15 Hacks for Building Diversity in Tech

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Dear Colleagues,

A major national priority and a major priority of many tech companies is to make our tech industry as diverse as our society. How can we capture the talents and contributions of people from diverse backgrounds who aren't well represented now in tech?

Recent research in social psychology shows that **simple changes** can sometimes have **large effects** on diversity. Several brief exercises have been shown to raise women's and ethnic minority students' achievement in science, engineering, and technology with effects that endure for years. How is this possible? It's not magic![1] Learn more—and help ensure women and minorities can thrive in your company!

This letter describes **15 changes you can make** to make diversity at your company work.
- **Part I** describes how you can help everyone feel welcome.
- **Part II** describes how you can hire the best talent.
- **Part III** describes how you can promote mindsets that increase resilience on the job and help workers persevere through challenges.
- **Part IV** describes everyday practices you can implement to help make diverse teams function well.

In each case, we describe the relevant research at a high level, provide a reference or two if you'd like to dig deeper, and note the name of a primary researcher expert in the area in case you'd like to reach out to them.

Part I: Making Everyone Feel Welcome

An important goal of any company is to make everyone feel welcome—and especially people from backgrounds that are different from the majority of the people in the company or the industry. How can you communicate to talented women and minorities that you really do want them on your team?

1. *Take down the Star Trek posters!*

Nobody likes it when they walk into a room and it looks like a place where people like them just don't belong. Research by **Sapna Cheryan at the University of Washington** shows that women look around at the physical environment in computer science classrooms and companies and when objects signal that the people who belong there are geeky men— we're talking about Star Trek posters, stacked soda cans from all-night coding sessions

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[1] Yeager, D. S. & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research, 81*, 267-301.

etc.—they lose interest. Changing the environment can capture women's interest. In one study, 94% of women (and 65% of men) preferred a technology company that had a nonstereotypical physical environment (e.g., nature posters) to one that had a stereotypical environment (e.g., Star Trek posters). In this case, women's interest in the company increased so much that it exceeded men's. What messages does your décor send about who belongs, maybe even messages you don't intend? How can you convey that you value all sorts of people?

> *For more:*
> Cheryan, S., Plaut, V.C., Davies, P., & Steele, C. M. (2009). Ambient belonging: How stereotypical environments impact gender participation in computer science. *Journal of Personality and Social Psychology, 97,* 1045-1060.

2. *Write job ads that include, not exclude*

Something similar happens with job ads. Research by **Danielle Gaucher at the University of Winnipeg** shows that job ads for male-dominated areas tend to use more words associated with male stereotypes (e.g., *leader*, *dominant*). That wording makes people think men dominate those settings and, in turn, undermines women's motivation to pursue those opportunities.

> *For more:*
> Gaucher, D., Friesen, J., & Kay, A. C. (2011). Evidence that gendered wording in job advertisements exists and sustains gender inequality. *Journal of Personality and Social Psychology, 101,* 109-128.

3. *Celebrate diversity—in everyone*

Sure it'd be great to be color-blind—but no one really is. And if your company isn't very diverse, telling racial minorities that you "just don't see color" is likely to seem, well, untruthful. Research by **Valerie Purdie-Vaughns at Columbia University** shows that African American professionals mistrust Silicon Valley companies that brag about colorblindness in mission statements, and especially when the company is not diverse. Instead communicating explicitly that you value diverse perspectives and identities helps minorities feel included.

> *For more:*
> Purdie-Vaughns, V., Steele, C. M., Davies, P. G., Ditlmann, R., & Crosby, J. R. (2008). Social identity contingencies: How diversity cues signal threat or safety for African Americans in mainstream institutions. *Journal of Personality and Social Psychology, 94*(4), 615-630

The problem is that sometimes these valuing diversity messages can make Whites feel left out. **Vicky Plaut at the University of California, Berkeley** shows that a new form of multiculturalism—called "all-inclusive multiculturalism"—that emphasizes that people

from all backgrounds contribute diversity to an organization can help everyone feel included.

