What Can Be Done?

Potential Solutions to Ameliorating Social Identity Threat for Women Scientists

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Although it is not a new question, how to address the varied issues faced by women in the sciences is still relevant. Indeed, progress has been made as the number of women earning doctorates in engineering and sciences has been on the incline for nearly half of a century (Malveaux, 2005). While the majority of women scientists are concentrated in the social and life sciences, women scientists in the STEM (Science, Technology, Engineering, and Mathematics) fields are proportionally fewer in number in academia representing approximately 31% of academics, and just approaching 12% in physical sciences and engineering, the number steadily decreasing for women in leadership positions (National Science Board, 2010; National Science Foundation, 2013). This marked advancement is not yet complete in terms of demonstrating women’s rightful place in academic science. As recently as January of 2005, Larry Summers, the then-president of Harvard University, provoked a firestorm of opposition from and on behalf of women scientists, a mark of progress in and of itself. In his remarks at the National Bureau of Economic Research (NBER) Conference on Diversifying the Science & Engineering Workforce, Summers ironically and carefully suggested that though the underrepresentation of women in science is due to many factors, innate ability could be one of them:

*“It is after all not the case that the role of women in science is the only example of a group that is significantly underrepresented in an important activity and whose underrepresentation contributes to a shortage of role models for others who are considering being in that group…It does appear that on many, many different human attributes-height, weight, propensity for criminality, overall IQ, mathematical ability, scientific ability-there is relatively clear evidence that whatever the difference in means-which can be debated-there is a difference in the standard deviation, and variability of a male and a female population. And that is true with respect to attributes that are and are not plausibly, culturally determined.”*

This instance is evidence of a persistent, negative stereotype against which women scientists contend that suggests that they are not as capable as their male counterparts of achieving in the sciences. Negative stereotypes, in turn, lower performance via the phenomenon of stereotype threat, reinforcing this cycle of perception (Steele & Aronson, 1995). Identification with one’s domain, i.e. to be a scientist, only increases the likelihood of experiencing this threat (Spencer, Steele, & Quinn, 1999). Stereotype threat has been documented in hundreds of lab studies (see Nguyen & Ryan, 2008 for a review), but the investigation of long-term exposure to sustained stereotype threat is in its nascent stages (Block, Koch, Liberman, Merriweather, & Roberson, 2011). Women scientists are exemplary sources for exploration of what can be done to mitigate the effects of sustained threat because they have contended against this negative stereotype about their social identity for prolonged periods, as demonstrated by their existence as scientists, a domain in which they are likely to be in the demographic minority.

As dated as the question of gender disparities in science seems, recent research is retrograde, reinforcing old stereotypes of natural ability differences among genders (Ceci & Williams, 2011), while empirical testing is only beginning to be documented (Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012). Additionally, much research and popular press has focused on strategies women can employ on an individual basis to manage negative perceptions of their identity in professional settings (Roberts, 2005; Sandberg, 2013). This focus on what women can do, e.g. “lean in”, absolves organizations from instituting systemic change. Consequently, there has been less of a spotlight on the climate that creates chilly conditions for women scientists in academia and what can be done about it from an institutional perspective. As one of the Advance projects of the National Science Foundation, we conducted extensive interviews with women scientists from an elite research university in the northeast of the United States. The final question in the semi-structured interviews asked what could be done to ameliorate the stereotype threat that women scientists face. What emerged from this question – and is the focus of this paper - are potential solutions to lessen the threat at multiple levels: individual, group, institutional, and societal.

*Gender Stereotypes and Stereotype Threat*

In order to know how to ameliorate stereotype threat and its effects, it is important to first understand the conditions that promote the likelihood for stereotype threat to occur. Gender stereotypes result from gender schemas about inherent differences between men and women, in which men are thought of as independent and task-oriented, where as women are seen as nurturing and communal (Valian, 1999). While not necessarily negative, these schemas lead to the overrating of men and underrating of women and provide the grounds upon which gender bias against women occur. A global reality, gender schemas in Sweden also explain why women are judged as less scientifically-qualified as men (Wennerås & Wold, 1997). Gender schemas also account for men and women being differentially evaluated in terms of professional competence, particularly when evidence is subjective, such that women do not benefit from having the same qualifications as their male counterparts (Valian, 1999).

