# STEM Inclusion Study

ORGANIZATION REPORT:
ASSOCIATION FOR WOMEN IN MATHEMATICS (AWM)


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# EXECUTIVE SUMMARY

The STEM Inclusion Study, led by Dr. Erin Cech (University of Michigan) and Dr. Tom Waidzunas (Temple University), is the first large-scale, national-level study to simultaneously examine the experiences of women, racial and ethnic minorities (REM), persons with disabilities, and lesbian, gay, bisexual, transgender, and queer (LGBTQ) individuals working in the science, technology, engineering and math (STEM) workforce.[1] The study advances knowledge of the structures and cultures of STEM fields that may undermine equality of opportunities and outcomes on the basis of gender, racial/ethnic category, disability, and LGBTQ status. Overall, the goal of the study is to better understand processes of disadvantage experienced by members of STEM-related professional organizations in order to inform diversity and inclusion efforts in these organizations, as well as other STEM-related entities and institutions.

This organization participated in the survey phase of the STEM Inclusion Study, alongside a number of other STEM-related professional organizations.[2] With permission from the organization, the research team surveyed members of this organization on a variety of topics related to members' day-to-day experiences in their workplaces and their encounters with other STEM professionals. Using data from this survey, this report examines trends regarding (a) *experiences of inclusion and marginalization*, analyzing employees' perceptions of their workplace climate, feelings of personal fit, and harassment on the job; (b) *professional valuation*, the extent to which respondents believe they are respected and taken seriously as STEM professionals, and (c) *reports of workplace fairness,* the frequency with which respondents report instances of hostility and unfair treatment in their workplaces toward members of disadvantaged groups. We compare reports of fairness across employment sector against the average of all sectors (college or university, for profit sector, and other employment sector).

Regarding *experiences of inclusion and marginalization*, persistent patterns emerged by disability status, LGBTQ status and race/ethnicity among women members of this organization. (Note: Due to the small proportion of men respondents, and the focus of the organization on the experiences of women in mathematics, we focus the analyses on differences among women.) Specifically, controlling for employment sector, education level, and age, persons with disabilities, LGBTQ respondents, and some racial/ethnic minority group members (particularly Hispanic and Asian respondents) are significantly more likely to report experiences of marginalization in their workplaces than their colleagues. A similar pattern emerged regarding *professional valuation*: persons with disabilities, LGBTQ respondents, and certain racial/ethnic minority group members are significantly more likely to report having their professional expertise devalued, receiving less respect from their supervisors and co-workers, and feeling as though they have to work harder than their colleagues to be seen as competent STEM professionals.

Regarding patterns in *workplace fairness,* organization members across different employment sectors reported witnessing or experiencing instances of negative treatment and harassment with some frequency: for instance, 51.2% of respondents reported witnessing negative treatment by gender in their workplaces in the last three years, and 28.2% reported witnessing negative treatment along the lines of race/ethnicity. These instances of negative treatment were reported most frequently by respondents employed in higher education.

This report begins with a brief introduction to inequality issues within the STEM workforce, then summarizes the survey results of this organization and offers suggestions for addressing these issues. We also provide data on the AWM-specific questions added to the survey by the organization. In particular, we highlight the finding that women with disabilities and racial and ethnic minority women report significantly less positive experiences than non-disabled and

[1] The STEM Inclusion Study (https://www.steminclusion.com/) is funded by the National Science Foundation (#HRD 1539140). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

[2] In total, the STEM Inclusion Study aims to include 15-20 professional organizations, seeking to maximize representation from the array of STEM disciplines, sectors, and industries. The names of the professional organizations are kept confidential to protect the confidentiality of individual survey participants.

white respondents on a host of measures related to marginalization and professional devaluation that we examine here. Additionally, the data show a pattern of negative experiences for LGBTQ-identifying individuals.

## BACKGROUND

In both public and scholarly discourse, there is growing interest surrounding the retention and representation of certain socio-demographic groups in the STEM workforce. Investigating the processes of disadvantage that underrepresented groups in STEM face helps illuminate the factors that prevent talented and motivated individuals from advancing in STEM. Yet, scholars are only beginning to understand the particular mechanisms that reproduce these disadvantages within STEM workplace interactions, within STEM organizations, and within the contexts of science and engineering professional cultures. There is a pressing need for more research on these issues.

Investigations such as those undertaken by the STEM Inclusion Study are especially timely, as research over the last three decades has documented processes reproducing the underrepresentation of women, racial/ethnic minorities, LGBTQ persons, and persons with disabilities in science and engineering. Historically, women have been underrepresented in STEM in the United States (Iskander et al. 2013), and similar patterns are recorded in countries such as Korea, Switzerland, and Australia (Buccheria, Abt Gurber and Bruhwiler 2011). Women are less likely than men to enter STEM fields and more likely than men to leave them (Frehill 2012). In attempts to explain these gaps, research has not found any evidence of a performance gap between men and women (Koul, Lerdpromkulrat and Chantara 2011). Rather, stereotypes regarding who "fits" STEM are strongly connected to women's under-representation in STEM, help perpetuate "chilly" climates for women, and undermine the perception of women's competence as STEM professionals (Archer et al. 2013, Cech 2013, Cech et al. 2011, Cheryan et al. 2011). For instance, in an experimental study of science faculty hiring a student lab manager, men applicants were rated as more competent and likable than women applicants and offered higher salaries, even though the applicants had otherwise identical applications (Moss-Racusin et al. 2012). Among faculty populations, women tend to receive fewer resources, less mentoring, face greater criticism and isolation from peers, and are shouldered with more administrative and service work than men (McIlwee & Robinson 1991, NSF 2007).

Existing research has also detailed the experiences and challenges of racial/ethnic minorities in STEM fields. Racial/ethnic minorities (particularly African Americans and Hispanics) are highly underrepresented in STEM majors, in STEM faculty positions, and in STEM positions in industry, compared to their representation in US population more broadly (Babco 2003, Huradto et al. 2010). This underrepresentation is attributed to a range of issues, including unequal educational opportunities and mentoring (Moreno et al. 2006), implicit bias (Turner 2002, Moody 2004), and feelings of isolation within academic departments and communities (Zambrana et al. 2015). This underrepresentation of racial/ethnic minority faculty in STEM departments, furthermore, gives minority students the impression that they do not have a place in STEM or academic fields (Nelson and Brammer 2012). Thus, the under-representation of minority faculty and students in STEM are closely tied with one another—without mentors with whom minority students can relate, they are less likely to believe that they can be successful in STEM fields (Nelson and Brammer 2012). Less research has examined the experiences of racial/ethnic minority persons employed in STEM outside of academia, although there is reason to believe that experiences of marginalization and exclusion extend to non-academic sectors as well.

Scholars are only beginning to understand the experiences of LGBTQ individuals in STEM, but limited previous research indicates that LGBTQ persons frequently face marginalization and unfair treatment compared to their non-LGBTQ peers. Cumulatively, prior studies indicate the existence of negative climates for LGBTQ faculty and students in higher education and suggest a link between this climate and academic/career consequences. One campus climate study of students, faculty, and administrators revealed negative experiences for LGBTQ college students and faculty (Rankin et. al 2010). For example, 31 percent of LGBTQ students and faculty reported that they were not comfortable with the climate on their campus climate and 20 percent feared for

their physical safety. Faculty and students in STEM departments specifically report similar, if not more extreme, experiences of marginalization in science and engineering departments (Cech 2013; Cech and Waidzunas 2011; Bilimoria and Stewart 2009; Gunckel 2009). Further, recent research on employees of STEM-related federal agencies found strong and persistent workplace experience inequalities for LGBTQ-identifying persons compared to their non-LGBTQ colleagues (Cech & Pham 2017).

Little is understood about the experiences of persons with disabilities in STEM education and employment as well. Early research suggests that STEM fields may be particularly difficult and marginalizing environments for those with disabilities. Disability is often associated with negative stereotypes about intellectual ability; those with disabilities are often perceived as less intellectually competent than their peers (Slaton 2013). In STEM, this association is further compounded by the fact that STEM culture often silences discussions of bodily ability when evaluating performance (Knorr-Certina 1995, Siebers 2010, Slaton 2013).

*Methodological Summary:* In the fall of 2017, the STEM Inclusion Study fielded a confidential survey to this organization's membership list.[3] Members were sent a pre-notification email in October 2017, followed by a week later by an email with a unique URL survey link. Participation in the survey was voluntary and individual responses are kept strictly confidential.[4] All survey results below are presented in a way that ensures that any given individual's responses are not individually identifiable. For the purposes of this report, we focus only on the workplace experiences of organization members who were employed at the time of the survey (N=299). We include the means for students alongside employed respondents in part three.

Table 1 below presents the proportion of employed respondents by gender,[5] race/ethnicity (respondents could identify with more than one racial/ethnic minority category), LGBTQ status, disability status,[6] and employment sector (university/college, for-profit, or other—including K-12, nonprofit, and self-employed members) for full-time, non-student respondents. We only provide intersectional demographic breakdowns form women respondents, due to the small number of men in the sample. We also present basic demographic information for student respondents. Because of the small sample size of students, and the focus of this analysis on workplace experiences, students are excluded from sections 1 and 2 below.

[3] The membership list was provided to the research team via a secure online file sharing application. The membership list was used only for the purposes of this research. This organization's participation the study was approved by the University of Michigan Institutional Review Board.

[4] Respondents participated in an online survey that took approximately 15-minutes to complete. The survey consisted of active members with a paid membership to this organization. The survey was distributed via a private email link. Survey sample size: 565 response rate: 26.5%. We include in this main analysis only those respondents who were employed at the time of the survey. Students are also included in the part 3 results. Survey data was analyzed using Stata statistical programming package. The survey results above report univariate statistics (means).

[5] The category "women" includes both cis-gender and transgender women and the category "men" includes both cis-gender and transgender men.

[6] Note: 11.44% of the sample identified as having a physical disability, and 13.85% of the sample identified as having a mental or emotional disability.

**Table 1: Descriptive Statistics of 1 by Demographic Characteristics**

| Demographic Characteristics | Percent of the Sample |
|---|---|
| **Full-time, non-student respondents (N=299):** | |
| Women | 89.96% |
| Men | 8.96% |
| Hispanic women | 7.17% |
| Asian women | 11.55% |
| Black women | 3.19% |
| White women | 76.10% |
| Other race/ethnicity-identified women | 11.99% |
| LGBTQ women | 11.11% |
| Women with disability (physical, mental or emotional) | 19.92% |
| Employed in university or college sector | 89.95% |
| Employed in for-profit sector | 3.00% |
| Employed in other sector (e.g., nonprofit, government) | 10.03% |
| **Students (Graduate and Undergraduate) (N=172):** | |
| Women | 88.51% |
| Men | 8.11% |
| Hispanic Women | 6.11% |
| Asian women | 25.95% |
| Black women | 6.11% |
| White women | 70.23% |
| Other race/ethnicity-identified women | 2.29% |
| LGBTQ women | 14.29% |
| Women with disability (mental, physical, or emotional) | 32.03% |

