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SUBTLE SEXISM IN STEM: INTRAGROUP DYNAMICS WITHIN MIXED-SEX ENGINEERING TEAMS

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ABSTRACT

Although various studies have assessed sexism in teamwork and sexism in STEM fields (science, technology, engineering, and math), there is limited research on women's experiences in STEM-oriented team settings. It is crucial to examine sexism in this domain, given the rise of teamwork structures in the workforce and the known disadvantages women face in both teams and STEM contexts. This thesis examines sexism in STEM teams through an Intragroup Dynamics Survey, which investigated gender differences regarding students' perceptions of how they were treated by teammates. Survey items were categorized as Interacting with Teammates, Expecting Quality, or Team Contribution, with one uncategorized item assessing interruptions. The Intragroup Dynamics Survey received 251 eligible responses from undergraduate engineering students at the Pennsylvania State University, University Park campus. The results revealed a significant gender difference within the Interacting with Teammates category, such that women indicated significantly more negative teammate interactions than their male peers. This finding aligned with our hypothesis that women would report significantly more negative team experiences than men. However, a correlation table also revealed intriguing findings that were not predicted by our research team. Specifically, racial minorities and international students indicated significantly lower Team Contribution scores and more frequent interruptions compared to White students and domestic students. Overall, this thesis reveals disparities for minority students in STEM teams and provides a foundation for further research in this domain.

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Chapter 1

Introduction

Teamwork as an Organizational Strategy

Throughout the past few decades, the implementation of workplace teams has become a popular trend among organizations, and for good reason. Businesses have found that combining individuals of diverse abilities into teams achieves more, high quality results for organizations (Tripathy, 2018). Additionally, companies implementing flexible teamwork reap various benefits. These advantages include innovation from combined skills, a strong company culture, increased employee camaraderie, and an enhanced ability to adapt to unexpected challenges (Edmondson, 2012). These various benefits of teamwork have earned the attention of experts in human resource management both nationally and globally, asserting its place in modern research (Tripathy, 2018).

Throughout teamwork literature, a team is defined as two or more individuals with specific roles who perform interdependent tasks, are adaptable, and share a common goal (Salas, Dickinson, & Converse, 1992). Teams also view themselves and other group members as a social entity within a larger system, such as an organization (Cohen and Bailey, 1997). Multiple studies have created different categories of teams, including Cohen and Bailey's (1997) work with parallel, project, and management teams. Robbins, Millet, Cacioppe, and Waters-March (1998) also contributed by defining problem-solving, self-managing, and cross-functional teams.

Across categories, teams have become a popular work design in organizations of various kinds (Stevens & Campion, 1994).

As previously mentioned, teamwork structures in the workforce have financial benefits for organizations, often improving their competitive position in their field (Edmondson, 2012). Black and Lynch (2004) suggest that the implementation of teams at work are what led the resurgence of business productivity in the late 1990s and early 2000s. For this reason, teams are widely considered high performance workplace practices among human resource professionals. When faced with increased competition in the field, various organizations establish team structures to combat external challenges and improve internal functioning (Cohen & Bailey, 1997). This is due to teamwork's positive effect on employee morale, productivity, and satisfaction. Working in teams also increases the quality of work performed and decreases overall costs for organizations. This is especially evident in self-managed teams, given the autonomy and employee empowerment associated with self-regulation (Cohen, Ledford, & Spreitzer, 1996). Establishing workplace teams is also associated with lower employee turnover rates and less management hierarchy.

Overall, implementing team structures benefits a company's bottom line, given that organizations with self-managed teams are likely to be more profitable than organizations without structured teams. For this reason, it is essential that experts in human resource management familiarize themselves with what goes on as teams work together. Are all team members equally benefitting from this workplace structure? Are all team members listened to? Unfortunately, existing research points to the contrary, suggesting that hierarchies tend to develop in goal-oriented interactions. Sexism is one prominent consequence of this development (Ridgeway, 1997). For this reason, it is increasingly important to study workplace teams and discover which employees are acknowledged by teammates and which employees are consistently overlooked.

Sexism in Workplace Teams

Sexism is any behavior, policy, language, or other action that expresses men's institutionalized and systematic superiority over women (Piercey, 2000). Sexism is essentially characterized by women being subordinate to men (Alsbrook, 1976) and is still extremely pervasive in organizations (Castilla, 2005). Sexism often has negative effects on how women are perceived by their workplace team members and evaluators (Heilman & Haynes, 2005). Aside from teamwork, women consistently face discrimination in multiple areas of their career. Castilla (2005) established that employees' gender influences salary earnings even after accounting for performance ratings. Additionally, Heilman (1995) asserts that women are consistently underrepresented in top management of high profile firms, specifically Fortune 500 companies. Heilman and Haynes (2005) suggest many causes for this disparate impact, commonly known as the glass ceiling. Essentially, men are consistently perceived as high-achieving employees with strong instrumental characteristics while women are perceived as nurturing employees with strong expressive characteristics. Along with these assumptions, career success is typically associated with men over women, particularly in male-dominated fields. Heilman and Haynes (2005) state that because sex is a visible attribute, these sex stereotypes are extremely likely to emerge in the workplace. Research also suggests that even feminine communication styles elicit perceptions of whining and insecurity, leading to negative attitudes towards women at work (Wolfe & Powell, 2009).

As previously mentioned, this institutionalized sexism is evident within workplace teams. To investigate this, Heilman and Haynes (2005) collected evaluations of mix-sex team members after they worked together on a male-typed task. Female team members were evaluated as significantly less competent and influential, and having taken less of a leadership role compared to their male team members. This was consistent even when the group performance noted only positive outcomes. These findings suggest that when the evaluator was not assured that women played a key role in the team's success, the assumption was that they did not. Overall, the ambiguity of the group performance ratings allowed the evaluator to disregard contributions of team members who were expected not to perform well, based on negative sex stereotypes (Heilman & Haynes, 2005). Research has shown other negative team outcomes for women as well. For example, women's perspectives are not always considered valid by male teammates and women may be assigned unimportant tasks within teams (Meadows & Sekaquaptewa, 2013). Overall, research suggests that women working in mixed-sex teams may be overlooked with their contributions and potential going unrecognized. Eventually, this could result in women being bypassed for career advancement opportunities, contributing to the glass ceiling (Heilman & Haynes, 2005).