Bias and stereotyping are largely an unconscious processes, such that scientists of both genders were unaware of the tendency to rate women lab applicants lower in competence and hireability than male applicants, even though they reported liking the female applicant more (Moss-Racusin et al., 2012). One consistent negative stereotype is that women are simply not as adept at science or math as men, a stereotype which precedes women choosing to enter the sciences professionally. This claim is different from traditional views of gender discrimination because it is centered in the illusion of merit, in which gender differences in achievement can be objectively explained (Valian, 1999). Ceci and Williams (2011) insist that gender discrimination is an issue of the past that is draining present resources, citing biological differences in math ability on the basis of standardized test scores, thus reinforcing the vicious cycle. While not blatant discrimination, negative stereotypes, such as inherent differences and preferences among genders, negatively affect how women perform via stereotype threat, which further reinforces the negative stereotype that is perpetuated in research today, a veritable catch-22.

*Ameliorating Stereotype Threat*

Being in the demographic minority in a situation is one such contextual factor that leads to stereotype threat (Spencer et al., 1999; Block et al., 2011). In the domain of science, persistent gender disparities is consistently explained by women making different career choices than men (Ecklund, Lincoln, & Tansey, 2012). Ecklund et al. (2012) found that while women were more likely to cite discrimination for women’s differential discipline choices, men were most likely to attribute such differences to preference, with some offering a difference in natural ability as a plausible explanation. It is evident that stereotype threat is still a likely culprit in the sciences for women scientists. However, since stereotype threat is an intraindividual process, much about what we know about how to alleviate its effects is at the individual level, leaving the burden of implementing solutions at the feet of those threatened.

*Individual.* In addition to demonstration that stereotype threat lowers short-term task performance, researchers have also documented strategies for reducing the effect of stereotype threat in situations. As such, many of the solutions are at the individual level of implementation. These include reframing the task such that negative stereotypes are irrelevant (Steele & Aronson, 1995; Spencer et al., 1999), emphasizing an incremental view of ability (Dweck & Leggett, 1988), even specifically naming stereotype threat as a way to alleviate the fear and providing a way to attribute anxiety externally (Johns, Schmader, & Martens, 2008; Johns, Inzlict, & Schmader, 2008). Other research affirms that the use of self-affirmation (Martens, Johns, Greenberg, & Schimel, 2006) and providing role models (real or imagined) may also ameliorate the threat (McIntyre, Paulson, & Lord, 2003).

Individual-level strategies, however, have varying levels of effectiveness. Some attempt to fend off the stereotype (Block et al., 2011) through invigoration or increased effort on the task (Oswald & Harvey, 2000), which can be effective if the task is relatively simple and less so the more complex the task (Steele & Aronson, 1995), and if done long-term can adversely affect one’s health (James, LaCroix, Kleinbaum, & Strogatz, 1984). Others make internal attributions about lowered performance perhaps to deny the relevance of the negative stereotype (Block et al., 2011) and in order to regain a sense of control (Branscombe & Ellemers, 1998). Conversely, making external attributions can serve to protect one’s self-esteem (Crocker & Major, 1989) though doing so over long periods of time can invoke feelings of powerlessness over performance (Nussbaum & Steele, 2007).

*Group.* At the group-level of responding to stereotype threat exist the strategies that seek to engender resilience against the persistence of the negative stereotype, such as challenging the stereotype through educating others and holding them accountable for their stereotypes (Blocks et al., 2011; Roberts, 2005). Another group-level strategy is taking collective action against the factors that create the likelihood of stereotype threat to occur, such as increasing representative diversity (Block et al., 2011). Though these strategies can work to mitigate the group-level experience of stereotype threat, engaging in these activities can also detract away from the task-at-hand, thus also lowering objective task performance (Roberts, 2005). Moreover, being typecast as a trouble-maker can also have detrimental consequences on improving group standing, as well as gaining access to resources necessary to achieve equitable outcomes (Branscombe & Ellemers, 1998).

Block et al. (2011) identified the contextual factors at the individual and organizational levels that lead to the perception of stereotype threat. The cycle of responses to the perceived threat followed a similar pattern from individual-level strategies, e.g. fending off the stereotype or being discouraged to the stereotype, to group-level strategies of taking collective action and redefining what it means to be successful. In the long-term, group-level strategies are more effective than individual-level strategies of contending against stereotype threat. If solutions at the group-level are more effective than individual-level solutions, then how much more effective would institutional change be? Other than a few case studies, little is known about what to do about stereotype threat at the institutional level.