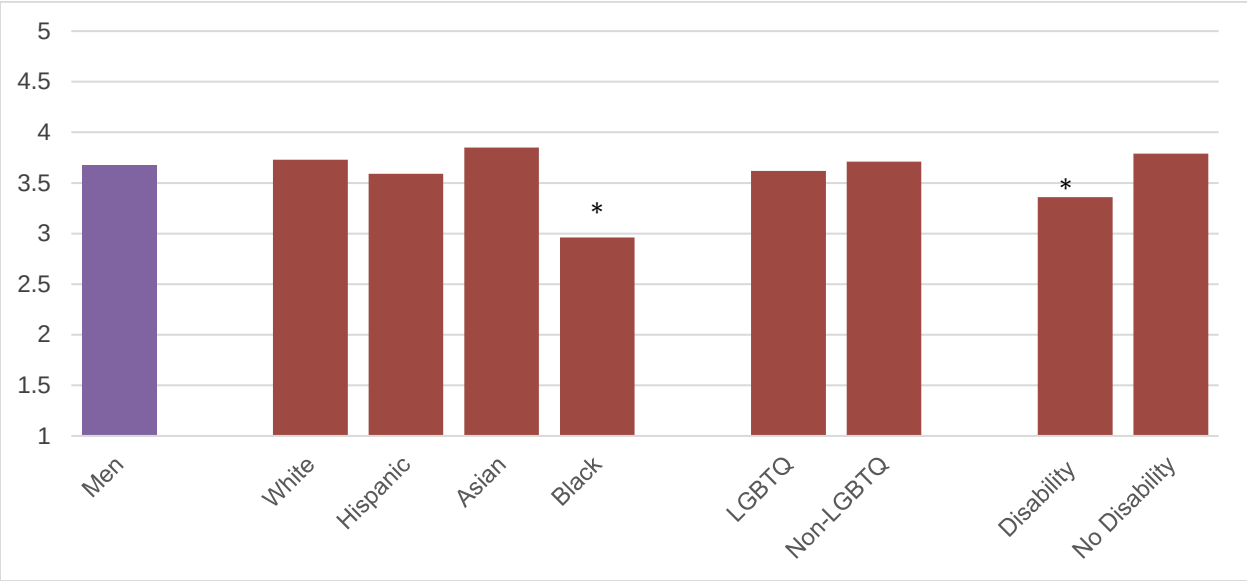
## 1. Inclusion and Marginalization

As noted above, previous research has found that women, racial/ethnic minorities, LGBTQ persons, and persons with disabilities in various arenas in STEM education and employment report more frequent experiences of marginalization and isolation than their colleagues (Frehill 2012, Cech 2013; Cech and Waidzunas 2011; Bilimoria and Stewart 2009; Gunckel 2009). This marginalization has consequences for long-term satisfaction and retention of these groups in STEM education and employment (Eglash 2002, Chang et. al 2008, Zambrana et. al 2015, Laschinger et. al 2004).

We explore patterns of inclusion and marginalization across demographic categories in this organization on four key indicators: (1) whether they feel like they fit in with other people in their workplace, (2) whether they have read or heard insensitive comments in their organization in the last year, (3) whether they worry that their mistakes garner more visibility than those of their colleagues, and (4) whether they have been harassed verbally or in writing in their workplace.

Because the membership of this organization is primarily women, we present these inclusion and marginalization outcomes the following way: (1) a bar representing the averages for all men respondents, (2) bars comparing women respondents by race, (3) bars comparing women respondents by LGBTQ status, and (4) bars comparing respondents by disability status.

## Fig 1: "I feel like I fit in with other people in my workplace."




***Predicted Probabilities of employed respondents for all men (purple bar), and for women respondents (red bars) by race/ethnicity, LGBTQ and disability status, net of differences by sector, age, and education level.*** *(1=strongly disagree to 5=strongly agree)*

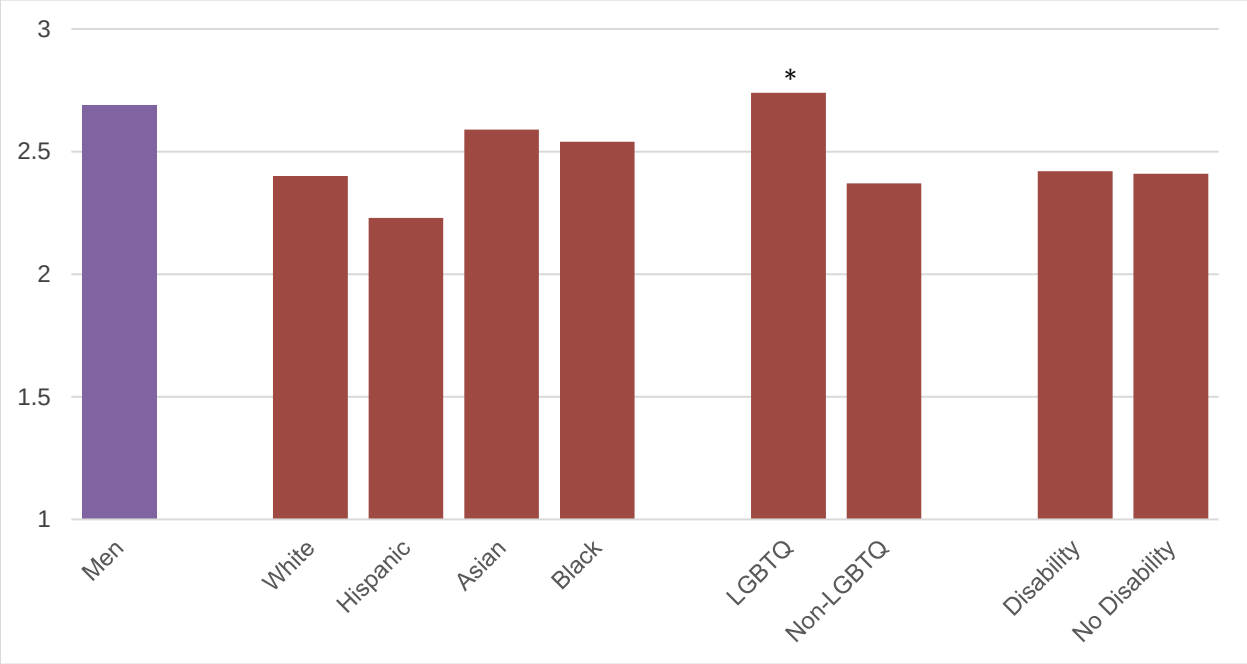
Figure 1 presents the extent to which respondents feel like they "fit in" with their colleagues in their workplaces (values range from 1-5, 1=Strongly Disagree through 5=Strongly Agree). The values are predicted probabilities, or the means for each group holding variation by age, sector, and education level constant.

Overall, the averages among all demographic groups is relatively high, with most respondent groups feeling on average between "Neither Disagree nor Agree" and "Agree" in regards to fitting in with others at their work.

There are several significant differences on this measure of marginalization, as indicated by the asterisks above the bar (***p<.001, **p<.01, *p<.05, †p<.10, two-tailed test).[7] First, women respondents with disabilities are significantly less likely than respondents without disabilities to report that they fit in. Further, black women were significantly less likely than white women to report feeling as though they fit in.

[7] Significance levels were determined by logistic, OLS, or ordered logistic regressions (depending on the dependent variable in question) that included measures for racial/ethnic category, LGBTQ status, age, disability status, education level and employment status. These models were multiply imputed (20 imputations using the chained command in Stata) so that all figures have an N=299

## Fig 2: "I have read or heard insensitive comments in my workplace that I found offensive."

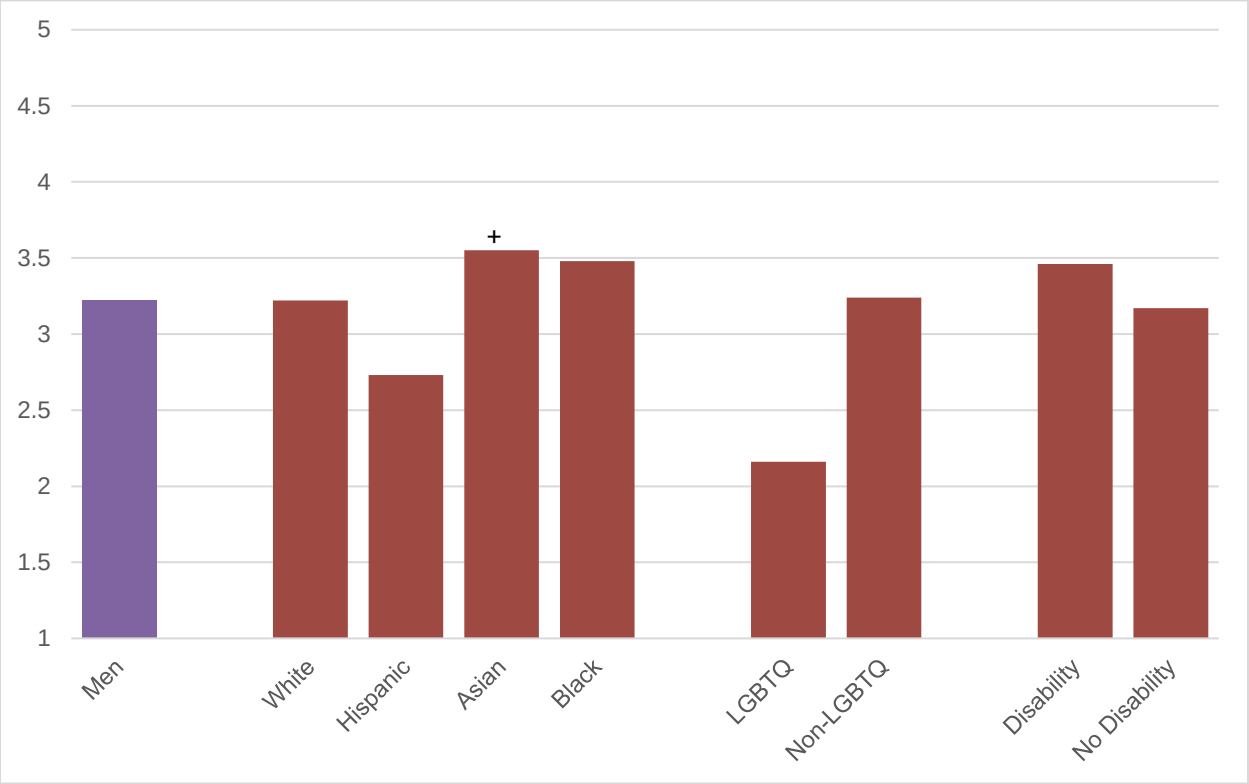



***Predicted Probabilities of employed respondents for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of sector, age, and education level.*** *(1=Never, 2=At least once in the past year, 3=At least once a month or more)*

This second measure indicates whether some groups are significantly more likely than others to have encountered insensitive or offensive comments in their workplaces. Such comments are an important mechanism of marginalization in workplaces. Overall, across all demographic groups, respondents reported encountering an offensive comment at least once in the past year (a mean value of 2 or more).

LGBTQ women reported these insensitive comments happen significantly more frequently than non-LGBTQ women reported them happening, net of controls. Although there is some variation in the means across other demographic categories, these differences are not statistically significant.

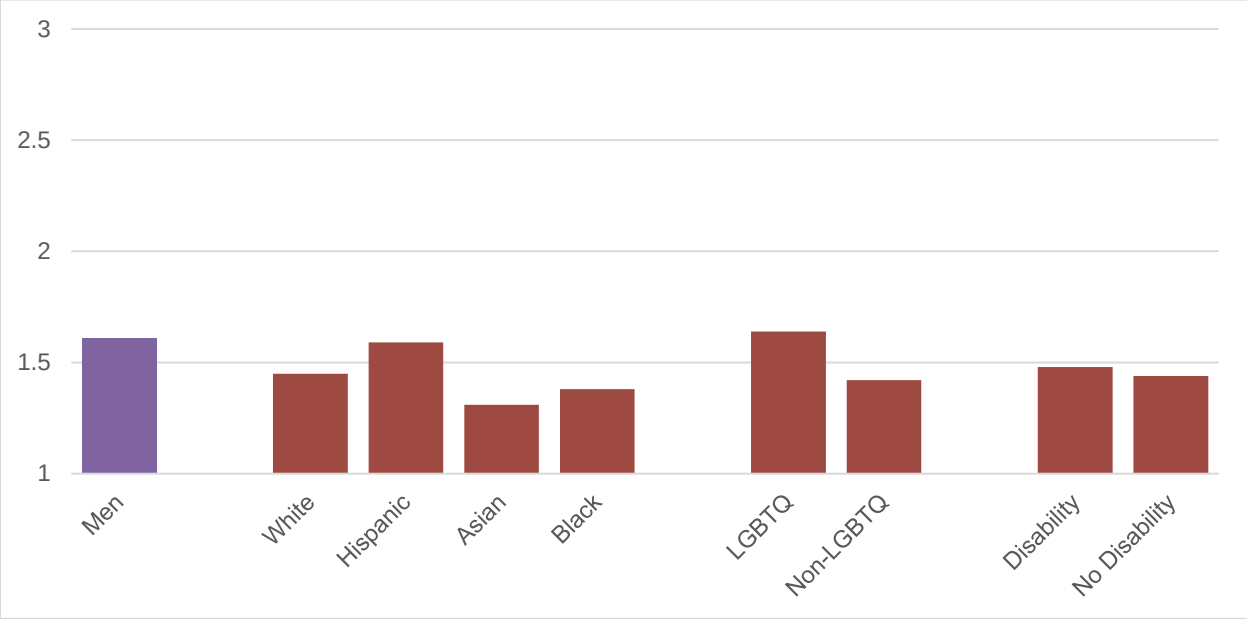
## Fig 3: "I worry that my mistakes are more noticeable than the mistakes of others."




