Article

Harnessing *Visible* Representation to Mitigate Bias

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Abstract

Numerous attempts to improve diversity by way of changing the hearts of decision makers have fallen short of the desired outcome. One underappreciated factor that contributes to bias resides not in decision makers' hearts, but instead in their minds. People possess images, or mental representations, for specific roles and professions. Which mental image or representation springs spontaneously to mind depends on the current status quo within a field. Whether or not an individual or groups' appearance matches visual stereotypes results in perceptually mediated preferences and prejudices, both of which harbor pernicious assumptions about who belongs in a professional setting and why. Leveraging these scientific insights can enact change. Shifting *visible* exemplars can change people's mental representations and their heart's evaluative reactions to others.

Keywords

representation, visual stereotyping, social vision, stereotypes, prejudice

Tweet

Visible representation is powerful in enhancing inclusion and diversity across industries. Persistent changes in visible representations provide a path forward for enacting change.

Key Points

- Efforts to promote diversity and inclusion through educational workshops have yet to produce meaningful and lasting changes to workspace diversity.
- People hold vivid mental representations for the typical member of the group, role, or profession, which develop from a biased exposure to exemplars.
- Mental representations often serve as a first-pass filter to inform judgments about a person's degree of "fit" for a specific role, leading to perceptually mediated prejudices and preferences.
- Repeated exposure to nonnormative exemplars can change mental representations and therefore mitigate biases in evaluations and decisions.
- Harnessing these insights has the potential to promote meaningful changes within organizations.

Introduction

Harnessing Visible Representation to Mitigate Bias

In a widely viewed 60 min interview that occurred 9 days before the 2020 election, then vice presidential candidate Kamala Harris opined that her presence in the race and possible term in office might have an impact on young girls in America. "It helps change the perception of who can do what, because that is still part of the battle after all," and she continued, "I can imagine what can be and be unburdened by what has been." As it turns out, Harris's speculation enjoys a solid scientific foundation. Indeed, representation in general, and highly visible representation of exemplars, in particular, enhances inclusion and diversity in leadership across a variety of industries.

Underrepresentation persists for women and racial minorities across a variety of sectors within society, including Science, Technology, Engineering, and Math (STEM), professorships, CEOs, executive boards, and legal partners. All too often, the very fact that some groups of individuals are numerically rare in a given role leads to the mistaken assumption that those groups must be a poor fit for the role. Harboring such beliefs, either implicitly or explicitly, tends to constrain the advancement of women and racial minorities and this can occur outside of awareness of decision makers. Consequently, various initiatives aim to educate decision makers in hopes that knowledge might inoculate them from biases and expand the diversity in leadership. These efforts can be construed as attempts to change the *hearts* of decision makers. Unfortunately, some such efforts

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have dubious efficacy. Indeed, many mitigation efforts backfire and perpetuate existing norms and biases (Paluck & Green, 2009).

Because efforts to change hearts routinely fall short of meeting objectives, we can look to alternative means to mitigate bias. One underappreciated factor that contributes to bias resides not in decision makers' hearts, but instead in their *minds*. Why? People possess images, or mental representations, for specific roles and professions: Doctor, Teacher, CEO, Nurse, Scientist, Politician, Student, Athlete, Professor. Merely thinking about each of these categories is sufficient to conjure a mental image or representation of the typical group member. Which mental image or representation springs spontaneously to mind depends on the current status quo within a field. Here, we describe why that matters and how policymakers can leverage scientific insights to enact change.

Why representation matters. The underrepresentation of women and some racial minorities in multiple prestigious and lucrative career domains is not due to a lack of interest, aptitude, or availability (National Science Foundation, Bridgeman & Wendler, 1991; National Center for Science and Engineering Statistics, 2013). Even after successfully entering such careers, women who hold advanced degrees tend to leave these fields at high rates (Glass et al., 2013).

The widespread attrition of minority group members from STEM careers reveals two unfortunate and related realities. First, the inability to retain talent indicates that these contexts fail to foster a sense of professional fit and efficacy for diverse groups. Second, the persistent asymmetry in representation also signals a potential lack of fit to others who might otherwise be inclined to pursue these paths. Thus, the very lack of visible diversity can also discourage the interest, engagement, and persistence of prospective candidates who could diversify the field.