Why do team settings elicit negative evaluations based on stereotypes? Mueller, Mulinge, and Glass (2002) suggest that gender becomes a more noticeable and relevant status characteristic in face-to-face, mixed-sex interactions. Because team structures force both male and female employees to constantly interact face-to-face, this may lead employees to be more conscious of gender and any underlying stereotypes. Discrimination in team settings may also occur simply because men and women place different values on teamwork experiences. For example, women typically indicate team members' liking, trusting, and helping as significantly more important to team effectiveness than men do. (Halterman, Dutkiewicz, & Halterman, 1991). Since men typically place less value on helping, they may overlook the contributions of a helpful, female team member. Perhaps this inconsistency in values as well as the face-to-face interaction perpetuates the disadvantages women face in workplace teams.

Sexism in STEM

One specific context in which sexism is also pervasive is in STEM fields (UNESCO, 2012). STEM typically refers to science, technology, engineering, and math. The Economics and Statistics Administration (ESA) provides a more specific definition, stating that STEM occupations are “jobs that include professional and technical support occupations in the fields of computer science and mathematics, engineering, and life and physical sciences” (Beede et al., 2011). This is particularly troubling as STEM fields often focus on teamwork, where women are also disadvantaged (Heilman & Haynes, 2005). As such, this work will investigate sexism in STEM, teamwork settings.

Although significant progress for gender equality in STEM was achieved throughout the twentieth century, women are still underrepresented across STEM careers (Prinsley, Beavis, & Clifford-Hordacre, 2016) and undergraduate STEM degrees (Beede et al., 2011). Women make up almost half of the American workforce and college-educated workforce, yet hold less than 25% of STEM jobs. Essentially, half as many women have STEM jobs as you would expect if the STEM gender representation reflected that of the overall American workforce. As for undergraduate STEM degrees, women are particularly underrepresented in engineering, which is the second largest STEM job, following computer and math positions. Only about one in seven engineers are women (Beede et al., 2011).

As previously mentioned, the glass ceiling is a common metaphor for women's structural challenges in career advancement. Essentially, persistent sexism in workforce makes it difficult for women to advance to the top of their careers, leading to less women in top management (Heilman & Haynes, 2005). Welde and Laursen (2011) build on this metaphor, describing STEM fields as the glass obstacle course. Essentially, the various barriers women face in STEM are implicit and unanticipated, creating additional negative experiences for women in the workforce (Welde and Laursen, 2011). When discussing the causes of this glass obstacle course, current literature focuses on three main themes – adolescent gender disparities, gendered career choices, and sexism in higher education towards women pursing STEM.

Adolescent Gender Disparities

Many young girls experience significant declines in STEM motivation during adolescence (Leaper, 2015). This decline is rooted in salient gender stereotypes, an early lack of confidence, and childhood peer groups. Regarding gender stereotypes, Western culture holds a strong stereotype that STEM is a male domain. Children as young as six believe that math and science careers are for men (Miller, Eagly, & Linn, 2015), exposing the pervasiveness of this stereotype. Girls are also less confident in their science and math abilities compared to their male peers, starting as early as fifth grade (Pajares, 2005). This early lack of confidence is especially problematic for young girls who believe academic abilities are innate. When young students with this fixed mindset face difficult math concepts, girls are more likely than boys to decrease in math performance (Dweck, 2007). This gender achievement gap in STEM begins in high school with crucial standardized tests (Wang & Degol, 2017) and increases throughout the professional pipeline (Rosser, 2012). Peer groups are also powerful forces that contribute to women's underrepresentation in STEM (Leaper, 2015). Women's peer groups typically reinforce communal goals and place less emphasis on dominance goals. This eventually leads to different career preferences for men and women, with women favoring helping occupations with person-oriented goals, such as nursing, education, and counseling, rather STEM fields (Leaper, 2015). Overall, gender differences in STEM abilities tend to be minimal throughout childhood. However, gender differences in career choices and divisions within STEM fields reflect different interests that can be traced back to early adolescence (Wang & Degol, 2017).

Gendered Career Choices

Welde and Laursen's (2011) glass obstacle course for women in STEM is also established by gender differences in career choices. Women's career choices often differ from men's because of peer groups, family-centered goals, and systemic messages that women do not belong in STEM fields. As previously mentioned, women's peer groups tend to value communal goals (Leaper, 2015) whereas STEM careers are often viewed as incompatible with communal goals. Therefore, women often view STEM careers as conflicting with their goals and values, leading them to pursue non-STEM careers (Diekman et al, 2010 & 2011). Additionally, women's communal goal to balance family and work also contributes to their underrepresentation in STEM (Leaper, 2015). Among individuals with equally strong math skills and STEM career interests, gendered differences in lifestyle priorities appear in their mid-thirties, with women prioritizing family and men prioritizing career goals (Ferriman, Lubinski, & Benbow, 2009). Although this time of life is optimal for securing tenure in academia, it is also optimal for having children, which may put pressure on women to deemphasize the importance of their STEM careers and focus on family. Overall, women often perceive STEM as incompatible with the family-work balance they hope to achieve (Leaper, 2015), creating high attrition (Prinsley et al., 2016) and discouraging women from entering the field in the first place.

Lastly, women often avoid STEM careers because of systemic messages that they do not belong there. Specifically, women are often told implicitly and explicitly that being successful in a STEM career conflicts with female gender roles. This constant setback may convince women that they lack the abilities necessary for success and leave them feeling alienated (Grossman & Porche, 2013). Prinsley et al. (2016) discuss this further, outlining three main areas women consider before pursuing STEM. The first area is identity – is this for people like me? Prinsley et al. (2016) argue that a lack of female role models, poor sense of belonging and poor pay relative to male colleagues suggest that STEM is not for women after all. Next is perceived ability – do I feel confident in my ability to do this? As previously mentioned, female students feel less confident in their math and science skills compared to their male peers beginning in fifth and sixth grade (Pajares, 2005). Prinsley et al. (2016) also mention that women tend to be less confident in their STEM abilities even when tests reveal no gender differences in performance. The last area discussed is aspiration – can I see possibilities and pathways in this field? Because of the pervasive, cultural belief that STEM is a male domain, women may not see pathways for advancement in STEM, discouraging them from pursuing STEM careers. Overall, Prinsley et al. (2016) assert that women are deterred from choosing STEM career paths because of their concerns regarding identity, perceived ability, and aspiration.

When discussing sex discrimination in STEM, Leaper and Brown (2014) emphasize that discrimination is rooted in maintaining power and status between groups in society, in this case, with men maintaining power and status over women. Leaper and Brown (2014) suggest that this power dynamic is particularly evident in schools, especially against women pursuing prestigious, male-dominated fields. Qualitative research by Barthelemy, Mccormick, and Henderson (2016) and Welde and Laursen (2011) investigated this further with female physics and astronomy graduate students and PhD STEM students.