> *For more:*
> Plaut, V. C., Garnett, F. G., Buffardi, L., & Sanchez-Burks, J. (2011). What about me? Perceptions of exclusion and Whites' reactions to multiculturalism. *Journal of Personality and Social Psychology, 101,* 337-353.
>
> Stevens, F. G., Plaut, V. C., & Sanchez-Burks, J. (2008). Unlocking the benefits of diversity: All-inclusive multiculturalism and positive organizational change. *Journal of Applied Behavioral Science, 44,* 116-133.

4. *Talk about growing talent, not finding the (boy) geniuses*

While all companies want to hire and promote the best workers, the language they use may unintentionally send a message that excludes women and minorities. **Mary Murphy at Indiana University** finds that when companies talk about identifying and hiring "geniuses" with "innate, natural talent," it sends the message to women and people of color that companies are really looking for White or Asian men—the groups stereotypically associated with those attributes in business and tech. Instead, companies should communicate their mission to find and promote passionate, hard-working, and motivated workers who want to learn and grow. This language reduces concerns about stereotyping and motivates women and minorities to apply and feel included.

> *For more:*
> Emerson, K.T.U., & Murphy, M.C. (2015). A company I can trust? Organizational lay theories moderate stereotype threat for women. *Personality and Social Psychology Bulletin, 41,* 295-307*.*
>
> Leslie, S. J., Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science, 347*, 262–265.

5. *Be diverse and represent diverse people*

It's true that diversity begets diversity. Why? Because the more that women and minorities see people like them among their peers, supervisors, and upper management, the more they feel valued and respected. Diversity throughout an organization communicates that this is a company where gender and race do not block employees' mobility and success. Research by **Mary Murphy at Indiana University** finds that women and minorities are particularly vigilant to how many identity mates are in a workplace. More diversity reduces the pressure that women and minorities feel to represent and speak for their group. With increasing diversity, women and minorities feel more comfortable, less stressed, and are more committed to the organization—and satisfied employees are more likely to recommend the company to their network of friends and family, thereby increasing the pool of diverse workers the company can hire.

For more:
Murphy M. C., Steele, C. M. & Gross, J. J. (2007). Signaling threat: How situational cues affect women in math, science, and engineering settings. *Psychological Science, 18*, 879-885.

Emerson, K. T. U. & Murphy, M.C. (2014). Identity threat at work: How social identity threat and situational cues contribute to racial and ethnic disparities in the workplace. *Cultural Diversity and Ethnic Minority Psychology, 20,* 508-520.

6. *Communicate that tech is not just about me, me, me—it's also about working together, and making a difference*

What are you in it for? Turns out, people differ in what motivates them on the job. Research by **Amanda Diekman at Miami University** shows that for many people and especially for many women communal motivations to work with others and to better society drive career choices. Yet people often see science and technology as individual pursuits with self-focused goals, like to get rich. That mismatch doesn't inspire women. But touting the potential to work on collaborative teams in tech and to create products that make a real difference in society can help people see tech as an opportunity to achieve these communal goals—and thus inspire a new and more diverse generation of workers.

For more:
Diekman, A.B., Weisgram, E., & Belanger, A.L. (2015). New routes to recruiting and retaining women in STEM: Policy implications of a communal goal congruity perspective. *Social Issues and Policy Review, 9,* 52-88*.*

Diekman, A. B., Brown, E. R., Johnston, A. M., & Clark, E. K. (2010). Seeking congruity between roles and goals: A new look at why women opt out of STEM careers. *Psychological Science, 21,* 1051-1057*.*

Part II. Hiring the Best Talent

Everyone is exposed to common cultural stereotypes that allege that women are less capable in technical fields than men and that racial minorities are less intelligent than others. Even if you reject those stereotypes, they can prevent you from hiring the best talent.

How? It happens in two ways. First, stereotypes can bias decision-making. When people evaluate candidates for a gender-typed position they tend to prefer candidates of the "right" gender—even when they are no more qualified. For instance, research by **Corrinne Moss-Racusin at Skidmore College** *showed that science professors viewed a male job candidate as more competent than an identical female applicant, were more likely to offer him a position, and offered him higher pay and more mentoring support.*

For more:

Moss-Racusin, C. A., Dovidio, J. F., Brescoll, V. L., Graham, M. J., & Handelsman, J. (2012). Science faculty's subtle gender biases favor male students. *Proceedings of the National Academy of Science of the United States of America, 109,* 16474-16479.

