

An Integrated Framework for Gender Equity in Academic Medicine

Alyssa Westring, PhD, Jennifer M. McDonald, Phyllis Carr, MD, and Jeane Ann Grisso, MD, MSc

Abstract

In 2008, the National Institutes of Health funded 14 R01 grants to study causal factors that promote and support women's biomedical careers. The Research Partnership on Women in Biomedical Careers, a multi-institutional collaboration of the investigators, is one product of this initiative.

A comprehensive framework is needed to address change at many levels—department, institution, academic community, and beyond—and enable gender equity in the development of successful biomedical careers. The authors suggest four distinct but interrelated aspects of culture conducive to gender

equity: equal access to resources and opportunities, minimizing unconscious gender bias, enhancing work–life balance, and leadership engagement. They review the collection of eight articles in this issue, which each address one or more of the four dimensions of culture. The articles suggest that improving mentor–mentee fit, coaching grant reviewers on unconscious bias, and providing equal compensation and adequate resources for career development will contribute positively to gender equity in academic medicine.

Academic medicine must adopt an integrated perspective on culture for

women and acknowledge the multiple facets essential to gender equity. To effect change, culture must be addressed both within and beyond academic health centers (AHCs). Leaders within AHCs must examine their institutions' processes, resources, and assessment for fairness and transparency; mobilize personnel and financial resources to implement evidence-based initiatives; and assign accountability for providing transparent progress assessments. Beyond AHCs, organizations must examine their operations and implement change to ensure parity of funding, research, and leadership opportunities as well as transparency of assessment and accreditation.

A collection of articles in this issue^{1–8} addresses a wide array of factors that affect the careers of women in academic medicine. These eight articles resulted from a National Institutes of Health (NIH) initiative that funded 14 R01 grants in 2008 for the study of causal factors that promote and support the careers of women in biomedical science. The Research Partnership on Women in Biomedical Careers, a multi-institutional collaboration of the investigators funded by this R01, has since cumulatively published over 100 peer-reviewed journal articles. Although addressing gender disparities in science careers has grown from a marginalized niche area of study to a mainstream concern, this work has not yet resulted in robust changes in the academic medicine community.

From these articles we learn a great deal about gender bias, the need for new types

Please see the end of this article for information about the authors.

Correspondence should be addressed to Alyssa Westring, 1 E. Jackson Blvd., Chicago, IL 60604; telephone: (312) 362-5239; e-mail: awestrin@depaul.edu.

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of mentorship, work–family conflict, salary equity, academic productivity, and other factors that inhibit or contribute to women's success. Each article, appropriately, suggests steps for dealing with specific issues. Like most complex problems, the causes of gender disparities are multifactorial, and the solutions will require complex, integrated strategies. An important challenge is translating individual findings into effective, wide-ranging strategies to orchestrate meaningful institutional change. A comprehensive framework is needed to address change at the individual, department, institutional, and academic community levels. We need change strategies that disrupt the self-reinforcing systems of bias that perpetuate disparities in achievement by gender. We therefore propose an overarching framework that will help achieve this goal by synthesizing the research conducted to date, communicating the breadth and interrelationships of the challenges to women's career success to key stakeholders, and aid in designing, implementing, and evaluating evidence-based change.

The framework we propose builds on the work of Westring and colleagues,⁹

1 of the 14 NIH R01 grants. Through comprehensive research, the authors identified critical aspects of the work environment that are crucial for creating a culture conducive to women's academic success. Regarding gender in academic medicine, culture for women's career success may be assessed and addressed at many levels, including the department, specialty, institution, or field. Westring and colleagues demonstrated that there are four distinct but interrelated aspects of a culture conducive to gender equity: equal access to resources and opportunities, minimizing unconscious gender bias, enhancing work–life balance, and leadership engagement. Working in an environment with a positive culture was associated with greater job satisfaction and greater commitment to the institution; a supportive culture could buffer women from the negative effects of long work hours.¹⁰

Each article in this collection speaks to one or more of the four dimensions of a culture conducive to women's success. In the next section, we highlight how each sheds light on the distinct facets of culture identified in this framework.

