

# Is Your Organization Collegiality-Challenged? A Case Study Demonstrating The Effect of Unconscious Gender Bias

Deborah Campbell

Master's Candidate  
University of Bergen  
Bergen, Norway

[deborah-campbell@comcast.net](mailto:deborah-campbell@comcast.net)

Peter S. Hovmand, Ph.D.

George Warren Brown School of Social Work  
Washington University in St. Louis  
Campus Box 1196  
One Brookings Drive  
St. Louis, MO 63130

[phovmand@wustl.edu](mailto:phovmand@wustl.edu)

*Most people conceptualize gender bias in terms of individual behavior – men discriminating against women. This creates a tendency for men to feel personally blamed for gender bias. Yet feminist theories emphasize that gender bias is the resulting behavior of a cultural system, not individuals, and this system influences the behavior of both men and women. System dynamics has often been used to understand the systemic nature of social problems and clarify social theory, but has not yet been applied to a feminist theory of gender bias. Using a simple organizational case study, we describe and explore a feminist theory of the systemic nature of gender bias with system dynamics. The paper introduces key concepts, demonstrates how system dynamics clarifies the theory's systemic issues and potential solutions, and suggests how this new way to view gender bias might improve the collegiality of our personal and professional relationships for the long term.*

Despite progress in the United States toward the goal of achieving social and economic equality between women and men during the last 30 years, women continue to be underrepresented in the majority of higher paying occupations, politics, and corporate leadership. Women still face a wage gap relative to men, in the year 2000 earning on average 73% of what men earn, up from 61% in 1960 (Census Bureau, 2001). Even women who enter higher paying occupations with comparable levels of education and skills to men still earn less, *even in professions with more women* such as accounting (Census Bureau, 2001). In 2004, women hold 14% of the seats in the U. S. Congress, 25% of state executive offices, 22% of state

legislator positions, and 15% of mayoral positions for cities with populations over 100,000 (Center for American Women and Politics, 2004).

## 1 Job Discrimination as a Dynamic and Systemic Problem

Direct or indirect discrimination has been cited as one contributing explanation for why the wage gap between women and men persists (U. S. General Accounting Office, 2003) and why women are not proportionately represented in leadership positions and higher paying occupations. Job discrimination is commonly understood in terms of biased attitudes and behaviors, and though flagrant discrimination still happens, discriminatory conduct is often hidden and sometimes unintentional (United States Commission on Civil Rights, 1981). Such acts build on and reinforce stereotypes, deny educational and economic opportunities to certain groups, and perpetuate discrimination independently of whether or not the acts were intentional (United States Commission on Civil Rights). Discrimination in this sense can take many forms, including differences in societal expectations, preferences to hire and promote men, policies that disadvantage women, and workplace practices that favor the ideal worker norms of men (U. S. General Accounting Office, 2003).

Yet, societal attitudes toward women's social and economic participation in the United States have changed significantly over the last 30 years. This would seem to present a paradox of sorts: Why does job discrimination persist despite enlightened attitudes toward women's participation in professional occupations?

There are various arguments offered for this. One popular argument is that U. S. culture is not so enlightened after all, and that what was once overt sex discrimination has now taken on a more subtle and covert form. What men learned from feminists, sexual harassment policies and litigation, and mass media, the argument goes, was not how to stop discriminating against women, but how to conceal discrimination more effectively. Hence, men are still intentionally promoting and endorsing discrimination against women. Another argument points to innate differences between women and men that "naturally" structure gender roles within work and family. Thus they argue that biology has been the major constraint, and changes in societal attitudes have simply added to the unrealistic social expectations that women can succeed at work while having a family. Still others simply argue that while attitudes have changed relatively quickly, changing the demographics of occupations will take much longer.

