Viewpoint: **A Challenge to Academic Health Centers and the National Institutes of Health to Prevent Unintended Gender Bias in the Selection of Clinical and Translational Science Award Leaders**

Molly Carnes, MD, MS, and Carole Bland, PhD

Abstract

In controlled studies, both men and women preferentially select men over women for leadership positions, even when credentials are identical and despite field studies demonstrating women's equivalent or slightly better leadership effectiveness. The assumption that men will make better leaders than women is attributed to the pervasive existence of unconscious stereotypes that characterize both men and leaders as agentic or action oriented and women as dependent.

The Clinical and Translational Science Award (CTSA) from the National Institutes of Health (NIH) Roadmap is a novel, prestigious award that will place considerable power in the hands of one principal investigator—conditions that predict activation of bias in favor of selecting male leaders. The authors review research supporting this assertion. To mitigate the impact of this bias and broaden the pool of potential leaders for this transformative initiative, the authors offer the following suggestions. To academic health centers they suggest (1) internal search committees comprised of at least 35% women that establish a priori the desired qualities for the CTSA leader and broadly solicit applicants, (2) explicit specification of the full range of desirable skills of a CTSA leader, and (3) systematic efforts to increase awareness of the negative impact of unconscious gender bias on women's advancement. To the NIH they suggest (1) the new multiple principal investigator rule for the CTSA program, (2) a statement in the request for applications (RFA) encouraging diversity among principal investigators, (3) repetition in the RFA of the public NIH statement of the importance of work life balance for young investigators, and (4) constitution of study sections with at least 35% women.

Acad Med. 2007; 82:202–206.

In the spring of 2005, the National Institutes of Health (NIH) released a program announcement soliciting proposals for Clinical and Translational Science Awards (CTSA) as part of the NIH Roadmap for Medical Research.[1] These sizeable and auspicious awards will merge several discrete NIH programs currently devoted to furthering clinical and translational research and career development. Heading up these programs at each academic health center (AHC) will be a single principal investigator (PI) where previously there may have been two or three. The budgets of these awards will be large—as much at $14 million dollars of direct costs annually for AHCs that already have certain NIH-funded programs in place. Although the ability to submit grant proposals with multiple PIs is being piloted by the NIH,[2] it will not apply to the CTSA program. Competition for these grants will be fierce, and success will confer considerable prestige and power on the individual PIs of selected programs—individuals who are most likely to be male.

Despite the clearly articulated commitment of the NIH to the advancement of women in biomedical and behavioral research,[3,4] decades of study in cognitive and social psychology[5–7] predict that the conditions the NIH has established for the development and funding of CTSAs will result in the preferential selection of men over women to lead the program at each applicant institution. In this article we examine why men, compared with women, are far more likely to be selected as PIs in CTSA proposals. We describe research on the characteristics of effective leadership and research relevant to the impact of unintended biases on women's success. On the basis of this background, we offer suggestions to the NIH and academic institutions for facilitating the selection of the best person—man or women—to lead a CTSA program.

Characteristics of Effective Leadership

Although in the past several decades, women have achieved entry into nearly every field traditionally held by men, elite leadership positions from Fortune 500 companies[8] to department chairs and deans of medical schools still rest solidly in the hands of men.[9,10] Could it be that men are more likely to rise to high-level positions because they are more effective leaders than women? To answer this question, we looked at contemporary research on leadership. This literature demonstrates that in nearly every organization studied, a leadership style termed "transformational" is most effective.[11,12] Transformational leaders inspire, innovate, mentor, and empower their followers to move toward a shared vision.[13] The two other predominant styles of leadership are termed "transactional," where leaders manage within the existing norms of the

Dr. Carnes is professor, Departments of Medicine, Psychiatry, and Industrial & Systems Engineering, University of Wisconsin, Madison, Wisconsin.

Dr. Bland is professor, Department of Family Medicine and Community Health, University of Minnesota, Minneapolis, Minnesota.