Equal Access to Opportunities and Resources

Successful careers in academic medicine hinge on access to critical opportunities and resources. Access to laboratory space and equipment, salary, grant funding, leadership positions, effective mentoring, and sponsorship can be key factors in fostering successful careers. Yet evidence shows that men and women do not equally share such resources. For instance, the longitudinal compensation study by Freund and colleagues¹ found that the gender disparity in pay continues despite knowledge of this discrepancy.

Another critical resource for academic faculty is grant funding. Although earlier research has noted gender disparities in grant funding, the articles in this collection suggest that this resource may be more evenly distributed than previously believed. In a national multi-institution study, Ginther and colleagues² demonstrated that for a specific NIH grant application, women and men faculty were equally likely to be initially funded. Over time, however, women were much less likely than men to resubmit or to submit multiple applications, meaning that overall women were less likely to receive a research award during the study period. Although the focus of this collection is on gender differences, it is important to note that Ginther and colleagues² also highlighted major racial differences within the cohort of women in their study. Compared with white women, black women were significantly less likely to receive NIH research awards.

Mentoring is another resource critical for career success that may be distributed unevenly across genders. Effective mentoring has been associated with career success in academic medicine.¹¹ Yet, prior research has shown that women faculty may not have access to mentors best positioned to facilitate and sponsor their careers.¹² In this collection, Carapinha and colleagues³ surveyed 3,100 women faculty across 13 medical schools about their mentoring preferences. Participants rated having a mentor in their own department as the most important mentor characteristic. Gender concordance was also rated more important by women without a current mentor. Matching career and personal interests were more critical for early-career than late-career faculty. However,

13% of the nearly 1,500 participants who provided a response reported never having a mentor. Given the insufficient representation of women in academic medical leadership and research positions, providing women faculty with effective, well-fitting mentorship becomes a critical feature of the work culture.

Management of Unconscious Gender Bias

Gender bias in academic medicine has received considerable attention as an obstacle to women's career success and an opportunity for initiating change efforts. The primary focus on bias has emphasized unconscious (or implicit) bias, rather than overt gender-based discrimination. Unconscious bias refers to implicit associations (e.g., that men and women both associate "scientist" or "leader" with "man") that can impact decision making without the awareness of the decision maker.^{13,14} The implications of such bias can have profound implications for careers.¹⁵

In this collection, there is further evidence that gender bias significantly affects the careers of women faculty and that steps are warranted toward remediating its negative impact. Remich and colleagues⁴ analyzed qualitative interviews with women in PhD programs to assess their experiences and awareness of gender bias early in their training. Of 22 women, 19 acknowledged systemic gender inequities in science and/or reported instances of bias. The authors concluded that although most participants had not yet directly experienced gender bias, they expected to be treated differently in the future on the basis of gender and were developing strategies to minimize such effects on their careers.

Kaatz and colleagues⁵ investigated gender bias in the reviews of NIH grant proposals. They analyzed 739 critiques of R01 applications, both funded and unfunded. They compared priority and criteria scores and text analysis results by the sex of the principal investigators (PIs) for both new and renewal applications. For renewals, reviewers assigned significantly worse scores to women versus men PIs despite using more positive adjectives (e.g., "outstanding," "excellent") in critiques of the women's applications. They concluded that

because of unconscious gender bias, reviewers hold women applicants to higher evaluation standards.

Support for Work-Life Balance

Among the most frequently noted obstacles to women's career success in academic medicine are challenges managing the demands of work and family, which has been quantitatively documented by Carr and colleagues.¹⁶ Women tend to take on a greater share of family and household responsibilities compared with men,¹⁷ and often face negative career penalties associated with parenthood.¹⁸ A culture that facilitates work-life balance thus becomes particularly critical.