All of these arguments rely on an oversimplified mental model of discrimination, where discrimination is solely the outcome of individual attitudes. Change the individual attitudes and the pattern will eventually change. If the pattern is not changing, then the problem must be that (a) individual attitudes are not really changing, (b) individual attitudes are not changing fast enough, or (c)

people had unrealistic expectations. What all of these options fail to recognize is the possibility that most discrimination happens not because of individual attitudes, but primarily as the result of social structure -- a system of social mechanisms. Specifically, patterns of inequality can persist over time through seemingly neutral social mechanisms or feedback loops, a theory that has been extensively written about by feminists such as MacKinnon (1989), but largely ignored in the dominant discourse on individual attitudes. Individuals can have all the right attitudes, make apparently all the right individual choices, while the collective action continues to result in persistent discrimination. Job discrimination is

*often reinforced by the well-established rules, policies, and practices of organizations. These actions are often regarded simply as part of the organization's way of doing business and are carried out by individuals as just part of their day's work. (United States Commission on Civil Rights, p. 11)*

Such discrimination is not a static or an isolated phenomenon, but feeds on itself in self-perpetuating cycles (United States Commission on Civil Rights). Thus, discrimination is an inherently dynamic and systemic social phenomenon.

This paper has two goals. The first is a research goal: to determine if the social structure driving gender bias, as described by feminist theory, can be represented using system dynamics, and if so (or even if not), can we learn something beneficial about the theory? To achieve this goal, we have described a problem that drives feminist theory, the disproportionate pay and representation of women in traditionally male occupations. The paper continues by presenting core concepts of feminist theory, including examples of gender bias, how gender bias is manifested in social structure, and how social structure creates the problem behavior. To facilitate this, we have chosen a particular problem context on which to focus: job discrimination based on gender bias in an organization.

Specifically, we represent in the form of causal loop diagrams a feminist theory that job discrimination can be explained in terms of systemic processes without the need to use variables representing malevolent intentions. That is, the theory argues that job discrimination can be understood strictly as a structural phenomenon without having to include individual agents who deliberately intend to subordinate women and curtail their economic opportunities. More broadly, we hope to show through this case study of job discrimination that feminist theory of gender bias, described in terms of patriarchy, is compatible with a system dynamics representation.

The second goal of our paper is both a professional and personal one: to raise awareness of the systemic nature of gender bias as described by feminist theory. As feminists, we believe systemic gender bias is a major barrier to

collegiality in organizations, and that the first step to overcoming this barrier is to construct new mental models of gender bias as primarily systemic in origin, to eliminate the pitfalls of current mental models that reduce aggregate patterns of behavior to individual behavior and intents. Therefore, the implications of gender bias on collegiality are surfaced at different points within the paper, to add generally to the constructive dialogue on collegiality during this conference, and more specifically to our consideration of women's participation in the System Dynamics Society.

## 2 Representing Feminist Theory using System Dynamics

It is not obvious whether one can adequately represent feminist theories using system dynamics. Feminist theory is arguably a biased theory with a particular political outcome in mind, which might generally be described as the improvement of women's political, economic, and social lives from the perspective that women are, and should be treated as, full members of society. Thus, much of feminist theory is concerned with understanding in what ways and how women are not being treated as full participants, as well as developing and evaluating possible solutions. Feminist theory does not exist as a single unified framework, but as a constellation of theories across a wide range of participants, from feminist activists in developing nations to academic feminists in nearly every discipline. Some would thus prefer referring to feminist theory as feminist *theories*, and feminism as feminisms.

That a theory is biased should not be confused with a theory not being objective. In system dynamics, theories or models<sup>1</sup> are useful simplifications of reality because they help us focus in on the essential aspects of some problem. All system dynamics models are therefore biased in some way. The question is therefore not whether a theory is biased, but whether or not a theory helps us see the aspects of some problem essential to finding a solution. But all system dynamics models are, in their formal expression as a computer simulation, objective in the sense that others can evaluate the conclusions based on the model by replicating and extending the simulation experiments.