This perpetual underrepresentation results in missed opportunities for advancing women and minority group members' earnings, wealth, mobility, leadership, and influence (Noonan, 2017). Implementing diversity within these career fields benefits not only individuals themselves but also companies. Diversifying professional settings brings new information and perspectives to address challenges and, as such, can foster innovation. In equitable and integrated work environments, diversity enhances creativity and even productivity (Noland et al., 2016; Smith-Doerr et al., 2017).

In spite of these benefits, the persistent lack of representation for women and some minorities in multiple fields is likely to linger in people's minds, leading to a biased impression of the typical professional within a career field. Next, we train our sights on understanding why these biases occur, to identify viable means to mitigate them.

Visual stereotyping. Visible asymmetries in numeric representation are often instantiated in people's mental representations of a specific field. Indeed, people hold mental representations for multiple groups, social roles, and professions. These mental representations provide a visual summary of an individual's impression of a field and they reveal prior exposure to and attitudes toward a particular group. For instance, when asked to "draw a scientist," both children and adults tend to produce drawings that depict White men (Chambers, 1983) and this pattern has remained remarkably consistent over the past five decades. Only in the most recent research are these patterns beginning to shift, and then only among the youngest children (Miller et al., 2018). Collectively, these findings reveal that people are exposed to White male scientists more than any other group from a young age and these exposures are reflected in people's mental representations of the category scientist.

Whereas some visual stereotypes reveal category-based perceptions, such as for scientists, other visual stereotypes are more subtle but remain equally widespread. A novel scientific technique called *reverse correlation* allows scientists to determine the appearance of these mental representations and render summary images that depict them. Mental representations exist for a range of social categories and characteristics (see, for example, Brinkman et al., 2017, for a review), including demographic groups such as gender and race; traits such as trustworthiness, dominance, and competence; professions and organizational roles such as nursery teacher, manager, physician; and even broader groups such as nationalities and political affiliation. Thus, the tendency to hold mental representations is widespread and it occurs for a range of groups, roles, and professions.

These mental representations are far from benign. Instead, they can serve as a first-pass filter through which other people are evaluated. In a broad sense, mental representations incline people to judge others harshly or favorably, which manifest as interpersonal prejudices and preferences, respectively. They also guide judgments about a person's likely "fit" within a group, influencing decisions about whether (or not) an individual is a likely fit within a team. These cases can be thought of as *visual stereotyping*: the process by which evaluations and decisions are influenced by the visual appearance of others.

The mechanisms of visual stereotyping. Understanding the mechanisms that underlie visual stereotyping helps illuminate how they can impede diversification efforts and also how to leverage these processes to promote diversity. Mental representations form early in life and are updated throughout the life span as a result of visual exposure. Repeated exposures to a group's exemplars facilitate associations that manifest in relatively stable mental representations. Young infants' early exposure to faces, for example, determines their visual preferences and even their perceptual proficiency in face processing. In many instances, babies prefer faces that are familiar, which leads infants to gaze longer at even

unknown faces that share the gender of their primary caregiver (Quinn et al., 2002; Ramsey-Rennels & Langlois, 2006). They also process novel faces more efficiently when images depict individuals of the same race as their family, another pattern that reflects a preference for familiar others (Kelly et al., 2005; Quinn et al., 2008). Relative to their monoracial peers, biracial infants are better equipped to process the faces of individuals from multiple racial groups (Gaither et al., 2012). The impacts of exposure are so strong that infants who are repeatedly exposed to photographs of nonhuman primates throughout their early months of life maintain an ability to distinguish between known and unknown monkey faces (Pascalis et al., 2002, 2005). Thus, visual exposure enhances perceptual dexterity and preferences early in life.

The content of exposure continues to influence people's mental representations throughout the life span. Highly visible exemplars influence observers' mental representations and preferences. For instance, televised programming and films tend to depict racial minorities infrequently and unfavorably (Higginbotham et al., 2020; Hunt & Ramón, 2020), perpetuating race biases (Weisbuch et al., 2009). Magazines also depict a biased representation of racial minorities (Schug et al., 2017). Media portrayals depict women in traditional roles (Steinke et al., 2007). Even the demographic skew of one's own neighborhood changes people's mental representation and alters their perceptual proficiency for making judgments about biracial faces (Freeman et al., 2016). Thus, exposure to a skewed set of exemplars shifts people's mental representations and, by extension, alters their perceptual proficiency and preferences, as well.

