






ANNUAL MEETING

Surviving Racism and Sexism in Academia: Sharing Experiences, Insights, and Perspectives

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Introduction

It is widely acknowledged that gender bias is pervasive in all levels of academia, affecting all women regardless of social identity (Llorens et al. 2021). Despite many resources invested into diversifying the workforce in ecology, little has changed in terms of retention of underrepresented minorities

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(URM; Miriti 2020, Cheng et al. 2021). This is especially true for groups at the intersection of different identities, such as women of color or indigenous women. The bottleneck for retention in academia seems to be the lack of minority representation at the higher ranks: increasing the diversity of incoming students without diversifying the faculty body limits URM students' sense of belonging and their ability to envision themselves pursuing successful careers in Ecology (Miriti 2020, Cheng et al. 2021, Berhe et al. 2022). Unless we fix the institutional discrimination against faculty of color and/or underrepresented backgrounds, especially women, lift the barriers for their recruitment, retention and advancement, and recognize and reward the extra efforts they devote to Diversity, Equity, and Inclusion (DEI) initiatives, there is little hope for improving diversity in the sciences. If we are not able to make this improvement, we also forfeit the benefits that come with it, such as the surge in creativity and innovation through diverse and multicultural perspectives (Freeman and Huang 2014), and an improved, more humane climate within departments. Motivated by the need to rectify this problem, we organized a symposium (Symposium 4, held at the 2021 ESA Annual Meeting), to which we invited women ecologists at different stages of their careers to share their knowledge, experiences, and perspectives on how impactful change can be made to promote women of color, and URM in general, in the academic workforce. The presentations by these scientists highlighted how training students to do research can be used for institutional assessment and for detecting bias, how academia can be transformed into a progressive lighthouse to inspire society, how it is essential to give a voice to URM scientists who have been wronged and to capitalize on the power of personal (counter) narratives, and how to educate URM on protecting themselves from micro- and macro-aggressions in their workplace.

Research on gender bias as a mentoring tool: Spreading awareness to the next generation of ecologists
(Speaker Ana M. C. Santos)

Research on gender bias in ecology and biogeography can be used as a tool for mentoring young scientists. In her talk, Ana Santos from the Universidad Autónoma de Madrid presented research on inequality, which she developed with four students. These student projects illustrated how and why awareness on gender bias should not only be raised among publishing agencies, university authorities, or funding agencies, but also among the students themselves as they represent the future of science and academia.

The first student project Ana presented was conducted by Lara Rio Moreno, who collected data from an international biogeography journal and found that the majority of first and last authors were male. She also analyzed these trends through time and found that the number of papers published by both males and females are increasing but less so for female authors. Ana then described the findings of a second student, Sheyla Pindado Sanz-Cruzado, who studied how researchers perceive the impact of maternity and paternity on research careers in Spain (Sanz-Cruzado et al. 2021). She found that researchers tend to view both maternity and paternity as detrimental to scientific careers, but particularly so for women's careers. She also found that women shoulder most of the child care duties compared to men. The third project, by Bárbara Borgio Royo, was on gender balance in Universities in Spain, Finland, and the United Kingdom (UK). She found that the universities in the UK had the lowest percentage of women working, and that this was particularly true at the highly ranked institution she was a student of. The average percentage of women staff was particularly low among full professors of the three countries. The fourth student, Erika Barahona Muzo, studied gender

balance in journal editorial boards in Ecology. She found that while the majority of the editors were men, the percentage of women editors increased with the journal's impact factor.

Collectively, the four studies clearly show that gender bias in academia is pervasive at different levels, from authorship to the composition of editorial boards, and contingent on the job position. Research on gender balance in academia is important, she continues, not only to understand the magnitude of the imbalance and its pervasiveness, but also as an important tool for mentoring students and bringing awareness to future generations. Ana's future directions include bringing more examples of research performed by women into the classroom and also fostering students to organize seminars focused on women in ecology.

Surviving racism and sexism in academia: experiences and insights (Speaker Priyanga Amarasekare)

In her talk, Priyanga Amarasekare from the University of California, Los Angeles, described herself as a woman with brown skin, an immigrant from a third-world country, and a single mother. She is also in a field, Mathematical Biology, in which women are underrepresented and women of color are rare, especially at the senior level. She has the lived experience of multiple overlapping identities, and the interdependent systems of discrimination and disadvantage that such identities entail. These experiences have given her the determination to help others navigate bias and make changes to prevent future bias. To do so, she has devised a three-step process: (1) identify the bias, (2) protect oneself from it, and (3) strive to make a change.