7. *Avoid bias in hiring 1: Commit to standards before looking at applicants*

How can your hiring teams overcome gender bias? Research by **Eric Uhlmann at INSEAD** shows that if you get decision-makers to commit to their hiring criteria *before* evaluating applications—What exactly do we need this person to be able to do? How important are different skills?—this can eliminate biases. Then people rely on the candidate's qualifications, not their gender.

> *For more:*
> Uhlmann, E. L., & Cohen, G. L. (2005). Constructed criteria: Redefining merit to justify discrimination. *Psychological Science, 16(*6), 474-480.

8. *Avoid bias in hiring 2: Hire a group, not a series of individuals*

Another way to eliminate bias in hiring is to get people out of the mindset of hiring one individual person at a time. When you hire a series of individuals, decision-makers tend to look for the prototypical candidate with each hire—and that biases them toward the usual suspects. Yet research by **Valerie Purdie-Vaughns at Columbia University** shows that when decision-makers instead think of their hires as a group—*I'm going to hire a new team*—characteristics that emerge across the group become more obvious. It pushes people to ask: How did my tech panel end up having 5 White men on it? How did I hire a team of 5 new engineers and they're all White or Asian men? Is that what I really want? No one likes to be biased. Hiring a group gives people a chance to self-correct.

> For more:
> Purdie-Vaughns, V. Romero-Canyas, R., & Walton, G. M. (Under review). Does choice architecture affect racial diversity? Case-by-case versus group selection decisions.

9. *Identify hidden talent*

A second way stereotypes can prevent you from hiring the best candidates is by causing bias in job candidates' scores on critical qualifications, like test scores and grades. When people perform in settings where they are aware of negative stereotypes about their intellectual abilities, they experience a kind of threat called "stereotype threat." This drags down their performance. It makes people perform less well than they are capable. Research by **Greg Walton at Stanford University** shows that the result is that common test scores and grades earned by women and racial minorities often underestimate their ability and potential. It's like women and minorities run into a headwind in science and technology. When they get the same score as men and non-minorities, they're actually faster runners. Accounting for this bias in evaluating job candidates can help you bring in the best people and more diverse people too.

For more:
Walton, G. M. & Spencer, S. J. (2009). Latent ability: Grades and test scores systematically underestimate the intellectual ability of negatively stereotyped students. *Psychological Science, 20,* 1132-1139.

Walton, G. M., Spencer, S. J., Erman, S. (2013). Affirmative meritocracy. *Social Issues and Policy Review, 7,* 1-35.

Part III. Promoting Mindsets that Increase Resilience on the Job

One of the most important qualities employees can have is resilience—the tendency to get back up when you've been knocked down, to persevere through challenges and difficulties. But what makes people resilient or not? A critical factor involves mindsets—how people make sense of challenges. Research shows that specific techniques can help people think about challenges in more adaptive ways—and, in turn, increase resilience and raise achievement months and years into the future. Moreover, mindset exercises can help people in the minority in a setting the most. That's because a natural consequence of being in the minority is to facilitate negative beliefs and worries—like "Maybe I'm dumb at coding" and "Maybe people like me don't belong here." Replacing these worries with more adaptive mindsets can help everyone thrive in tech.

10. Encourage a "growth mindset" about intelligence

We're surrounded by a culture that tells us that some people "are smart" and other people "are dumb." Research by **Carol Dweck at Stanford University** and **Joshua Aronson at New York University** shows that this idea—called a "fixed mindset" about intelligence—sets people up for failure. It makes people infer when they experience a challenge or struggle that they just don't have what it takes ("I'm just not a math person"). But when you teach people the truth about the brain and learning—that intelligence grows with hard work on challenging problems—people see challenges as opportunities ("I love a good challenge!") and respond to mistakes with relish ("Finally—Something I can learn from!"). This "growth mindset" about intelligence leads people to reengage after setbacks, to learn more from mistakes, to persist longer on tough problems and, over time, to learn and achieve at higher rates—all qualities that are essential in tech. And growth mindsets are especially helpful to women and minorities who often face negative stereotypes in business and tech.

