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# Systems of Career Influences: A Conceptual Model for Evaluating the Professional Development of Women in Academic Medicine

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## Abstract

***Background:*** Surprisingly little research is available to explain the well-documented organizational and societal influences on persistent inequities in advancement of women faculty.
***Methods:*** The Systems of Career Influences Model is a framework for exploring factors influencing women's progression to advanced academic rank, executive positions, and informal leadership roles in academic medicine. The model situates faculty as agents within a complex adaptive system consisting of a trajectory of career advancement with opportunities for formal professional development programming; a dynamic system of influences of organizational policies, practices, and culture; and a dynamic system of individual choices and decisions. These systems of influence may promote or inhibit career advancement. Within this system, women weigh competing influences to make career advancement decisions, and leaders of academic health centers prioritize limited resources to support the school's mission.
***Results and Conclusions:*** The Systems of Career Influences Model proved useful to identify key research questions. We used the model to probe how research in academic career development might be applied to content and methods of formal professional development programs. We generated a series of questions and hypotheses about how professional development programs might influence professional development of health science faculty members. Using the model as a guide, we developed a study using a quantitative and qualitative design. These analyses should provide insight into what works in recruiting and supporting productive men and women faculty in academic medical centers.

## Introduction

As academic medical faculties have grown and become more diverse, women's career development in academic medicine has been richly described in reports of statistical analyses yet sparsely studied in terms of comparative influences and outcomes.[1–4] Over the past three decades, the numbers of women completing medical school and doctoral science programs have steadily increased, and laws and policies that aim to level the playing field for professional advancement have been enacted and enforced. Despite this progress and in the face of increasing evidence that gender equity in leadership has organizational benefits, advanced academic ranks and administrative leadership do not present a picture of gender equity.[5,6]

Surprisingly little research is available to explain the causes and persistence of these gaps.[7] As a result, formal programmatic and policy solutions are often based on conjecture about the relationship of organizational and personal challenges to career advancement. The 2007 and 2008 workshops of the National Institutes of Health (NIH) Working Group on Women in Biomedical Careers confirmed that evidence is lacking for actions that might reliably be used to enhance career promoters for women and reduce their career inhibitors.[8] In response to the call for research to provide evidence for what works and what does not work in order to advance women in biomedical science, the authors proposed a framework for studying the various domains influencing the careers of women in academic medicine, especially as they apply to those who participated in national programs designed to support

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academic advancement and leadership. The conceptual model described in this article represents a summary of empirical literature on women's career development and was used to formulate hypotheses for the grant proposal. The purpose of this article is to present this model and to explore its utility as a framework for developing questions that could then lead to action-oriented research to enhance academic career development.

## Materials and Methods

The Systems of Career Influences Model (Fig. 1) is a conceptual framework for exploring factors influencing women's progression to advanced academic rank, executive positions, and informal leadership roles in academic medicine. This model was developed through an iterative process of organizing themes from pertinent literature on women's career development, best practices in professional development programs, and the collective experiences in academic leadership development of the authors, who are all members of the research team and members of the national advisory board for the project. (Advisory board members are all national leaders in academic medicine who have been involved in research and career development programs for medical faculty; for those involved in development of this model, see Acknowledgments.)

We followed three steps to explore the model as a framework to develop research questions about how formal professional development programs might influence academic women's career development (formal professional development programs include local and national mentoring programs, skill-building workshops, and leadership programs). First, we described pertinent background from research and expert opinion to characterize the systems represented in the conceptual model. Second, we selected, from the vast literature on these topics, hypothesis-driven research reports from within and outside of academic medicine to consider how that research might address career development challenges for academic medicine and for women in particular. Finally, we developed questions that could expand our understanding of how formal professional development programs might be explored in further research on academic women's career development. For each major domain of the model, we asked the question: What new research questions arise from considering the findings of this research in light of the Systems of Career Influences Model and potential programmatic outcomes? Thus, the background literature grounds the model in contemporary theories of career development; hypothesis-driven research provides current knowledge of what works and does not work in career development in a variety of environments; and the questions shine light on challenges of women's career development that have been insufficiently researched within academic medicine.

