English major, made similar points, explaining that students in her classes "generally really bond" and that they made use of Discord servers "to talk about schoolwork plus about our personal lives . . . I basically talk to my English peers like every day now."

Women in women-majority majors reported experiencing much more supportive and inclusive environments among their peers. These participants described more consistent academic and social support than those in women-minority fields. Ashley, a social work major, said:

> It just seemed that immediate connection that you have with the other students. And it's not like you're immediately friends. It was just like, everyone

> was so willing to help. And here are the articles that I used, or here are resources that helped me with this assignment or this paper.

Furthermore, unlike in women-minority fields, participants in women-majority majors reported more cohesive group project experiences. Madison, a dance major, explained that "collaboration has been extremely easy" and that "we basically just split up a lot of the work . . . it's been pretty smooth."

The additional support and understanding apparently present in women-majority majors does not appear to be simply about the gender demographics of the students, but also about the general culture of the departments in which women have greater representation. This difference was most apparent in my interview with Diana, who initially declared a STEM major but decided to switch to a degree in the humanities. This change in major aligned with the beginning of her gender transition. Diana claimed that there was a stark difference between the culture of her women-minority previous major and the culture of her new department. She acknowledged feeling more accepted in the women-majority major, and that if she had been open about her gender identity among her peers in her previous major "barely anybody would talk to me."

Interactions with Professors

Participants' interactions with their professors followed similar patterns, with students in women-minority majors experiencing marginalization that contrasted with the inclusion described by women in women-majority majors. Although all of the women-minority participants reported that their general experience with both men and women professors was positive, almost every woman interviewed had encountered marginalization from an instructor. Rachel recounted that "there's one, maybe two professors, where you raise your hand and he calls on every guy before he calls on you." Rana, a cyber security engineering major, explained a situation in which one of her professors "just did not like any girls." According to Rana, "I would turn in the exact same [project as a man student], but I would get a lower grade than" him. She explained that the class began to catch on to this phenomenon, as this professor "would always give the guys a full score," but never the women. To test their theory, they actually swapped names on assignments within a larger group project, attributing the work that women did to the men and vice versa. When they did this, the work *attributed* to the women students but completed by the men received lower grades, which affirmed their theory that the grading differences were based on the professor's gender bias. Despite reporting the professor to the appropriate department within State University, she recalled that nothing was done to rectify the situation, and her GPA suffered as a result of this course.

Women-minority participants reported that department faculty often attempted to acknowledge gender disparities and to encourage women to thrive within women-minority fields, but with mixed results. Some participants mentioned strategies that professors used in attempting to include women. For instance, Friba explained that "the

majority of the professors that are teaching cybersecurity, they're very pro-woman" and that "they always mentioned female role models that they have had, and not too long ago, the Head of Cyber Security Engineering Program was a woman," which made Friba feel that women were supported within her major. Additionally, Tristan mentioned a system used by one of her professors in which "he picks a few people to be class representatives" who can communicate the class's needs to the professor. Significantly, the professor explained that he wanted to "pick the most diverse group of people." Although this system does not address gender directly, Tristan felt that it was an effective means of ensuring success for all students.

However, despite the good intentions of many women-minority faculty members, sometimes their efforts to acknowledge the gender disparities of their fields were counterproductive. Although professors should be aware of gender disparities within certain majors, participants mentioned instances in which instructors further isolated women students in their attempts to draw attention to women's underrepresentation. Rachel explained:

> I have professors that are like, 'One girl per group,' which then makes you feel like a token diversity piece . . . It makes you feel like you're forced to be in a place where people don't want you necessarily.

This quotation illustrates how women in men-dominated fields must make a considerable effort to collaborate with men, not only because of the demographics of their classes, but because they are sometimes intentionally isolated from other women, a practice that at times resulted in the demoralizing exclusion of the lone woman by the men in the group.

Finally, when asked how colleges could make women in STEM feel more included, Rachel commented that:

> I think having more female professors would help. I have found that when I have female professors, I do better . . . The times that I've had female professors are the times where the class has been more 50/50 split with women . . . It's been closer to a 50/50 even split than it has in my classes that are male professors. I think because we feel more comfortable being taught by women because there's most likely not going to be any gender bias.

This quote illustrates the positive impact that women faculty can have in making women-minority fields more inclusive for women students.