1. Identifying bias

Identifying bias can be complicated because it can be difficult to distinguish from constructive criticism. However, Priyanga's advice is to look for recurring patterns. Identifying bias is a comparative process where one must establish unequal treatment based on gender, race, ethnicity, sexual orientation, etc. For instance: Are male students receiving more attention and guidance, more time to talk in meetings or more consistent praise? Are they getting better career advice and better recommendation letters?

2. Protecting oneself

Learning how to *respond* and not to *react* is key. Reactions are immediate and based on emotions rather than reason. Those who react often do not consider long-term impacts of words or actions, which can harm them in the end. Responses, in contrast, come more slowly and are more rational than emotional. They evaluate long-term effects and the desired outcome. They allow one to identify the problem, assess the damage, and then formulate a plan of action. Learning about others' experiences is another way to protect oneself, which can be done by reading narratives by female and minority scholars such as news stories, journal articles, and institutional reports on biases.

It is crucial to formulate a plan of action to protect oneself. First, document the incident immediately by writing it down. This forces one to think carefully of what happened, what it means, and what to do next. The biggest challenge in establishing bias is the lack of independent corroboration. So, it is important to email the narrative to yourself or a trusted friend or mentor. It is a big mistake not to share these narratives because not sharing can lead to "They said, I said" scenarios. Finally, think about the desired outcome. Obviously, one would like the bias to stop,

but it is also important to think about alternative outcomes. Reporting the bias and requesting redress may not always be possible if it is too traumatic or if there is too little evidence, as cases of abuse are often dismissed due to insufficient evidence. Not taking action, on the other hand, could mean living with the consequences: past experiences can lead to posttraumatic stress, and ongoing bias can lead to stress and anxiety. Either scenario means significant costs to the victim in terms of time, energy, and emotional trauma. Thus, it is important to safeguard one's mental and physical health. To do so, Priyanga recommends keeping a journal, seeking therapy or counseling, mindfulness, or pursuing any activities that bring one joy. Again, reading about the experiences of others and learning about the actions they have taken to safeguard their mental, physical, and emotional health can be helpful. But, the most important thing of all, Priyanga says, is to excel at your work: "Your greatest victory will be to prove your detractors wrong!"

3. Making change

One person can do relatively little, but there is strength in numbers. Documentation of multiple incidents may help establish recurrent patterns and may lead to collective action. This can begin by contacting institutional resources such as equity advisors, campus counseling and psychological services, or discrimination prevention offices. Change comes slowly, but every little bit of effort counts and these little efforts help empower oneself and heal wounds. Priyanga says to remember that you are not alone: "It is a collective struggle: others have been there before, and others will be there after you."

Acts of survival: working to change the unacceptable disparities in ecological participation
(Speaker Maria Miriti)

Maria Miriti, from The Ohio State University, discussed the importance of educating and advocating for inclusivity in science, technology, engineering, and math (STEM). Her first key point was the need to recognize that scientific contributions are not independent of identity. We frequently disregard cultural and societal influences on scientific practice. However, culture has a major influence on whose work is recognized and what scientific questions are worth pursuing. Acknowledging cultural influences on ecological knowledge in teaching will help to recognize the many ways in which our understanding of nature is biased, and how such biases limit student retention in ecology and environmental disciplines. For instance, disregarding color means disregarding racialized experiences, which leads to continued discrimination. Race matters, and even though everyone may have to suffer micro-aggressions, the outcomes are quite distinct, most strongly in response to race. Furthermore, these outcomes are exacerbated by a rewards system. Teaching, research, and service are the metrics of hiring and promotion, with research productivity being the most valued. Black faculty, however, are two and a half times more likely to report stress due to micro-aggressions, which negatively impacts their research productivity. Studies also show that racial minorities in STEM, especially women of color, have their research and service undervalued and suffer greater disrespect from students compared to their white colleagues. One activity that is important for developing effective interventions for Black scholars, in particular Black women, is to listen to and account for personal stories as storytelling, which can reveal elements of departmental climates that are difficult to capture in quantitative studies. This highlights the urgent participation of everyone, not just the marginalized, to find effective interventions to eliminate disparities and support diverse participation.