Theories can be biased in any number of ways, from their ontological assumptions through the selection criteria of supporting and disconfirming cases. In system dynamics, one might tend to think of biases in terms of some feedback loops being explicitly included while others are ignored. To address this, one

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<sup>1</sup> The terms theory and model will be used interchangeably throughout this paper. Some might object to this, pointing to differences between theories and models. However, in system dynamics a theory is usually thought of and evaluated as a formal system dynamics model.

would seek to include a more complete<sup>2</sup> set of feedback loops and evaluate their relative impact on the qualitative behavior of a system. Other biases would include the stock-flow ontology, endogenous perspective, and assumptions involved with representing concepts as quantified variables. All of these biases pertain to concepts entailed within system dynamics (as opposed to prejudices of its practitioners). If it is more difficult to represent feminist theories of job discrimination in system dynamics than organizational theories of business problems because of such biases, then it points to potential limitations in how we evaluate system dynamics in organizational theory.

The aim of this paper is not to compare and contrast a feminist theory of job discrimination with other theories of job discrimination using system dynamics. Such a comparison would assume that one could fairly and adequately represent terms from feminist theory in system dynamics. Lane (2001) has noted the difficulty of translating terms from social theory into formal system dynamics models. Rather, the aim is more modest and exploratory: to simply understand what issues arise as one takes a problem pressing to feminists (job discrimination) and tries to model that problem in system dynamics. Thus, we are not seeking to prove feminist theory (as the authors, we already align ourselves as feminists), but to understand the possibilities and limitations of system dynamics for developing better feminist social theories. Concepts in the remainder of the paper are therefore defined from this decidedly feminist perspective.

### 3 Structure, Individual Attitudes, and Individual Agency

In this paper, we are primarily interested in understanding to what extent job discrimination can be understood *only* in terms of structure. That is, we are interested in pushing what we think is a structural theory to its limits. Social structure is a set of social mechanisms that gives rise to a pattern in aggregated individual behavior. Social structure is in this sense an abstraction, and only exists to the extent that individuals behave in ways that collectively generate the larger pattern.

A case in point is the chivalrous act of a man holding a door open for a woman. There is an individual act by a man with usually benign intentions. Then there is the aggregate behavior pattern that women experience that has the effect of communicating gender role expectations and their associated capabilities. No individual man is required to think that he is reinforcing a stereotype of women as

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<sup>2</sup> The notion of completeness operating here presupposes that key feedback mechanisms have been excluded. That is, if someone has not included all of the relevant feedback loops, then a model is incomplete and biased. However, system dynamics does not have a general notion of completeness because system dynamics does not employ a concept like the set of all feedback loops. Instead, the set of all relevant feedback loops is evaluated pragmatically with respect to a particular problem.

needing the assistance of men to reproduce the pattern. He might do so out of respectful intentions or unconscious habit. However, focusing on individual motivations or actions represents a basic misunderstanding of the pattern and its consequences for women.

One can point to other examples as well. A neighbor might not recycle plastics, papers, glass, and other materials. Perhaps the person's intentions are to fill up the landfills faster and contribute to global destruction. However, it's probably more likely that the person is either indifferent or unaware of how their individual actions contribute to an aggregate pattern of behavior that will have environmental consequences. Again, focusing on the individual motivations or actions misses the point one is usually trying to raise when focusing on the consequences of the aggregated behaviors.

This does not mean that individual attitudes, choices, and actions do not come into play. Individuals can and do influence structure through collective action. And individuals do make a difference in their local environments by how they behave. It does, after all, make a difference in some people's lives whether or not a man confronts a male colleague's sexist joke or views a promotion decision fairly. Thus, there is still a role for individual responsibility. The problem arises, however, when people believe that paying attention to one's own individual attitudes is sufficient.

What this means is that one can no longer simply assume that changing attitudes will be sufficient for eliminating discrimination or bringing parity to the organization's demographics. Moreover, enthusiastically recruiting women into an organization, while necessary, might be insufficient for transforming the actual practices within the organization. One can have, without a structural analysis, the best of intentions and yet fail miserably as an organization in working toward the goal of increasing women's participation. Consider then the following case study of an organization wanting to increase the participation of women in a male dominated field such as engineering, business, or system dynamics. The organization's leaders want to know: "How can we increase the percentage of women employees in our organization?"

