Diversity Matters in Academic Radiology: Acknowledging and Addressing Unconscious Bias

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Abstract

To meet challenges related to changing demographics, and to optimize the promise of diversity, radiologists must bridge the gap between numbers of women and historically underrepresented minorities in radiology and radiation oncology as contrasted with other medical specialties. Research reveals multiple ways that women and underrepresented minorities can benefit radiology education, research, and practice. To achieve those benefits, promising practices promote developing and implementing strategies that support diversity as an institutional priority and cultivate shared responsibility among all members to create inclusive learning and workplace environments. Strategies also include providing professional development to empower and equip members to accomplish diversity-related goals. Among topics for professional development about diversity, unconscious bias has shown positive results. Unconscious bias refers to ways humans unknowingly draw upon assumptions about individuals and groups to make decisions about them. Researchers have documented unconscious bias in a variety of contexts and professions, including health care, in which they have studied differential treatment, diagnosis, prescribed care, patient well-being and compliance, physician-patient interactions, clinical decision making, and medical school education. These studies demonstrate unfavorable impacts on members of underrepresented groups and women. Learning about and striving to counteract unconscious bias points to promising practices for increasing the numbers of women and underrepresented minorities in the radiology and radiation oncology workforce.

Key Words: Unconscious bias, diversity, gender, URM

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INTRODUCTION

Women and underrepresented minorities are significantly underrepresented in the radiology physician workforce despite an available medical student pipeline [1]. To address this dearth, the ACR created the Commission for Women and General Diversity to identify barriers to a diverse physician workforce in radiology and radiation oncology (RRO) and to provide policy recommendations to overcome those barriers. Diversifying the radiology workforce has become an increasingly important goal, not only because of underrepresentation but also because of population changes and their implications. By 2050, the percentage of Asians and Hispanics will triple, the black population will double, and white people will be the minority racial group [2]. Thus, there will be an increase in patients and prospective providers from traditionally underrepresented groups. Increasing the diversity of the workforce may facilitate addressing the varied needs of diverse patient populations and will help mitigate persistent disparities in health care access, delivery, and outcomes that beleaguer those populations from cradle to grave. To meet challenges and optimize opportunities related to changing demographics, radiologists must bridge the gap between numbers of historically underrepresented minorities in RRO in contrast with other medical specialties. They need to understand impediments to expanding diversity of

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radiologists and to identify ways to remove those impediments [3]. They also must attend to lower percentages of women in radiology as contrasted both with the US population and women who attend medical school [1]. Because they constitute 50% of the US population and more than 50% of the college-bound population, girls and women are an important source of human capital for the RRO workforce [4].

In this review, we explain how and why diversity matters to radiology and explore how managing unconscious bias can help address challenges to diversifying the field.

DIVERSITY MATTERS

Diversity has long been a priority for many institutions and organizations. More often than not, it has been talked about more than acted upon. In higher education, diversity often denotes an ethical imperative to provide access to traditionally underrepresented groups. This imperative has become more pressing in recent years, leading organizations such as the ACR to become more serious about its efforts. In general, diversity refers to similarities and differences among humans on the basis of their social identities. In the United States, the most salient social identity groups are gender, race, ethnicity, age, sexual orientation, social class, nationality, religion, and ability status [5]. These categories matter because they encompass hierarchies that place members in dominant or nondominant positions that can affect their lives. Dominant groups tend to have more economic and cultural power than nondominant groups, and their ways of knowing and being tend to be more valued. Also, nondominant groups are more likely to experience discrimination and to be associated with negative stereotypes [6]. Within institutions of higher education and medical care, these social identity dynamics influence policies, procedures, and practices that foster inequity and perpetuate health disparities.

Efforts related to diversity in medicine generally, and RRO specifically, tend to focus on gender and race, with the intent to improve access and success for women and members of racial groups that are underrepresented in medicine (URM) [7].[1] However, researchers and practitioners increasingly are studying other identities, such as sexual orientation, gender identification, religion, geography, age, disability, veteran status, and disadvantaged background.