Several articles in this issue speak to work-life issues as a factor in women's careers. DeCastro Jones and colleagues⁶ found that despite relatively consistent career goals between men and women faculty at the outset, women were more likely to prioritize balancing work and life than men, which could alter their goals over time. There is also evidence that current practices for supporting work-life balance are insufficient and that some work-family policies are often not taken advantage of by young faculty (e.g., extending the tenure clock, extensive parental leaves).¹⁹

Raj and colleagues⁷ did not find gender differences in the proportion of faculty with a recent federal grant, yet women lagged behind men in publications. The authors propose that family-related demands may more profoundly impact women than men. Women with children published less than men with children, but there were no gender differences for those without children. This, like much prior research, suggests that family demands impact women differently than men.

Leadership Engagement

In research on women's careers, it has become increasingly clear that without the engagement of leadership on every level, the impact of efforts to support women will be limited. Although leadership engagement is important within institutions at the department and school levels, engagement from national societies, grant funding agencies, and administrative bodies is also critical. Leadership attention to gender bias,

access to resources and opportunities, and work–life balance is a key factor in translating a desire for gender equality into a cultural reality. Supportive policies/practices are only effective when implemented in the context of engaged leadership.

In this collection, Plank-Bazinet and colleagues⁸ describe how the NIH, a gatekeeper to career success in science, has addressed gender disparities. The NIH Office of Research on Women's Health (ORWH) is charged with “develop[ing] opportunities and support for recruitment, retention, reentry, and advancement of women in biomedical careers”⁸ and has designed programmatic efforts to address critical career junctures. For example, the Building Interdisciplinary Research Careers in Women's Health (known as BIRCWH) program targets junior faculty and offers supplemental access to resources and opportunities through research and mentorship. The Research Supplements to Promote Reentry Into Biomedical and Behavior Research Programs provide similar supports to help those who have left the workforce (e.g., for family-related reasons) to return. The ORWH has also worked closely with the NIH Working Group on Women in Biomedical Careers to address important facets of the culture related to gender bias, work–family balance, and access to resources and opportunities. Despite these efforts, findings such as those from Kaatz and colleagues⁵ suggest that there are opportunities still for NIH leadership to engage further in initiatives to address gender biases such as the grant review process.

Call to Action: An Integrated Approach to Gender Equity

The landmark report “Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering” concluded, “Career impediments for women deprive the nation of an important source of talented and accomplished scientists and engineers who could contribute to our nation's competitiveness.”²⁰ The articles in this collection offer feasible steps that are likely to address these career impediments. The evidence they present suggests that approaches such as improving mentor–mentee fit, coaching grant reviewers on implicit or

unconscious bias, and providing equal compensation and adequate resources for career development will likely contribute positively to gender equity in academic medicine. Although we applaud individuals and institutions who champion such efforts, we also recognize that these are often only available to relatively few faculty, implemented inconsistently, and not evaluated rigorously for their effectiveness. In other words, they lack integrated, comprehensive, and widespread implementation. As a result, progress may be slow and inconsistent.

Therefore, our call to action stems from our belief that the path to gender equity requires academic medicine to adopt an integrated perspective on the culture for women and the multiple facets of the work environment that have been demonstrated to be essential to gender equity. For meaningful change to occur, the culture must be addressed at academic health centers (AHCs) both from within (e.g., deans, department chairs) and from external sources (e.g., federal and private funding agencies). First, internal and external leaders should examine their institutions, identifying ways their culture perpetuates unequal access to resources and opportunities, subtle discrimination associated with unconscious biases, obstacles for those managing work and family demands, and lack of leadership engagement in promoting gender equity. Next, institutions must mobilize personnel and financial resources to implement evidence-based initiatives to remediate identified problems. Finally, institutions must require transparent assessments of progress and continued accountability.