The impacts of visual stereotyping. Once formed, mental representations affect a variety of perceptual and evaluative judgments. For instance, people who violate gendered expectations—prescribing men to appear masculine and women to appear feminine—tend to be judged as less attractive than their more gender-conforming peers (Johnson & Tassinary, 2007) and they are stigmatized more broadly (Lick & Johnson, 2013).

Appearance also affects decisions about people's suitability for various roles within organizations. When people's appearance aligns with mental representations for a particular role, others judge and treat them more favorably. For example, people associate specific appearance cues with U.S. political parties (i.e., Democrats and Republicans, Carpinella & Johnson, 2013). When a politician's appearance aligns with a constituency's expectations, they earn a greater vote share (Hehman et al., 2014), even from opposite party voters (Olivola et al., 2012). In addition, lay observers' impressions of faces reliably predict the success of CEOs and law partners (Rule & Ambady, 2008, 2011) Moreover, members of a group appear more similar to one another than would be expected by chance, and this occurs for groups that allow individuals to opt in (e.g., online Facebook groups) and for groups that have stringent vetting processes for acceptance (e.g., fraternities and baseball teams; Hehman et al., 2018). Collectively, these patterns demonstrate strong relation between appearance and outcomes.

The tendency for people to hold mental representations for various groups, combined with the tendency to make appearance-based decisions about others, maintains the asymmetric status quo for representation in some fields. Therefore, the mental representations that emerge from biased exposures also impede what might help to overcome it: *visible* representation. Indeed, the availability (or lack thereof) of visible exemplars within a field fundamentally shifts social perception: prejudices and preferences.

Perceptually mediated prejudices. Mental representations constrain what is deemed acceptable and desirable for a given field, resulting in perceptually mediated prejudice against individuals whose appearance differs from visual stereotypes. These mental representations do not merely reflect visual compositions for a given field; they prescribe rules for visual appearance within these professional fields.

People begin to form meaningful impressions of others based on merely a glimpse of a person's face or body (Freeman & Johnson, 2016). Part of that process involves categorizing others into known groups (Allport, 1954). When someone's appearance misaligns with existing mental representations, observers struggle to visually process them. Judgments about the person are more effortful and taxing. This disfluency feels unpleasant and undermines evaluations of the individual. For instance, when observers judge others whose appearance is subtly gender atypical, they process the face less efficiently and they evaluate the person less favorably (Lick et al., 2015; Lick & Johnson, 2013, 2015). The perceptual process itself impinges on evaluative judgments. Thus, the relative difficulty or ease of arriving at decisions about others influences judgments. When observers have a more difficult time integrating conflicting information (e.g., a man who also appears feminine or a woman who also appears masculine), judgments are slightly more effortful. This disfluency, in and of itself, is sufficient to perpetuate biases that manifest as prejudice.

Expectations for gendered appearance dictate associations with STEM versus non-STEM career fields. Specifically, while women suffer from a decreased association with STEM by virtue of their sex, both men and women suffer a decreased association with STEM career fields when they appear more visually feminine (and less visually masculine; Shropshire, 2016, 2018). Indeed, being a woman and being classified as more visually feminine enhance one's association with career fields in humanities domains. Thus, expectations associated with STEM career fields align with men and masculine appearance; expectations associated with humanities fields align with women and feminine appearance. Mental representations, in particular, are imbued with

visual stereotypes that compel prejudiced evaluations of individuals who deviate from what is expected.

Perceptually mediated preferences. Perceptually mediated *preferences* occur when someone's appearance aligns with expectations. Winners of election contests quite literally "look the part" for their political party (Carpinella & Johnson, 2013). Naïve observers could accurately label the political party affiliation of members of the 111th House of Representatives. Observers (perhaps correctly) inferred that the two main political parties in the United States have distinct perspectives on gender, with conservatives/Republicans avowing more traditional gender roles and liberals/Democrats preferring greater levels of egalitarianism. These presumed inclinations are embodied in the successfully elected members of Congress, particularly among its women. The faces of Republican Representatives were considerably more feminine than the faces of Democratic Representatives. This pattern was also borne out in election contests (Carpinella et al., 2016; Hehman et al., 2014). Constituents apparently prefer candidates who look the part for their ideological bent.