WHY FOCUS ON URM AND WOMEN

Research about diversity in radiology has focused more frequently on women than on URM [3]. This growing body of work indicates that women are underrepresented across most aspects of radiology relative to the US population. Moreover, although percentages of women matriculating in medical school and the medical profession have increased, radiology has not kept pace [1]. Women are significantly underrepresented as residents, academic faculty members, and practicing radiologists [1]. They are represented to a greater extent than men in academic radiology [1] and certain subspecialties (eg, pediatric radiology and women's imaging) [7]. Among the 20 largest residency training specialties, diagnostic radiology ranks 9th. However, it places 17th in female representation. Within academic radiology practices, women are underrepresented among senior faculty members, and they are less likely to be tenured [8]. Among medical school faculty members, women and men are represented in equal numbers as assistant professors [8]. However, many women remain assistant professors for their entire careers. The percentage of female full professors in academic radiology departments is 18% as contrasted with 26% in the fields of pediatrics and obstetrics and gynecology [8]. Women also are underrepresented in leadership positions in radiology. In academic contexts and in private practice, 14% of men are leaders, in contrast to 7% of women [9]. Among radiology department chairs, 16% are women [9].

Although research on the racial and ethnic composition of RRO is scarce, it documents radiology as one of the least racially diverse health care workforces, with underrepresentation of URM groups across all practice levels [1]. Statistics on women and URM in RRO show no or limited increase in representation for women or underrepresented minority groups between 2002-2003 and 2010-2011, with a less than 1% change per year [8]. Thus, a need clearly exists for proactive measures.

Striving to increase numbers of URM and women in radiology matters for more reasons than improving their representation in RRO. In general, a diverse workforce helps enhance creativity, productivity, problem

[1] The American Association of Medical Colleges adopted the term *underrepresented in medicine* to refer to racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population (African Americans, Mexican Americans, Native Americans, and mainland Puerto Ricans).

solving, innovation, loyalty, and teamwork [5]. More specifically, research reveals multiple ways women and URM can benefit radiology education, research, and practice.

Students from medical schools with more diverse student bodies report feeling more confident working with patients from different cultural backgrounds [10]. URM students also are more likely than their peers to aspire to serve the underserved and to follow through on that goal [11]. Racial and ethnic minorities are more likely to practice in areas with large numbers of underserved and minority populations [11]. Furthermore, shared race or ethnicity between patients and physicians can enhance communication, patient satisfaction, and compliance with medical recommendations, as well as reduce negative health outcomes [12]. Physician race and ethnicity are the strongest predictors that a physician will care for more vulnerable and underserved communities, irrespective of socioeconomic status [13]. Even if URM physicians do not have similar backgrounds to their patients, their commitment to serving the underserved may enhance effective relationships with patients who may feel more affinity with them. Patients managed by a physician from the same culture report more satisfaction with their treatment and their ability to effectively communicate with the physician [11]. Thus, increasing the numbers of URM physicians can help address health disparities and improve patient outcomes.

Similar dynamics exist in research about women in medicine. Because women are more likely than men to pursue careers in women's health, they can help lessen health disparities that are specific to women (eg, breast cancer) [14]. For instance, they can help decrease the shortage of radiologists in breast imaging [15] and pediatric radiology [16]. Also, increasing female representation in leadership positions may help advance the field. Evidence implies that women may enact different leadership styles; they also may have different research and practice priorities than their male counterparts [17]. Therefore, increasing female representation in leadership roles may foster the development of new insights and approaches in ways that benefit physicians and patients. The bottom line is that greater diversity in the health professions may lead to improved public health for the entire population as well as for those from underserved groups by increasing access, service quality, and cultural responsiveness.