***Predicted Probabilities of employed respondents, for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of differences by sector, age, and education level.*** *(1=strongly disagree to 5=strongly agree)*

Another important indicator of marginalization is the extent to which persons fear that their mistakes will be more visible than those of their colleagues. In the figure above, there was one significant group differences: Asian women were marginally more likely than white women to report that their mistakes garner more negative attention than their colleagues.

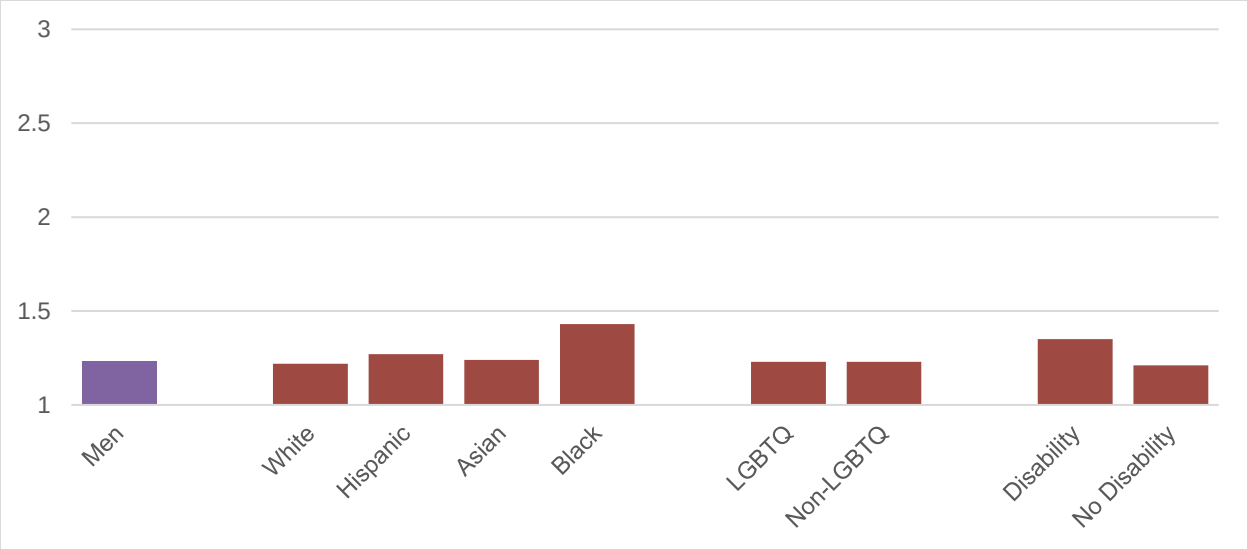
## Fig 4: "A co-worker makes a negative comment or joke about women, racial/ethnic minorities, LGBTQ people, or people with disabilities."\




***Predicted Probabilities of employed respondents for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of sector, age, and education level.*** *(1=Never, 2=At least once in the past year, 3=At least once a month or more)*

Figure 4 depicts an aggregated measure that reports the frequency with which respondents reported hearing overtly offensive comments about disadvantaged groups in the workplace (1=Never, 4=Frequently). Although LGBTQ and Hispanic women reported more frequent instances of offensive comments in the workplace when compared to their straight and white female peers, these differences are not statistically significant.

## Fig 5: "I was harassed verbally or in writing on the job in the last year."




***Predicted Probabilities of employed respondents for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of sector, age, and education level.*** *(1=Never, 2=At least once in the past year, 3=At least once a month or more)*

Finally, Figure 5 depicts the frequency with which respondents report experiencing harassment in their workplace. Overall, experiences of direct harassment are relatively rare. Though black women and women with disabilities reported higher levels of harassment than their white and non-disabled counterparts, these differences were not found to be statistically significant.

***Summary of Patterns of Marginalization***

Several strong demographic patterns emerged on the marginalization measures above. Patterns were found along the lines of race, ability status, and sexuality, with Asian, black, LGBTQ and women with disabilities respondents reporting more frequent patterns of marginalization within their workplace than other women. For example, women who identify as LGBTQ were more likely than non-LGBTQ women to report encountering insensitive comments within their workplace, and respondents with disabilities were less likely to report that they "fit" within their workplace when compared to women without disabilities. These results point to a concerning pattern of institutional marginalization of women with disabilities, and those who identify as sexual minorities in their workplaces.

Another pattern that emerged is the marginalization experienced by women of color. Asian and black respondents reported feeling as though their mistakes were more noticeable than their peers and that that they do not feel a sense of fit within their workplace. These patterns suggest important points of consideration for this organization as it advocates for the interests of its members.

In short, women who identify as LGBTQ, women with disabilities, Asian women, and black women were significantly more likely than their non-LGBTQ, non-disabled, and white counterparts to report marginalization in their workplaces.

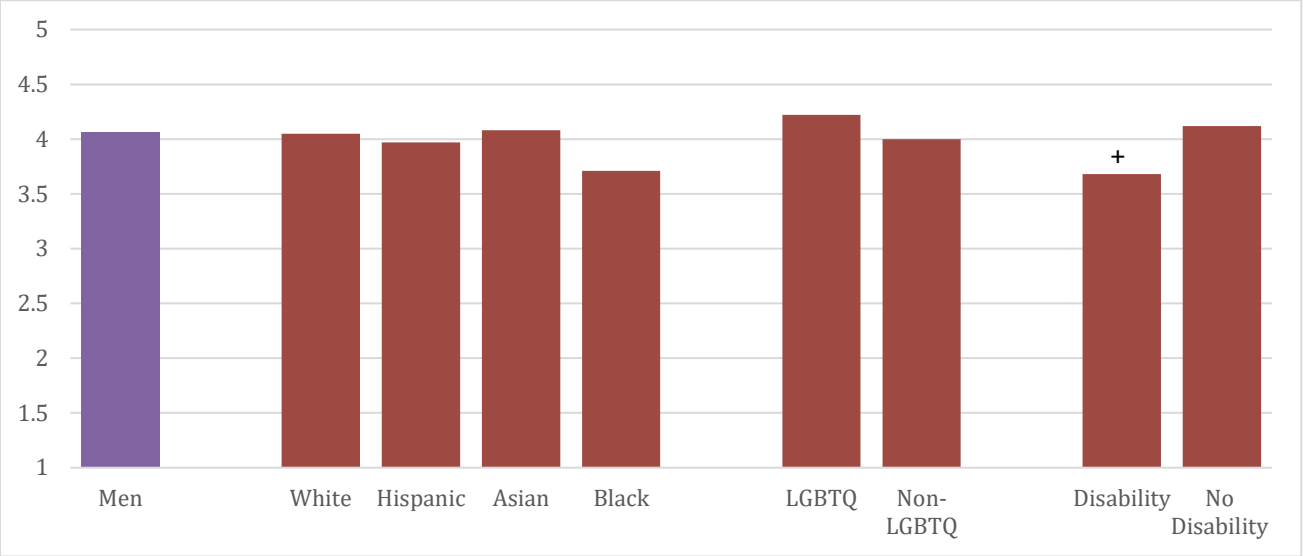
### 2. Professional (De)valuation

Prior research has found that disadvantaged groups within STEM often report that their colleagues question their scientific and engineering competence and performance (Moss-Racusin et. al 2012, Steele 2003, Chang et al. 2008, Williams 2014). Disparities in the recognition of the professional excellence of women, people of

color, LGBTQ individuals, and persons with disabilities in STEM exacerbate the disciplinary issues of underrepresentation and attrition in STEM education and careers (Shapin 1995, Collins and Evans 2007, Williams 2014, Steele 2003, Chang et al. 2008, Nelson and Brammer 2012).

In this section, we examine five important indicators of professional devaluation: (1) whether respondents believe their work is respected in their workplace, (2) whether they believe their supervisor respects them, (3) whether they believe they are held to the same standard as their colleagues, (4) whether their boss gives them less credit than they deserve, and (5) whether they believe they have to work harder than their colleagues to be perceived as legitimate professionals.

## Fig 6: "In my workplace, my work is respected."



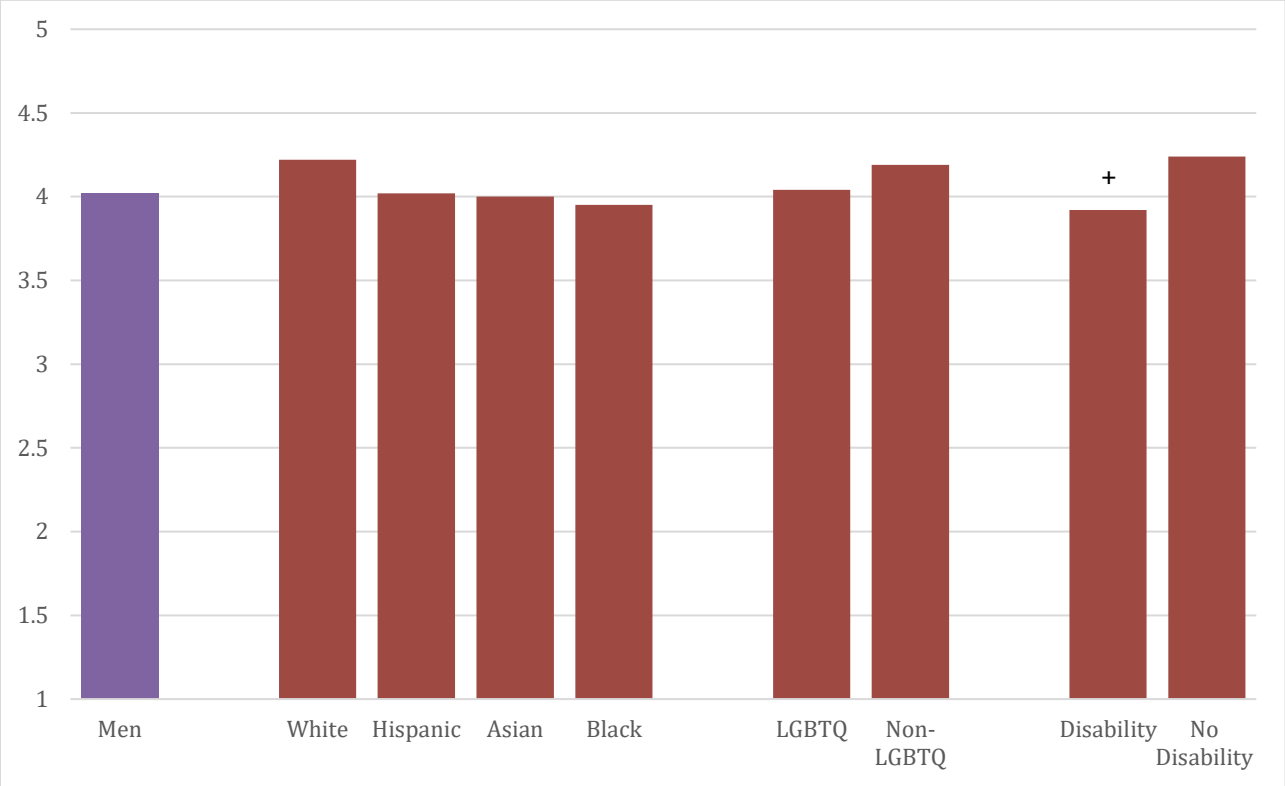

***Predicted Probabilities of employed respondents for all men (purple bar), and for women respondents (red bars) by race/ethnicity, LGBTQ and disability status, net of differences by sector, age, and education level.*** *(1=strongly disagree to 5=strongly agree)*

As above, the bar charts in this section present the predicted means for each demographic category, net of variation by age, education level, and sector. The asterisks represent significant differences across those categories, as determined by OLS or ologit regression models (***p<.001, **p<.01, *p<.05, †p<.10, two-tailed test).