For more:
Aronson, J., Fried, C. B., & Good, C. (2002). Reducing the effect of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology, 38,* 113-125.

Blackwell, L. A., Trzesniewski, K. H., & Dweck, C. S. (2007). Theories of intelligence and achievement across the junior high school transition: A longitudinal study and an intervention. *Child Development, 78*, 246-263.

Dweck, C. S. (2006). *Mindset: The new psychology of success.* New York, NY: Random House.

The Project for Education Research that Scales (PERTS) has created Mindset Kit, a free resource to help teach people about a growth mindset: https://www.mindsetkit.org/

11. Tell stories to bolster belonging

One challenge of being different in a setting is that when things go badly it's easy to wonder whether it means that people like you just don't belong. At times like this it can be essential to share stories that convey that everyone struggles at first—say, feels lonely or isolated or is criticized—and, moreover, that such struggles pass with time as people become more integrated in a setting and, eventually, feel at home. That helps people stay in the game. Research **by Greg Walton at Stanford University** shows that sharing stories like this from upperclassmen with first-year college students, and giving students the opportunity to reflect on how this process has been true for them, can raise achievement among students who are disadvantaged in the setting. In one study, this hour-long exercise raised African American students' GPA in a highly selective college over the next three years, halving the racial achievement gap. In another study, it raised women's grades in male-dominated engineering fields over a full academic year, eliminating gender differences. What accounts for these lasting effects? The "social-belonging intervention" helps people see everyday difficulties as normal challenges to be overcome—not a permanent indictment of their belonging. Then they get back on their feet and build the friendships and mentor relationships that everybody needs to succeed in a demanding setting.

> *For more:*
> Walton, G. M., Logel, C., Peach, J., Spencer, S, & Zanna, M. P. (2015). Two brief interventions to mitigate a "chilly climate" transform women's experience, relationships, and achievement in engineering. *Journal of Educational Psychology, 107,* 468-485*.*
>
> Walton, G. M. & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science, 331,* 1447-1451.

12. Incorporating personal values at work to help people feel like a whole person, not a stereotype

Another problem people face when they are negatively stereotyped in a setting is it can seem like all you are in that context is the negative stereotype—like all you are is the old guy in the office, or the token woman in engineering. That makes challenges seem especially threatening. In this context, it can be helpful to give people an opportunity to connect with their broader values, what is really important to them, who they really are. That helps people feel less overwhelmed and better able to ride out stressors and challenges. One way to do this is through "value-affirmation exercises"—brief writing tasks in which people reflect on personally important values in school or at work. Research by

many scholars especially **Geoff Cohen at Stanford University** shows that "value-affirmation interventions" can cause large and lasting improvements in achievement for people who face negative stereotypes in a setting. In one study, a value-affirmation intervention conducted in college physics raised women's exam scores, reducing the gender gap by 61% (after accounting for academic preparation).

For more:
> Cohen, G. L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science, 324,* 400-403.
>
> Harackiewcz, J. M., Canning, E. A., Tibbetts, Y., Giffen, C. J., Blair, S. S., Rouse, D. I., & Hyde, J. S. (2014). Closing the social class achievement gap for first-generation students in undergraduate biology. *Journal of Educational Psychology, 106,* 375-389.
>
> Miyake, A., Smith-Kost, L. E., Finkelstein, N. D., Pollock, S. J., Cohen, G. L., & Ito, T. A. (2010). Reducing the gender achievement gap in college science: A classroom study of values affirmation. *Science, 330,* 1234-1237.
>
> Walton, G. M., Logel, C., Peach, J., Spencer, S, & Zanna, M. P. (2015). Two brief interventions to mitigate a "chilly climate" transform women's experience, relationships, and achievement in engineering. *Journal of Educational Psychology, 107,* 468-485*.*

Part IV. Everyday Practices that Help Diverse Teams Succeed

You can get a diverse team in the door but that doesn't mean people will necessarily work well together. How can you make diverse teams work effectively on a daily basis?