The majority of women interviewed by Barthelemy et al. (2016) reported microaggressions throughout their graduate school experience. These microaggressions included subtle sexual objectification, sexist language, sexist jokes, and not being listened too by supervisors and peers. Although experiences such as sexist language may seem insignificant, these instances build up over time, making women feel alienated. For example, one women interviewed by Barthelemy et al. (2016) reported her advisors referring to her work as “lady physics”, implying that her work is somehow inferior to that of her male peers. A woman interviewed by Welde and Laursen (2011) discussed microaggressions as well, recalling when her undergraduate advisor described her as “sunny” on a graduate school recommendation letter. Although this comment was subtle, this student felt as though her advisor was undermining her STEM accomplishments by focusing on characteristics that were irrelevant to academia. Barthelemy et al. (2016) assert that although these biases are small, they certainly matter, as they consistently make women feel unwelcome in STEM higher education programs.

These qualitative studies also exposed a culture of informal exclusion that women face as they pursue STEM at the graduate level. Women interviewed by Welde and Laursen (2011) mentioned the “old boys’ club” that exists in STEM graduate programs. This is essentially an informal network where the male colleagues are automatically “buddies,” securing the invite for coffee, beer, social events, and so on. Women reported that over time, not getting the invite led them to feel less connected to peers and professors in their program. Some women even mentioned consciously acting and dressing less feminine, in hopes of fitting in with this informal, exclusive network (Welde & Laursen, 2011). Again, Barthelemy et al. (2016) suggest that these small acts of exclusion grow into major disadvantages for women pursuing STEM. After all, having less connections with your professors and advisors may eventually lead to less publications, grants, and networking opportunities. Additionally, constant exclusion may lead women to set their goals lower, resulting in less career accomplishments (Barthelemy et al., 2016).

In addition to microaggressions and informal, exclusive cultures, overt discrimination is also a problem for many women pursuing STEM in graduate school. Some female participants with Welde and Laursen (2011) reported blatant, hostile sexism in their STEM graduate program. These reports included sexual harassment, groping, and public assumptions that they were sexually involved with professors to secure a spot in the program (Welde & Laursen, 2011). Other recent studies have exposed discrimination in STEM higher education as well. For example, Knobloch-Westerwick, Glynn, and Huge (2013) found that college students who viewed the same conference abstracts with stereotypically masculine themes rated the abstract as lower in scientific quality when the author was a woman, rather than a man. Additionally, Moss-Racusin et al. (2012) and Ruben, Sapienza, and Zingales (2014) found that faculty are often biased against women in STEM, disproportionately hiring males for academic positions, such as lab managers. Barthelemy et al. (2016) suggest that this ongoing, overt discrimination not only disadvantages women in their careers but can have negative mental health impacts as well. Overall, women pursuing STEM in higher education face an accumulation of microaggressions, exclusion, and hostile sexism that creates long-term barriers for success.

Implications

The adversity women experience in STEM fields should be of great interest to both organizations and universities, given the various implications of this underrepresentation. One major implication is that many intelligent women choose not to pursue STEM because of the well-known barriers in these fields. These women are essentially “untapped talent” on which organizations and universities are missing out (Prinsley et al. 2016). Additionally, the previously mentioned barriers for women in STEM higher education programs contributes to a “leaky pipeline” for women who advance in these fields. There is a high attrition for women in STEM careers (Prinsley et al., 2016) and many women who earn STEM degrees end up working in non-STEM positions afterwards, such as education or healthcare jobs (Beede et al., 2011). Again, this results in organizations and universities losing talented, high achieving individuals. Organizations and universities should also be concerned with these findings because STEM is a critical aspect of America’s global competitiveness and overall innovation. Therefore, discouraging women from entering and staying in these crucial fields, whether intentional or implicit, does American corporations and universities a huge disservice (Beede et al., 2011).

Although sexism has been studied in team settings and STEM fields, there is limited research on sexism within STEM-oriented teams. This lack of information on STEM teams is concerning, given the frequent sex discrimination in both domains (Heilman & Haynes, 2005; Wang & Degol, 2017). This gap in research is also troubling because team structures are gaining popularity in STEM fields. For example, Sanders (2008) argues that integrative STEM, scientific inquiry in teams, is the optimal approach to STEM education. Capraro, Capraro, & Morgan (2013) promote similar ideas, suggesting that project-based learning maximizes adolescent STEM students' potential. Project-based learning prioritizes teamwork, as this model emphasizes collaboration, peer communication, and problem solving to prepare students for higher education STEM programs (Capraro et al., 2013). For higher education, Baldwin (2009) criticizes the "lone-wolf" mentality of STEM programs, stating that an emphasis on collaboration is needed to improve the field. These STEM teamwork conversations are happening outside the classroom as well. For example, Fiore et al. (2012) created a framework to improve communication among geographically dispersed faculty working on STEM projects. These studies suggest that team structures are increasingly emphasized in STEM fields. Therefore, it is crucial for researchers to investigate populations, such as women, who are consistently disadvantaged in both team and STEM environments (Heilman & Haynes, 2005; Wang & Degol, 2017).

Despite the overall lack of research on STEM teams, Meadows and Sekaquaptewa (2013) contribute some findings to this literature, investigating gender stereotypes and role adoption within mixed-sex student teams. Specifically, this study uses group presentation recordings, survey data, and qualitative focus groups to assess whether men adopt more technical roles than women during engineering group projects. The presentation recordings revealed a significant gender difference in the delivery of technical and non-technical material during the presentation, with men presenting more technical information regardless of the group's gender ratio. When groups opened the floor for class questions, men also answered significantly more questions than women (Meadows and Sekaquaptewa, 2013). The authors' survey data supplements these results, revealing that students who presented more technical information and answered more class questions reported greater self-perceived learning. This is a concerning finding, given that women were significantly less likely to present technical information and answer class questions (Meadows and Sekaquaptewa, 2013). Lastly, the qualitative, focus group data demonstrated that gender stereotypes influenced the group project roles men and women adopted. Students reported that teammates who were seen as engineering experts took on important technical roles. These perceived experts were predominantly men, leaving women with supporting roles such as organizing and note taking (Meadows and Sekaquaptewa, 2013). Overall, this study demonstrates that women are typically disadvantaged in STEM teamwork settings, particularly when roles are assigned to team members. This finding is informative for diversity and teamwork literature. However, Meadows and Sekaquaptewa (2013) do not focus on women's perceptions of these experiences. Our study aims to build on Meadows and Sekaquaptewa's (2013) findings on role adoption, investigating how women feel they were treated by their teammates in STEM contexts.