Correspondence should be addressed to Dr. Carnes, Center for Women's Health Research, 700 Regent Street, Suite 301, Madison, WI 53715; telephone: (608) 263-9770; fax: (608) 265-6423; e-mail: (mlcarnes@wisc.edu).

organization providing rewards for satisfactory performance, and "laisez-faire," which is marked by a lack of involvement and failure to take responsibility.[13]

Bernard Bass, one of the foremost researchers on leadership, asserts that transformational leaders are best able to effect changes in organizational culture.[13,14] Because a goal of the CTSA initiative is to change the prevailing institutional culture for clinical and translational research and career development, it follows that transformational leaders would be highly desirable for the PI role. Of relevance, Brown and Moshavi[15] examined the leadership effectiveness of 70 university department chairs from the perspective of 440 members of their departments and confirmed that leaders who exhibited transformational-style behaviors were viewed as most effective. Eagly et al[16] performed a meta-analysis of 45 studies in which male and female leaders were compared on standardized measures of transformational, transactional and laissez-faire leadership styles. Although differences were small, female leaders emerged as being more transformational in their leadership style than male leaders. Confirming this female advantage in academic settings, Rosser[17] examined the leadership effectiveness of 16 male and 6 female deans at a major research university from the perceptions of 865 faculty members and administrative staff. Controlling for respondent variables, on five-point Likert scales female deans were rated as significantly more effective leaders than their male counterparts on all seven dimensions of leadership assessed.

In sum, research on organizational leadership confirms that nothing about women's intrinsic traits or socialized behaviors would prevent them from effectively leading CTSAs. On the contrary, there is evidence to suggest that women leaders, who seem to be more likely than men to exhibit transformational styles of leadership, may be ideal leaders to effect the change in institutional culture sought by the NIH.[18]

The Impact of Unconscious Assumptions about Men and Women

In the face of convincing evidence of women's leadership effectiveness in academic and other organizations, why is it unlikely that women will be put forth as PIs of the CTSAs?

The explanation for the persistent selection bias for male leaders rests on the existence of stereotyped assumptions about the intrinsic traits and expected behaviors of men and women. We describe some of these stereotyped assumptions, how those assumptions are activated and applied, and strategies for mitigating unintended bias.

What are the socially ingrained assumptions about men and women?

One measure of gender-based stereotypes is the Bem Sex Role Inventory.[19] Although first developed 30 years ago, recent studies of the Bem Inventory find that both men and women continue to indicate that it is more desirable for men to be "assertive," "dominant," "forceful," act "as a leader," and have "leadership abilities"; for women, it is considered more desirable to be "gentle," "compassionate," "soft spoken," and "yielding."[20,21] Overall, the stereotyped behaviors for men are categorized as agentic or action oriented and for women as predominantly dependent or communal.[5,6] The stereotyped assumptions about the intrinsic traits and expected behaviors of a good leader are also generally agentic and thus more aligned with unconscious assumptions about male attributes than female attributes.[5,7] Studies consistently find that men are assumed to possess intrinsic qualities that make them more competent leaders than women[7,22,23] even when male and female applicants have identical credentials, experience, and work history.[5,24–26]

The unconscious linking of stereotypically male with stereotypically leader traits, at least in part, relates to the paucity of women in elite leadership positions. Davidson and Burke[22] demonstrated this in a meta-analysis of 49 experimental studies in which both male and female applicants were rated. Synthesizing data across studies, they found that male applicants received higher ratings and were offered higher compensation than equally qualified female applicants when the job was one traditionally occupied by men. Similarly, when Cejka and Eagly[23] asked evaluators to rate the attributes necessary for 10 occupations, those in which men comprised more than 75% of the workforce were more likely to be rated as requiring stereotypically male attributes and also as having greater prestige and higher wages. Kawakami et al[28] found that even after counterstereotype training to assist evaluators in recognizing and resisting biases against women, when subsequently asked to hire someone for a leadership position, men were overwhelmingly more likely than women to be selected.

The prejudice against female leaders in traditionally male jobs is multifaceted. Heilman et al[26] found, for example, that when irrefutable evidence of competence at a traditionally male job (assistant vice president) was provided to evaluators, men and women were rated as comparably competent. However, if the target in question was a woman, she was assumed to be interpersonally hostile and unlikable compared with a target male with identical credentials. Heilman et al[26] then showed that likeability and competence were independently associated with evaluators' willingness to recommend an employee for higher pay or institutional rewards. Relevant to the issue of biases against women's competence, particularly with the growing emphasis on the need for research to be conducted in teams, is a series of studies by Heilman and Haynes,[27] which found that in mixed-sex work groups the contribution of female members may be discounted.

The presumed assumption of male leadership competence is so deeply embedded in people's attitudes, that when Sczesny et al[29] had evaluators view photographs of target individuals and subsequently rate their leadership competence solely on appearance, they found that even among men, those with a more typically "masculine" appearance in photographs were viewed as more competent leaders than men with more "feminine" physical attributes. Demonstrating how easily the unconscious bias against women as leaders is activated and applied, in another experiment[30] this group of authors found that reviewers examining theoretical applicants for a manager position gave more favorable evaluations to applications written on paper that had been sprayed with a "masculine" perfume than identical applications on paper

sprayed with a perfume determined a priori to be "feminine."