#### 4 A Note on Language in Feminist Theories

J. L. Austin once noted about language that while philosophers might want to develop their own meanings for words such as ‘real’ and ‘truth’ and express disdain at the lay person’s use of such terms, all philosophers must start with the ordinary use. A similar thing can be said about the language for naming discrimination for the organization wanting to increase the number of female employees. Inevitably, one might want to use (or avoid for obverse reasons) words like ‘sexism’ and ‘patriarchy’ to describe aspects of discrimination. Such terms arrive loaded with negative content in their ordinary use. To either ignore the words or ignore the fact that people come with preconceived meanings for them would be a mistake. Thus, it is helpful to both acknowledge the potential differences in associated meanings and be explicit about how the terms are used within this paper.

Gender-based discrimination is usually discussed in conjunction with concepts like sexism and the oppression of women by men. The terms ‘women’ and ‘men’ in this context are aggregates and refer to social groups (Young, 1990). Social groups are constructions. While there might be various objective ways of differentiating people into two categories (e.g. blue eyes and brown eyes), there is no assumed relationship between the categories. But with socially constructed categories, there is a relationship attached (e.g., male/female, white/black, upper-class/lower-class). One finds oneself in a social group, as opposed to choosing a group. There is, as Young points out, a quality of thrown-ness.

The *oppression of women by men* is not at the level of an individual man oppressing an individual woman, but at the level of men as a social group defining and participating in a pattern of behaviors that collectively subordinate women as a social group. An individual woman will find herself having to contend with the pattern of behaviors of the group, from men holding doors to sexist humor, to threat of rape and domestic violence. *Sexism* is thus a structural power relationship between women as a group and men as a group.

Johnson describes a *society* as not just a collection of men and women, but also the system structure of shared meanings and relationships in which they participate (1997). He and others refer to this system structure as *culture* -- “*the system of values, beliefs, shared meanings, norms and traditions that distinguish one group of people from another*” (Cox, 1994, p. 161; Thomas, 1991). Lane, summarizing and quoting Giddens’ structuration theory, states that this system structure “*is the term used to describe the rules that shape social actions*” (2001, p. 297). While culture is only manifested in and through the activities of individual men and women, it is the observable *patterns* of interaction, the *meaning* that is attributed to them, and the fact that they become perceived as *objective rules* of

behavior that separates culture from individuals within society (Lane, 2001). A fundamental characteristic of culture is that most of the rules (shared meanings, assumptions) are invisible and unexamined (Johnson, 1997; Thomas, 1991). This makes culture like water to fish – a social environment that we take for granted.

The term ‘patriarchy’ is often closely associated with the term ‘sexism’, as sexist behavior is a result of patriarchy. A *patriarchy* is a kind of society in which the cultural rules for the behavior of both women and men favor men. A patriarchal society is one in which positions of leadership and influence are held primarily by men. This results in power differences between men and women and “*promotes the idea that men are superior to women ... because we don’t distinguish between the superiority of positions in a hierarchy and the kinds of people who usually occupy them*” (Johnson, 1997, p. 5). A patriarchal society is also one in which the core societal values closely resemble the cultural definitions of masculinity and the ideal man. As a result, qualities that are culturally defined as masculine (e.g. control, strength, efficiency, toughness, competitiveness, decisiveness, and self-sufficiency) are valued, and qualities that are culturally defined as feminine (e.g. cooperation, equality, sharing, compassion, vulnerability, emotional expressiveness, and intuitive ways of thinking) are devalued (Johnson, 1997).<sup>3</sup> Thus, a patriarchal society establishes a differentiation between men and women that perpetuates a deeply rooted cultural assumption that men are superior to women. Sexism results from mental models built on that assumption.

The idea that men are superior to women is perpetuated by *stereotypes* -- oversimplified mental models held in common by members of one group about members of another group. As humans, pattern recognition and categorization are valuable tools for processing information. Stereotypes are a distorted extension of this categorization process because they are oversimplified and evaluative. We have opinions associated with these categories. Stereotypes are not objective (Cox, 1994).