The present study aims to address this gap in current literature, investigating intragroup dynamics among undergraduate engineering students at The Pennsylvania State University. These undergraduates participated in a semester-long mechanical engineering design project with a team of students, establishing this arena as both a teamwork and STEM setting. This study focuses specifically on engineering students because among STEM domains, the underrepresentation of women is especially pervasive in engineering (Beede et al., 2011).

This study differs from previous teamwork and STEM research in two main ways. First, this is a quantitative study with survey data. Previous studies on sexism in higher education STEM programs have relied on qualitative interviews to expose the hardships faced by female students (Welde & Laursen, 2011; Barthelemy et al. 2016). The present study's survey data produced quantitative findings about gendered, STEM team experiences that allow for statistical analysis. This study also differs from previous work because of the nature of the survey questions. This survey aims to discover how students, particularly female students, felt they were treated by their teammates. For example, did women feel as though their teammates communicated effectively with them or accepted their feedback? This approach greatly differs from studies that investigate sexism in teams based on team members' evaluations of each other or based on third-party evaluations. Overall, the present study aims to supplement previous literature by combining teamwork and STEM environments, using quantitative survey data, and asking students how they felt they were treated by their team members.

Our research team created an Intragroup Dynamics Survey to collect data for this study. This survey assesses students' teamwork experiences in three areas. First is the Interacting with Teammates category, which investigates students' feelings about their teammates' communication, enthusiasm, and acceptance of feedback. Next is the Expecting Quality category, which investigates students' thoughts on the quality of work their teammates expected them to produce. The last area is the Team Contributions category, which investigates whether students felt like they provided ideas and facilitated effective communication. We also created an additional item for the Team Contribution category, assessing the frequency of interruptions from teammates. Our team hypothesized a significant gender difference in all three item categories, with female engineering students reporting lower scores than their male peers. We also predicted a significant gender difference for the interruption item, with female engineering students reporting higher scores than their male peers. Essentially, we anticipated that women would indicate more negative teamwork experiences than men.

Chapter 2

Methods

Participants

Participants were 251 undergraduate engineering students at the Pennsylvania State University, University Park campus. All participants were juniors or seniors enrolled in ME 440, Mechanical Systems Design Project, for the Spring 2019 semester. We surveyed students in this particular course because ME 440 provides a teamwork setting requiring students to apply fundamental design and analysis methods to an industry-sponsored engineering project. Within their teams, ME 440 students practice identifying problems, forming conceptual designs, specifying manufacturing processes, creating prototypes, and analyzing results. Additionally, teams are responsible for meeting their customer’s needs and presenting their work process and final project design. Overall, teamwork is a core aspect of ME 440, creating a perfect environment for us to investigate our research questions. This engineering course also establishes a STEM environment that is task-oriented.

Of the 275 responses we received, 24 were not eligible for analysis. One response was removed for being under 18-years-old, eight were removed for not being Penn State undergraduate engineering students, 11 were removed for incomplete survey progress, and four were removed for not identifying as male or female. This left 251 responses for us to analyze, consisting of 203 men and 48 women. Of the 203 men, 135 identified as White or Caucasian, 48 as Asian, three as Black or African American, seven as Hispanic or Latino and ten as other. 113 men were Juniors and 90 were seniors. 45 men classified as international students. Of the 48 women, 33 identified as White or Caucasian, 11 as Asian, one as Black or African American, two as Hispanic or Latino, and one as other. 17 women were Juniors and 31 were Seniors. 12 women classified as international students.

Survey Items

We created an Intragroup Dynamics Survey to assess the participants' teamwork experiences throughout their semester in ME 440. This survey consists of 14 items. 13 of these items were adopted from the Likert, short version of the Comprehensive Assessment of Team Member Effectiveness Scale, developed and validated by Loughry, Ohland, and Moore (2007). Our Intragroup Dynamics Survey is based on two of the scale's five categories – Interacting with Teammates and Expecting Quality. The remaining three categories are Contributing to the Team's Work, Keeping the Team on Track, and Having Relevant Knowledge, Skills, and Abilities (Loughry et al., 2007). As this research focuses on how women engineering students feel about their teamwork experiences, particularly their teamwork interactions and their teammates' expectations of their work, the Interacting with Teammates and Expecting Quality categories are the most relevant to this investigation. Therefore, we focused on these two categories when developing survey items. Using the short-version of the Comprehensive Assessment of Team Dynamics Survey (Loughry et al., 2007), we selected eight items from the Interacting with Teammates category and three items from the Expecting Quality category based on the items' relevance to our research questions. We also selected two items from the Interacting with Teammates category to create our Team Contribution category because these items focused on individuals' behavior, rather than their teammates' behavior.

Loughry et al. (2007) presented the survey items as statements, such as "Communicated effectively." Our team reworded these items so they assessed students' thoughts on how their teammates interacted with them and what their teammates expected of them. For example, "Communicated effectively" was changed to "My teammates communicated effectively with me." All items were measured on a 5-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. The following Intragroup Dynamics Survey items were developed based on the Interacting with Teammates category of the Comprehensive Assessment of Team Member Effectiveness Scale (Loughry et al., 2007):

My teammates communicated effectively with me.

My teammates provided me with encouragement.

My teammates expressed enthusiasm about working as a team.

My teammates heard what I had to say about issues that affected the team.

My teammates got my input on important matters before going ahead.

My teammates accepted my feedback about their strengths and weaknesses.

My teammates used my feedback to improve performance.

My teammates let me help them when it was necessary.

The following items were developed based on the Expecting Quality category of the Comprehensive Assessment of Team Member Effectiveness Scale (Loughry et al., 2007):

My teammates expected me to succeed.

My teammates believed that I could produce high-quality work.

My teammates believed that I should achieve high standards.

The following items were developed based on the Interacting with Teammates category of the Comprehensive Assessment of Team Member Effectiveness Scale and adopted to fit our Team Contribution category (Loughry et al., 2007):

I provided insights and ideas that improved the team's project.

I facilitated effective communication in the team.