*Potential Solutions from Women in Science Literature*

There is little in the stereotype threat literature that addresses solutions at higher levels. In his cumulative book on stereotype threat, Claude Steele (2011) proffers potential solutions to this experience of existing negative stereotypes against a social identity, including ensuring a critical mass of representation. We turn to the literature on women in science to explore the effectiveness of such solutions that have been implemented. When the committee on women faculty was established at MIT (Massachusetts Institute of Technology) in 1996, the purpose was to study the status of women faculty. This opened the door for many researchers and other institutions to do the same, shedding light on the reality that women were not as supported or represented as men faculty were and the myth as to why that was the case. The solutions they proposed to the administration, laying out details for what could be done at the institutional level such as improving the status of and ensuring equity for senior women faculty through raising consciousness and intentionally seeking out women leaders, improving the professional lives of junior women faculty through the standardization of maternity and tenure policies, and increasing the overall number of women faculty and realistically addressing work-life balance have echoed over the years, (MIT, 1999). In the decade following the study, many of the recommendations were implemented, notably the increase in women faculty which increased from 30 to 52 in science, 16% of the science faculty (an increase of 6%); and from 32 to 60 women in engineering, or 19% of the engineering faculty, a 8% increase from 1999 (MIT, 2011).

In addition to the persistent dearth of women scientists proportionally, there is evidence that resources are also distributed unevenly among men and women scientists, such that women - who already constitute a minority in the STEM fields - are also given fewer resources. A seemingly simple solution, Valian (1999) discussed the reality of accumulative disadvantage for women who contend against the gender disparity in time, space, and resources necessary to conduct the research that affect progress in academia. Further, because women are also affected by the negative stereotypes of being seen as less-deserving of such resources, it is even more difficult for them to negotiate and advocate for themselves, resulting in another perceptual cycle. Ironically, women are often then cited as being the reason for the lack in their own advancement. In her popular - albeit controversial - book, Sheryl Sandberg (2013) reinforces this idea, as evidenced in its nomenclature, which is a call to women – not organizations – to “lean in.” While this approach to teach women how to gain access to they key information necessary for success, this reasoning further excuses institutions from making sure that women have equal access to such information (Valian, 1999).

The literature on women in science makes clear that there is a persistent gender gap in academic science. And though a range of remedies has been offered to narrow this gap, implicitly ranging from individual- to institutional-level strategies, it still exists. Negative stereotyping of social identities, and its effect on performance via stereotype threat, has been acknowledged as one source for the continued gender disparity. However, previous literature on women in science has not adequately used the framework of stereotype threat, which has only recently been extended to long-term exploration, in addressing the underlying mechanisms of why this question remains relevant. Through extensive interviews with women scientists about this social identity threat, we also explored potential solutions specifically with the frame of contending against negative stereotypes in mind.

Current Study

In discussions about stereotype threat and the gap that exists about long-term effects of living and working under persistent negative stereotypes against one’s identity, our research team was providentially presented with the opportunity to explore how women scientists cope with the reality of negative stereotypes against their social identities. Taking inspiration from the seminal MIT study on the status of women faculty in science and a book published by the National Academy of Sciences’ Committee, Maximizing the Potential of Women in Academic Sciences and Engineering (2006), we set out to further understand what solutions women offer to ameliorate the negative effects of social identity threat for present and future women scientists. We hypothesized that solutions offered would differ by career stage, with junior scientists – those with less exposure to being in the demographic minority at work – would focus on individual-level strategies, while senior women scientists, who would have more experiences working in a predominantly-male environment, would offer more institutional-levels of change.

Methods

Participants were recruited via an ADVANCE grant from the National Science Foundation. Data were collected through semi-structured interviews, as well as a demographic survey administered at the conclusion of the interviews. 26 women scientists employed at a top tier research university were randomly sampled both by specialization (biology, geology, engineering, and earth sciences) and by career stage (post-doc through full professor). 4 women were biologists, 5 were in climate, 8 in engineering, and 9 in earth sciences. 7 women were post docs (ranging in age from 28-46 years), 10 women were junior researchers/pre-tenure (ranging in age from 31-43 years), and 9 women were senior researchers/post-tenure (ranging in age from 41-51 years). It appears that our sample yielded women scientists who followed a traditional career and family trajectory.