In patriarchal cultures there are stereotypes for both women and men. These are multi-faceted and complex, yet we can use a collection of personality characteristics as an example. If we revisit the masculine ideal, we see that the stereotype for men includes characteristics such as strong, in control, efficient, tough, competitive, decisive, and self-sufficient. Patriarchal culture is inherently dualistic. Masculinity and femininity are not defined separately, but as opposites of each other (see for example, Daly, 1990). Men are the standard, and women are defined in relationship to men. As a result, the stereotype characteristics for women include the opposites of the characteristics for men, such as weak, out of

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<sup>3</sup> Note, however, that not all aspects of the feminine are devalued. Women are often prized for their beauty or as caregivers to children, men and the elderly. As such, they are valued “*primarily for their usefulness to men*” (Johnson, 1997, p. 87).



control, inefficient, soft, cooperative, indecisive, and dependent, as well as characteristics that we devalue (so we do not associate them with men), such as compassion, caring, and vulnerability. Where women can excel within patriarchy is the stereotype of the ideal woman, defined by characteristics that identify her in relationship to men, such as attractive, sexy, and nurturing (all characteristics, by the way, that are not typically of value in the workplace).

Just as we use any categorization scheme to help us assimilate information, we use stereotypes as filters to help us respond to distinctions in people. The problem is that they are mostly inaccurate and they carry opinions with them that influence our objectivity. “[W]e tend to invoke and act on these categories automatically, with little awareness of how these assumptions are actually driving our perceptions and actions” (Senge, 1996, p. 10). Ultimately, both women and men are injured by such stereotypes.

*Feminists*, in a movement to end the oppression of women, have sought to eradicate such stereotypes because of their role in limiting women’s economic and social opportunities. This emphasis on stereotypes has often been misunderstood and dismissed as minor. What feminists have identified, however, is the link between stereotypes as flawed mental models and the underlying social structure that generates discrimination. The next section will illustrate this relationship through the case study of an organization within a male dominated field wanting to increase the number of its women employees.

*Collegiality* has been defined by the System Dynamics Society’s Call for Papers as “a harmony that achieves consensus on the issues” and “the congeniality shared among colleagues”. Webster’s takes it further and based on the historical meaning of the word, defines collegiality as “the relationship of colleagues” in which each colleague has approximate equal power and authority. While collegiality is not a term used regularly in feminist literature, the goal of all feminist work is to ensure equal power and authority for women in all spheres of their lives. In the view of feminists, it is the systemic nature of gender bias that deprives women of equal power and authority. Not until our cultures are bias-free will we experience collegiality.

## 5 Case Study of an Organization

Until this point, the paper has provided necessary background for feminist theories of discrimination: the problems that drive their formation, the terminology used in describing them, as well as a general description of the theories themselves. In this section the paper represents these theories using system dynamics, in the problem context of job discrimination.

The leaders of an organization in some male dominated field want to know: “How can we increase the percentage of women employees in our organization?”

In combining feminist theory and system dynamics to help us answer this question, we start with the basics of bringing employees into the organization – the recruiting and hiring process – and then explore how patriarchy may influence this process. Afterwards, we look into how employees leave the organization – the turnover process – exploring the influence of patriarchy on the organization’s culture, its collegiality, and the potential effect on turnover.

### 5.1 Hiring

The generic hiring process begins with open positions (see Figure 1). As a result, the organization begins recruiting. In our example, recruiting is done by word of mouth (current employees encouraging colleagues from other organizations or their professional networks to apply), so employees are needed for recruiting. Recruiting generates a pool of applicants. Applicants are hired and become employees. This completes the first loop, the recruiting/hiring loop. In addition, hiring fills open positions. This completes the second loop, the filling open positions loop. The recruiting/hiring loop is a reinforcing loop which would continue to generate applicants and add employees if it were not controlled by the filling open positions loop, a balancing loop, which turns off the recruiting/hiring mechanism when all the open positions have been filled.