Our team developed an additional item to investigate women's experiences with interruptions throughout the engineering design project. We are greatly interested in interruptions as a form of subtle sexism in team environments. Interruptions were not assessed by the Comprehensive Assessment of Team Member Effectiveness Scale (Loughry et al., 2007), therefore we created our own scale item to investigate this concept. Our research team anticipated that women would indicate significantly more interruptions from teammates than their male peers, as a result of subtle sexism in this STEM teamwork setting. The following item was created by our research team as the third Team Contribution item:

My teammates often interrupted me when I tried to make suggestions. *

In addition, we also collected information as to the respondents' demographics including:

Which term best describes your gender?

a. Man

b. Woman

c. None of the above or prefer not to answer

What is your race?

a. White or Caucasian

b. Black or African American

c. Asian

d. Hispanic or Latino

e. Other

Are you classified by PSU as an international student?

a. Yes

b. No

Which class are you?

a. Junior

b. Senior

What team are you on?

a. __________

The complete Intragroup Dynamics Survey that participants received is listed in Appendix A.

Procedure

Participants received the Intragroup Dynamics Survey in a Qualtrics link via email from ME 440 professors. Professors sent these emails in late April of 2019, after the mechanical engineering design projects were completed. Teams received extra credit for completing this survey.

Chapter 3
Results

Correlation Table

In order to investigate the relationship between scale items, we created a correlation table among all questions asked. This correlation table revealed intriguing relationships among variables, especially among item categories (Interacting with Teammates, Expecting Quality, Team Contribution) and between the item categories and demographic questions.

Interacting with Teammates was positively correlated with both Expecting Quality (.699) and Team Contribution (.400), such that students with high Interacting with Teammates scores reported high Expecting Quality and Team Contribution scores. Interacting with Teammates items were also negatively correlated with our interruption item from the Team Contribution category (-.195), such that students with high Interacting with Teammates scores reported less interruptions from teammates.

Expecting Quality and Team Contribution were positively correlated with each other (.437), such that students with high Expecting Quality scores reported high Team Contribution scores. Our interruption item from the Team Contribution category was also negatively correlated with Expecting Quality (-.214) and the Team Contribution items (-.801), such that students with high Expecting Quality and Team Contribution scores reported less interruptions from their teammates.

This correlation table also demonstrated relationships between item categories and demographic items. There was a significant gender difference within the Interacting with Teammates category (-.144), such that female students reported significantly lower Interacting with Teammate scores than male students. Additionally, gender and class were related such that significantly more women indicated senior status than junior status (.159). Regarding race, there was a negative correlation between race and Team Contribution items (-.139), such that non-White students reported lower Team Contribution scores than White students. Race was also positively correlated with our interruption item (.125), such that non-White students reported more interruptions from teammates than White students. Lastly, race was positively associated with international student status (.503), such that most students who identified as non-White also identified as international students. International student status was also negatively correlated with Team Contribution (-.297), such that international students reported significantly lower Team Contribution scores than domestic students. Additionally, international student status was positively correlated with our interruption item (.239), such that international students reported significantly more interruptions from teammates than domestic students. The complete correlation table is listed in Appendix B.

Interacting with Teammates

In order to understand women's unique STEM teamwork experiences, t-tests were used to investigate differences between genders. Our research team analyzed the three survey categories separately. Reliability was acceptable for Interacting with Teammates items (α = .932). In the Interacting with Teammates category, all respondents had a mean of 4.35 with a standard deviation of 0.76. Men had a mean of 4.41 with a standard deviation of 0.68 and women had a mean of 4.13 with a standard deviation of 0.98. A t-test revealed a statistically significant difference between men and women's responses in the Interacting with Teammates category (-1.85). This significant difference indicates that compared to men, women felt that their teammates communicated less effectively with them, showed less enthusiasm, were less accepting of feedback, and so on.

Expecting Quality

Reliability was acceptable for Expecting Quality items (α = .877). In the Expecting Quality category, all respondents had a mean of 4.59 with a standard deviation of 0.66. Men had a mean of 4.61 with a standard deviation of 0.62 and women had a mean of 4.51 with a standard deviation of 0.78. A t-test did not reveal a statistically significant difference between men and women's responses in the Expecting Quality category (0.87), indicating that men and women had similar feelings regarding their teammate's expectations of them.

Team Contribution

Reliability was acceptable for Team Contribution items (α = .622). In the Team Contribution category, all respondents had a mean of 4.31 with a standard deviation of 0.67. In this category, men had a mean of 4.35 with a standard deviation of 0.63 and women had a mean of 4.15 with a standard deviation of 0.82. A t-test did not reveal a statistically significant difference between men and women's responses in the Team Contribution category (1.54), indicating that men and women had similar feelings about their contributions to the project. The results from these analyses are listed in Appendix B.

Essentially, results from the Interacting with Teammates category aligned with our hypothesis, indicating that women experienced significantly more negative team experiences in this area compared to their male peers. We did not find a significant difference in the Expecting Quality or Team Contribution category, which differed from our hypothesis. However, in addition to the significant gender difference in the Interacting with Teammates category, our correlation table revealed significant differences based on race and international student status.

Chapter 4

Discussion

This study aimed to assess women's experiences in STEM-oriented team environments. Specifically, we investigated engineering students' perceptions of their teammate interactions, the quality of work teammates expected from them, their contributions to the project, and their experience with interruptions. We hypothesized that women would report significantly more negative team experiences than men. Essentially, we expected that compared to men, women would indicate significantly lower scores within the three item categories and higher scores for our interruption item. Although not all results aligned with this hypothesis, our results reveal intriguing findings with crucial implications for the future of team structures in STEM.

Correlation Table

Item Categories

Our correlation table revealed various relationships between item categories that demonstrate the effectiveness of the Intragroup Dynamics Survey. First, the correlation table revealed significant positive correlations between our three item categories – Interacting with Teammates, Expecting Quality, and Team Contribution. This finding suggests that students who reported high scores in one category generally reported high scores in the remaining categories, signaling positive team experiences. Additionally, students who reported low scores in one category generally reported low scores in the other two categories as well, signaling negative team experiences. This positive correlation is reassuring because our research team expected individual students to report similar scores in all three categories, indicating overall positive or negative team experiences. This finding demonstrates that the Intragroup Dynamics Survey item categories are related to one another and are adequate methods for measuring how individuals perceive their overall team experiences.