Although the unconscious bias toward selecting male leaders is strong, it is important to emphasize that among the 20 items in the questionnaire most widely used to assess transformational leadership behaviors[11,31] only one item aligns with male agentic stereotypes: "manifesting power and confidence." Most of the other measures of effective leaders are gender neutral; for example, "concern for moral and ethical aspects of decisions," "enthusiasm about goal accomplishment," and "facilitating problem understanding from different perspectives." Some of the items are communal and thus more aligned with female stereotypes; for example, "transcending self-interest for collective good" and "helping subordinates develop their strengths." Nevertheless, as illustrated in the few examples provided, when assessments of leadership qualifications are based on perceptions of attributes rather than actual attributes, the evidence overwhelmingly indicates that men will be selected over women. Furthermore, the more prestigious and powerful the leadership position, such as the PI of a CTSA, the greater the likelihood that automatic stereotypes will be activated, envisioning a man in this position.

How do stereotyped assumptions get activated?

Some conditions enhance activation of automatic, unconscious stereotypes in a way that would further disadvantage women being evaluated for a position of leadership. Ambiguous performance criteria or an emphasis on the *potential* to perform in a leadership role—both conditions surrounding development and review of the CTSAs—will favor the selection of men over women.[6] Recalling Heilman's study of assistant vice presidents, only when performance criteria were ambiguous were men consistently viewed as being more competent.[26] In the absence of predetermined criteria for a position, evaluators can also redefine the merit of men's and women's accomplishments to fit the desired outcome. Uhlmann and Cohen[32] found this reconstruction of the merit of an applicant's accomplishments both to favor selection of a male over a female applicant for a traditionally male job, as well as to favor selection of a

female over a male for a traditionally female job. A study by Steinpreis et al[33] illustrates both reconstruction of merit to fit the unconscious gendered view of a job as well as the disadvantage against women when potential for success is required. The authors sent to a national sample of academic psychologists identical curriculum vitae with a gendered male or female name of a junior or more senior applicant for a faculty position. Despite the applicants' identical records, only at the senior level, where potential had been proven, were evaluations of competence comparable between the male and female candidates. For the junior applicants, identical teaching and research accomplishments were weighted differently depending on the gender of the applicant to the woman's disadvantage. Thus, combined with the unconscious assumption that an elite leader will be male, men will be further favored for selection as CTSA PIs by the lack of explicit specification of qualifications and the emphasis on the potential for success in a novel program, particularly in the absence of an opportunity to provide clear evidence of competence.

Having a small proportion of women in a group of evaluators generally disadvantages a female target. Kanter[34] in her studies of organizations has indicated that the relative numbers of men and women in groups are critical in shaping a group's dynamics. She asserts that as women enter groups of men, only when a ratio of women to men of approximately 35:65 is reached will the culture of the group change. Confirming the importance of the proportion of women in groups evaluating and selecting applicants, Yoder et al[35] studying 93 academic psychology departments found that only when women comprised 36 to 65% of the faculty were men and women equally likely to be hired. In meta-analyses of both experimental and field studies, the percentage of male evaluators also had significant effects on judgment about job performance such that when raters were all male, men were rated significantly more highly than women, whereas when raters were mixed males and females there was either no evidence of gender bias, or women were rated more highly.[36–38] Although a number of changes were made in the solicitation and review process in the NIH Director's Pioneer Awards between 2004 and

2005,[39,40] the potential impact of raising the proportion of women scientific reviewers from 4 of 64 (6%) to 28 of 64 (44%) cannot be ignored in the increase of women from zero to 43% of the awardees.[41,42] Traditional means of selecting a PI for a prestigious program like the CTSA is through appointment by a single top administrator. This method precludes the opportunity to have a group of 35% women evaluating candidates for the position and would predict preference for selection of a male PI.

Can activation of these automatic stereotypes be mitigated?

If institutions established internal search committees to select the CTSA PIs, it would create the opportunity to reduce the bias-activating conditions detailed above. This committee could make explicit the full range of desired attributes for the ideal CTSA leader. Not unexpectedly, many of the desirable attributes for a CTSA PI are the traits of a transformational leader and might include good communication skills to a variety of audiences; experience with consensus building and inspiring others to work toward a shared vision; a history of building programs with full participation of multiple disciplines; examples of nurturing the careers of women and others underrepresented in academic health sciences; role modeling a balanced life; and clear demonstration of an understanding of the relational complexities in building a new multidisciplinary program. All these skills are gender neutral. An internal committee would also provide the opportunity for applicants to submit clear evidence of their qualifications, which should override the assumption that men will be more competent leaders than women.[26,29,33,43] These committees could be constituted to include at least 35% women, further reducing the likelihood for activation of gender stereotypes.