Similarly, as mentioned, the members of groups with selective membership norms, such as fraternities, sororities, and even law firms, tend to resemble one another (Hehman et al., 2018). Perhaps this occurs partly because people prefer individuals who resemble the self and this preference exerts a subtle influence during the selection process. The end result is that group members resemble one another more than expected by chance. Preference for self-similar others also occurs in elections (Bailenson et al., 2008). Moreover, when another person resembles a significant other, people's judgments skew toward that existing attitude, even when the two targets are unrelated (Andersen & Chen, 2002).

Thus, perceptual biases dictate expectations for appearance resulting in preferential selection and evaluation for individuals who align with expectations, as well as prejudicial selection and evaluation of individuals who do not align with expectations. Given that individuals are so vigilant to the perceived fit of others, it makes sense that they would be similarly vigilant to their own perceived fit. As such, the visible exemplars within a field can change not only social perceptions, but also self-perceptions as well.

Implications for underrepresented individuals. Our review thus far highlights a pernicious cycle in which a rarity of women and minorities in professional settings produces a mental representation that perpetuates visual stereotyping whereby a person's appearance can compel perceptually based prejudices and preferences. Not surprisingly, these impacts are not restricted to interpersonal evaluations of fit. They also impact observers themselves who judge their own fit or lack thereof based on the availability of visible exemplars. Groups composed of similar others are deemed hospitable to the self, but groups composed of dissimilar others are deemed hostile to the self.

Observers form mental representations of previously unknown groups rapidly and readily. Devoid of prior knowledge about a group, observers were tasked with forming an impression of them. In much the same way that a series of isolated exposures to individuals coalesce to yield a coherent mental representation for a particular group, exposure to multiple group members at once also yields a coherent mental representation of a specific group. To test this, observers viewed groups of 12 faces that varied in their gender composition. After merely a glimpse, observers accurately detected the ratio of men to women in each group (Alt et al., 2019; Goodale et al., 2018), and they used that information to make self-relevant judgments. As the ratio of men to women in a group increased, observers agreed that the group had greater potential for hostility (Alt et al., 2019), was more likely to harbor sexist norms, and exhibited more negative affect (Goodale et al., 2018). Moreover, men felt greater fit among male-dominated groups, women felt greater fit among female-dominated groups, and the effect was considerably stronger for women.

Thus, mental representations can reflect either an accumulation of exposures to individual exemplars or a single exposure to a collection of individuals. Each of these processes yields an aggregate mental representation that serves as a yardstick to determine the fit of others or oneself within the group.

Leveraging the Perceptual System

Mental representations of groups embolden visual stereotyping and biases decision making. Overcoming such biases is essential to achieving a fair, equitable, and diverse workforce, as well as making the best use of available talent. Attempting to ameliorate employee biases, U.S. companies spend eight billion dollars on diversity training annually (Hansen, 2003). Although diversity trainings vary widely, nearly half of midsize companies and all Fortune 500 companies use diversity trainings that yield poor returns for improving diversity and even result in adverse effects (Dover et al., 2020; Israel et al., 2017; Mobley & Payne, 1992).

Awaiting improved diversity training, some shortcuts might help. Decoupling perceptual biases from negative evaluations provides a promising means to enact change. Accumulated experiences can impact evaluations of others, leading to superficial preferences and prejudices that reinforce the status quo (e.g., Lick & Johnson, 2016). And this provides a unique opportunity to exploit the social perceptual system to short circuit biased judgments. How? People's visual exposure to exemplars can vary quite dramatically. For instance, one's community demographics, entertainment choices, and media outlets (both traditional and social in nature) curate a visual picture book that functionally forms

one's mental representations. For instance, people who live in racially homogeneous communities have a more difficult time categorizing the apparent race of biracial individuals, relative to people who live in more racially integrated communities (Freeman et al., 2016). This pattern by which one's experience with visible exemplars builds the mental representations that underlie prejudice and preferences can be changed. As such, changing one's exposure to visible exemplars has the potential to change mental representations and their implications for evaluations, as well.

Indeed, repeated exposure can change people's mental representation (Lick & Johnson, 2014). Observers saw a series of faces that exaggerated either the femininity of women or the masculinity of men or neither. After merely 3 min of exposure to exaggerated faces, people's mental representation shifted substantially. Similar impacts occur for weight bias (Lick, 2015). Repeated exposures not only shifted mental representations but also mitigated gender-linked forms of prejudice. Changing exposure to the exemplars quite literally changed people's minds. And then their hearts followed.