### *The Systems of Career Influences Model: A trajectory of advancement influenced by dynamic systems of individual choice and organizational practices*

The Systems of Career Influences Model (Fig. 1) situates women faculty members as agents within the complex adaptive systems that function in academic medical centers, consisting of interdependent and evolving professional and organizational systems.[9–11] Career development proceeds within the tensions of three interdependent systems: a cyclic trajectory of career advancement that can be promoted or inhibited by a dynamic system of organizational policies, practices, and culture and a dynamic system of individual choices and decisions. In this adaptation of Senge's concepts of organizational learning,[12] the potential for actions and outcomes of each of the two dynamic systems to either promote or inhibit processes of career advancement is represented by opposing circular vectors.

The model assumes that the individuals joining medical faculties have the capability to build a career through service

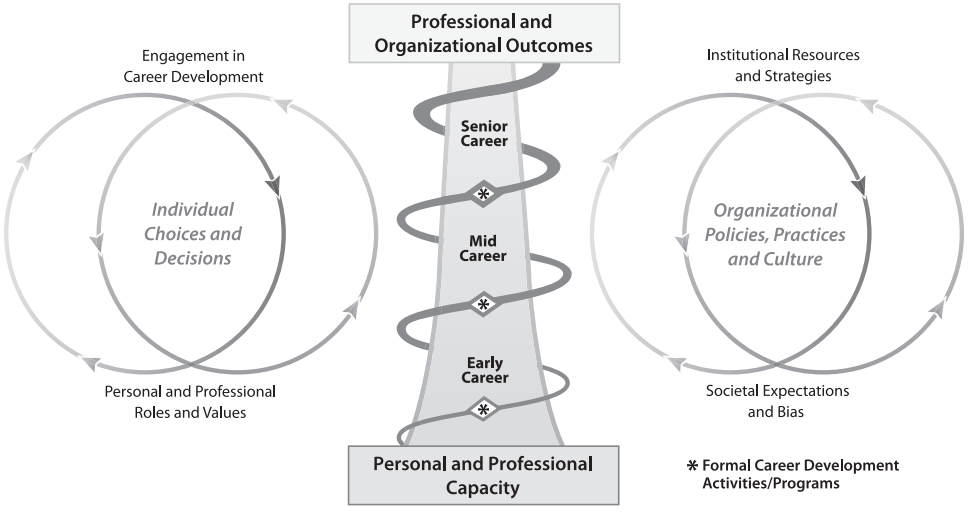


**FIG. 1.** Systems of career influences on academic medical women's professional development. The Systems of Career Influences Model presents three dynamic systems of career development: a central cyclic trajectory of career advancement; a system of organizational influences, some of which promote and some of which inhibit career advancement (depicted as opposing circular vectors on the right); and a system of individual decisions about career and personal life, some of which promote and some of which inhibit career advancement (depicted at left). The potential for formal career development activities to enrich faculty potential and advancement is represented by expansions along the career trajectory.

and scholarship in research, education, or clinical care and aspire to make meaningful contributions to their institutional and professional communities. Women faculty negotiate the specific circumstances of their profession and gender within a culture that has the potential to hinder or enable their achievement in a variety of ways. The model acknowledges the critical importance of the congruence of organizational goals with individual roles and responsibilities, of knowledge and skill-building opportunities, gender-equitable policies and practices, effective mentorship, and valuing of women's contributions to the organization.[13,14]

The career advancement pathway depicted in the model (Fig. 1, center) is a circuitous trajectory characterized by steadily diminishing numbers and relative proportions of women in each academic rank as individuals exit from the academic workforce or fail to advance in academic rank. For those who remain, each transition, from early career (rank of instructor or assistant professor) through midcareer (associate professor and increasing leadership responsibility) and up through senior career (full professor rank and administrative leadership roles), is characterized by new challenges and opportunities inherent in departing from the previous responsibilities and taking on new roles. The Continuum of Leadership Model of Morahan et al.[15] describes these as phases of progressive development of competency in self-efficacy, political savvy, personal and professional growth, and building communities of practice. Our model suggests a potential for enrichment of professional skills and increased opportunity resulting from career development activities at each level of ascending academic rank and leadership responsibility.

Consistent with previously described career models,[16–18] our Systems of Career Influences Model includes dynamic systems of influence that mediate progress along the pathway of advancement: individual choices and decisions about personal and professional activities (Fig. 1, left) and organizational policies, practices, and culture that guide institutional strategy and mediate societal expectations that lead to gender bias (Fig. 1, right). Elements of the two systems of influence can either promote or inhibit women's progress and can be either complementary or competing on this career trajectory. Within this complex system, each faculty member weighs potentially competing influences to make responsible decisions, and leaders of academic health centers prioritize use of increasingly limited resources to support the missions of the organization and to retain highly contributing faculty.