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| --- | --- | --- | --- |
| Career Stage | Married/Living with partner | Have Children | American |
| Post doc (n=7) | 4 | 1 | 3 |
| Junior researcher/pre-tenure (n=10) | 5 | 2 | 3 |
| Senior researcher/post-tenure (n=9) | 8 | 8 | 5 |
| Total n=26 | 16 | 11 | 11 |

The interviewers consisted of 4 members of the research team (the present author and co-authors), 2 associate professors and 2 doctoral students. Interviewers were matched to interviewee to mirror career stage, such that the doctoral students were paired with post-docs and junior faculty, while the professors interviewed the more senior scientists. Interviews were conducted in person and lasted from 45 minutes to 2 hours. They were recorded with consent of the interviewee and transcribed by an outside agency and inserted into Nvivo for coding analysis.

The interviews explored whether women scientists perceive stereotype threat and at what point in their career or stage in life. We also explored the reactions and strategies for coping with the perceived threat and whether or not they changed over time or varied by career stage. For the present analysis, the focus is on the final question asked at the end of the interview, which was directly asked to 25 of the 26 women, “What would you like to see change to ameliorate this situation for women scientists in the future?” This question was coded by 2 of the interviewers of the research team who, after coding independently, would meet in person and correspond until consensus was reached. The coding scheme was developed through two levels of codes that filtered into higher-order themes. What emerged from the data were solutions at multiple levels of implementation. In order to determine how the levels of solutions offered were distributed by career stage, each coded solution was counted and summed for each of the women scientists who were post-docs, junior researchers/pre-tenure, and senior researchers/post-tenure.

Results

As expected, the solutions that the women scientists interviewed offered naturally filtered into multiple levels of analysis at the individual, group, and institutional levels, as seen in Table 1. Some women went further to discuss societal-level changes, so this next level of solutions was added. Figure 1 shows how the solutions offered differed by career stage. Contrary to our prediction, junior women were not more likely to offer individual-level solutions than other women at later career stages. However, all women – regardless of career stage – stressed institutional-level solutions above all other levels. Further, with the exception of the institutional-level in which one woman from each career stage stressed institutional-level solutions alone and one junior woman suggesting societal-level change only, most of the women offered solutions at multiple levels.

Individual-level Solutions

At the individual level, the three high-level codes were work-life balance (n=15), building confidence (n=8) and navigating the system (n=5). Work-life balance included balancing how to successfully have both a career and family, paying attention to how much you’re working in order to prevent burn out, and carving time out away from work, as one woman asserted*, “I try not to work at all during the weekends until Sunday evening.“* Work-life balance also includes balancing work with life outside of the family and doing other things besides work in order to maintain happiness, as one woman stated, *“It is nice to go hiking every now and then, you know, and do some exercise, and just hang out and do nothing, read a book…watch a movie.”*

Building confidence involves challenging oneself, developing presentation skills, increasing psychological safety, combatting irrational beliefs and educating oneself about the realities of stereotype threat so as to make external, rather than internal attributions, and not to take difficulties personally as one senior scientist admitted,

*“I think if we can change the way women feel about it* [the threat] *when it happens so that they don’t turn it back in on themselves…I just spent way too much of my time hating myself and just trying to analyze what I did wrong. And it makes no sense…”*

Navigating the system includes remaining visible, salary negotiation, and not overcommitting to academic service such as committees and reviews. One scientist relayed advice given to her from another woman scientist saying,

*“We are women. There are not that many…everybody says, ‘We need a woman on this committee.’ And so you actually get trapped into a lot more obligations of this kind than men do at the same stage. And at the same time you don’t have that much time for doing other kinds of research. And she says she gets so many review requests for proposals for papers and so on, she just says, ‘I just say yes to three times as many as I submit and beyond that I just say no.’ Which is probably fine because you just pick up the load that you put into the system.”*

Group-level Solutions

At the group-level, the high-level codes were social support (n=12), which includes positive role modeling and mentorship, and networking and building community within and outside of the science community (n=11). As one junior scientist noted concerning the effect of role-modeling and mentorship,

*“Say you’re going to university, and lots of your professors are actually women, then that will make you feel more motivated. It’s like, ‘Oh, if she can do it, why not me?’, in that kind of way. So, obviously the more women become professors, the more women may want to stay in science and carry on and all that.”*

This sentiment was echoed by both junior and more senior women scientists, with the senior scientists being cognizant of how they portray the difficulties faced by being a woman scientist so as not to scare the younger women away, saying *“hopefully we’re not giving them the negative picture…I think we are cautious of that.”*

In terms of building community and networking one scientist stressed to *“Definitely try to interact more, and interaction between female faculty and female students.”* And another woman stressed how necessary networking in terms of collaboration is, *“I think networking is fundamental. I mean, it's fundamental in science, and it's fundamental to survival in these types of institutions.”* Particularly networking, in the form of women’s meetings, between junior and senior women scientists have an impact on how younger scientists navigate the system and enact individual-level strategies. *“It was just nice to see all the experience that older women have made in the past,”* noted one scientist.