Figure 6 captures the extent to which respondents feel as though their work is respected within their workplaces (1-5; 1=Strongly Disagree, 5=Strongly Agree). Respondents typically feel that their professional work is respected: means lie on average between somewhat and strongly agree.

However, women with disabilities are marginally less likely than those without disabilities to report that their work is respected by their colleagues. None of the other demographic differences reached statistical significance.

## Fig 7: “My supervisor treats me with respect.”

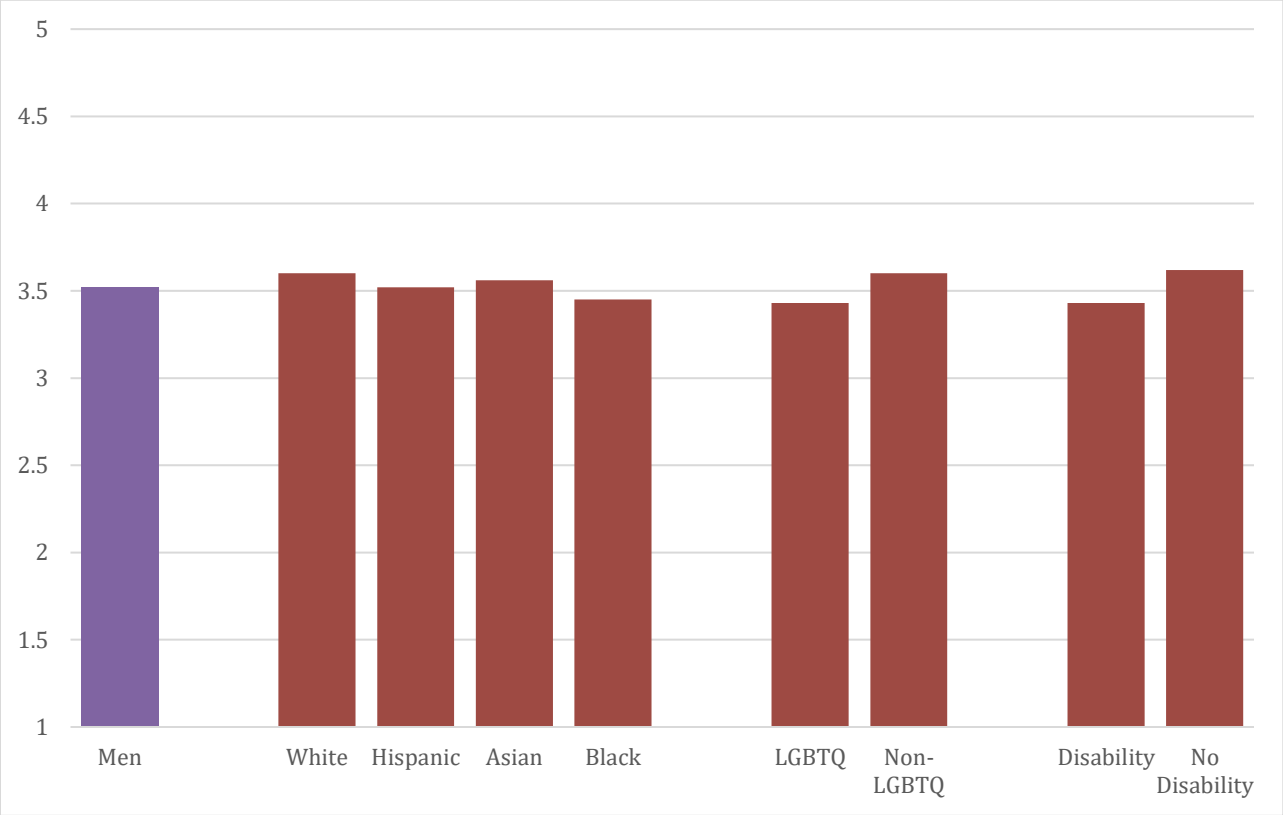



***Predicted Probabilities of employed respondents for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of differences by sector, age, and education level.*** *(1=strongly disagree to 5=strongly agree)*

The second measure captures whether respondents feel respected by their supervisors (Fig 7). In general, respondents typically report that they experience at least a modest degree of respect from their supervisors. However, there are important demographic differences.

Specifically, women with disabilities are marginally less likely than those without disabilities with the same education level, the same age, and in the same sector to report that their supervisors respect their work. No other demographic differences reached statistical significance.

## Fig 8: "I am held to the same standard as others for promotion and advancement."

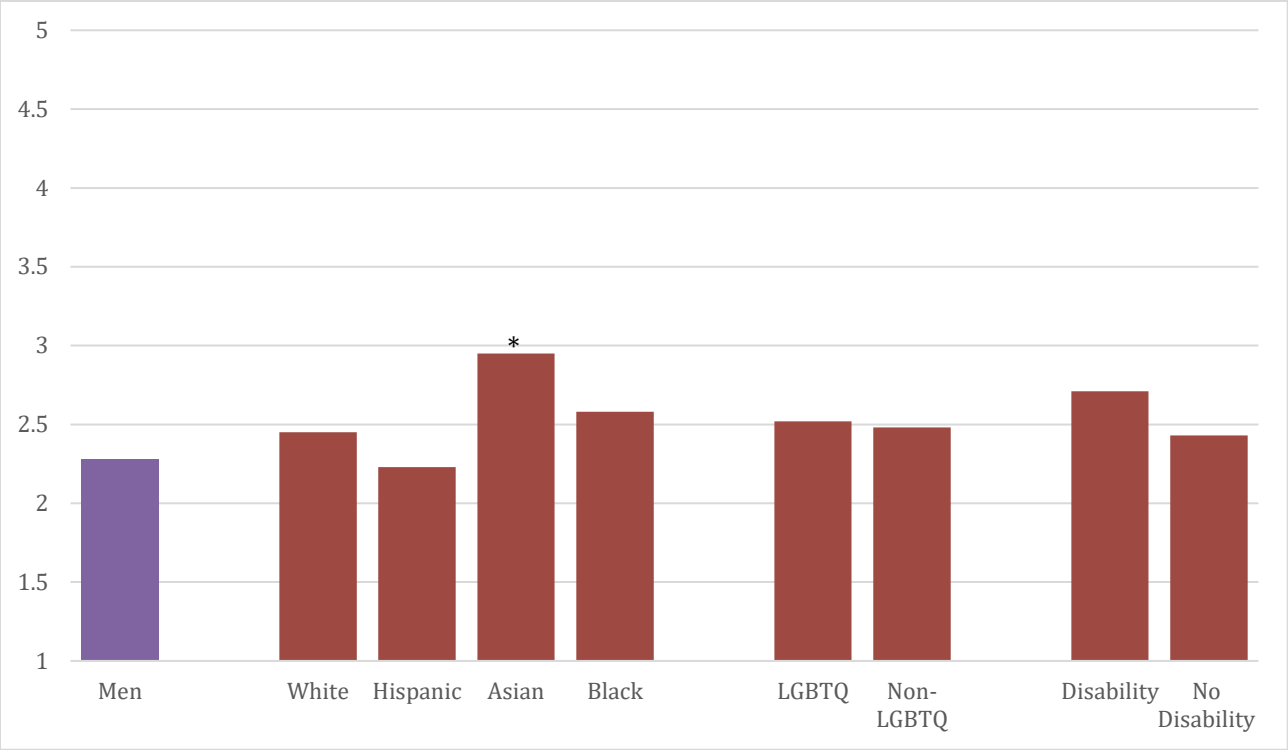



***Predicted Probabilities of employed respondents for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of differences by sector, age, and education level.*** *(1=strongly disagree to 5=strongly agree)*

Another important indicator of professional respect is the extent to which respondents believe that they are held to the same standard as their colleagues for advancement and promotion (Fig 8). Those who feel that they are held to a higher standard may not advance as quickly, and are not given the same level of respect for the same quality of work.

While LGBTQ-identifying women and women with disabilities had lower averages on this variable than their non-LGBTQ peers without disabilities, these differences were not found to be significant.

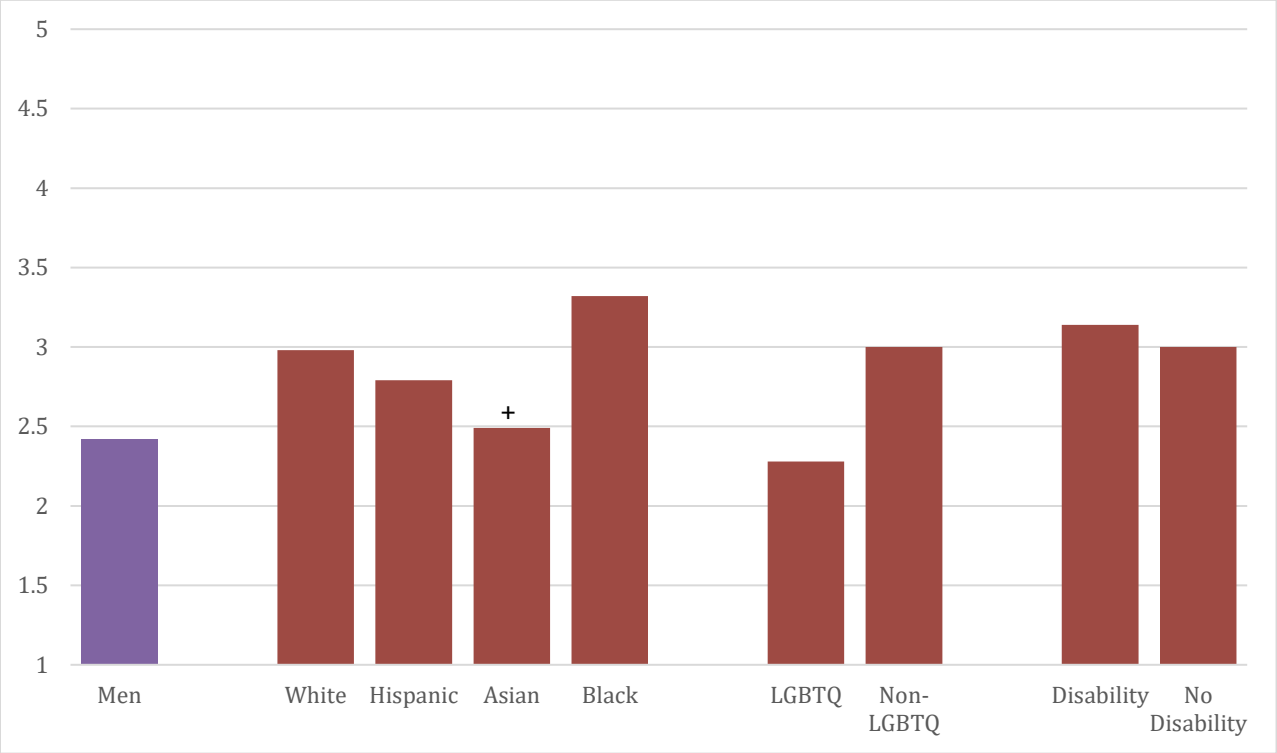
## Fig 9: "My boss gives me less credit than I deserve."