### *The trajectory of advancement for women in academic medicine*

Studies of women's sluggish advancement through organizational ranks to top leadership positions show remarkably similar findings across professions, organizations, and specialties. The professional specialties that are traditionally most incongruent with societal expectations for women, such as engineering and surgery, show the greatest disparities in men's and women's advancement. In surveys of faculty in the sciences[19] and medicine,[20] work satisfaction is generally lower among women than among men. Advancement is usually slower, and salaries are often lower for women than for men.[2,20–24] Not surprisingly in light of these findings, the departure rates from academic medical faculties are greater for women than for men.[25]

The extent to which women participate in service and teaching relative to research activities may affect their advancement, particularly in research-intensive schools. Professional women in general are often expected to tend to the service functions in organizations,[26–28] and some studies indicate that women express more interest than men in the societal missions of organizations.[29–31] A study of University of Massachusetts, Amherst, faculty administrators found that women were more likely than men to assume interim and midlevel administrative positions and to spend less time on research and more time on mentoring. Such choices at earlier ranks resulted in a longer duration before reaching full professor rank for women.[32]

These studies do not distinguish on the basis of race, ethnicity, culture, or background of the faculty. Studies of unconscious bias in employment suggest that in job recruitment, black and Hispanic faculty members are less likely to be considered for leadership positions,[33] particularly for high status positions,[34] but the impact on faculty advancement remains to be studied. One study of faculty promotion rates showed lower rates of promotion for all underrepresented minority faculty in U.S. medical schools, but subpopulations of men and women within these groups were not studied.[35]

***What new research questions arise from considering the findings of this research in career development in light of the Systems of Career Influences Model and potential programmatic outcomes?***

- Are women in medicine more likely than men in the same professions to assume interim and midlevel administrative positions, such as interim chair or director of programs, at earlier stages of career development? How do men and women assess such opportunities at different phases in their careers? What effect does this have on academic medical faculty with respect to promotion in academic rank or opportunities to advance into senior leadership positions?
- Do women who actively seek out formal professional development experiences fare better in advancement and describe a more rewarding and productive academic life than those who do not seek such program support? Do they make decisions about teaching, service, and research activities differently after participating in such experiences?
- How do women from underrepresented minority groups experience personal and organizational systems differently from white women? What adjustments in professional development programs are needed to enhance their career experiences?

### *Organizational policies, practices, and culture: Institutional strategies and gender bias*

The historical mission and contemporary financial models of academic medicine create paradoxical challenges for faculty advancement. Faculty members are expected to simultaneously strive to be individually successful contributors to their institution and society; committed professionals who work tirelessly for their patients, students, and the public; and role models of emotional, social, and physical health. These expectations compete, and no one achieves all of them all of the time. The younger generation may have different expectations for men and women in work and family life; studies

conflict, but most suggest that younger faculty favor more work flexibility and shared family responsibilities.[36] The current academic work culture does not always support these preferences. Organizational policies and practices support a culture of elite, triple-threat researchers (teacher-clinician-administrator) who bring high levels of external funding to the institution through grants or clinical fees and also maintain quality levels of service and teaching. This culture, however, favors those whose personal support from family members and employed assistants frees them to devote the full force of their talents to these pursuits. These faculty are also more likely to have access to a network of influential colleagues who are able to guide them in meeting the unspoken expectations that are placed on the successful academician.[37] Cheung and Halpern[38] describe a "culture of gender" that transcends national boundaries with prejudicial stereotypes and scrutinizes women's physical appearance, clothing, and family responsibilities with a magnifying glass while portraying their male counterparts as dealing with substantive issues. Thus, our professional cultures create a cumulative disadvantage for women in navigating such pathways, starting from initial recruitment to awards and recognition to advancement and selection for leadership roles.