Institutional-level Solutions

Most notably, at the institutional-level, women scientists offered the most solutions. Figure 1 illustrates that women at each career-stage indicated institutional-level solutions above all other levels. Additionally, 25 of the women who were asked this question mentioned representation of women, including having women in leadership, increasing representation and retention. As one scientist illustrated how powerful more women in leadership positions would be and the adverse effects of not having representation,

*“I think we really need a lot more women in management, even at the director's level, even if it means creating just two director's posts tied to have that. And to have a woman who's actually gone through the system so that we can see that as a possibility. And at the moment it's like, you know, the directors offices are behind glass doors. And it's just like penetrating that glass door is just really hard.”*

In addition to women in leadership positions, having more women in general is a shared sentiment that would better the situation for all as one women affirmed, “*I think really the thing that has to change is the numbers. And whatever needs to be done to get the numbers—because once the numbers are different, it will happen. It* [Change] *will not happen without the numbers.”* And another pointed to evidence of the effectiveness at more equitable representation, *“So, here in [my] department, there are…maybe four or five women. And I talked to some of my colleagues there and it really changed the way faculty meetings are run and different discussions—there’s just different points of view.”*

One clear way to increase representation is to prevent attrition or increase retention, some women pointed at the pipeline as reasons to the low numbers in their fields, *“I think one thing would be how do we get women from graduate school to post-doc and post-doc to professors. I think that's one of the biggest challenges right now in academia for women, because I think a lot of women just are leaving …”*

Also at the institutional-level, women mentioned the need for resources (n=18), including training and programs such as Advance,

*“There’s so much work out there done on how women are perceived different in academia. And so, I don’t know why [as] a premier institution, why we can’t have someone come in and speak with us, or have some ongoing training for young professors to facilitate that. If [the university] really is serious about bringing in women and retaining them, then why not provide them with some extra resources?”*

Many women mentioned that clarifying the tenure process as a necessary solution (n=17),

*“I think the university could also do a lot more to make the system more objective. I know they can’t completely make it objective, but – and they won’t, they will never make tenure or promotion prescriptive. But they can at least ensure that people write down their opinions, and document them. And I think that does make people less likely to put opinions on paper that are not appropriate.”*

And another woman affirmed, *“make the tenure process more transparent and more automatic. I think that would be great.”*

In addition to improving the tenure process, almost half of the scientists also mentioned the need for flexible career options for both women and men (n=12),

*“In some ways I think our academic training programs maybe ought to prepare students in general, not just women, but men as well, for other options. We tend to think about just replacing ourselves and having people do what we do. And we think of that as being better than other options. It might be good to just disabuse themselves of those notions and think about other ways in which people can use their talents, that are also socially responsible, that are good for – I mean, there are lots of things that people can do.”*

Having flexible career options not only affects scientists, but can also be costly for institutions as well, as one woman pointed out,

*“I think it really has to do with recognition of the different avenues by which we get from the point A of being a young scientist to the point B of being a full professor or a senior research scientist, whatever that endpoint might be. And that the way in which institutions deal with accommodating our schedules and our lives in order to get to that point needs to change. They need to make it more flexible or more accommodating, or else they're training people, and it's very expensive to train people, and then losing them to god knows what alternative career. I think that is just a waste of resources. From purely economic point of view it's a waste of resources to do that.”*

The reality of gender bias and the need to combat that at the institutional level was a solution with which many women agreed (n=11), including equitable treatment between men and women, eradicating the need for preferential treatment, as one senior scientist lamented, *”I’d like where you could get past where you have to do special things for women. That’s what I’d like to see…if they have one opening, it’s going to end being a guy. We can only hire women if it’s a special deal. I’d like to see if we could change that.”*

Maternity and childcare benefits are relevant solutions to some women in the sample (n=9), for in the United States there exists no federal maternity leave. Therefore, there are no standard benefits that institutions offer to their employees. So one woman noted how she would like to see that addressed, *“I would like to see subsidized childcare. I mean, there is a source of subsidized childcare but it takes all of the salary of a senior scientist to pay for a child at the childcare [here]*.”