Our team was also reassured by the significant negative correlation between the three item categories and our interruption item. This finding suggests that students who had positive interactions with teammates, felt their teammates expected them to do well, and felt they contributed to the project recalled less frequent interruptions from teammates. Meanwhile, students who had negative interactions with teammates, felt their teammates did not expect them to do well, and felt they did not contribute to the project recalled more frequent interruptions from teammates. This negative correlation aligns with our research team's expectations for the Intragroup Dynamics Survey items. This finding also has larger implications for teamwork research as a whole. Although interruptions are quick, small instances that often go unaddressed, our correlation table suggests that individuals who are interrupted frequently generally have negative team experiences as a whole. This thesis is not an experimental study. Therefore, we cannot conclude whether interruptions lead to negative team experiences or if negative team experiences somehow lead to more interruptions, perhaps through deceased agency or motivation throughout the project. Although the direction of this relationship remains unknown, the association between interruptions and overall team experience is important for teammates to understand in academic contexts and the workplace. Interruptions may seem insignificant, however, they are clearly related to an individual's perceptions of how they were treated by teammates. Therefore, it may be worthwhile for faculty, management, and other team leaders to encourage teammates to listen to each other without interruption. This explicit direction may have a positive impact on team members' experiences, especially team members from underrepresented groups. Overall, the significant negative correlation between the three item categories and our interruption item is an informative finding for STEM organizations working with team structures.

Item Categories and Demographics

Our research team only hypothesized results regarding significant gender differences. However, the correlation table demonstrated significant findings from other demographics besides gender, specifically race and international student status. Regarding race, there was a significant negative correlation between race and Team Contribution items, such that non-White students indicated lower Team Contribution scores than White students. This finding suggests that racial minorities in ME 440 felt that they contributed less to the Mechanical Systems Design Project compared to their White peers. Race was also positively correlated with our interruption item, such that non-White students indicated more frequent interruptions from teammates than White students. International student status was also negatively correlated with Team Contribution items and positively correlated with the interruption item. This suggests that compared to domestic students, international students felt that they contributed less to the Mechanical Systems Design Project and were interrupted by teammates more frequently. This similarity between racial minorities and international students make sense, give the significant positive correlation between race and international student status. This finding demonstrates that most students who identified as non-White also identified as international students. Essentially, there was significant overlap between these two demographics, leading to similar correlations.

These survey results from racial minorities and international students suggest that marginalized groups face disadvantages in STEM-oriented team environments. Although this study primarily focuses on women's experiences in STEM teams, these findings relating to racial minorities and international students are still concerning for STEM programs and organizations. If non-White or international STEM professionals feel a lack of personal contribution to projects and are frequently interrupted by teammates, these employees may experience decreased motivation, harming organizations' productivity. Additionally, negative academic team experiences may deter racial minorities and international students from exploring STEM majors or remaining a STEM student throughout college. Overall, our correlation table exposes racial disparities regarding team contributions and interruptions, which can have negative, long-term consequences for STEM academic programs and organizations.

Gender Results

Interacting with Teammates

The results of this study demonstrate that within the Interacting with Teammates category, female engineering students indicated significantly more negative teamwork experiences than their male peers. This significant gender difference aligns with our research team's hypothesis and has informative implications for both academic and workplace settings. Specifically, this significant gender difference in the Interacting with Teammates category reveals potential problems regarding communication, teamwork attitudes, collaborative behavior, and feedback.

Regarding communication, female students, compared to male students, reported that their teammates communicated less effectively with them. Strong communication skills are crucial for effective teamwork, especially for high performance teams (Castka et al., 2001). therefore, this perceived lack of communication should be concerning for universities and organizations with STEM teamwork structures. Regarding teamwork attitudes, women, compared to men, stated that their teammates provided less encouragement and enthusiasm about working as a team. If women perceive that their teammates have negative attitudes about a project or lack interest in the team's work, this may lower their motivation to contribute ideas and prioritize the task. This lack of perceived encouragement and enthusiasm may also affect the team's productivity, inhibiting the university or organization from achieving its goals. The results on collaborative behavior also reveal concerning problems for STEM teams. Compared to male students, female students reported that their teammates heard less about what they had to say on team issues and their teammates got less input from them on important matters before going ahead. These scores suggest that women felt left out of important team decisions. These reports mirror the results of Weld and Laursen (2011), where women felt less connected to their peers after constant small acts of exclusion. Over time, this exclusion may lead women to lower their career goals (Barthelemy et al., 2016), having a negative impact on academic or organizational achievement. Lastly, the significant gender difference in the Interacting with Teammates category exposes potential problems in academic and workplace settings regarding team feedback. Compared to their male peers, female students reported that their teammates accepted less feedback about strengths and weaknesses and used less feedback to improve performance. Female students also reported lower scores regarding teammates accepting help when it was necessary. These results suggest that when women provided suggestions to enhance team performance, they felt their ideas were not accepted or used by their teammates. Both universities and organizations want to produce high quality work. Therefore, a perceived disregard for performance-related feedback should be a concern for leaders in STEM academic programs and companies. Overall, the significant gender difference in the Interacting with Teammates category exposes potential problems for future ME 440 classes and for other STEM teams in academia and business.

Our Interacting with Teammates results also provide insight as to why some women avoid STEM fields or leave their established STEM careers. Constant negative teammate interactions are likely frustrating for women and could potentially affect their overall interest in and passion for STEM fields. In academic settings, female students considering STEM majors may take courses with group projects and feel discouraged by their teammate interactions. These negative teamwork experiences may deter them from pursuing a STEM major throughout their college career. In the workplace, daily setbacks from teammate interactions may build up over time, convincing women they do not belong in STEM environments. Additionally, negative teammate interactions may contribute to the informal yet exclusive culture revealed in previous studies (Welde & Laursen, 2011). This exclusion may reinforce the idea that women would be better off on a non-STEM career path, contributing to women's high attrition rate in STEM fields (Prinsley et al., 2016).

Our Interacting with Teammates results reveal a need for more inclusive and collaborative environments in STEM teamwork settings. These results are especially informative for academic and business STEM leaders hoping to increase gender diversity. Improving intragroup dynamics may assist these leaders in reaching their diversity goals by attracting and retaining more women in STEM. To improve intragroup dynamics, universities and organizations could provide increased instruction on effective teamwork. For example, if professors promote strong communication and feedback acceptance throughout a semester-long group project, students may be more conscious of how they interact with teammates and what implications these interactions have. Having leaders emphasize the importance of respectful communication within teams may address the concerns revealed by this study and improve the experiences of women in STEM teams.