STRATEGIES FOR INCREASING DIVERSITY IN RRO

An emerging body of literature on diversity and higher education offers guidance for how radiology can become more diverse [18]. Promising practices promote developing and implementing strategies that support diversity as an institutional priority and cultivate shared responsibility among all members to create inclusive learning and workplace environments [18]. Efforts should be made to integrate diversity and inclusion into core missions of organizations and their leadership, and to leverage the potential of diversity. Organizations should review policies, practices, and programs and institute changes as need to achieve diversity priorities. Those strategies also should include providing professional development to empower and equip members to accomplish diversity-related goals [18]. Examples include educating medical students about cultural competence and health disparities, teaching faculty members about culturally responsive pedagogy, training practitioners to interact with patients, educating admissions committees about holistic approaches, fostering respect in the medical workplace, guiding leaders to mentor diverse protégés, and training search committees to recruit and hire diverse applicants. These professional development initiatives usually aim to heighten awareness of challenges that impede inclusion, and to provide perspectives and practices to overcome them. Among topics for professional development about diversity, unconscious bias has received a lot of attention and has shown positive results [19].

UNCONSCIOUS BIAS

Unconscious bias, also known as implicit bias, refers to ways that humans unknowingly draw upon assumptions about individuals and groups to make decisions about them. This type of cognition occurs involuntarily, automatically, and beyond one's awareness [20]. Unconscious biases are triggered when we quickly judge or assess people and situations. These processes are natural and valuable because they help us be more efficient. However, unconscious biases can have harmful consequences when we rely on assumptions or stereotypes to make connections between people and negative or positive attributes. Those connections replicate social identity hierarchies that value some people more than others [20]. Negative beliefs about race (and other identity categories) are deeply ingrained

in US society through socializing influences such as media, education, religion, and families [5]. As a result of being exposed to these beliefs, our brains have developed schemas about various groups. These schemas may be activated during moments when we are not attending to our thoughts and actions. They are especially likely during high-stress environments and situations in which individuals feel pressured to make decisions or are engaged in multiple tasks. As discussed later, research has shown that the most well-intentioned people may unknowingly allow unconscious thoughts and feelings to influence decisions that they believe to be objective [20]. Thus, unconscious bias matters because humans usually are not aware that it influences their attitudes and behaviors, and it often contradicts conscious values and positive intentions.

Researchers have documented unconscious bias in a variety of contexts and professions, and they have concluded that biases are pervasive [20]. Unconscious bias infuses organizational cultures and affects formal and informal decision-making processes. For instance, unconscious bias can affect choices about whom to mentor, invite to external events, ask to work on a research project, recognize for their contributions, or even deem credible. Unconscious bias also can influence how individuals conduct evaluations of others, including reviewing admissions files, grading students, diagnosing patients, and assessing tenure and promotion files, to cite a few examples.

Especially relevant to radiology are findings about implicit bias in health care. In 2003, in a landmark report titled *Unequal Treatment*, the Institute of Medicine reported that across simple to advanced diagnostic and therapeutic interventions, members of URM groups receive fewer procedures and poorer quality medical care than white patients [21]. The report cited unconscious bias among multiple factors that contribute to racial disparities and deficits in the quality of care.

Research on unconscious bias in health care has focused on topics such as differential treatment, diagnosis, prescribed care, patient well-being and compliance, physician-patient interactions, clinical decision making, and medical school education [21,22]. Many of these demonstrate unfavorable impacts on members of underrepresented groups and women. A survey concluded that participating physicians' rate of implicit bias against blacks or Latinos was quite high [23]. Such bias can trigger unconscious stereotypes and prejudices that can influence the medical encounter, including clinical decision making [24]. Unconscious bias also may engender ineffective patient-physician interaction. White physicians who implicitly related black patients with being "less cooperative" were less likely to refer them for specific medical care than they were to refer white patients [25]. Although Asian Americans have a higher morbidity rate for cancer than any other group, they are least likely to be recommended for cancer screening [26].