By contrast, women in women-majority fields reported having more consistently positive relationships and interactions with professors. Ashley, a social work major, said that "I haven't come across a professor in social work that wasn't available, or that they didn't offer any help. Honestly, it just speaks to the profession itself. Everyone, the students and professors, are so helpful." Ashley's experience was consistent with the rest of the participants in women-majority fields, who noted that they felt generally supported and encouraged by most of their instructors. Furthermore, Diana, a women-majority

major who switched from a women-minority STEM field, explained that there was a clear difference in how professors treated their students between these two majors. Diana said that the professors in her previous major "look at your work and they don't really care about anything about you, but in [my new major] they care a lot about who you are." She explained how jarring, yet pleasant, it was to "suddenly have all of these . . . professors asking you what your pronouns are," and asking, "people to . . . come out of their shell a little and engage with their identity and how they present themselves." Thus, the women-majority participants described feeling much more personally supported by their professors than those in women-minority majors.

The Emotional Impact of Major Demographics

How participants experienced the emotional impact of the gender demographics of their major informed their broader experiences within their academic departments. As a result of the gender imbalance in their classes, women-minority participants generally felt both pressure to succeed and pride in themselves for persevering in a major where women were underrepresented. By contrast, women-majority participants appreciated being among primarily women but were often frustrated by having to justify their choice of a major.

Participants in women-minority majors experienced a confluence of feelings of pride, stress, and anxiety about being one of the few women in their major. In response to a question regarding how it felt to be a woman in a women-minority field, Zara explained that:

> It's kind of nice knowing I'm breaking down barriers and things like that. But it also sucks, because it's like being one of the few women, we basically set the standard for what women in our major looks like. But also it sucks, because now we have to deal with the argument of, "Oh yeah, you just got this job because you're a woman," or, "Oh yeah, you just got into this school because you're a woman."

Zara also noted that "if you mess up significantly, especially in class, someone could potentially say, 'Oh, that's why you shouldn't let women in.'" As a result of this concern, she feared making errors in class that could be noticed by her peers.

Tristan expressed similar sentiments, explaining that although it is "kind of a cool thing that I get to be one of the few [women] and I'm sort of proving something, it's also a lot of pressure" to represent the experiences and knowledge of all women. Overall, Tristan claimed that "the biggest thing that I have noticed being one of the few women in my major is I feel a lot of pressure to prove something that I wish I didn't." Thus, participants expressed the complexity of being a woman within a women-minority major, as many of them experienced both additional pressures to succeed *and* pride in being a woman in a field where women were underrepresented.

Students in women-majority majors reported that they felt more comfortable surrounded by women rather than men. Colleen, an English major, noted that "at the

end of the day, when we talk about things like . . . sexism, I feel women are like, 'We get it.'" Furthermore, she stated that it was "comforting," and "nice to have like similar voices in the department when we're talking about these things and . . . especially old texts," that were written during a time "when . . . men were deemed superior in every way." Hannah, another English major, said "I feel more connected to my female peers and my female professors just because we share a common trait, which is that we're women." She also commented that many of her English classes feel "sort of like a girl's slumber party." Ashley, a social work major, noted that "when I walked into all of my social work classes, it was mostly women . . . I honestly felt safe." Many women-majority participants asserted that they wanted men to join them in their fields, mentioning the benefits of having more men working as teachers and social workers, but that they simultaneously enjoyed working among mostly women.

Though women-majority participants described affirming experiences in the classroom, in other settings they described the emotional impact of confronting widespread notions that their majors were less worthwhile than women-minority majors. Candice, a psychology major, mentioned that "a lot of men don't take psychology majors that seriously" because "psychology is a lot about . . . human emotion" and "women tend to be more empathetic." She expressed frustration about the fact that many men in her life, both friends and family members, questioned her decision not to enter a technological field: "they're like, 'What are you going to do with that? Like, you should do something more practical.'"

Colleen expressed similar frustrations about having to "permanently justify" herself, saying that whenever she explained that she was an English major and planned to teach, people gave responses such as, "Why? You don't make any money" and suggested alternative careers. She described a time in which she was being interviewed for a scholarship opportunity, and the interviewer asked her "Why go into teaching when you could go into something *more*?" Furthermore, she explained that people "are kind of surprised and slightly judgmental" about her major choice due to its perceived lack of prestige and earning potential, and she felt that people were especially judgmental towards her because she did not fit the stereotype of an Asian-American studying STEM. Frequent disregard for participants' majors and devaluing of women-majority fields more broadly carried a significant emotional toll.