Expecting Quality and Team Contribution

Although there was a significant gender difference in the Interacting with Teammates category, there was not a significant gender difference in the Expecting Quality category or the Team Contribution category. These results differed from our hypothesis. For the Expecting Quality category, male and female students both felt that their teammates expected them to succeed, believed they could produce high-quality work, and believed they should achieve high standards. Essentially, ME 440 students felt that their teammates had high expectations of them, regardless of their gender. Although male and female students reported similarly high teammate expectations, we wonder if these equal quality expectations were undermined by the negative team interactions women perceived. Female students may have been frustrated throughout the semester, knowing that while their teammates had high quality expectations, they would not accept feedback, get input on important matters, or allow help when necessary.

For the Team Contribution category, male and female students both felt that they provided insights and ideas that improved the team's project and facilitated effective communication in the team. These results suggest that both men and women felt like they contributed to the project and had an impact on the final product. This is an encouraging finding, however, we are curious whether women's overall attitudes towards the project reflect this Team Contribution category or the more negative experiences in the Interacting with Teammates category. Strong feelings of team contribution may outweigh negative teammate interactions regarding women's overall thoughts on a STEM team project. However, it is also possible that women are especially discouraged by negative team interactions when they feel as though they have positively contributed to the project's final outcome. Our research team suggests that future studies investigate how the Intragroup Dynamics Survey item categories are related to women's overall feelings about the team project. This could be accomplished through an additional survey item assessing women's thoughts on the project as a whole or perhaps a qualitative interview to supplement survey responses. Although the results from the Expecting Quality and Team Contribution categories did not reveal a significant gender difference, they are still informative results that sparked new research questions for future studies on intragroup dynamics in STEM teams.

Limitations and Future Directions

The Intragroup Dynamics Survey results were intriguing and informative, however, this study has limitations as well. The main limitation is our sample, as only 48 of our 251 eligible respondents were women. Our research team expected our sample to be male-dominated. In Fall 2018, only 22.3% of University Park engineering students were women. Mechanical engineering is especially male-dominated, with only 13.7% women in Fall 2018 ("Penn State Engineering: Undergraduate Enrollment"). ME 440 is a mechanical engineering course, therefore, we expected to have a small percentage of women in our sample. Although this limitation was predictable, future studies can gain a stronger understanding of how women experience STEM teams with more women in their samples. Our sample is also limited because we only surveyed mechanical engineering students. The Penn State College of Engineering offers 16 majors and thousands of underclassmen are enrolled as pre-engineering majors as well ("Penn State Engineering: Undergraduate Enrollment"). Future studies can address this limitation by investigating intragroup dynamics in multiple areas of engineering or other STEM fields. Investigating teams in other STEM domains would supplement this thesis and provide a stronger understanding of how underrepresented groups experience STEM teamwork.

This study also established new research questions for future studies on intragroup dynamics in STEM teams. For example, how do negative teamwork experiences impact female STEM students' motivation to prioritize projects? If Interacting with Teammate scores are positively correlated with project motivation or productivity, this would make inclusive STEM teams even more crucial for universities and organizations. Both universities and organizations aim to produce high quality work efficiently. Therefore, a decline in motivation or productivity would be counterproductive and concerning for STEM leaders in both academia and business. Essentially, researching the relationship between intragroup dynamics, motivation, and productivity could make this research more relevant to STEM programs and companies, establishing a business case for improving inclusion within team structures. Additionally, measuring motivation and productivity could reveal whether lower Interacting with Teammate scores outweigh higher Expecting Quality and Team Contribution scores regarding women's overall attitudes towards team projects. If students with low Interacting with Teammates scores and high Expecting Quality and Team Contribution scores are still motivated, productive, and satisfied with the team experience, perhaps feelings of confidence and contribution are crucial to maximize team members' performance. However, if motivation, productivity, and overall satisfaction decline with low Interacting with Teammates scores, regardless of scores in the other two categories, respectful communication may be the important factor in fostering effective teams. Overall, studying project motivation and productivity would be a rational next step in this research domain, as the results could reveal the larger implications of exclusion in STEM teams and help clarify the results of this thesis.

In addition to assessing motivation and productivity, future studies could also investigate how team leaders play a role in women's STEM team experiences. In academic settings, professors' project instructions, team check-ins, and accessibility may have a positive or negative impact on how women in STEM courses experience team projects. For example, discouraging interruptions within teams at the beginning of the semester may make students more aware of interruptions as they collaboratively work on their projects. This awareness could potentially lead to less interruptions between teammates and hopefully more positive team experiences for students from underrepresented groups. This type of investigation could provide useful data for universities, as it could inform trainings for STEM faculty. Additionally, this research could inform STEM organizations how management can influence employees' team experiences. Again, having someone in a leadership position express the importance of respectful team communication at the beginning of a project may have a positive impact on minority employees' STEM team experiences. Our team is also curious how having a woman or racial minority as a team leader would affect minorities' team experiences in STEM environments. We anticipate that having diverse faculty and management may lead to more positive experiences for women and racial minorities in STEM teams. This concept could be investigated experimentally, building on the framework of this thesis.

Lastly, our research team is interested in how LGBTQ students would respond to the Intragroup Dynamics Survey compared to heterosexual, cisgender students. Because the LGBTQ community faces discrimination in academia (Schmidt et al., 2011), the workplace (Eliason et al., 2011), and STEM domains (Bilimoria & Stewart, 2009; Cech & Waidzunas, 2011), we anticipate that LGBTQ students will face setbacks in STEM teams, potentially deterring them from pursuing STEM careers. Future studies could assess this research question through an additional demographic question on the Intragroup Dynamics Survey regarding students' sexuality. Assessing additional demographics, such as sexuality, would allow researchers to gain a stronger understanding of which groups are disadvantaged in STEM team environments. Additionally, analyzing survey responses based on various demographics could provide more data to establish that promoting inclusive and collaborative team interactions should be a priority for leaders in STEM fields.

This thesis bridges the research gap between sexism in teams and sexism in STEM, assessing women's perceptions of how they were treated in STEM-oriented teams. Our results suggest that women are disadvantaged in this domain, specifically regarding interactions with teammates. Our results also reveal that racial minorities and international students face disparities in STEM teams compared to White students and domestic students. These findings are concerning for both universities and organizations aiming to diversify their STEM talent and present various opportunities and new research questions for future studies. Overall, this thesis opens the door for increased research on how underrepresented groups experience teamwork in STEM environments. Our team hopes that through increased research, STEM leaders in both academia and business will acknowledge existing disparities in this domain and strive to promote inclusion within team structures.