From fieldwork in rural communities to bioinformatics in Mexico City and back to the field: Lessons for women in ecology (Speaker Alicia Mastretta-Yanes)

Currently, a PI with the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Alicia's presentation examined gender roles and stereotypes during three distinct periods of her academic journey: as a student, a teacher, and a principal investigator. First, she detailed her social service project as a student in rural communities where the majority of landowners were male. Next, she discussed her experience in teaching and working toward preventing stereotypes, after completing her Ph.D. Finally, she spoke of her current role as the PI of a transdisciplinary research program in forest management, which involves very few women. As an undergraduate student attending the Universidad Nacional Autónoma de México (UNAM), Alicia was required to perform community service related to her area of study while taking a natural resources course. The objective was to help to incentivize alternatives for cattle raising in low-income rural communities to avoid deforestation. The course's students were mostly women from Mexico City, so one of their main challenges was interacting with the predominantly male landowners. The students were trying to implement payment for environmental services in exchange for the protection of forest remnants, but landlords were reluctant to work with the students. Their professor, Julia Carabias, had to intervene and speak with the landowners; she insisted that if they wanted to participate in the program they would need to work with her female students. The landowners eventually acquiesced and as a result of this collaboration, ecotourism businesses belonging to the community were also implemented as an alternative to cattle raising. An unexpected result was that, after witnessing Alicia and her colleagues' efforts, women from the community began taking a more active role in directive positions within their lands, changing the local gender dynamics. After receiving her Ph.D., Alicia started teaching a course on bioinformatics for ecology and evolution for graduate students back in Mexico City. The challenge with teaching her course was the stereotype that computer programming is a male prerogative. To combat this false narrative, she started her class by showing data from surveys answered by current and past students demonstrating that both women and men attending the course started programming on a similar level, and reached similar skills at the end. She also asked students to read on the history of bioinformatics and programming, showcasing successful women programmers and how the male programmer stereotype arose. Since she started teaching this course in 2015, she has found no statistical difference in the performance of female and male students. Currently, Alicia is a PI on a transdisciplinary project on the forest surrounding Mexico City that is degraded by fire and pollution. Her research aims to use natural variation from the trees for the restoration of the forests while involving women in forest conservation. Her approach to combating sexism in the classroom, in academia, and in the field is following the same steps we take to do our research: (1) take the problem seriously, (2) read copiously about it, (3) collaborate with experts on the subject, (4) think outside the box, (5) try, fail, and repeat until succeeding, and (6) share experiences broadly.

Further experiences shared during the live discussion—motherhood and the lack of safe spaces

Sustaining motherhood and careers in profoundly masculinized science sectors still constitutes a huge challenge for women. This was one of the points most strongly emphasized by the speakers during our live discussion. In fact, it has been shown that parenthood disproportionately impacts women's careers in STEM: female researchers dedicate more time toward parenting than their male counterparts, especially when the children are young (Sanz-Cruzado et al. 2021), causing 43% of

new mothers to leave full-time STEM employment, compared to 23% of new fathers (Cech and Blair-Loy 2019). The unequal parenting burden at home only adds to the many academic disadvantages faced by women in the workplace, including unclear institutional maternity policies, nonextension of contracts, and the lack of maternity friendly work arrangements (Eren 2022). Such a strenuous obstacle course demonstrates how unfeasible it is for new mothers to sustain full-time careers in STEM. This struggle for existence in academia is obviously exacerbated for single or widowed mothers, who for that reason should have a protected status instead of being marginalized, as is often the case. Moreover, the COVID-19 pandemic has exacerbated the problem: Editors of several journals noted a decline in the number of papers submitted by women compared to a 50% increase in submissions by men (Caruzo et al. 2020, MacArthur et al. 2020). Considering that most women become mothers during their working lives, STEM fields must do more to retain women with children and those considering motherhood. In other words, women should not have to choose between their families and their careers. Initiatives which support paid leave, flexible work hours, reduced class loads in academia, grant pausing, and no-cost grant extension during maternity leave are necessary to increase inclusivity and diversity in science and the retention of trained and experienced women in these male-dominated professions in STEM (Guatimosim 2020).