***Predicted Probabilities of employed respondents for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of differences by sector, age, and education level.*** *(1=strongly disagree to 5=strongly agree)*

Similar to the measures above, Figure 9 reports the extent to which respondents agree that their boss gives them less credit than they deserve. In general, respondents typically disagree with this statement: the average for each group sits between "somewhat disagree" and "neutral." Asian women were significantly more likely to agree with this statement than white women. Although women with disabilities were more likely than those without disabilities to report receiving less credit than they deserve, this disparity was not found to be statistically significant.

## Fig 10: "I have to work harder than my colleagues to be perceived as a legitimate professional."




***Predicted Probabilities of employed respondents for all men, and for women respondents by race/ethnicity, LGBTQ and disability status, net of differences by sector, age, and education level.*** *(1=strongly disagree to 5=strongly agree)*

As a final measure of professional valuation, Figure 10 above reports the predicted means on a measure that asks respondents the extent to which they agree that they have to work harder than their colleagues to be perceived as a legitimate professional. As a whole, responses average between "disagree" and "neutral."

As before, Asian women are marginally more likely than their white female counterparts to agree that they have to work harder than colleagues to be perceived as a legitimate professional.

***Summary of Patterns of Professional Devaluation***

Among the measures in this professional devaluation category, we see similar trends as those reported in the measures relating to marginalization. In this category, race was the basis of the strongest pattern observed. Asian women frequently reported instances of professional devaluation. Asian women were significantly more likely than their white counterparts to report receiving less credit than they deserve and having to work harder to be perceived as competent. Again, these differences are net of variation in the sample by education level, age, and employment sector.

Another strong pattern emerged regarding disability status: women who reported having mental or physical disabilities reported receiving less respect from their supervisor and less respect for the work that they do when compared to women who reported no physical or mental disabilities

## 3. Patterns of workplace fairness across sectors

In the sections above, we compared experiences of marginalization and professional devaluation across demographic categories, controlling for variation by several work factors, including employment sector. However, members of this organization work in a variety of employment sectors (e.g., universities, for-profit companies); the climate for disadvantaged groups may vary

considerably across these sectors. As such, this section compares indicators of workplace unfairness across different employment sectors. It allows us to ask, are certain employment sectors more positive for under-represented groups than others?

The three figures below present the proportion of respondents in each sector who agree that women, racial/ethnic minorities, and LGBTQ persons must work harder than others to convince their colleagues of their competence. For the sake of comparison, we also present the proportion of student respondents who agreed with each question.

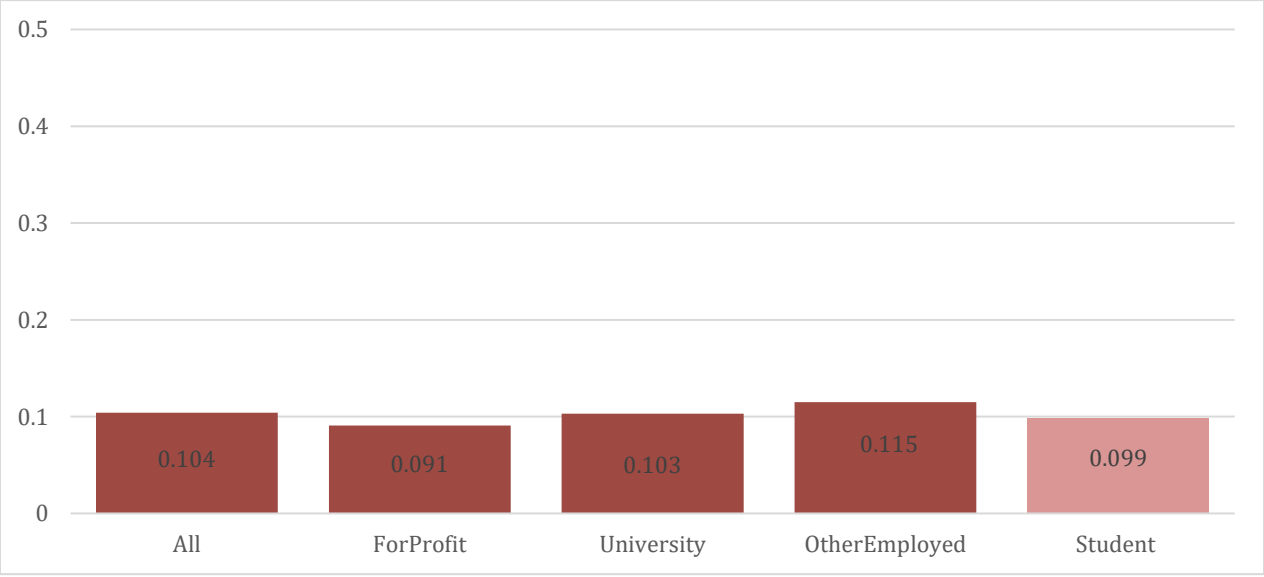
## Fig 11: Proportion of respondents by sector agreeing that "Women in my workplace must work harder than men to convince colleagues of their competence."

***Predicted Probabilities of employed respondents (darker bars), and students (lighter bar), by sector.*** *(proportion who agree between 0 and 1)*

## Fig 12: Proportion of respondents by sector agreeing that "Racial/ethnic minorities in my workplace must work harder than whites to convince colleagues of their competence."

***Predicted Probabilities of employed respondents (darker bars), and students (lighter bar), by sector.*** *(proportion who agree between 0 and 1)*

## Fig 13: Proportion of respondents by sector agreeing that "LGBTQ individuals in my workplace must work harder than non-LGBTQ persons to convince colleagues of their competence."




***Predicted Probabilities of employed respondents (darker bars), and students (lighter bar), by sector.*** *(proportion who agree between 0 and 1).*

The figures above represent the proportion of respondents in each sector who agree with each statement, net of variation by demographics (gender, race/ethnicity, age, disability status, LGBTQ status, and education level). Asterisks would indicate significant differences between university/college sector (comprised of 4-year and 2-year institutions) and the other two sector categories: for-profit private sector, other sectors (a small category that includes non-profit and governmental sectors), and students (both undergraduate and graduate). Significance levels determined by logistic regression models; see FN 5 for details (***p<.001, **p<.01, *p<.05, †p<.10, two-tailed test).

Starting with the first figure in this section, Figure 11, the leftmost column in the graph displays the proportion of respondents overall (44.7%) who report that women have to work harder than men to convince colleagues of their competence. However, there was no significant variation in this outcome across sectors.

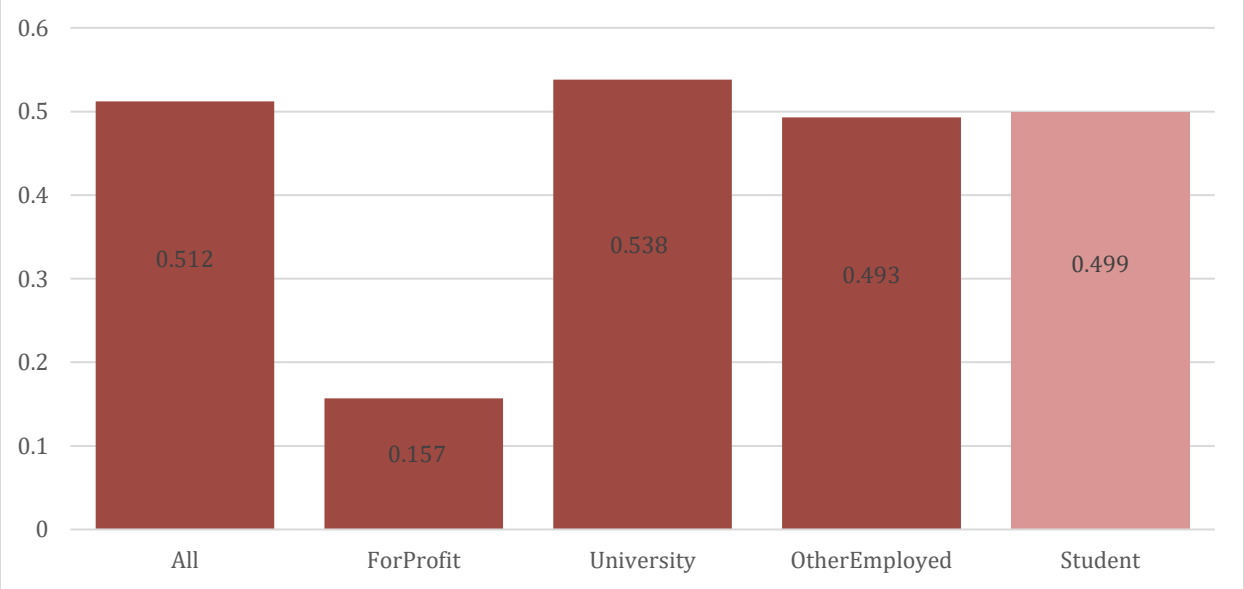
Figure 12 presents results on a question that asks whether respondents believe that people of color in their organization have to work harder than their white colleagues. Across all employment sectors, 31.9% of respondents agree that racial/ethnic minorities have to work harder than whites in their organization to be seen as competent professionals. As before, there was no significant variation across sectors.

Although LGBTQ status is not always able to be read off the body, as gender and race/ethnicity often are, workers still may witness differential treatment of out LGBTQ colleagues in their workplaces (Cech & Rothwell 2017). Figure 13 indicates that 10.4% of respondents report that LGBTQ persons in their work environment have to work harder than their non-LGBTQ colleagues to convince others of their competence. The variation in these outcomes across sectors were not found to be significant.

Note that these results are best understood *relationally:* to see which sectors have the strongest or weakest patterns of chilly climates. Estimates of bias in workplaces tend to underestimate levels of bias in organizations overall. Further, there weren't significant differences found between students and those employed in academia or the workforce, indicating that these issues are not relegated to only those in the workforce.

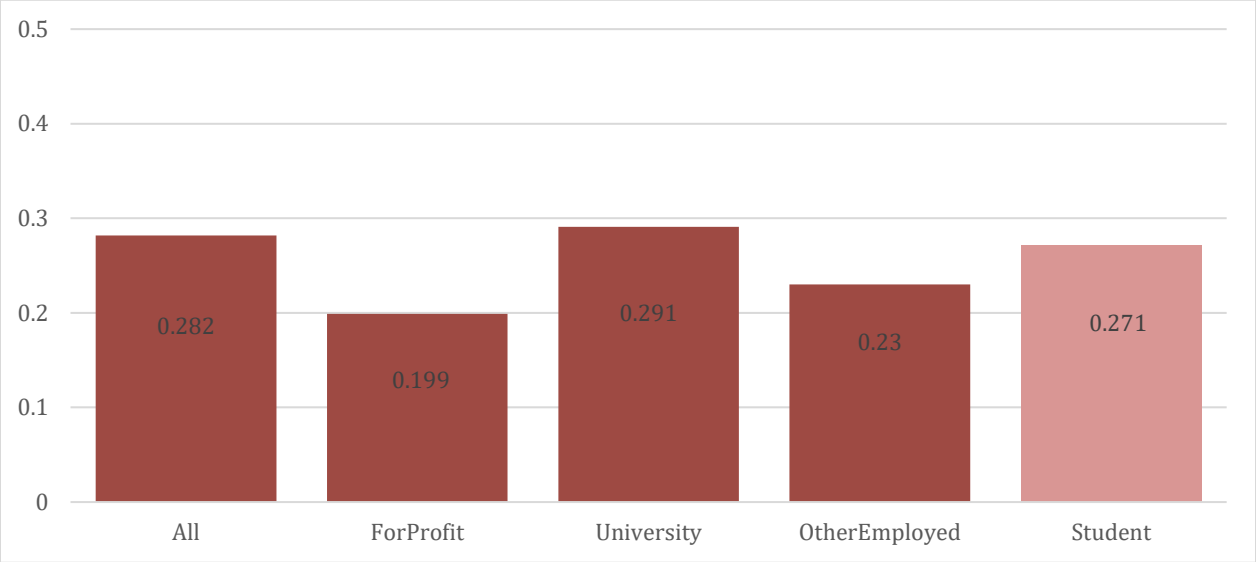
Figures 14-17 below present the proportion of respondents in each employment sector who report having personally witnessed people in their workplace being treated differently based on their demographic category.