How could this call to action be implemented both within and outside of AHCs? Within AHCs, insights about the current status of the culture can be gleaned in several key ways. First, although many institutions collect faculty satisfaction data, they often fail to assess those aspects of the work culture that most directly affect women's careers. A comprehensive faculty survey examining all four facets of the culture⁹ is an important tool to enable change. Further, objective data related to recruitment, compensation, startup packages, and promotions can be analyzed with respect to gender disparities. Beyond analyzing data for gender differences, we encourage analyses exploring the interaction

between race and gender, given that culture barriers may be amplified for women of color.

Once AHCs characterize the current status of their environment for women, it is essential that resources be mobilized to remediate known areas of weakness. Often, the cheapest and most convenient steps that institutions implement to support women faculty are developmental programs aimed at the women themselves (i.e., workshops teaching negotiation, writing, or work–life balance skills). Although well intentioned, such initiatives have the simultaneous impact of subtly implying that women are the cause of their own career challenges and allowing leadership to feel that sufficient steps have been taken to address disparities. Instead, we advocate for both a top-down and a bottom-up approach to institutional change. For instance, implicit bias training could be required for those with recruitment or hiring responsibilities. Mentors could be provided with training and salary support to encourage effective mentoring of women faculty. Policies that support women's careers during child-raising years (e.g., extensions for tenure probationary periods) could be implemented, and convenient child care and lactation facilities could be provided.

Finally, AHCs should be transparent in reporting their current status and held accountable for evaluating the effectiveness of initiatives implemented to address disparities. Too often, programs are implemented but not evaluated. This drains resources from institutions without providing evidence of return on investment. For gender parity to be achieved, there must be rigorous attention to whether the desired changes are being achieved and a mind-set of continuous improvement adopted.

External institutions beyond AHCs must likewise closely examine their operations and leverage for change to ensure parity of funding, research, and leadership opportunities as well as transparency of assessment and accreditation. Important external organizations include research funding agencies, state and federal government, licensure and accreditation organizations, medical societies, and health-related industries.

Support for research on how best to advance women’s careers in biomedical science has been limited. Gender equity and diversity in general should be central issues for scholarship. Research is needed on how to address gender bias, measure and ensure equal access to resources, train leaders to support diverse faculty, and support work–life balance. NIH is critical for adequate funding to test multilevel interventions that address these issues simultaneously. NIH can also lead in raising awareness, supporting faculty development, and fostering cross-institutional initiatives. NIH should regularly publish composite information on demographics, field, award type and budget request, review score, and funding outcomes for all funding applications. Private philanthropy can stimulate ideas and support innovation. The Doris Duke Foundation recently developed a novel program in which medical schools provide supplemental funds for early-career physician scientists to help them maintain productivity during periods of difficult extraprofessional demands, such as child or elder care.

Medical and scientific journals should systematically examine their review processes and take steps to minimize gender bias, such as blinded reviews. Honorary societies could review their nomination and election processes to address the underrepresentation of women leaders in their organizations. The Liaison Committee on Medical Education, which provides standards to which medical schools should adhere, could consider salary equity review and equal access to resources by gender to be part of accreditation for medical schools.

In summary, there are enormous opportunities for external systems to contribute to and incentivize substantial reform of the academic medical enterprise—structure, incentives, and accountability—to change outcomes and achieve gender equity. To achieve meaningful systemic changes of the academic health institution, multilevel and integrated interventions are needed

across the academic and health system sectors.

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A. Westring is associate professor of management, Driehaus College of Business, DePaul University, Chicago, Illinois.

J.M. McDonald is project manager, Research Partnership on Women in Biomedical Careers, and freelance editor, Alexandria, Virginia.

P. Carr is associate physician, Massachusetts General Hospital, and faculty member, Harvard Medical School, Boston, Massachusetts.

J.A. Grisso is emeritus professor of medicine, public health, and nursing, University of Pennsylvania, Philadelphia, Pennsylvania.

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