A recent review of key literature on unconscious bias in faculty and leadership recruitment[39] suggests that when evaluators of candidates for promotion or for new positions are under time pressure or are operating under definitions of leadership that are only loosely linked to specific roles and responsibilities, preferential selection of men results, even when the credentials of male and female applicants are identical. Unless selection criteria are specifically defined, both men and women evaluators will unconsciously default to stereotypes that associate men with science careers and women with liberal arts and family. These stereotypical expectations of men to be agentic (assertive and decisive) and women to be communal (nurturing and egalitarian) limit the breadth of leadership behaviors available to our organizations.[40,41] Responses to stereotypes can undermine both leadership effectiveness and confidence in gender-incongruent roles, disadvantaging women in fields that traditionally favor agentic leadership, such as surgery, and in consideration for chief executive positions.[42–45] In addition, the roles of women as family caretakers and the underdevelopment of women's social capital (e.g., the breadth and depth of social networks that for men often evolve outside the work environment and lead to opportunities as a result of informal relationships with colleagues and superiors) create a cumulative disadvantage to women in salary and in advancement over time.[46]

***What new research questions arise from considering the findings of this research in organizational practices and policies in light of the Systems of Career Influences Model and potential programmatic outcomes?***

- How might institutionally based mentoring and skill-building programs mitigate unconscious bias among faculty and administrative leaders?
- How does education on bias and discrimination differ between mixed-gender and women-only programs?
- How might participation in career development programs encourage the use of existing institutional policies and the development of additional ones?

### *Individual choices and decisions: Aligning values and responsibilities*

Although they traverse apparently comparable educational pathways as scientists (graduate student to postdoctoral fellow to independent investigator) and as clinicians (medical student to resident and fellow to credentialed practitioner), men and women have different professional experiences. Research describes distinctions in career choices based on self-confidence, personal and professional values, and personal choices based on differing family roles and approaches to managing responsibilities.[47–49]

Pivotal drivers for both men and women selecting academic medicine include the presence of mentors and role models, interest in teaching or research, and high value placed on intellectual challenge.[6,50] Research suggests, however, that women are more likely than men to participate in interdisciplinary, collaborative research.[51,52] In addition, women are more likely than men to consider perceived quality of life, earnings potential, and organizational reward; they are less likely than men to identify role models for personal-professional balance or to identify recognition as a national leader as motivating.[53] A Johns Hopkins follow-up study of women faculty who left the institution identified themes that influenced their decisions to leave. These included a deficit of role models who combine academic careers with family responsibilities; lack of effective mentorship in research, combined with having to give up teaching and clinical roles to be successful; inability to manage competing demands of work and home; and an individualistic and noncollaborative institutional environment work culture.[54] Although this discrepancy in individual values and institutional priorities has a negative impact on all faculty, the effect on women is disproportionate.

Recent studies of NIH extramural funding noted gender differences in rates of RO1 funding that appear to be largely attributable to rates in reapplication for awards. [55,56] Although women and men had equal success rates when they did reapply, the differences in reapplication rates resulted in men having more awards overall because they were more likely to be continuously funded at all points in their careers.[57]

Studies outside of academic medicine suggest that the challenges of managing professional careers and family responsibilities are universal. Cheung and Halpern report that women in the United States, China, and the Netherlands are all more likely than men to use strategies that integrate work and family roles "in ways that enable them to harmonize both."[38] They propose a model of leadership development that includes redefining normative work and family roles and crafting personal guidelines for work and family interface.

In the course of discussions of how to sustain a vibrant workforce in academic medicine, the issue of part-time appointments and flexible work schedules frequently arises, especially for women with young children. A recent Association of American Medical Colleges (AAMC) study of part-time faculty reported both personal reasons (family responsibilities, health, and lifestyle) and professional reasons (managing workload, responsibilities outside of professional assignments) for considering part-time status.[58] In one of the few studies addressing the effect of part-time assignments, Harrison and Gregg[59] compared attitudes of faculty clinician educators and their division chiefs after the faculty had participated in an endowed program to support part-time work.

The authors described approaches of "working less" and "working differently" as faculty and their chiefs negotiated effective changes, and they suggest that academic medicine reconceptualize work and open discussions of work assignment flexibility.

***What new research questions arise from considering the findings of this research on how individuals make personal and professional choices, in light of the Systems of Career Influences Model and potential programmatic outcomes?***

- How might career and development programs affect barriers to career advancement, such as research grant application and reapplication rates, discrepancies between individual and organizational values, and access to influential role models?
- How do women leaders in academic medicine describe the integration of their work and family roles at different stages of career development and family development? How does this compare with work and family roles for men?
- How might leadership and management training of division chiefs and department chairs support increased flexibility and creativity in faculty work schedules?