## Fig 14: Proportion of respondents by sector who reported witnessing person(s) being treated differently due to gender in last three years.



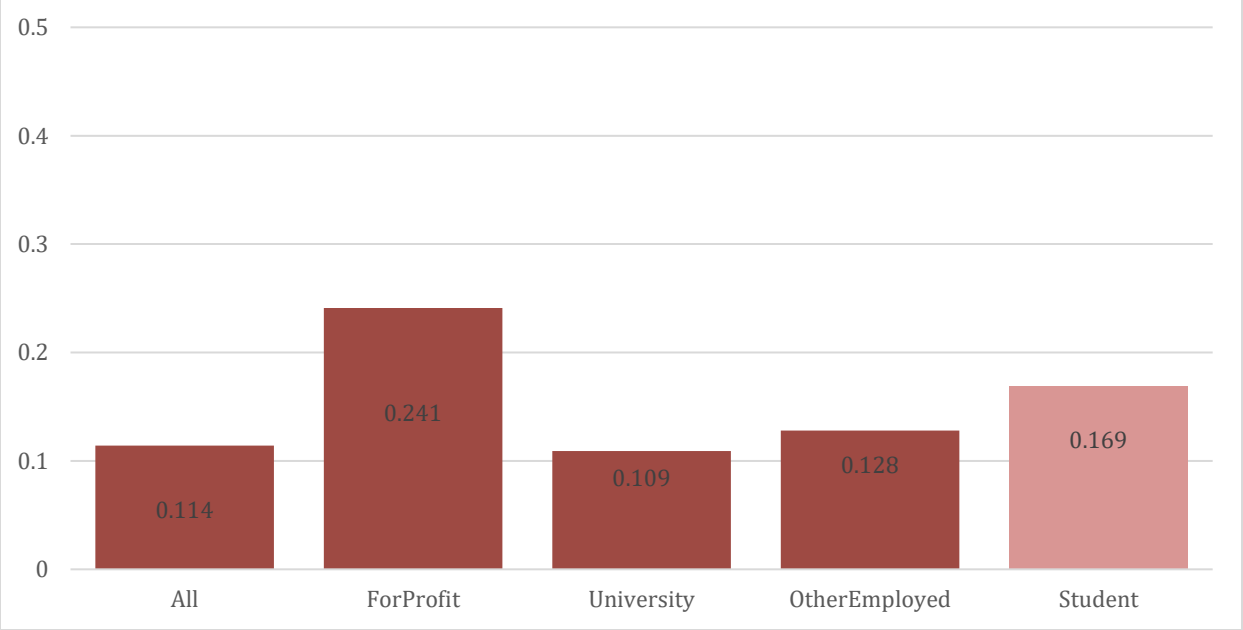

***Predicted Probabilities of employed respondents (darker bars), and students (lighter bar), by sector.*** *(proportion who agree, between 0 and 1)*

## Fig 15: Proportion of respondents by sector who reported witnessing person(s) being treated differently due to race/ethnicity in last three years.



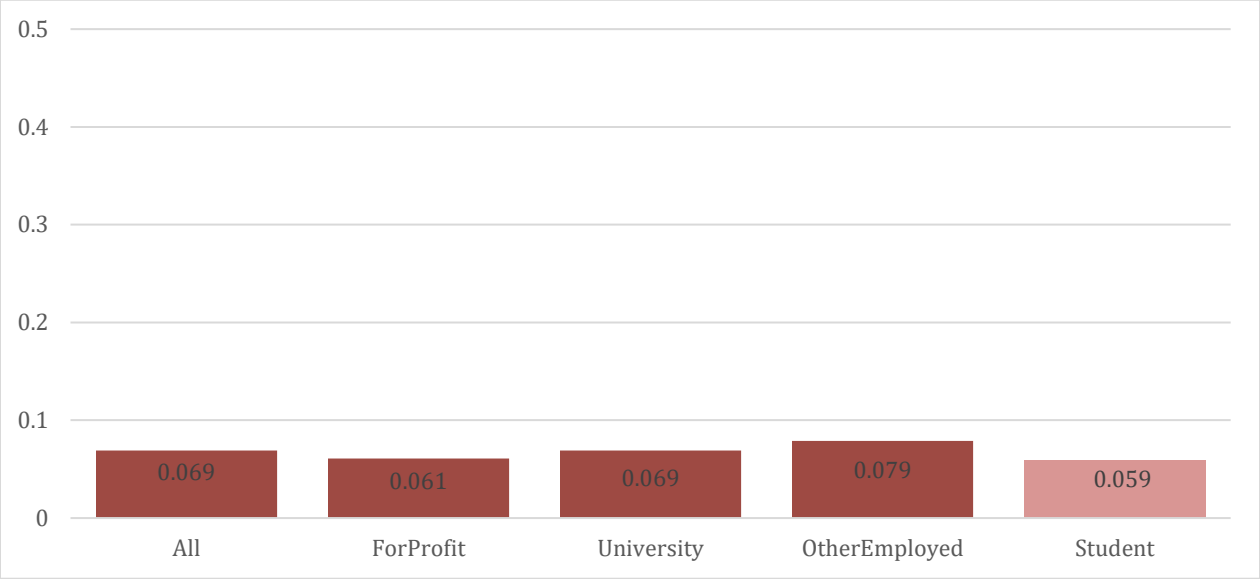

***Predicted Probabilities of employed respondents (darker bars), and students (lighter bar), by sector.*** *(proportion who agree, between 0 and 1)*

## Fig 16: Proportion of respondents by sector who reported witnessing person(s) being treated differently due to LGBTQ status in last three years.




***Predicted Probabilities of employed respondents (darker bars), and students (lighter bar), by sector.*** *(proportion who agree, between 0 and 1).*

## Fig 17: Proportion of respondents by sector who reported witnessing person(s) being treated differently due to disability status in last three years.




***Predicted Probabilities of employed respondents (darker bars), and students (lighter bar), by sector.*** *(proportion who agree, between 0 and 1)*

As with the previous set, Figures 14-17 present the proportion of respondents in each employment sector who report that they have observed women (Fig. 14), racial/ethnic minorities (Fig. 15), LGBTQ persons (Fig. 16) and persons with disabilities (Fig. 17) being treated differently in their workplace on the basis of these statuses. Significance levels would indicate statistically significant differences between respondents in the university/college sector versus individuals in other sectors, as determined by logistic regression models; see footnote 5 for more details (***p<.001, **p<.01, *p<.05, †p<.10, two-tailed test). However, none of these sectors differed significantly from one another on these measures.

Figure 14 depicts the frequency with which respondents reported that they observed a person or persons being treated differently in their workplace on the basis of gender in the last three years. Among all employment sectors, 51.2% of all respondents report witnessing instances where someone was treated differently on the basis of gender in their organization in the last three years. 53.8% of respondents working in higher education reported witnessing differential treatment by gender in the last three years. When compared to those employed in higher education, fewer respondents employed in the for-profit sector (15.7%) reported observing a person being treated differently due to their gender identity, but this difference was not statistically significant. Note that these employment sector differences are net of variation by demographic categories of respondents (gender, race/ethnicity, etc.).

The next figure (Fig. 15) presents the frequency with which respondents have observed differential treatment on the basis of race/ethnicity in their workplaces. Among respondents in all workplace sectors, 28.2% reported observing at least one instance of race-based differential treatment in the last three years. There are no significant differences by sector.

Figure 16 depicts the proportion of respondents who reported observing differential treatment in their workplace on the basis of LGBTQ status. As before (possibly due to the frequent invisibility of LGBTQ status), a comparatively low proportion of respondents reported observing LGBTQ-based differential treatment. However, 11.4% overall reported observing an instance of this form of bias in the last three years.

Finally, Figure 17 presents the proportion of respondents who reported that they observed differential treatment on the basis of disability status. Among respondents across all employment sectors, 6.9% reported viewing an instance of disability-based differential treatment in the last 3 years. Results on these measures were fairly consistent, with no significant differences across sector. Once again, reports from students tended to reflect the same patterns reported by those in the workforce.

As before, these results are best understood relationally—to see patterns of workplace unfairness across employment sectors. People typically under-report harassment and differential treatment in their organizations, so these should be taken as conservative estimates of the actual bias occurring in these sectors. To see how different demographic groups report on their own experience of bias, see Parts 1 and 2 above.

***Summary of patterns***

The models in this section demonstrated no significant sector differences. Nearly half of respondents (44.7%) agreed women in their workplaces had to work harder than men to convince colleagues of their competence. Similarly, roughly half (51.2%) reported witnessing an instance of someone being treated differently due to their gender identity. 36.1% of respondents agreed racial/ethnic minorities in their workplace must work harder than white colleagues to be viewed as competent, and 27.6% of respondents reported witnessing someone recently being treated different due to their race.

Further, 10.3% of respondents across all organizations agreed that LGBTQ individuals must work harder than non-LGBTQ individuals to convince colleagues of their competence. Lastly, 7.9% of those in all sectors reported recently witnessing someone being treated differently due to disability status.

## 4. Results from AWM-Specific Questions

Regarding the questions that are specific to the Association for Women in Mathematics members, we asked respondents what AWM programs they found most useful. The greatest number of respondents reported that the most useful program was the AWM travel grant (43%), followed by the AWM student chapter (34%), AWM workshops (31%), and AWM presence at various events (29%).

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### Figure 18: Respondents Views Towards AWM and AWM Programs

| Which current AWM programs do you find most valuable to you? (Select up to 5) | |
|---|---|
| AWM Travel Grants | 42.78% |
| AWM Student Chapter | 34.51% |
| AWM Workshops | 30.52% |
| AWM Presence at JMM, SIAM, Mathfest including the AWM Booth in the exhibit hall | 29.34% |
| AWM Named Lectures | 19.25% |
| AWM Prizes and Awards | 18.08% |
| AWM Research Symposia | 17.61% |
| AWM Mentoring Grants | 16.67% |
| AWM Mentor Network | 14.79% |
| AWM Poster Session | 8.45% |
| AWM Presence the USA Science & Engr Festival and the National Math Festival | 6.81% |
| AWM Fellows Program | 5.63% |
| AWM Advocacy and Hill Days | 5.4% |
| AWM Essay Contest | 5.16% |
| **How could AWM, AWM Programs, or the AWM Network better support you in your career? (Top 3 Themes Reported)*** | |
| 1. Offer more network and mentoring opportunities (especially for students and junior faculty). | |
| 2. Offer more funding opportunities to help support collaboration and to help with the cost of attending professional conferences. | |
| 3. Bring in more speakers. Specifically, promote female speakers at AWM-related events. | |

*** For the full list of responses, see Appendix 1.**

Respondents were also asked about the ways in which AWM could better support them in their current career. The three most frequent responses offered were: (A) providing more networking and mentoring opportunities, especially for graduate students and junior faculty, (B) more funding opportunities for student collaboration and conference attendance, (C) bringing in more female speakers at AWM events.

# SUMMARY OF FINDINGS

The results from this survey point to both positive and negative aspects of diversity and inclusion as experienced by members of this professional organization. First, personal experiences of harassment in general are relatively low, and respondents across demographic groups generally felt their work is respected by their colleagues and that their supervisors treated them with respect. Respondents on average generally did not believe their boss gave them less credit than they deserve, nor that they have to work harder than others to be given the same professional recognition. Most respondents in this organization did not report high levels of LGBTQ bias via workplace unfairness in their organizations (although it is not clear whether this is due to the lack of visibility of LGBTQ status vis a vis other demographic characteristics like gender and race/ethnicity). Lastly, the majority of respondents did not observe instances of workplace unfairness toward persons with disabilities. While these general trends suggest that members of this organization tend to have positive experiences in their workplaces, these patterns differed substantially across demographic category.

