

Diversity and Inclusivity at NIST

BY MARY THEOFANOS AND JUSTYNA ZWOLAK (NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY)

Who we are

The Articles of Confederation and President George Washington recognized that the “Uniformity in the currency, weights, and measures of the United States is an object of great importance” but it wasn’t until March 3, 1901 when the United States (US) Congress chartered the creation of the National Bureau of Standards (NBS). At that time, the US had few, national standards. It was difficult for Americans to conduct fair transactions or get parts to fit together properly. Construction materials were of uneven quality, and household products were unreliable. The US was becoming a world power and other industrialized nations already had established standards laboratories. NBS was charged with the development and to be the custodian of national standards. In 1988, NBS became the National Institute of Standards and Technology, or NIST.

Today, NIST is a non-regulatory Federal science and engineering agency within the US Department of Commerce. NIST has an incredibly broad portfolio of responsibilities. As America’s laboratory for advancing innovation we have programs focused on national priorities, from advanced manufacturing and the digital economy to precision metrology, quantum science, and biosciences. NIST’s overall mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. One of NIST’s biggest strengths is its reputation. NIST is known for its technical excellence, uncompromising integrity, rigor, and perseverance at the frontiers of science.

While perhaps not well known outside of NIST, but equally important is our core value of inclusivity. We recognize the benefits of improved creativity and innovation, improved problem solving and increased organizational flexibility that result from a diverse and inclusive environment. In the fall of 2019, NIST embarked on a journey to understand the state of diversity and inclusivity at NIST.

What we did

While several initiatives were undertaken, this article shares insights from a study that specifically explored the experiences of NIST employees to identify how different opportunities and outcomes might exist in regard to gender, specifically women. The study consisted of three consecutive phases. We began with a statistical analysis of approximately 10 years of human resources (HR) data that focused on the composition and demographics of the NIST workforce [1]. We examined how women’s salaries, promotions, awards, and other indicators compare to those of men in the organization. In-depth interviews [2] of 40 employees from a range of positions and career paths followed the HR data analysis. Finally, we employed a larger-scale survey of all federal employees across NIST for a more comprehensive view of experiences, beliefs, and perceptions [3]. A total of 1,093 respondents completed the survey for a 33.2% response rate. The greater representation provided the ability to confirm and determine the extent of the findings from the interviews.

What we learned about the NIST culture

Gender is baked into social structures and NIST is no exception. NIST's social structure has evolved over the last 120 years influenced by broader societal cultural assumptions and attributes of NIST itself. Attributes that have heavily shaped the culture at NIST include that we are a federal organization, a premiere scientific organization, have a reputation of scientific excellence, and a strong belief in meritocracy.

Each of these characterizations contributes to the role of gender at NIST. Federal agencies find comfort in the status quo and resist change or are slow to change given the hierarchical nature of the organizations and the bureaucracy that governs their operations. While patriarchy permeates the federal government and our societal culture at large, it is also foundational to the culture of science. Patriarchy has created and relied upon specific images and perceptions of what it means and who is best suited to be a scientist and a leader. Consider that in 120 years all but one of the 16 confirmed NIST Directors have been men. In addition, scientific excellence established NIST as a premiere scientific organization, yet this value also inhibits change under the pretense that somehow change will erode the achieved excellence. "It's working so don't change it". Finally, the scientific principles of objectivity and rationality that underpin the NIST belief in meritocracy (that talent, effort, and achievement will be rewarded rather than social class) also contribute to the gendered social structure and the reluctance to accept change.

The themes of patriarchy, excellence in science, and meritocracy identified through the interviews and survey provide the backdrop and set the stage for the current characterizations of NIST from the interviews and the survey as a "Boys Club" and "Elitist" environment. An environment where men are seen as scientists, leaders, as competent and, as a result, valued. Conversely, the NIST environment sees women as administrators rather than scientists or leaders. Many women feel they are perceived as less competent and are less valued because of their gender. The Principal Investigator model encourages individual work and competition, values individual accomplishments and the belief that projects are more important than people. Given that men hold the majority of the leadership roles and the Principal Investigator model is prevalent, it should not come as a surprise that many women feel they must work harder to be recognized and accepted, to be promoted, and provided opportunities for advancement. These radically different perspectives result in experiences and outcomes that provide advantages and opportunities for men while erecting barriers for women.

Experiences of women at NIST as result of the culture

The comparison of survey responses between men and women revealed a number of questions where both genders experience NIST in the same way. For example, both women and men share the belief that teamwork is valued and rewarded at NIST. In addition, both genders believe they "fit in" with their colleagues, that opportunities to be hired do not depend on gender and that the need to balance work and other life obligations is supported. Both genders also agree that doing interesting, challenging work gives them a sense of accomplishment that provides the most satisfaction.

However, for many questions significant differences were found between genders, providing evidence that men and women have different views and understanding of how gender affects certain aspects of the culture, beliefs, and even interactions at NIST. In particular, statistically significant differences were found for men and women with respect to the diversity and inclusivity, meritocracy, gendered experiences, promotions, and opportunities.