> *13. Create spaces for women to work more with other women*

One of the challenges for women in tech involves interactions with men. Whatever men's actual views, the reality of social stereotypes means that women contend with the possibility that men could view them or treat them disrespectfully, not as a valued work partners. That can make women hold back in interactions and not perform to their best.

One solution is to give women more spaces to work with other women. Research by **Nilanjana "Buju" Dasgupta at University of Massachusetts, Amherst** shows that the gender composition of small teams has a substantial impact on women's motivation and performance in engineering. Women participate more actively in project teams when the members are mostly female (vs. mostly male or equal gender proportions). Not only that, but women also feel less anxious and more confident and maintain greater career aspirations in engineering when they are part of majority female teams. Paying attention to how teams are structured can help support women in tech.

> *For more:*

Dasgupta, N., McManus Scircle, M., & Hunsinger, M. (2015). Female peers in small work groups enhance women's motivation, verbal participation, and career aspirations in engineering. *Proceedings of the National Academy of Sciences of the United States of America, 112,* 4988-4993.

14. Encourage men to convey an attitude of inclusion and respect to female work partners

What if you just don't have many women in your company yet? What if the reality is that women will work with many men? Research by **Lauren Aguilar at Stanford University** shows that even small gestures from men that convey to women that they see women as valued work partners can increase women's performance in quantitative fields. Why? It's because women then perceive the men as feeling genuinely connected to her. Presumably then they worry less about being judged through the lens of a negative stereotype.

> *For more:*
> Aguilar, L. J., Carr, P. B., & Walton, G. M. (In preparation). [Cues of working together forestall stereotype threat.]
>
> Walton, G. M. & Carr, P. B. (2012). Social belonging and the motivation and intellectual achievement of negatively stereotyped students. In M. Inzlicht & T. Schmader (Eds.) *Stereotype threat: Theory, processes, and application* (pp. 89-106). New York: Oxford University Press.

15. Train managers to tell subordinates <u>why</u> they are giving critical feedback

Here's something frustrating. You work hard to give an employee some awesome critical feedback on a project they're working on. You show them all the problems in their work and what could be better. Then they respond with…nothing. What happened? The problem is that even as critical feedback is one of the most valuable resources for growth and improvement, it can turn people off. And the problem is especially acute when people give criticism across group lines—when a White manager criticizes a Latino employee's work, or when a male engineer critiques a woman's code. Then the subordinate can wonder whether maybe their manager thinks they're dumb or is biased. Yet research by **Geoff Cohen at Stanford University** shows that a simple clarification—*Why am I giving you this critical feedback? Because this project is hard and I think you can do it*—can make all the difference. In one study, when a teacher's critical feedback on essays written by African American students was prefaced with "I'm giving you these comments because I have very high expectations and I know that you can reach them" the percentage who chose to redouble their efforts and revise their essay for a higher grade increased from 17% to 71%.

> For more:
> Cohen, G. L. & Steele, C. M. (2002). A barrier of mistrust: How stereotypes affect cross-race mentoring. In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 305–331). Oxford, England: Academic Press.

Cohen, G. L., Steele, C. M., & Ross, L. D. (1999). The mentor's dilemma: Providing critical feedback across the racial divide. *Personality and Social Psychology Bulletin, 25,* 1302–1318.

Yeager, D. S., Purdie-Vaughns, V., Garcia, J., Apfel, N., Brzustoski, P., Master, A., Hessert, W. T., Williams, M. E., & Cohen, G. L. (2014). Breaking the cycle of mistrust: Wise interventions to provide critical feedback across the racial divide. *Journal of Experimental Psychology: General, 143,* 804-824.

So those are 15 social-psychology hacks for building diversity in tech!

If you'd like to learn more, here's a recent review we wrote of much of the scientific literature:

Walton, G. M.*, Murphy, M. C.*, & Ryan, A. M.* (2015). Stereotype threat in organizations: Implications for equity and performance In F. P. Morgeson, H. Aguinis, & S. J. Ashford (Eds.) *Annual Review of Organizational Psychology and Organizational Behavior.*

*All three authors contributed equally to this work.

If you have any questions, please feel free to reach out to any of the researchers listed above. Or if you'd like to reach out to us, our emails are below.

Good luck—let's create a world where everyone can thrive in tech!

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