The survey results pointed to several concerning trends regarding the marginalization and professional valuation of under-represented groups. Women respondents in this organization with disabilities had significantly more negative experiences on a host of measures than women without disabilities. Significant patterns were also found by LGBTQ status, where LGBTQ-identifying women more frequently experienced marginalization and professional devaluation across a handful of measures.

Some significant racial/ethnic differences also emerged. Asian women in particular were significantly more likely than white women to report that their competency and value was questioned in their workplace experience professional devaluation and marginalization. This was also the case that black women were less likely than white women to report that they "fit in" with other people at their workplace.

Finally, a notably high proportion of respondents across employment sectors reported systematic biases in their workplaces and reported witnessing differential treatment in their organizations in the last three years. 45.8% of respondents reported that women in their organizations must work harder than men to be viewed as competent and 36.1% of respondents believe the same for people of color. 50% of individuals overall reported personally witnessing people being treated differently due to their gender, and 27.6% of reported people being treated differently because of their racial/ethnic minority status. The fact that these measures of unfairness in the workplace vary little by sector suggests that these are problems dealt with by persons across the membership of this organization in general, not just those employed in particular sectors.

Broadly speaking, results from this study highlight both areas that are encouraging and areas that require further consideration. These results indicate crucial considerations regarding the satisfaction and retention of talented women, persons with disabilities, LGBTQ individuals and racial/ethnic minorities, in STEM, as both workplace climate and experiences of discrimination have an impact on organization members' satisfaction, and subsequent retention in STEM.

## Suggestions for Moving Forward

The results reviewed above point to three key areas of intervention that the organization should consider:

**1.**

**Racial/ethnic minority women report more negative work experiences compared to white women. Feelings of marginalization and experiences of exclusion are significantly more common among these respondents.** The organization should consider ways it can help foster inclusion for women of color, as well as having open dialog about the ways that the STEM expertise of women and people of color are undermined in members' workplaces.

**2.**
**Disability status was a significant factor in many marginalization and devaluation measures.** Disability status is rarely considered and discussed within the context of inclusion and diversity in STEM related professional organizations. However, nearly 20% of members of this organization report some kind of disability, whether physical or mental, and those who do frequently report more negative workplace experiences. The organization should consider initiatives and programming that might allow persons with disabilities to articulate the ways that this organization could better provide support and promote their interests.

**3.**
**LGBTQ-identifying women respondents in this organization were also more likely to experience marginalization and exclusion than their non-LGBTQ peers.** While LGBTQ identity may be less visible, members of this organization identifying as LGBTQ were significantly more likely than non-LGBTQ respondents to report a chilly climate. A few STEM professional organizations have begun to consider LGBTQ inclusion issues alongside other axes of disadvantage; these results indicate that dialog and efforts addressing anti-LGBTQ bias in this field are much needed.

## Recommendations

Given the unique entity of the professional organization and its reach, our recommendations for STEM diversity and inclusion initiatives within AWM may also be applicable for AWM members to utilize within their own workplaces.

Our recommendations for the Association for Women in Mathematics include:

- Regular dialog with constituencies of disadvantaged groups (e.g., through focus groups and panels) to identify ongoing issues and ways the organization could provide support through programming, networking, and policy change.
- Regular 'climate surveys' measuring factors such as marginalization, inclusion and professional (de)valuation.
- Increase the number of AWM employees and leaders who are persons with disabilities, LGBTQ persons, and people of color—in all categories, from administrative to professional.
- Recommend dual/multi membership and other partnerships with minority-centered STEM professional organizations.
- Partner with companies and organizations that offer employment opportunities for mathematics teachers of minority status.
- Consider—or provide greater support for—minority-group-focused caucuses within the organization which can serve as information and networking hubs.
- Bring in more women speakers of color at AWM-sponsored and related events.
- Integrate diversity and inclusion programming into current conferences (e.g, the expansion of the current new faculty or employee training to involve a seminar on macroaggressions in workplaces; adding an implicit bias workshop into a leadership/management training; sponsoring workshops about supporting underrepresented students in STEM majors).
- Create and continue programming at AWM conferences regarding disability etiquette, hidden illnesses, work habits, and accommodations testing.
- Ensure that the diversity represented in the organization is reflected in the choice of keynote and plenary speakers at regional and national conferences.
- Create an AWM scholarship fund specifically to help advance the education and careers of women, persons with disabilities, LGBTQ individuals, and people of color.
- Spotlight individuals in mathematics (e.g., a website feature) who are addressing issues of

marginalization and exclusion within the field.

- Ensure all organization websites and emails are fully ADA compliant and compatible with accessibility plug-ins.
- Video-record and close-caption significant keynote addresses at AWM conferences and make them available online for those who are unable to attend.
- Expand the Diversity section of the AWM website and work to make it a more highlighted section of the site (e.g, on the navigation bar).
    - Consider adding information, Q&As, and resources regarding disability etiquette, gender identity etiquette, and so forth, accessible to all who visit the AWM website.
    - Consider featuring articles, stories, and interviews regarding the underrepresentation of women of color in mathematics and STEM as a whole.
    - Consider adding a retention and recruitment section on the website listing advice and current research on supporting women and people of color in STEM education (geared toward those in academia teaching minority students).
- Share and publicize AWM's diversity goals to increase accountability.
- Develop a diversity, equity, and inclusion (DEI) 'seed fund' for AWM members to establish DEI initiatives in their workplace.
- Collaborate with a diversity-centered consulting firm to receive further recommendations, learn hiring practices to combat inequity, and create other methods of increasing membership diversity.

Note that the findings here cannot reveal all patterns of marginalization that may pertain to groups experiencing multiple forms of marginalization simultaneously. Further work in the STEM Inclusion Study that aggregates survey responses from multiple professional associations will provide further analysis on these intersections.

This organization's participation in the STEM Inclusion Study is an important signal of its willingness to consider and confront diversity and inclusion issues among its membership. Inequality in STEM is an intractable problem that has no silver bullet solution. It will take deliberate and sustained effort to help move the needle in this and other STEM-related professional organizations.

| Inclusion and Marginalization Questions | |
|---|---|
| *(a) Insensitive Comments* | I have read, heard and/or seen insensitive comments in my workplace that I found offensive. (mean = 2.22) |
| *(b) I Fit In* | Overall, I feel I 'fit in' with the other people in my workplace. (mean = 3.89) |
| *(c) Noticeable Mistakes* | I worry that my mistakes are more noticeable than the mistakes of others. (mean = 2.67) |
| *(d) Chilly Climate* | How often does the following happen at work: (1) A co-worker makes a negative comment or joke about women, (2) A co-worker makes a negative comment or joke about racial/ethnic minorities, (3) A co-worker makes a negative comment or joke about LGBTQ people, (4) A co-worker makes a negative comment or joke about people with disabilities. (mean = 1.38) |
| *(e) Harassed* | In the last 12 months, I was harassed verbally or in writing on the job. (mean = 1.18) |
| **Professional (De)valuation Questions** | |
| *(a) Same Standard* | I am held to the same standard as others for promotion or advancement. (mean = 2.87) |
| *(b) Less Credit* | My boss gives me less credit than I deserve. (mean = 2.32) |
| *(c) Work Harder* | I have to work harder than my colleagues to be perceived as a legitimate professional. (mean = 2.49) |
| *(d) Supervisor Respect* | My supervisor treats me with respect. (mean = 4.2) |
| *(e) Respect Work* | In my workplace, my work is respected. (mean = 4.2) |
| **Workplace Fairness Questions** | |
| *(a) Women Work Harder* | Generally speaking, women in my workplace must work harder than men to convince colleagues of their competence. (mean = .267) |
| *(b) LGBTQ Work Harder* | Generally speaking, LGBTQ individuals in my workplace must work harder than non-LGBTQ individuals to convince colleagues of their competence. (mean = .061) |
| *(c) REM Work Harder* | Generally speaking, racial/ethnic minority individuals in my workplace must work harder than non-minority individuals to convince colleagues of their competence. (mean = .173) |
| *(d) Harassed Race* | Overall, in the last 3 years, have you ever observed a person or persons being treated differently in your workplace due to any of the following characteristics? Race or ethnicity. (mean = .151) |
| *(e) Harassed Gender* | Overall, in the last 3 years, have you ever observed a person or persons being treated differently in your workplace due to any of the following characteristics? Gender. (mean = .278) |
| *(f) Harassed LGBTQ* | Overall, in the last 3 years, have you ever observed a person or persons being treated differently in your workplace due to any of the following characteristics? Sexual Identity. (mean = .038) |
| *(g) Harassed Disability* | Overall, in the last 3 years, have you ever observed a person or persons being treated differently in your workplace due to any of the following characteristics? Disability. (mean = .053) |

In the "Inclusion and Marginalization" questions, the variables *InsensitiveComments*, *Harassed*, and *ChillyClimate* were all coded on a 1-3 scale, with 1=Never, 2=At least once in the past year, and 3= At least once a month or more.

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## Appendix 1: Answer to AWM Question: "How could the AWM, AWM Programs, or the AWM network better support you in your career?"

- We have an AWM chapter at my university. It provides me with a support group, and a space to discuss challenges I've faced as a woman in math. I don't think AWM could do anything better, although I think our AWM chapter would improve if we had more women in the department at every level (graduate students, postdocs and faculty).
- I would like to get a Masters Degree in Mathematics, not just in Math Education. But there does not seem to be a program I could join that would allow me to keep teaching while getting my Masters. AWM could highlight professional development opportunities for teachers looking for more rigorous math training.
- Women who are AWM members and contribute dues but are not part of the inner circle are not supported by the AWM in bodies making specific career decisions. You have to be insider to get individual vocal support and this support comes regardless of lack of relevant achievement. The AWM needs to make efforts to include women who have not built their Mathematical career on AWM membership.
- AWM, though intended to be international, is quite US centered which makes some initiatives less relevant for non-Americans and/or makes non-Americans non-eligible for some programs (e.g. partner initiatives with NSF). See more partnerships with professional and funding agencies in other countries, at least within North America.
- Advocate with state and federal government for better funding for colleges and universities and for high standards in teacher education. We are directly seeing harm from the current political climate. We cannot attract future teachers to our education programs; standards are being lowered, and we fear the consequences for children in school and for society. Our budget has been cut repeatedly, with increasingly noticeable results for our programs and our students.
- Would like a serious mentor - not one for namesake
- It could be easier to get funding to bring in external speakers in the AWM network, so far I have had to look internally at my university for funding.
- Not sure. I do feel AWM does support me in some way.
- It would be good if the AWM had more funds to support research collaborations and attendance at professional conferences. The AWM could also help to promote more equity in professional publications (more female editors, double-blind review processes).
- The AWM has been an absolutely amazing source of support for me from the start of my career: from advice about job hunts and obtaining tenure to providing support networks where women can discuss harassment and bias. I am now a full professor at a research university and can give the AWM credit for being part of this achievement. It seems now men are more vocally sexist again as they were when I was younger, and we are going to need to step back up and help young women more again.
- Leadership development workshops, opportunities, Implicit Bias training , Legal resources Mentoring at every stage of career
- AWM provides me opportunities to network with other professionals in the field and also provides potential funding for young professionals like me who can not get enough funding through my own institution.
- Find friends and encourage each other.
- I strongly approve of the AWM's current programs, and would be happy to be made aware of any opportunities to get involved further. I/we should be supporting them.
- As an older PhD graduate student, it was difficult to feel that I fit the model of students that were eligible for AWM programs, so this question is probably not applicable to my situation.
- Perhaps sharing some experience.