Finally, at the institutional-level, in addition to training and resources for women, a few of the scientists pointed out the men also would benefit from specific training,

*“I really wish that they made the male professors…maybe they could do it for everyone. But have sensitivity training. I really do, because they just seem not too sensitive sometimes. And when I say ‘sensitivity training,’ you know what I mean: training on how to work with different people.”*

Societal-level Solutions

Ultimately, some of the women scientists interviewed believe that the solution exists outside of the individual or institution and that change needs to occur at the societal level for it to be sustainable. Many scientists noted raising awareness as a necessary solution (n=10) as one aptly noted, *“I think we’re battling an awful lot…I think we need to embark on raising awareness at all levels, which to some extent is moving towards societal change.”* Several of the woman scientists pointed towards early childhood and education as a solution for ensuring equity in the future (n=9) as a woman pointed out, *“I think everything starts in the family level. I think if you are raised such a way that you are told you have choices; you will make a good choice. I think that's important.”* And a couple of the more optimistic women scientists (n=2) believed that change is happening now,

*“I think in the next, I don't know, 20 years, it's going to look really different, and I think that will be really welcome and really nice. I think once the old guard moves out, it will be very different, at least in ecology. I can't say that's true of engineering or any, you know, but ecology, the women that are in their 30s and 40s, I think they outnumber the men right now. The only problem is that because they're younger, they don't have a lot of the power within the departments, and so yeah, I think once that old guard moves out, there are actually women in the higher positions within the ecology departments. I think it will look different, but I think it's starting to happen already, like that change is starting to occur already…you have to wait it out.”*

Discussion

As our research demonstrates, the solutions offered to ameliorate the experience of social identity threat for women scientists were able to be clearly differentiated by level of implementation. Being able to identify who is responsible for what can be done at all levels is essential to ensuring that the change is sustainable. It also became clear that the institutional level was seen as most important by woman scientists at all career stages. Our sample also offered solutions beyond the institution to the societal level, the source of the negative stereotype that contributes to experiences of social identity threat.

At the individual level, it was apparent that building one’s confidence, learning how to navigate the system, and achieving work-life balance are helpful to bettering the experiences of women scientists, however they are not sufficient as none of the women in our sample who offered solutions at the individual level, ended there. While it is important for women to “lean in” (Sandberg, 2013) and learn how to advocate for themselves, it is key from our findings that the way to remedy these experiences does not lie at the feet of women alone.

At the group level, providing social support through mentorship and role-modeling, as well as building community via networking, were offered as necessary solutions that would allow women to share their experiences, thereby reducing the effects of the threat (Block et al., 2011). In *Beyond Bias and Barriers* (2006) the National Academy of Science acknowledged the reality of the negative stereotype of a group’s scientific or academic ability as precursor for discrimination and systemic disadvantage faced by those in the demographic minority, along with the lack of mentors and exclusion from the networks that aid in advancement, areas at the group-level that our sample of women scientists discussed.

Most strikingly, every woman in our sample, regardless of career stage, mentioned that the representation of women needed to be changed at the institutional level, having both a critical mass (Steele, 2011; Ecklund et al., 2012), and women in leadership (Valian, 2000). Institutional intervention is the level most likely to tackle the majority of the experiences of disadvantage faced by women scientists (Valian, 1999). These solutions, along with combatting gender bias and providing clarity about tenure procedures and enhancing childcare benefits, are necessary elements that supersede the individual level solutions of navigating the system and achieving a balance in work and life, giving women the time and space to advance scientifically.

Optimistically, a few of our woman scientists commented that change is happening now. However, this change is slowest moving in the academic sciences where women face an additional stereotype against their gender identity. As this research further establishes, we have not yet arrived at a place of true gender equality in the sciences. Hopefully, with the continuation of this line of research and the implementation of change in society and multiple institutions, the change that is sought is happening and will continue such that the negative stereotype of women’s scientific ability will be completely lifted.

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Table 1. Coding by Level for Potential Solutions

|  |  |  |
| --- | --- | --- |
| **Level** | **Solution** | **n = 25** |
| Individual | Work-Life Balance  Building Confidence  Navigating the System | 15  8  5 |
| Group | Social-Support   * Role-modeling * Mentorship   Networking and Building Community | 12  11 |
| Institutional | Representation   * Women in Leadership * Increase in Representation * Increase Retention   Resources   * Training for Women * Advance   Clarity of Tenure Process  Flexible Career Options  Combatting Gender Bias   * Equitable Treatment   Maternity and Childcare Benefits  Training for Men | 25  18  17  12  11  9  5 |
| Societal | Raising Awareness  Early Childhood and Education  Change is now | 10  9  2 |

Figure 1. Level of Solutions by Career Stage