While NIST strives to be an objective organization guided by the principle of excellence and merit, the survey revealed that not all employees perceive it as such. In fact, over a third of all respondents expressed beliefs that the best opportunities do not go to the most deserving employees but rather are given based on who one knows (see Fig. 1). These opinions were particularly prevalent among women, with over half reporting belief in the first statement (compared to fewer than a third of men) and an alarming three quarters of women agreed with the latter (compared to only about 6 in 10 men).

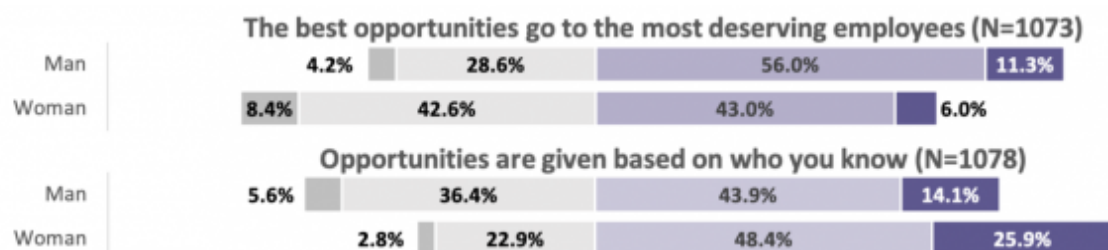


Figure 1. Gender Differences in Perceptions of NIST's Culture. Graph shows the distribution of responses by gender where responses range from "Strongly Disagree" (left-most/dark gray) to "Strongly Agree" (right-most/dark purple). The number of respondents for each question is shown in parenthesis. (Reproduced from Ref. [3])

One survey respondent summed it up:

Similarly, in the open-ended comments, survey respondents voiced concerns about organizational subjectivity with nearly a quarter of the comments in the perception section discussing the subjective nature of the NIST culture. At the same time nearly 90 % of respondents, regardless of gender, agreed that "NIST believes itself to be objective". This disconnect between beliefs in objectivity and subjectivity within the organization highlights the role of bias and lack of transparency in processes and procedures that may be contributing to disadvantaging women at NIST.

While it is very encouraging that over 90 % of respondents, regardless of gender, agree that the need to balance work and life obligations is supported at NIST, significantly more women believe that the culture of NIST is patriarchal and that women with young or school-aged children are considered less committed to their careers than women who are not mothers. Interestingly, men with small children were not perceived as less committed to their careers.