### *Individual choices and decisions: Active engagement, mentoring, and sponsorship*

Effective career development programs maintain a constant focus on program improvement and reflect basic tenets of learning (goal orientation, built-in assessment, action learning). Successful programs allow the participant to adapt lessons to her own work over time, involve superiors as coaches and facilitators in real-work applications, and incorporate systems by which those who improve performance are rewarded for their achievements.[60–62] Not surprisingly, program participants who most actively engage in the lessons and follow through to apply them to work circumstances benefit most. Goldsmith and Morgan write that "the more consistent and frequent the follow-up [after a program or coaching intervention], the greater the perception of improved leadership effectiveness."[61]

Leadership development may be embedded within other faculty or career development programs or may stand alone as an intervention for enhancing faculty effectiveness. A recent systematic review of the literature on leadership programs in academic medicine found consistently high levels of satisfaction with programs, self-reported changes in attitude, and, often, self-perceived changes in behavior.[63] Findings suggest that such programs may have institutional impact, but evidence for this is limited by weak research designs in many reports. However, faculty appear to benefit from programs that incorporate multiple instructional methods, experiential learning and reflective practice, integration of individual and group projects with the involvement of a senior mentor, development of collegial relationships for continuing support, and institutional support. The outcomes of men and women participants were not compared, although the components of successful programming were consistent across the single woman-only program studied and all other programs.[63]

Studies of mentoring programs show the greatest benefit when mentoring activities involve multiple mentors and ongoing relationships focus on shared activity.[64–67] Large studies of executives show important differences in the types of mentoring received by men and women.[66,67] Although women in these studies reported having more mentors, they received fewer promotions. The authors attribute the differences in promotion rates to the mentor's level of active engagement; women reported receiving mentoring in professional style and approaches to change, whereas men found senior mentors who publicly endorsed them and championed their move to the next position. This lack of sponsorship activity is perceived as a gap for women's career development and advancement.

***What new research questions arise from considering the findings of this research in mentoring and follow-up on career development intentions in light of the Systems of Career Influences Model and potential programmatic outcomes?***

- How effective is a professional development plan that combines several independent, free-standing, skill-based workshops as compared with a single longitudinal, cohort-based program? Are the outcomes similar if a faculty member compiles a portfolio of short workshops tailored to her career development and organizational needs?
- Under what conditions does co-worker and stakeholder follow-up occur in the academic health center environment? Does formal leadership program development affect this? If so, how?
- What is the balance of mentorship and sponsorship among men and women in academic medicine? How can programs increase the kind of mentoring and sponsorship advocacy that leads to strategic connections and opportunities for interesting new positions for women?
- What learning (i.e., attitude and behavior changes) occurs for the mentor over the course of an extended professional development program for the mentee?

## Conclusions

The Systems of Career Influences Model provides a dynamic framework that raises research questions to explore a variety of influences on women's career development, both those that promote and those that inhibit advancement. Our hypothesis is that effective career development programming can provide strategies to enhance individual women's ability to navigate the complexities of advancement in academic medical systems and to increase leadership capability within their organizations. To support further explanatory research and evidence-based changes in practice based on strong research, we offer a model for exploring the relationships and interactions of the organizational, individual, and societal components of the complex system that must be navigated.

In a study of leadership emergence, Lichtenstein et al.[11] suggested that analysis of such a system requires cross-sectional data on nonlinear processes, with a focus on dynamics and interdependence. Such an approach requires multiple methods of quantitative and qualitative analysis across multiple systems before findings can be used to develop new policies or to provide career guidance. This article presents questions that arise at the intersection of the experience of academic career development through rank and increasing responsibilities and formal professional development programs as they enhance essential skills, provide insight about

how to interpret and use organizational policies and practices, and contribute to expanding professional networks. The authors' subsequent research will test the model by systematically analyzing existing data on academic career advancement of women participating in three national leadership programs, the AAMC's Early and Mid Career Women Faculty Development Programs[68] and Drexel's Hedwig van Ameringen Executive Leadership in Academic Medicine program (ELAM).[69] This multimethods project aims to compare academic career outcomes of participants to those of matched nonparticipants, to obtain qualitative responses of women academics in carefully constructed interviews; and to validate our findings among leaders in academic medicine. The results of these studies and other studies supported by ongoing NIH-sponsored projects investigating the processes by which women advance in academic medicine[70] will inform the next iteration of the model. Ultimately, such a model might be applied to understand professional development among both men and women faculty and the paths they take in advancing through academic ranks. Additionally, it might be adapted into a framework to explore generational differences across the biomedical workforce in terms of student career development. Such an approach shows promise to generate research that increases the pool of leadership talent available in our institutions.

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### Disclosure Statement

No competing financial interests exist for any of the authors.

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