Another challenge that women face in male-majority institutions is the fear of speaking up against discrimination. This results from the perception that the institution will not change, or that retaliation will occur; retaliation that can end a career (Rolison 2000). Although changes tend to happen slowly, institutional policy initiatives can be created to develop opportunities for women to voice concerns. These policies need to be publicly prominent, clear, and practical to amend this fear. Such policies include acknowledging the critical contributions of women, providing the freedom to openly speak up against discrimination, and establishing effective means of protecting those who speak up from retaliation. Institutions can also create affinity groups where women can feel comfortable communicating their issues in a safe environment and gain a support system. The issues raised in these groups can then be brought up to the managers by the heads of each affinity group for managers to get involved and address the concerns that women are facing in their workplaces (Gaines 2017). These solutions can ultimately foster a community of representation and support for women to speak up against discrimination.

Lessons learned and moving forward

The main goal of our symposium was to discuss the purported advances made by academic institutions toward solving one of our age's most pressing issues: the reparation and inclusion of groups historically marginalized by scientific communities, especially women of color. All of our speakers' testimonies reflect that, although many institutions are increasingly concerned about diversity, equity, and inclusion, underrepresented minorities (URM) still struggle with insurmountable obstacles to pursue their careers in ecology, especially women of color. Even though our speakers had different racial and cultural backgrounds and were at different stages of their careers, there were common themes in all of their experiences. They all emphasized that groups that are at the intersection of multiple overlapping identities are particularly vulnerable, with these overlapping identities leading to multiple interactive effects on the way they experience and react to pressure and aggression in the workplace. Moreover, during the symposium's live discussion session, our speakers highlighted the impact of maternity on the progression of their scientific careers as well as the importance of sharing experiences broadly, teaching students how to navigate hostile departmental environments, and

leading by example with the dual goal of protecting oneself from bias and working toward eradicating it in the foreseeable future. There is still a long way to go to achieve greater inclusion of URM in academia, but our speakers have presented a set of brilliant and creative paths forward. These insights provide an invaluable guide not only to survive and navigate a gender- and racial-biased world in the short term, but also to transform it in the long run. At the same time, we cannot emphasize strongly enough that the scientific community as a whole should be responsible for protecting URM and strive for an equal workplace, as opposed to relegating the burden to the already overstrained victims of abuse and discrimination.

Little progress in promoting diversity, equity, and inclusion can be made without first accounting for the multiplicative effects of overlapping identities. Gender bias impacts all women, but especially those whose gender intersects with other identities that are often discriminated against, such as race and ethnicity, socioeconomic status, religion, gender expression, gender identity, sexual orientation, or disabilities (Armstrong and Jovanovic 2015, Guatimosim 2020, Llorens et al. 2021). Effectively tackling these issues of intersectionality requires both structural and cultural change. Academic journals, for example, need to pay attention to potential sources of gender bias in order to be able to identify ways to mitigate them. One way to improve accountability and transparency is to make demographic information regarding authors and reviewers publicly available. Some journals are publicly releasing statements in support of diversity in authors, citations, and/or referees. For example, Cell Press is encouraging authors to evaluate their citation list biases, as well as to ensure diversity in their research participants, authors, and collaborators (Sweet 2021). Initiatives like these might help researchers to think about their own biases.

Institutions that can see DEI initiatives as a long-term investment, instead of a cost, have much to gain. In science, gender diversity can drive discovery and innovation through diversity in research teams, methods, and questions (Nielsen et al. 2018). On the other hand, discrimination in the workplace can lead to low productivity and affect self-esteem and morale (Newman 2014, Nielsen et al. 2018). Traumatic experiences can begin in the undergraduate stage (Settles et al. 2016) and will compound throughout a woman's career. Women in STEM doctoral programs, for example, have to experience aggressive communication, dismissive treatment, and micro-aggressions in their daily interactions with members of their departments (Cabay et al. 2018). The experiences of our speakers highlight the fact that mistreatment of women continues after graduate school and throughout their entire careers. As a result, there is increased burnout and psychological damage of female researchers (Pascoe and Richman 2009, Hall et al. 2015). Gender equality in STEM has the potential to lead to gains at the social and economic levels (Shannon et al. 2019), but the lack of safe environments for women causes a great waste of human potential. Moreover, as new generations become increasingly aware and concerned about discrimination issues, institutions that insist in turning the blind eye on the matter will fatally lose significance and be obfuscated by the ones that champion DEI causes.

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