Appendix A

Intragroup Dynamics Survey

Eligibility:

Are you 18 years or older?

a. Yes

b. No

Are you a current undergraduate engineering student at Penn State?

a. Yes

b. No

The first 14 items use a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

The following items refer to your teammates' behaviors. Please indicate the extent to which you agree with the following statements:

1. My teammates communicated effectively with me.
2. My teammates provided me with encouragement.
3. My teammates expressed enthusiasm about working as a team.
4. My teammates heard what I had to say about issues that affected the team.
5. My teammates got my input on important matters before going ahead.
6. My teammates accepted my feedback about their strengths and weaknesses.
7. My teammates used my feedback to improve performance.

8. My teammates let me help them when it was necessary.
9. My teammates expected me to succeed.
10. My teammates believed that I could produce high-quality work.
11. My teammates believed that I should achieve high standards.
12. My teammates often interrupted me when I tried to make suggestions. *

The following items refer to your behaviors on the team. Please indicate the extent to which you agree with the following statements:

13. I provided insights and ideas that improved the team's project.
14. I facilitated effective communication in the team.

Demographics:

Which term best describes your gender?

a. Man

b. Woman

c. None of the above or prefer not to answer

What is your race?

a. White or Caucasian

b. Black or African American

c. Asian

d. Hispanic or Latino

e. Other

Are you classified by PSU as an international student?

a. Yes

b. No

Which class are you?

a. Junior

b. Senior

a. What team are you on?

____

Appendix B

Tables

Table 1 Intragroup Dynamics Survey Correlation Table

	Interacting with Teammates	Expecting Quality	Team Contribution	Which term best describes your gender?	What is your race?	Are you classified by PSU as an international student?	Which class are you?	My teammates often interrupted me when I tried to make suggestions.
Interacting with Teammates	1	.699**	.400**	-.144*	.028	-.008	-.067	-.195**
Expecting Quality	.699**	1	.437**	-.064	-.069	-.087	-.033	-.214**
Team Contribution	.400**	.437**	1	-.115	-.139*	-.297**	-.033	-.801**
Which term best describes your gender?	-.144*	-.064	-.0115	1	-.034	0.03	.159*	.101
What is your race?	.028	-.069	-.139	-.034	1	.503**	-.067	.125*
Are you classified by PSU as an international student?	-.008	-.087	-.297**	.03	.503**	1	-.066	.239**
Which class are you?	-.067	-.033	-.033	.159*	-.067	-.066	1	.074
My teammates	-.195**	-.214**	-.801**	.101	.125*	.239**	.074	1

often interrupted me when I tried to make suggestions.								

Table 2 Intragroup Dynamics Survey Results

Category	All Respondents		Female Students		Male Students		p-value
	M	*SD*	*M*	*SD*	*M*	*SD*	t-test
Interacting with teammates	4.35	0.76	4.13	0.98	4.41	0.68	-1.85*
Expecting quality	4.59	0.66	4.51	0.78	4.61	0.62	0.87
Team contribution	4.31	0.67	4.15	0.82	4.35	0.63	1.54

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ACADEMIC VITA

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Education

- The Pennsylvania State University (University Park); College of Liberal Arts, Senior and Schreyer Honors Scholar
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- Majors: Labor & Employment Relations and Psychology; Minor: Italian

Honors and Awards

- The Josephine J. Rhea Award for Excellence in Italian: Spring 2019
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  - Awarded to the Junior in the School of Labor and Employment Relations with the highest GPA.
- Gamma Kappa Alpha – Italian Honors Society
- The Phi Beta Kappa Society

Research Experience

- **Research Assistant**, Mapping the Student Engagement Journey (The Pennsylvania State University, Library Learning Services): Fall 2019 – Present
  - Assisting the Penn State Student Engagement Librarian with a large student engagement research project. Investigating how undergraduates discover, chose, and experience student engagement opportunities.
  - Conducting in-depth interview, coding qualitative data, and helping write results for publication.
  - Co-presenting this project at the Penn State Student Engagement Summit in November 2019.
- **Research Assistant**, Underrepresented Perspectives Lab (The Pennsylvania State University Psychology Department): Spring 2018 – Present
  - Assists Dr. Jes Matsick and her graduate students on tasks relating to prejudice and minority attitudes towards dominant groups. Overall focus on historically underrepresented populations.
  - Conducts literature reviews, recruits participants, cleans data, proofreads surveys, and credits participants.

Professional Experience

- **Investigative Intern**, The Rhode Island Commission for Human Rights (Providence, RI): Summer 2019
  - Assisted with the investigative process of discrimination charges regarding employment and housing. Evaluated evidence and helped determine whether cases have probable cause for discrimination.
  - Drafted documents including requests for additional evidence, determination letters, and case summaries.

- **New Student Orientation Leader** (The Pennsylvania State University): Summer 2018
    - One of 24 New Student Orientation Leaders; Welcomed 7,500+ new students to Penn State's Class of 2022.
    - Facilitated small group discussions regarding diversity & inclusion, consent, mental health, and decision making.
    - Presented to hundreds of families on academic planning, responded to questions about campus life, and worked cooperatively with a team of students.

Volunteer Work

- **Domestic Violence/Sexual Assault Response Advocate**, Centre Safe (State College, PA): Fall 2018 – Present
    - Participant in Centre Safe's 77-hour training program. Learned how to properly assess and respond to domestic violence and sexual assault incidents through a 24/7 hotline.
    - Completing 480 hours of service through hotline response, outreach events, shelter support, and sexual assault response at Mount Nittany Medical Center.
- **Site Leader**, Penn State Alternative Breaks: Spring 2018 – Fall 2018
    - Co-led eight Penn State students on a service trip during Winter Break 2018 to the Department of Juvenile Justice in Columbia, South Carolina. Overall focus on mass incarceration in the U.S.
    - Was responsible for choosing a site, working cohesively with a co-site leader, educating participants on social justice topics, supervising productive service, and facilitating group reflections.
    - Participated on a disaster relief trip to Beaumont, Texas in Spring of 2018.

Co-curricular Activities

- **Vice President of Recruitment for Delta Phi Epsilon** (Delta Pi Chapter): Spring 2018 – Spring 2019
    - Member of the Executive Board for a chapter of 150+ women. Branded our organization through primary recruitment and social media.
    - Facilitated recruitment trainings for the chapter, delegated coordinator tasks, and facilitated team meetings.
- **Tour Guide** with Penn State Lion Scouts: Fall 2016 – Present
    - Leads campus tours for prospective students and alumni.