Some actions can further reduce the activation and application of unconscious biases. Exposure to admired individuals who represent a counterstereotype image[44,45] is effective. Lowery et al[46] found, for example, that when the individual conducting a study on biases was black, students were less likely to exhibit antiblack biases in measures of their unconscious stereotypes. Similarly,

a greater proportion of distinguished women scientists on any review committee would be expected to provide ample opportunity for counterstereotype images. Explicitly instructing individuals to resist stereotyped responses has also been demonstrated to reduce measurements of automatic bias.[46,47] The CTSA request for applications does not contain any specific encouragement from the NIH to consider diversity in selection of PIs.[48] It is difficult to know if such a statement can influence activation of bias; however, given the starkly different proportion of women awardees between the first and second years of the NIH Director's Pioneer Awards it is noteworthy that in the second but not the first round, the request for applications (RFA) specifically encouraged women to apply.

Summary Comments and Recommendations

Women currently hold approximately half of awarded medical degrees and doctoral degrees in biological sciences. Relevant to CTSA leadership, however, is that women have comprised over 30% of medical school classes since 1983[9] and have received over 25% of doctoral degrees in biological sciences since 1985,[49] allowing sufficient time for a substantial number of women to become established leaders in academic health sciences. As evidence of this, women receive approximately 25% of NIH R01s.[41] Women's participation as full and equal partners in the future of academic health sciences will only occur if women are included in the highest strata of leadership. We are confident that it was not the intention of the NIH to stack the deck against the selection of women as leaders in CTSAs. Indeed most of the systematic bias against women's advancement in traditionally male fields is unconscious, but nevertheless exclusionary.[7] We predict that the current strategy is unlikely to result in a single woman appointed principal investigator of a CTSA proposal, and undoubtedly women will head less than 25% of the proposals submitted or awarded. Rather than avoiding application of the multiple PI rule to CTSAs, we suggest that to prevent further institutionalizing barriers to the advancement of women in academic health sciences, this is exactly the program in which multiple PIs are

needed. Multiple PIs would allow women who have risen to leadership in such programs as the General Clinical Research Centers, Clinical Research Curriculum Awards, and Multidisciplinary Clinical Research Career Development Program to continue as leaders at their institutions and nationally. In several public forums where the CTSA was presented by NIH directors, the importance of considering the work environment and work–life balance in the career development of young scientists was specifically stated.[50] The RFA, however, contained no encouragement for CTSAs to consider such issues.[48] Although work–life balance and work place climate is important to both men and women, it is of particular importance to women at all career levels.[51–54]

We need the best leaders—male or female—to lead this transformative initiative. To minimize the impact of gender bias on selection of CTSA PIs, broaden the pool of potential leaders, and prevent the loss of women leaders in the existing NIH clinical and translational research programs, we offer the following suggestions. We suggest that AHCs (1) constitute internal search committees comprised of at least 35% women that establish a priori the desired qualities for the CTSA leader and broadly solicit internal applicants, (2) develop explicit criteria, including the full range of desirable skills of a CTSA leader, which may include those that are stereotypically male, female, and gender neutral, and (3) undertake systematic efforts to increase awareness of unconscious gender stereotypes and their negative impact on women's academic career advancement, particularly as they move toward top leadership. We suggest that the NIH (1) allow the new multiple PI rule to apply to the CTSA program, (2) include a statement in the RFA encouraging gender and ethnic/racial diversity among principal investigators, (3) repeat in the RFA the public statement made by NIH Roadmap leaders regarding the importance of work–life balance for young investigators, and (4) strive to constitute study sections to contain least 35% women. The NIH could also fund research on interventions to reduce the activation and application of gender bias in academic environments.

In short, we challenge the current leaders of AHCs and all those involved in review of the CTSAs at the NIH to make a conscious effort to work against the inexorable force of social conditioning, which predicts that when conditions demand selection of a single, top leader for a highly prestigious program with considerable power and a large budget, that single leader will be male.

Note added in proof.

Since we finished writing this article and at the time it went to print, 12 CTSA sites have been awarded, and all 12 have male PIs. Of the 35 applications received, none had a female PI. The goal of the NIH is to have 60 CTSAs—will they all be led by men?

Acknowledgments

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