Intersectional approaches to counter harassment and discrimination in geophysics

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Summary

Despite decades of efforts to improve gender equity in Geophysics, women remain underrepresented in the profession. Increasing the number of women in Geophysics requires addressing the experiences of women already working in the field, and those in training for a career in this area. Intersectionality is a theoretical framework drawn from Black feminist scholarship that offers a useful lens through which to examine the current circumstances for women in Geophysics and to envision different future conditions. A review of ongoing efforts to reduce sexual harassment and gender-based discrimination in the Geosciences broadly complements this exploration of women's experiences in Geophysics.

Introduction: Women in the Geosciences

Estimates based on data collected by the U.S. National Science Foundation suggest that women constitute less than 20% of the professional geosciences community. Holmes, O'Connell, Frey & Ongley (2003) conducted a detailed review of the degrees awarded in the geosciences between 1990 and 2000 and documented inequities for women. Specifically, they found that "hiring of women into specific subdisciplines has not kept pace with their Ph.D. production over time" (Holmes et al., 2003, p. 458) and that geophysics was one of these subdisciplines with a notable disparity in the representation of women. The SEG Wiki Biographies database also includes a "Women in geoscience" subsection designed to highlight the contributions of women to the field. Of the 200 biographies included on the page, only 56 are women (SEG Wiki). A 2016 report from the American Geosciences Institute indicated that the percentage of Bachelor's and Master's degrees awarded to women has remained fairly flat, at about 40%, over the last decade (Keane, 2017). Approximately 45% of doctoral degrees in the geosciences were awarded to women in 2016 (Keane, 2017), but the number of women holding advanced positions in the field has yet to increase to reflect these numbers—an SEG report, in fact, documented that since its inception, only 5.7% of the organization's elected leaders have been women (Capello, Pellerin, & Bakamjian, 2015). This is concerning in light of findings by Sprunt, Ali, Schneider and MacQueen (2017) who found that students and faculty who worked in departments with female chairs experienced more positive gender relationships in the workplace. Despite some progress, gender equity in the geosciences remains an elusive goal.

Theory: Intersectionality

The concept of "intersectionality" is frequently attributed to legal scholar Kimberlé Crenshaw, whose article Mapping the margins: intersectionality, identity politics, and violence against women of color, published in 1991, demonstrated how experiencing multiple forms of social oppression simultaneously (i.e. racism and sexism, and classism) impact women of color disproportionately. Being socially categorized as a member of more than one marginalized group compounds women of color's experiences of discrimination, demonstrating how privilege and oppression are not equally distributed (Crenshaw, 1991). The work of other women scholars of color, including bell hooks, the Combahee River Collective, Gloria Anzaldúa, and Patricia Hill Collins have also contributed to the development of intersectionality as a framework for study and a field of research. In a 2015 exploration of how the concept of intersectionality has been expanded, defined, and even misappropriated in the last few decades, Collins (2015) traced its roots through theories of racial identity construction and formation, hegemony, and cultural practices that maintain oppression. In Collins' (2015) words, "intersectionality can be conceptualized as an overarching knowledge project whose changing contours grow from and respond to social formations of complex social inequalities" (p. 5). This definition reminds those of us interested in promoting equity in various spaces to reflect on how categories of identity—including gender and race—are socially constructed and acquire different meanings over time.

The application of an historical lens is essential to understanding challenges to diversifying fields like the geosciences, because the current practices of institutions such as higher education are inextricably rooted in centuries of institutionalized discrimination. In their review of the experiences of undergraduate women of color in STEM, Ong, Wright, Espinosa and Orfield (2011) sought to counter a stereotype that women and people of color are underrepresented in these fields due to lack of interest of capability. Rather, through their examination of the "double bind" faced by women of color, they demonstrated that sexism and racism are powerful forces both outside of and within the academy, and reinforce practices that can (even unintentionally) exclude people from STEM spaces.

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Collins (2015) has also described how intersectionality can be employed specifically to examine violence as a social problem, rather than identifying specific incidents between individuals. This conceptualization is highly useful for efforts to understand the experiences of women in science, and in developing strategies to counter gender-based harassment and discrimination. Intersectionality has gained increasing attention in STEM fields and was even used as the theme for the annual meeting of the Association for Women in Science (AWIS) in 2017.