Discussion

The purpose of this study was to explore the experiences of women undergraduates in women-minority and women-majority majors. Presented findings speak to three themes where experiential differences were observed between women in fields with disparities in gender representation, namely relationships with classmates, interactions with professors, and the emotional impact of major demographics. These findings expand on previous studies of major choice and gendered experiences in higher education to

illuminate the ways gender inequality persists in academic settings (Arum et al., 2018; Buchmann, 2009). By offering a comparative perspective on women-minority and women-majority majors, the study complicates previous notions of how women experience unequal gender representation in various fields of study. The patterns documented have implications for women's academic and social experiences in higher education.

Participants in women-minority fields referenced instances in which the sexism of their classmates or instructors negatively affected their confidence or their grade in a course, supporting findings that experiencing gender bias from classmates can hinder motivation and career aspirations in women (Leaper & Starr, 2019), as well as findings about the pervasive nature of sexism within the academy (Crimmins, 2019; Maldonado & Draeger, 2017). For instance, women-minority participants' negative group project experiences reflected findings from Rodriguez et al. (2020) in which Latina STEM majors were denied "the ability to fully participate in meaningful engineering experiences" when working in group projects due to exclusion or condescension from their peers (p. 259). Our findings extend this work, illustrating how even well-intentioned efforts by faculty members to support social integration for women students in women-minority fields sometimes backfired, causing women to feel isolated or undervalued. These insights underscore that inclusion requires more than avoiding sexist behavior. It necessitates thoughtful strategies that promote inclusion, which we address with specific examples in the Implications for Practice section below.

Being in a women-minority field came with a significant emotional toll. The experience most commonly reported by the participants in women-minority fields was feeling lonely, isolated, or out of place among their peers, and they sometimes experienced condescension and intentional exclusion, which is especially troubling given the importance of feelings of belonging for college student degree completion (Strayhorn, 2012). These findings support previous research on chilly climates in academic spaces, particularly for women in STEM fields (Jensen & Deemer, 2019; Šaras et al., 2018).

Furthermore, women-minority participants discussed the social effort required of them. Due to the lack of women in their fields, participants in women-minority majors felt responsible for befriending their men classmates, as the men did not need to approach women in order to make friends within their department, which further isolated the women students. This is particularly concerning given the positive correlation between peer relationships and GPA among STEM students (Park et al., 2021). Two participants also referenced instances of unwanted sexual attention from men peers, which made them wary of studying with men, and supports findings about the prevalence of sexual harassment in STEM fields (Leaper & Starr, 2019). Although most of the women-minority participants were pleased with the majority of their peers and professors, negative incidents sometimes marred an overall positive experience.

Conversely, participants in women-majority fields reported fewer social and academic challenges. They reported that their group project experiences tended to be inclusive and that their professors were generally encouraging and understanding. Just as Kinzie

et al. (2007) found that students at women's colleges experienced advantages due to the supportive environment fostered at their institutions, participants in women-majority fields reported experiencing encouraging departmental cultures. These students explained that it was easier to befriend their peers and work with others on assignments, and that they were more likely to receive understanding responses from their professors than women-minority participants. This pattern supports Kanter's (1977) theory that once women achieve a certain degree of representation within an organization, they experience less marginalization. Thus, the more inclusive environments of women-majority majors can be attributed to the "warm" academic climate, as well as the high volume of women within these disciplines. This warmth is especially significant given the importance of having access to safe academic spaces, fostering an inclusive classroom, and having productive conversations about marginalized identities (Quaye & Chang, 2012).

Notably though, majoring in a women-majority field came with its own challenges for women. Participants in these majors experienced various kinds of marginalization related to their chosen field of study. One of the most frustrating challenges for participants in women-majority majors was the lack of recognition that their field of study garnered, especially from men. Some participants felt that they had to constantly justify the academic rigor of their majors, their earning potential, and their career goals. This struggle complicates assumptions that majoring in women-majority fields provides women with greater support and affirmation. Rather, the participants in this study show that being in an inclusive academic environment cannot fully insulate one from the broader devaluation of women's fields of study (Bobbitt-Zeher, 2007).