Research on implicit bias in academia outlines various ways that unconscious bias can affect the recruitment and selection process of students, staff members, and faculty members [25,27]. If colleagues tend to perceive that equally qualified women (and members of underrepresented minority groups) have limited aptitude and therefore choose them less often than men, their educational and career opportunities may be limited.

A large body of research about employment processes is also instructive for radiology. This literature reports effects of unconscious bias on recruitment, interview processes, hiring, retention, and merit reviews [19]. Common among these are studies that disseminate resumes that vary only by applicants' names to prospective employers. These studies consistently conclude that employers are significantly more likely to follow up on applicants whose names imply membership in a dominant group than those in a nondominant group (eg, for white-sounding names such as Emily and Greg versus black-sounding names such as Lakisha and Jamal) [28]. Studies also have proved a reduced likelihood of selecting persons with Arab- or Muslim-sounding names or foreign names [19]. In a résumé project on male-sounding names (John) as contrasted with female-sounding names (Jennifer), science, technology, engineering, and medicine faculty members perceived Jennifer as less competent and were less likely to agree to mentor her or hire her as a laboratory manager. They also proposed paying Jennifer 13% less than John [27]. Women respondents were as likely to show these biases as men. These and other studies imply how pervasive unconscious bias is, as well as its role in perpetuating discrimination, though unintended.

RECOMMENDATIONS

Individual Level

Numerous strategies and techniques can help individuals and institutions manage unconscious bias effectively. Individuals should explore how their biases might affect their attitudes and behavior, and institutions should strive

to bias-proof their policies, procedures, and programs. First steps for individuals include learning about unconscious bias and becoming committed to managing their biases. They also should understand that those biases are normal, even though they might contradict one's explicit values and commitments to equity. Individuals should review research about how bias can affect their behaviors and become more alert to times when they might be biased. They can engage in self-monitoring and metacognition to discern when they are thinking under the influence of dominant belief systems that place humans into hierarchies that socialize us to value some groups less than others [6]. To assess their propensity for bias, they might take the well-validated implicit associations test, which measures the strength of an individual's associations between identity groups (eg, women, gay people) and evaluations or stereotypes (eg, good, bad; nurturing, dominating) [29]. Individuals also should deepen their commitment to acquiring skills that can help them to manage bias. For example, a research project on radiologic technologists recommended that they try to take the perspective of patients [30]. Trying to imagine challenges members of underrepresented groups face can help decrease unconscious bias.

Individuals also can disrupt stereotypes about members of underrepresented groups by obtaining evidence-based knowledge about those groups rather than relying implicitly on sources such as mainstream media, which tend to present skewed, negative portrayals [6]. Getting to know members of URM groups is another effective way to diminish the effects of unconscious bias. To encourage interaction across differences, many campuses are engaging in intergroup dialogue programs for students, and they are beginning to incorporate them for faculty and staff members [18]. Individuals also can conscientiously seek examples of counter-stereotypes of underrepresented groups. Exposure to counter-stereotypes can help change attitudes about others, especially when one does not view those examples as exceptions but rather realizes that numerous others also exist. A final, easy-to-implement technique is simply to slow down and focus when engaged in a decision-making activity, to reduce the brain's tendency to rely on prejudicial schemas during rapid cognition.

Institutional Level

Leaders can implement numerous steps to manage effects of bias at the institutional level.

They can evaluate program statistics by race, ethnicity, and gender to look for patterns in recruitment, retention, mentoring programs, research opportunities, and appraisal processes that might be affected by unconscious bias. As they analyze data, they should discern differences within gender and race categories to look for patterns that may be instructive. For example, they should disaggregate gender data by race; similarly, for people of color, they should disaggregate by gender and across all racial-ethnic categories. In addition, they should gather data on other aspects of identity for which they solicit information from students, faculty members, staff members, and patients. Conducting nuanced analyses can help identify groups to which institutions might pay particular attention (eg, Native American men or black women) that might be hidden in demographics based solely on single categories (eg, gender or race).