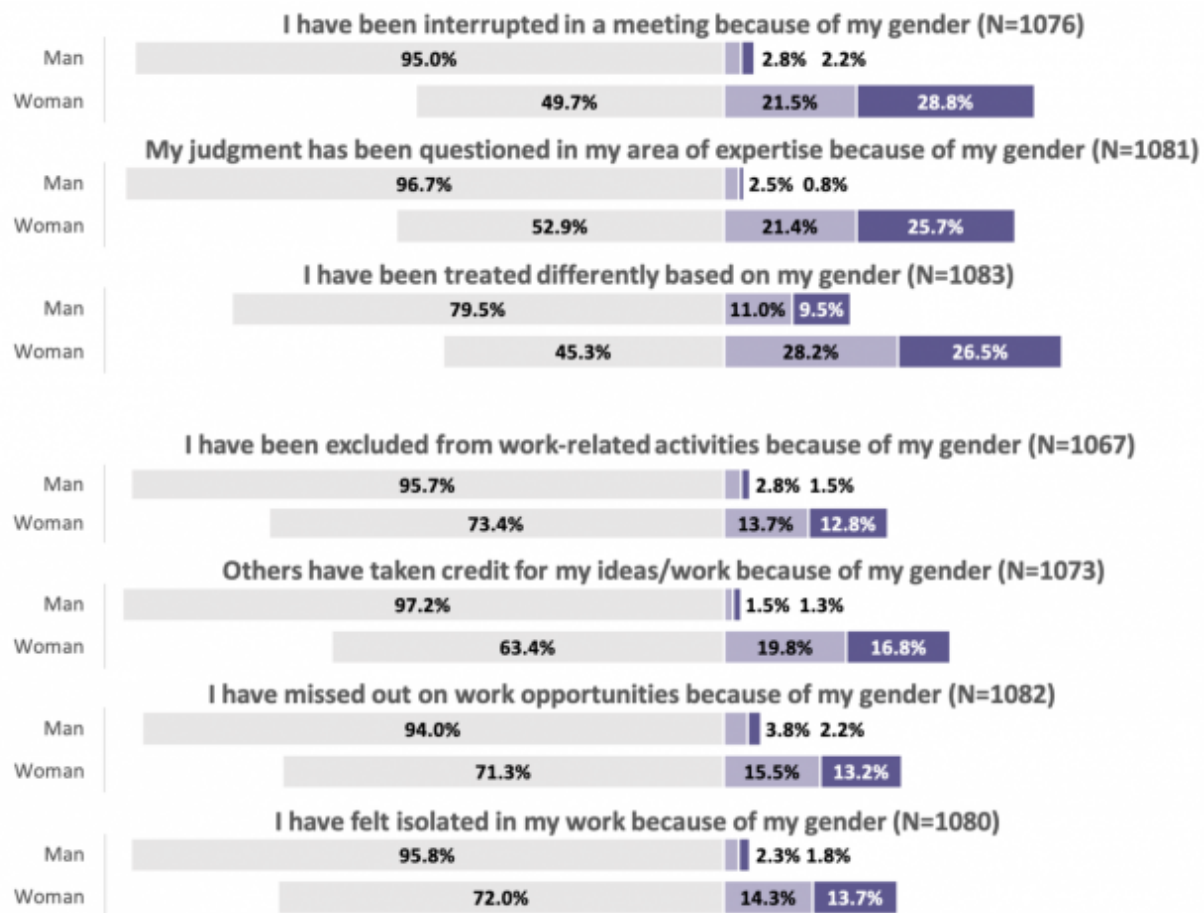


Figure 2. Gender Differences in Perception of Experiences at NIST. Graph shows the distribution of responses by gender where responses range from “Strongly Disagree” (left-most/dark gray) to “Strongly Agree” (right-most/dark purple). The number of respondents for each question is shown in parenthesis. (Reproduced from Ref. [3])

The responses to questions relating to gendered experiences showed even more striking differences, as shown in Fig. 2. It is alarming that about half of women reported that they have been interrupted in meetings, had their judgement in the area of their expertise questioned, or have been treated differently based on their gender. Over a quarter of women also reported being excluded from meetings, emails, or other work-related activities denied credit for ideas or work, missed out on opportunities, and felt isolated in their work because of their gender. Significantly more women believe they must work harder to be recognized and accepted (about half) or provided opportunities for advancement (about a third) compared to just a few men.

Over a quarter of the open-ended comments in the “gendered experiences” and the “interactions at NIST” section of the survey expressed concern that women are not respected at NIST. One of the respondents shared the following experience:

Another respondent reported:

Comments and behaviors like this are unprofessional, disrespectful, and create a hostile environment where women report feeling unwelcomed, insecure, and even harassed. In fact, more than a quarter of women reported experiencing gender-based harassment, an experience reported by only a handful of men.

When women feel they are not treated fairly, have to work harder to prove themselves, and have reduced opportunities for promotion and advancement because of their gender, it is not surprising that they are not well represented in leadership. At the time of this study, the percentage of leadership at NIST tells the story – only one confirmed female NIST Director in its history; in 2019 women held none of the three NIST Associate Directors positions, 21 % of Operating Unit Directors, 16 % of Senior Executive Service staff; and just over 5% of Senior Scientific, Professional or NIST Fellows were women, 29 % of supervisors, 22% of Group Leaders, 38% of Division Chiefs. If we also include the NIST portrait gallery of distinguished scientists, engineers, and administrators for outstanding career contributions to the work of NBS/NIST over the years, just 9% of those portraits depict women yet the percentage of women at NIST has continued to increase. In 1993 women represented 32% of the workforce and 14% of the scientific career path. Today women represent 25% of the scientific career path. One could assume that women are simply not interested in leadership positions, but in fact, we found that slightly more women than men expressed interest in becoming a leader at NIST. However, significantly more women also expressed concerns that they do not have equal opportunity to move into a leadership position. Finally, nearly three times as many women as men believe that they would not be accepted and respected as leaders. Thus, while women clearly are interested in becoming leaders at NIST, they do not find the current climate conducive to doing so.

Going Forward

We have identified many ways in which women experience work at NIST very differently than men including cultural biases, micro-aggressions and gendered outcomes. While both genders agree on some important points related to NIST culture, there are some revealing aspects of NIST's culture where women report experiencing a very different NIST than their male colleagues. The bottom line is women do not want to be treated differently—they want to be treated fairly, as equals. As women, we want to be judged on our abilities, what we can do, why we were hired, and not because of our gender, our looks or dress as one of the interview participants describes in the following quote.

Women alone cannot solve the problem. Everyone at NIST must contribute to and participate in the cultural changes required to underpin a diverse and inclusive environment. Men and women need to be part of the solution; leadership and staff need to be part of the solution—the changes need to be far-reaching and organization-wide.

Because, despite all of these gendered experiences and differences – there is one thing that we at NIST all have in common – when asked “When you wake up in the morning and think about going to work, what’s your first reaction? What emotions come to mind? – we love our jobs!

References

1. Evans, J., Koepke, A., Lund, S.P., Theofanos, M.F. , Examining Recent HR Data for Gender Bias Among Federal Employees at NIST. NIST IR 21143, March 2021, National Institute of Standards and Technology.
2. Theofanos, M., Prettyman, S., Evans, J., Furman, S. , Voices of NIST: A Study of Gender and Inclusivity, Findings from In-depth Interviews. NIST TN 21143, March 2021, National Institute of Standards and Technology.

3. Theofanos, M.F., Evans, J., Zwolak, J.P., Prettyman, S., Survey on Gender, Equity and Inclusion. NIST IR 21143, March 2021, National Institute of Standards and Technology.