There are limitations to this research that require discussion. Though the study sample included participants in three women-minority majors, half of them majored in cyber security engineering. Because that particular major was oversampled, future research involving greater diversity of majors could increase understanding of more subtle differences between various women-majority and women-minority majors. Moreover, interviewing only one trans student may limit the extent to which readers consider these findings transferrable to other settings and student populations. Future studies should specify that trans women are encouraged to participate in order to more fully explore the experiences of both trans women and cis women. Finally, this research was conducted at a single large, public, four-year university in the mid-Atlantic region of the United States. Due to the specificity of this setting, the findings of this study cannot be generalized to represent the experiences of all women in women-majority and women-minority fields.

This study points to additional important directions for further research. For instance, it is vital to recognize that there are distinctions between the women-majority majors that appeared in this study. One of those differences is in the demographics of the faculty teaching in those fields. According to the participants, majors such as social work consisted of primarily women professors, whereas majors such as English were more mixed between men and women instructors. In this study, the classification of a major

as either women-majority, women-minority, or neither was based on student demographics. Further study on the effects of faculty demographics, particularly among women-majority fields, would add nuance to findings about women's experiences in these majors, as research shows that professors' gender has an impact on women students' success (Carrell et al., 2010).

Furthermore, researchers might consider using participant observation to study classes and student organization meetings to observe these gender dynamics directly. Given that women-majority majors have been overlooked in research on higher education, future studies could examine the daily experiences of women and men in women-majority academic spaces in order to enrich scholars' understanding of gender relations in academic fields in which women are the majority.

Implications for Practice

These findings point to several implications for practice in higher education. First, intentionally separating women for group assignments serves to further isolate women students in women-minority settings. Not only does it inhibit friendships among women in the classroom, but it places students in an uncomfortable situation, and forces them to represent the entirety of their gender, which can amplify the marginalization of women in women-minority majors (Spencer et al., 2016). Although instructors cannot immediately alter the gender imbalance of their classrooms, they can attempt to reduce the social burden by being aware of how social and historical contexts shape systems of oppression in their fields (Vaccaro et al., 2021).

Strategies that appeared to be successful for women in women-minority fields were efforts to make sure that multiple perspectives and voices were represented in the classroom, aligning with research finding that professors' attempts to assist women without singling them out were helpful for women's success in men-dominated majors (Lawson et al., 2018). Participants appreciated the method of choosing a diverse group of class representatives to report to the professor about students' perceptions and experiences of the class. Another effective method was professors referencing women role models (see also Reinking & Martin, 2018).

Similarly, presented findings show that having women faculty, especially in leadership positions, bolsters the confidence of women students within that field. Indeed, learning from women professors can significantly improve women students' performance in math and science classes (Carrell et al., 2010). Universities should be intentional in their hiring practices in order to ensure that they hire women professors for positions in women-minority disciplines. Moreover, beyond the point of hire, research indicates that programming to support faculty success is likewise important (Kniess et al., 2017).

The support that women-majority participants reported receiving from peers and professors is encouraging, and faculty should continue to strive to maintain this friendly,

accepting climate. A significant challenge for women in women-majority fields was feeling as though their major was devalued by people in their lives, including other college students. To help combat this perception of women-majority majors, university administrators should be mindful about which departments receive the most attention and resources in order to ensure that all departments are presented as having value.

Student affairs practitioners can likewise play an important role in providing support for women students in both women-majority and women-minority majors. As women confront stereotypes, marginalization, and devaluation in various academic settings, they may benefit from the support of academic advisors, career development professionals, academic support specialists, and counseling staff. Programming and resources that support women through the process of choosing a major and corresponding career path could prove helpful (Kalaivanan et al., 2022). While there are many resources for selecting a field of study, few of these directly engage with the impact of gender beliefs (Ridgeway, 2011). Beyond the point of major selection, resources designed to support social inclusion, academic success, and persistence will also be valuable. For example, research suggests that mentoring programs and other resources for building social capital can play a positive role (Sarna et al., 2021; Soria & Stebleton, 2013).

Conclusion

This qualitative study of the experiences of women undergraduates in women-majority and women-minority majors contributes new insights about gender inequality, suggesting strategies that could improve women's experiences in higher education. A significant contribution of this study is the insight that even women in women-majority majors experience the effects of sexism, regardless of the support they receive within their field. For students to be fully supported, women in all fields of study must be acknowledged, not only those pursuing STEM or other women-minority degrees. Overall, this type of work represents an important area of study, as understanding the gendered factors impacting student success is crucial for promoting equity and access within higher education.

Disclosure Statement

The authors report there are no competing interests to declare.

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