Leaders should review all employment processes for hidden biases, including screening résumés, conducting interviews, onboarding new hires, assigning mentors, evaluating performance, promoting employees, and terminating workers [31]. Referring to previous research and practices can guide these endeavors.

Institutions can educate people about unconscious bias and how to lessen its effects. For instance, a wealth of information exists about how to conduct searches and implement admissions processes [31-33]. Suggested techniques include providing unconscious bias training, conducting holistic reviews, agreeing on guidelines for decision making, and implementing reviews of application materials that have been redacted of social identity cues (eg, applicant names because they may invoke unconscious bias on the basis of gender, nationality, or race and ethnicity) [31]. Simply asking groups that are preparing to engage in formal decision making to be aware of the potential for bias and reminding them of the institution's commitment to diversity and equity can make a positive difference [31]. In addition to providing professional development about formal decision-making processes, institutions should offer training on how managing unconscious bias can foster more inclusive, respectful workplace environments. They might educate employees about microaggressions: verbal, nonverbal, and contextual messages that can intentionally or unintentionally communicate negative or derogatory meaning to members of underrepresented groups [34].

Unconscious bias is an important topic for medical education because growing a more diverse workforce

necessitates recruiting and graduating a diverse student body, as well as preparing all future professionals to engage humanely and effectively with diverse patients. Institutions should infuse their curricula with diversity-related content that includes implicit bias instruction. They also should be conscientious about providing students with a variety of information and positive exemplars related to underrepresented groups, to counteract the possibility of reinforcing negative stereotypes by focusing only on health disparities and negative aspects of patients' lives.[2] Related to this, institutions should identify ways to promote counter-stereotypical images of underrepresented groups, which is important for faculty and staff members as well as students [31]. Persistent negative representations of groups can reinforce negative stereotypes and trigger negative automatic associations. When people repeatedly see images of certain groups in certain roles or conditions, they will tend to associate them with those roles or conditions, especially if they have limited personal experience with such groups. Institutions can be proactive by inviting guest lecturers or visiting scholars who are women and/or members of URM groups and by including positive images in printed materials and in institutional decor.

Any efforts to provide professional development should proceed cautiously because people tend to be resistant and skeptical. Understandably, they may be threatened by the prospect of learning that they have enacted biased behaviors. Therefore, institutions should introduce and implement training in a supportive way that frames unconscious bias as something all humans enact and with optimistic intentions for alleviating the impacts of bias in service of enhancing diversity and inclusion. Finally, leaders should encourage and incentivize faculty members and students to conduct research about unconscious bias and diversity in radiology to guide future endeavors.

In closing, it is important to recognize that focusing on unconscious bias must not overshadow the fact that explicit bias against various groups exists and continues to be a pressing issue in all sectors of society. However, learning about unconscious bias and striving to counteract its negative effects seems to be a viable strategy for helping the profession of radiology diversify its workforce.

[2] Thanks to Dr Judith Amorosa for raising this important point during a personal communication during the Association of University Radiologists annual meeting in San Diego in 2016.

TAKE-HOME POINTS

- RRO is lagging behind other medical specialties in numbers of women and URM.
- Increasing the diversity of the RRO workforce might help meet the varied needs of diverse patient populations, including persistent disparities in health care access, delivery, and outcomes.
- Increasing the presence of women and URM in the RRO workforce can benefit radiology education, research, and practice.
- Among topics for professional development about diversity that can help accomplish diversity-related goals, unconscious bias has received a lot of attention and has shown positive results.
- Unconscious bias refers to ways that humans unknowingly draw upon assumptions about individuals and groups to make decisions about them. These biases can lead to differential treatment on the basis of negative or positive stereotypes about social identity groups.
- Research on unconscious bias in medical professions has reported its negative impact on URM and female faculty members, students, and patients.
- Unconscious bias can be managed at individual and institutional levels.

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