Expanding Understandings of Women's Experiences in Geosciences

Applying intersectionality as a lens to further examine the experiences of women in the geosciences requires acknowledging the severe underrepresentation of people of color of all genders in the field, as well as examining the impact of other factors of identity that are typically marginalized in STEM workplaces; these include disability status, income background, nationality, and ethnicity. In 2016, fewer than 10% of geoscience graduates in the U.S. (of all genders, at all degree levels) identified as African American, Hispanic/Latino, Native American/Alaskan, or Native Hawaiian/Pacific Islander (Wilson, 2017). A 2014 survey by the Royal Astronomical Society, which aimed to capture data about diversity in the astronomy and geophysics community, found that in comparison to demographics of the U.K. as a whole, RAS membership was significantly less diverse in terms of gender representation, disability status, and ethnic origin (Massey, 2015). Wilson (2017) also noted the lack of socioeconomic diversity in the geosciences; using parental degree attainment as a proxy, an analysis of recent graduates found that a majority reported having parents with postsecondary degrees.

Women in the geosciences whose identities include other factors that are not acknowledged or supported face additional challenges in pursuing a productive and successful scientific career. In a study of women in astronomy and planetary science, Clancy, Lee, Rodgers and Richey (2017) found that women of color experienced significantly higher rates of harassment and assault and were more likely to report generally negative workplace experiences. Furthermore, even less attention has been paid to gender identity and expression in the workplace, creating circumstances in which people of all genders can be excluded from professional opportunity. A broad social conflation of gender with sexuality also leads to misunderstandings that can marginalize non-heterosexual identified people in their work and study.

Intersectionality provides a way to more closely examine how women with different identities have different experiences, and suggests that efforts aimed at increasing the number of women in geophysics must be more attuned to these nuances. Most importantly, intersectionality requires structures and systems to change to support women with diverse identities; programs that only target individual behaviors or supports are not in keeping with an intersectional lens.

Harassment and Bullying in STEM workplaces

Reports of egregious conduct and ongoing sexual harassment and gender discrimination across multiple professions and workplaces are frequent in mainstream journalism and media. STEM fields are no exception, with recent high-profile cases reported in prominent science outlets of senior male researchers engaging in decades-long misconduct to the detriment of women who worked with them as students or colleagues. Clancy, Nelson, Rutherford, and Hinde (2014) documented that the scientific trainee period is one of particular vulnerability; in their study, 71% of women reported experiencing harassment and 26% experienced assault while in the field as a trainee, with most perpetrators holding a supervisory role or other form of hierarchical power. Other research has shown that early socialization experiences in STEM fields reinforce masculine norms (Dryburgh, 1999), tend to emphasize technical expertise over interpersonal skills (Seron, Silbey, Cech & Rubineau, 2016), and encourage deference to authority figures, who tend to be men (Clark & Corcoran, 1986; Chesler & Chesler, 2002). Faulkner (2000) has suggested that socialization processes in STEM encourage individuals who work in these fields to separate their professional identities from their other social identities. The development of these habits often coincides with early career induction experiences, including lab and field research. In fields like geophysics, where field work is often an important aspect of development of new scientists and an essential part of ongoing work, attending to the ways that different individuals are vulnerable in remote locations is key. Sprunt et al. (2017) found that although men and women students reported similar comfort with the physical demands of field work, women were only half as likely to feel comfortable asking for a break or a slow-down when needed, and were more likely to report lack of toilet facilities as a challenge. Encouraging new women geophysicists to consider themselves as whole individuals, rather than compartmentalize their professional and personal identities, can have important benefits

for both psychological and physical well-being.

Although efforts to combat sexual harassment are commonplace in most academic and corporate workplaces, and anti-discrimination clauses are required by law in many countries, social science research suggests that most current approaches are ineffective in developing inclusive climates. Kearney, Rochlen and King (2004) found that one training program increased men's ability to recognize behavior as harassment, but did not impact their tolerance of such behaviors in the workplace, while previous research by Bingham and Scherer (2001) demonstrated that men who participated in an anti-harassment program were more likely to blame victims who reported such treatment. A recent content analysis of the material used in commonly implemented anti-harassment trainings have changed little since the early 1990s, and typically do little to present these efforts of part of larger ethical commitments in the workplace (Tippett, 2018). Other research also suggests that subtle discriminatory behaviors may contribute equally to negative workplace climates as overt forms (Jones, Peddie, Gilrane, King & Gray, 2013).