- More resources (such as sending out relevant internship opportunities) to undergraduate students
- Advocacy  Grants
- Mentor or local gatherings
- The AWM should clarify its position in regards to transgender and non-binary mathematicians.
- Keep raising awareness of the fact that many conferences do not find female speakers
- Have more networking and mentoring opportunities available at the regional level, not just at national meetings.  Lead frank discussions about workplace issues such as harassment, overwork and undervaluing women's contributions to the profession, navigating multiple identities, etc.
- Undergraduate conferences
- Maybe put a log-in portal on your website?
- I wish the mentoring program had an option for more junior faculty to have a more senior mentor.  I don't think it would be necessary for the mentoring to be as intensive as the ones for students, but it would be really helpful to have this kind of support system, especially from a senior researcher in a field different from my own.
- AWM has been great to help my career. I can't think of much beyond what they do other than perhaps collaborate with AWIS and other groups more.
- More travel funding opportunities for people at smaller institutions or more rural regions
- Get me a job where women are valued?
- The support is aimed primarily at young career individuals but the eligibility is dependent on the time since degree, which is becoming longer.
- More mentoring and networking opportunities.
- More networking events, and more internships or jobs opportunities.
- More opportunities for mid-career women to reconnect with their research agenda.  Pushing for childcare at conferences/meetings.
- I was assigned a mentor through AWM, and I reached out as a mentee but never received any response. Yet, I am not sure who I should tell that my mentor never responded, and I don't want it to reflect poorly upon them.
- I don't know. I'm so overwhelmed, I have no idea how to get the support I need or even what that would look like.  Maybe helping me see what other career opportunities exist?
- Leadership culture at many universities needs improvement.
- I've been to a couple of the AWM syposia. I generally don't like going to women-centric conferences or events because they usually leave me with a funny feeling that the material there wasn't quite "good enough" for a normal conference. However, the AWM symposia didn't feel like this at all - they felt like any other normal math conference, except that the math was better than average for the conferences I've been to, and I somehow felt more involved and more confident in myself than I usually do at conferences. Please make sure you keep having these, and that you keep the quality high!
- The AWM focuses a lot on R1 schools that have plenty of funding. It would be helpful if they could broaden the focus to be more inclusive of people at other types of institutions.
- Mentorship of women helps them and stay in academic jobs.  Attending workshops like WAMB last April was a life changing experience that has dramatically helped me see what good mentorship looks like and provided major support for me in my research endeavors.
- I have no suggestions for AWM, I feel it's an excellent organization.
- Provide more conference/networking opportunities specifically designed for women who are in industry jobs.
- I am lucky to have a graduate coordinator who is very aware and passionate about the issues women in math face. I am not sure exactly how this could be done by AWM, but I think that encouraging faculty members, especially people in positions of power, to care about promoting women in math goes a long way.
- Tips on cultivating an effective classroom presence.

- Curate an easily accessible resource collection of research related to implicit bias, measures of gender inequity, and effective remedies to increase equity.
- Being a part of AWM provides me the opportunity to develop lasting connections and form lasting friendships with peers who share the same interests as I do. I can get to know many good mentors and gain valuable insight that's relevant to my field of study.
- The AWM could offer more programs for people in adjunct positions, especially since a greater percentage of women in academia are adjuncts. In particular I know of *no* programs for helping adjuncts continue their research or improve their teaching as there are for professors at institutions that are more teaching focused.
- AWM is great. I'd love more applied math at AWM events, though I know it's there.
- AWM seems to care most about women who have a PhD (a carryover form academia and playing into a male-dominated system). Plenty of women who work in a math field may not have a PhD, and it is still valuable to get them to a position of influence in their field, so that they can positively drive change across the board for females, creating more role models, etc etc.
- Suggest sources of resource materials to make mathematics more relevant to groups that are not well represented in stem. Share more methods that have been found to reach more women and minorities.
- I'd love to see more interaction with AMATYC, not just a both at their conferences.
- I'd like to see seminars on evaluation process and the biases - particularly free webinars for administrative deans/evaluation committee members. I'd also like to see a focus on some intersectionality of being a woman AND a person of color or a mother or etc... I'd also like to see awards that value outreach/taking on leadership positions/research on diversity in maAdvocate for the work of addressing inequality and improving diversity to be RECOGNIZED more broadly. Not just specific awards but as a general measure of a persons contributions to Mathematics. This would include teaching hiring and promotion committees. Help us send the message that this work matters and should be rated as important. Some committees see this work as a throw-away line on a CV when it is actually very time and energy consuming thematics that aren't necessarily the same as doing "mathematical" research.
- In the universities of Greece, the gender discrimination or diversity issues are not taken so "seriously" or technically as in some other countries. To be more correct, it is out of topic here since the universities are more homogenous here as most of the students are Greeks. But still, I as a foreigner and as a woman here, have not experienced any serious discriminations.
- I think they're doing great already! My student chapter of AWM holds great events and professional development seminars.
- Honestly, I am unaware of most of the programs that AWM is currently doing to support me in my career/workplace. That could definitely be my own fault, the fault of my chapter, or the fault of the organization or some combination. It would be great to have some kind of networking capability through AWM. I'm on the job market right now, and it would be great to be able to take advantage of something like that. This seems like something really basic, though, so maybe it already exists, and I just don't know about it?
- Offer training or skills on how to deal with workplace conflicts
- Promote achievements of other women in mathematics to make sure we are visible. AWM does a good job of this.
- It's hard to find internships for math related fields, if there was a way to help find those things that would be helpful.
- Stay relatable! Continue to have speakers who are relatable not who come off as celebrities or someone unreachable. I would like to see the running list of available speakers updated again. It looks like there used to be a very nice running spreadsheet of women who were willing to speak at student chapter events, including the locations they were willing to visit, but this is no longer up to date.

- More opportunities to speak with like minded people and women going through similar career paths
- Network building or collaborative workshops are very useful! Organize more follow up activities such as meetings (regional or national), reunions, conferences.
- Mentoring during mid-late postdoc phase; perhaps establishing a peer network of women in this career phase or early career phase.
- professional opportunities that are in my specific field (not just women mentoring women.... although that is sometimes helpful the focus is too much on these types of narrow interactions.... they don't translate into field specific advancement)
- Mentornship, fellowship
- -Funding traveling for professional development activities -Funding traveling to conference where women can promote their research -Convincing academic institutions that husband's of women in the same field should be giving a part time position to support their family -Daycare facilities on campuses of partial help for postdocs and PhD students so they can work longer hours
- More regional meetings to promote diversity in research.
- More resources for AWM student group faculty advisors. More of a discussion about 'promoting each other's accomplishments' and a 'network of mentors'. A discussion based on 'Every other Thursday' would also be useful.
- Create more programs on soft skills and networking strategies from writing letters layout to 30 second elevator pitches.
- Fund some gatherings of women/femmes in my department
- The AWM could make a better effort to support women mathematicians at all levels, instead of women at the top.
- I think more could be done to continue to provide support networks to women and other under-represented folks, but I'm not really sure how to do that...
- As a president of an AWM student chapter, I think AWM is great and I am thankful for everything they do!
- Clearer mentorship paths would be helpful for some of the women in our chapter.
- I can't think of specific ways in which AWM could help me in my primary place of employment.
- At least, AWM can be a platform for me to establish a research collaboration with scientists from other countries
- More work around racial and ethnic diversity More acceptance of nontraditional paths to success
- By organizing more and more often women in mathematics-workshops.
- More small travel grants to visit collaborators.
- It would be nice to have programs specifically for mid-career, senior researchers, regardless of other sources of support
- Hard to say! I think one thing I absolutely love is having a trusted "partner" (not romantic) with whom I regularly discuss professional issues. This was something I started with a friend at another university, and has been extremely valuable to me. It's not a mentorship -- we are on equal footing -- but a lot of mentorship is going on. We give each other regular advice and feedback about handling any number of situations, and the honesty with which we can have these conversations have really helped me focus on what's important to me. I wonder if AWM might consider a pairing program by which semi-senior women could be paired to have conversations once every two weeks or whatever they like. (Maybe best if it's women who do research in different fields), but allowing these people compare notes, give each other "reality checks" and also perspective on all sorts of daily/monthly/yearly professional issues. I have no idea how well this would work with a random assignment, but I thought I would share about something that has benefited me personally in the past two years.
- It would be great to see AWM expand its reach outside the USA, with joint meetings, award ceremonies and named lectureships.

- We have a sexual harassment problem and a retaliation problem against people who raise these issues.
- I'm pretty happy with the opportunities and programs available from the AWM.
- Holding workshops about how to deal with a bully at work.
- Tips for dealing with day-to-day situations, like someone commenting on your clothing in the workplace.
- I think AWM is doing a good job, broadly. I wish the student I mentioned had had a AWM mentor, or had gone to a supportive summer program just before her grad school.
- Travel funding to conferences, workshops for everyone (including me) on creating an inclusive environment
- AWM poster sessions - not only for recent graduates
- More funding support for graduate students, postdocs and earlier career researchers
- Provide mid career opportunities.
- Supporting more women in ways that increase their population among research mathematicians will likely make the whole community saner and more empathetic. It may be too late for me, but it will be good for those coming later.
- Even more mentoring/support type programs and more help/support for young researchers.
- 1. How to handle stress and difficult co-workers. 2. Support groups for promotion to full professor. I was involved in programs such as Project NExT both nationally and regionally and valued the program 100%. They helped me earn tenure. I wish there was a group that assisted in the next step: Associate professor to full professor, especially for women. Maybe there is and I'm unaware of it. In that case, maybe more advertisement on the support is needed. Thank you for the survey:)
- I think women and women's organizations should talk about the consequences of intersectionality. As a women of color I have had much more difficulty dealing with white women than I have with men of any race. I find that men of all races and colors have been more likely to promote me than have white women. I find white women frequently wanting to indirectly let me know that they are "better" than me in all respects. As women struggle to find equality, it is important that they not do so at the expense of other women. This needs to be talked about more and given more serious thought.
- Provide more opportunities for Undergraduate students.
- I'm a man. I don't think AWM *should* support me except insofar as it could help me better help achieve gender equality in math.
- Disseminate results of this survey!
- Provide mid-level and senior level workshops for women. Travel and funding opportunities seem harder to come by (and are thus more competitive) the more senior one gets in their career. There are many more funding opportunities for new faculty and PhDs. Workshops on how to move into new research topics or move into administration would be useful.
- Personally, I find AWM's mission of trying to support 'women in math,' ranging from grade school girls to research mathematicians at top departments, too diffuse. I have thought that I would most benefit from more opportunities to interact with women like me, that is who have or are trying to achieve success at the level to which I aspire. To illustrate the problem, I have two female colleagues at similar rank. I have two young children and they each have one. However, the childcare arrangements in their households are clearly unevenly split, whereas in mine it is not. Hence, their careers are proceeding at a measurably slower pace, and there is little common ground for beneficial (or even just enjoyable) interactions.
- Connecting people in non academic jobs with academics
- Allow for more international participants to be funded in opportunities, i.e., remove the stipulation that the researcher must be based at a US institution
- I think the programs for AWM are already an excellent resource.
- The AWM research symposiums are fantastic opportunities for sharing research and networking, and we need to keep them going! At the AWM research symposium I attended most recently, I was really

struck by how there was a very different vibe compared to most (very male-dominated) conferences I attend. It was so much easier to network with people--colleagues made an effort to introduce me to new people, groups were inclusive, and it was easy to talk with others.

- Funding for research and summer salary Student chapters are great! But, somehow the students seem to think faculty aren't really members. That wasn't how I envisioned it. I thought it was more of an AWM chapter than a "student only chapter"
- Help those that review articles or grants to understand implicit bias before evaluating.
- By somehow doing more to encourage departments to care about diversity. Perhaps by publishing a list of departments with a demonstrated commitment to diversity? Or by facilitating diversity-related grants?