Evidence-Based Recommendations

Being able to change the mental representations of individuals quickly and efficiently by exposing them to a new set of exemplars has implications for enacting change more broadly.

Changing the actual representation. Of course, the most effective way to overcome the impact of a biased mental representation on the recruitment, retention, and advancement of a diverse work force is to take active steps to diversify spaces. Within an organization, decision makers can support programs that actively seek out talented individuals who might otherwise be disinclined to see their fit within the organization. More broadly within society, commitments to portray increasing levels of diversity for given work sectors will also shift the mental representations among the population.

The promise and peril in showing one's own team. More broadly, at an organizational level, the visible exemplars associated with an organization provide the basis for emerging mental representations. Even among organizations that are making great strides toward achieving more diverse representations, visual images might inadvertently signal an existing and impactful bias. These impacts are widespread across sectors of society. Whether depicting university faculty members, corporate boards, or alumni panels, photographic rosters can showcase a pattern and generate a mental representation that matters. Such images become a visible reality that signals to individuals who belongs and thrives and who does not. They can reify the organizational norms by perpetuating existing biases or they can enhance a sense of inclusion by reinforcing a sense of fit for all. On one hand, organizations can harness visual imagery effectively if they already exhibit exemplary levels of diversity. On the other hand, visual imagery can undermine efforts to enhance inclusion and belonging for organizations that are still striving to diversify. In such circumstances, *aspirational* imagery can signal to observers a strong organizational commitment to diversity. These images will only be effective when they (a) are aspirational, yet accurate; (b) avoid depictions of isolated exemplars or "token" representation; and (c) reflect the organization's true goals.

The importance of blinded evaluations. The existence of mental representations for a field, organization, or work group opens the possibility that decision makers might inadvertently allow the appearance of prospective and existing employees to bias decision making. As reviewed, in multiple domains, "looking the part" led to more favorable evaluations, including electoral politics, recruitment into social groups, and even performance within a law firm. One way to overcome the potential for such biases is to pursue "blind" initial reviews and interviews. This allows decision makers to form impressions without any undue influence of appearance-based prejudices or preferences. Another way to overcome these possibilities is to conduct reviews and interviews using identical scripted prompts for all individuals. This allows decision makers to form impressions of all candidates for review along a common metric.

Expand perceptual dexterity by expanding exposure. In addition, individuals can be proactive about reducing their own potentially biased decision making. Because mental representations build on exposure to visible exemplars over time, diversifying one's exposure to daily visual cues will shift mental representations over time. And, given that mental representations underlie perceptually mediated prejudices and preferences, actively changing one's exposure can expand perceptual dexterity and mitigate biases. One way to facilitate these shifts in mental representations is to seek personal and professional activities that enhance the diversity in one's visual exposures and interpersonal interactions. Reducing the homogeneity of personal social environments can also fundamentally shift the perceptual foundation that perpetuated underrepresentation in professional environments in the first place.

Providing visible and available exemplars within organizations. Some organizations face a bruising reality that they lack diversity. A visible homogeneity among team members is likely to perpetuate the very asymmetric representation that an organization might wish to overcome: The visible homogeneity could undermine recruitment efforts when candidates feel a lack of fit for themselves or could perpetuate decision makers' biases to advance self-similar others. In

such circumstances, the active involvement of visible exemplars can help to facilitate feelings of inclusion that protect individuals from the alienating effects of a lack of visible diversity. Both peer and expert ingroup members serve as "social vaccines" to increase fit and belonging and protect individuals' self-concept from stereotypes that their visible identity makes them ill-suited for a given career field (see, for a review, Dasgupta, 2011; Stout et al., 2011). Furthermore, visible exemplars that deviate from stereotypic media portrayals provide potent buffers for other underrepresented group members (Cheryan et al., 2009, 2011).

Conclusion

When Kamala Harris opined that her presence as a vice presidential nominee might allow a young girl to "imagine what can be and be unburdened by what has been," we agree. Visible representation is powerful. *What has been* provides the foundation that shapes the mind's mental representations and the heart's evaluative reactions to others. And yet, persistent changes in visible representations provide an alternate, an aspirational foundation for representing *what can be*. Seeing turns believing into reality.

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