Harassment Prevention as Part of Developing Inclusive Workplaces and Professional Societies

SEG has an anti-harassment policy that is posted on the organization's website, and which uses language that acknowledges gender diversity and other characteristics that can be the target of unwanted attention, and that connects inclusive environments to high quality science. The wording of this statement is certainly a step in the right direction; but as the research explored in the previous section has documented, more explicit education of society memberships and interventions in other spaces beyond professional meetings are needed to help policies like this succeed. One strategy is to cultivate an understanding that engaging in harassment or discriminatory behavior is a violation of scientific and research ethics, not just a breach of professional interpersonal norms and expectations. In its development of a new scientific integrity policy and code of conduct in 2012, The American Geophysical Union identified a set of key values to guide its activities and future goals; this list included "diversity of backgrounds, scientific ideas, and approaches," "equality and inclusiveness," "an active role in educating and nurturing the next generation of scientists," and "unselfish cooperation in research" (McPhaden, 2018). Undergraduate and graduate research training programs and close interaction with mentors have been shown to be important factors in encouraging students from underrepresented groups to remain in the geosciences field (Baber, Pifer, Colbeck & Furman, 2010). Ensuring that these experiences are guided by such ethical commitments are important steps toward developing positive, inclusive workplaces for the next generation of geophysics professionals. AGU's official statement on Harassment, Bullying, and Discrimination now acknowledges that these behaviors impact the production of scientific knowledge, not just the experiences of scientists who are targeted; in part, the statement reads "discrimination, harassment (in any form), and bullying create a hostile environment that reduces the quality, integrity, and pace of the advancement of science by marginalizing individuals and communities. It also damages productivity and career advancement, and prevents the healthy exchange of ideas" (American Geophysical Union, 2017).

How to respond when harassment does occur is another challenge for geophysicists. The reporting procedures required for victims of harassment or discrimination also often pose an undue burden to individuals who may have experienced a trauma or who remain in regular contact with their harasser due to professional obligations. Despite SEG's inclusive anti-harassment language and clear definition of what does and does not constitute harassment, the directives for reporting an incident require a targeted individual to confront an offender directly, record specific details of an incident, gather witness statements, and submit an official letter of complaint with their signature and identifying information. These types of reporting strategies discourage victims of harassment from filing complaints for fear of retaliation by senior colleagues, supervisors, or other influential figures in their field. This is another reason that bystander intervention programs have increasingly been seen as more effective in protecting potential targets of harassment; further, such programs expand the understanding of who is responsible for preventing such actions to a broader community. Rather than placing the burden of action and reporting on the victim of abuse or discrimination, bystander intervention is based on a collective approach to building social and workplace climates in which all members are aware of their own behaviors and take on the responsibility of protecting and advocating for others.

Ashburn-Nardo, Morris and Goodwin (2008) suggested that programs that directly confront behaviors rooted in prejudice are more likely to have positive results. Trainings that begin with identifying and addressing implicit bias, defined as judgments or behaviors that result from subtle or even subconscious cognitive processes, therefore offer important starting points to address

discrimination and harassment. Support for the need to address implicit bias comes from research that has found that bystanders' racial and gender identities impact the likelihood and manner in which they will respond on behalf of targets of harassment (Dickter & Newton, 2013; Katze, Merrilees, Hoxmeier & Motisi, 2017).

The ongoing ADVANCEGeo project is in development with the contributions of an interdisciplinary team of geoscientists and researchers committed to diversifying STEM fields. Supported by an NSF grant, our goals are to:

1) Develop and test harassment bystander intervention training with geoscience-relevant scenarios and that incorporate intersectionality
2) Develop teaching modules that identify harassment as research misconduct
3) Disseminate products via partnership with professional societies
4) Develop a sustainable mode that can be transferred to other disciplines.

This project recognizes the crucial role played by professional organizations, such as SEG, in the ongoing socialization and support of all geoscience professionals.

Conclusions: Envisioning the Future

Supporting the future of the geophysics profession involves embedding an understanding that preventing harassment and discrimination is part of being a good scientist. Intersectionality provides a useful framework by which all members of the geophysics community can imagine themselves as advocates for one another. Rather than relying on oversimplified understandings of identity categories, individuals can utilize their varied forms of privilege to intervene in both subtle and explicit ways to promote inclusivity—in ways that go beyond men advocating for women (although this remains an essential responsibility, particularly on the part of senior scientists who are influential in hiring and promotion decisions). For example, White geophysicists can do more to acknowledge their racial privilege and commit to creating spaces for people of color in their workplaces, able-bodied students can commit to supporting their peers with disabilities, and cisgender men and women can work to disrupt limited understandings of gender presentation that marginalize transgender and non-binary individuals. Most importantly, scientists must come to understand personal identity as inherently connected to scientific practice and productivity, rather than as an afterthought or distraction. The field of geophysics stands to benefit greatly from an expanded understanding of who belongs to the community, and to welcoming more people to be part of it.

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