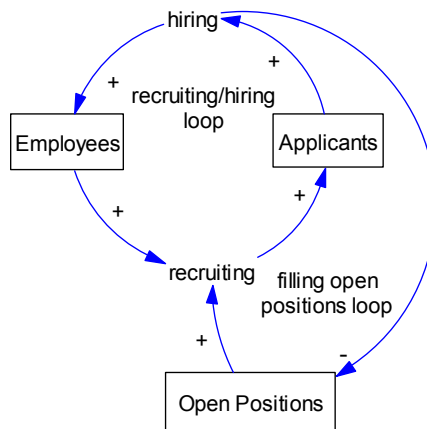


Figure 1. Generic Hiring with Word of Mouth Recruiting Process

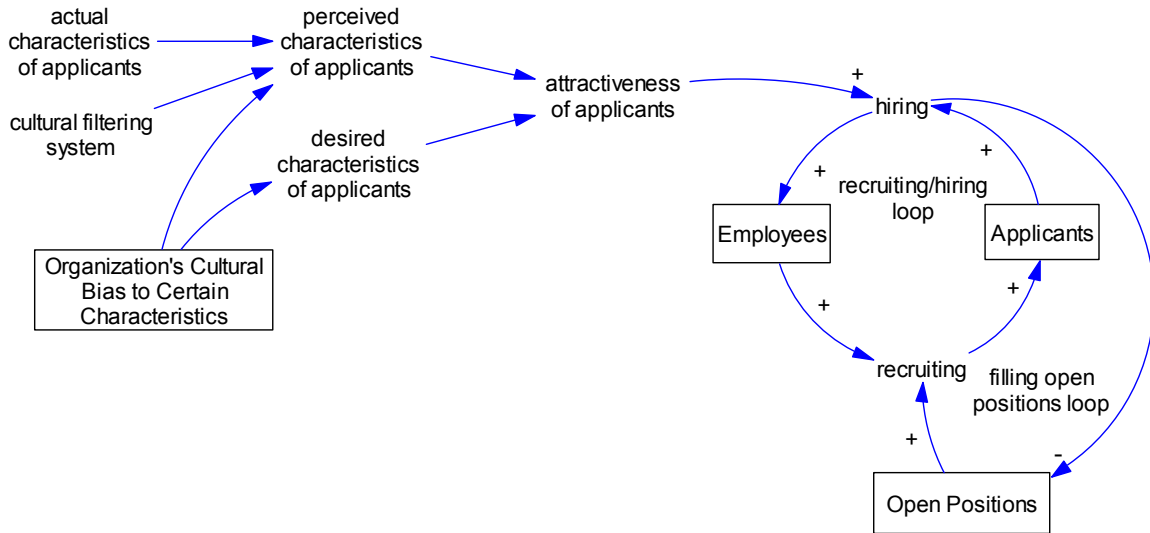


Figure 2. Generic Hiring with Attractiveness

Applicants are not generally hired though, just because they apply. It is important to the organization to hire applicants who they perceive as attractive, who have the characteristics the organization believes are important for both the applicant and the organization to be successful. As shown in Figure 2, this attractiveness is determined by comparing the organization's desired characteristics with the perceived characteristics of the applicant. The desired characteristics of applicants are defined by the cultural bias of the organization (e.g. they are an engineering-centric organization). Perceived characteristics are the result of the applicant's actual characteristics (gleaned from a resume, interviews, references, etc.) filtered by the organization's cultural filtering system. The hiring manager views the applicant's actual characteristics using filters of beliefs, values, norms, and shared meanings she and her organization have about similar people.

While the variables desired, actual, and perceived characteristics, as well as cultural filtering system may not appear to be labeled dynamically (they do not increase and decrease naturally), they are defined to be dynamic in an alternative way. We imagine that each of these variables is an array of generic characteristics, similar to the personality characteristics described in section 4. The value of the organization's cultural bias determines which characteristics are the desired characteristics and sets those array elements to a value, while the remaining undesired array elements remain zero. The organization's cultural bias additionally weights how accurately the actual characteristics of the applicant are perceived. The higher the bias, the more likely the applicant's actual characteristics will be affected by the cultural filtering system, causing potential

misperception (modeled by replacing actual characteristics with stereotype characteristics). The lower the bias, the more likely the applicant’s actual characteristics will be perceived as they are. The attractiveness of the applicant is then determined by the closeness of fit of the two arrays, perceived characteristics and desired characteristics.

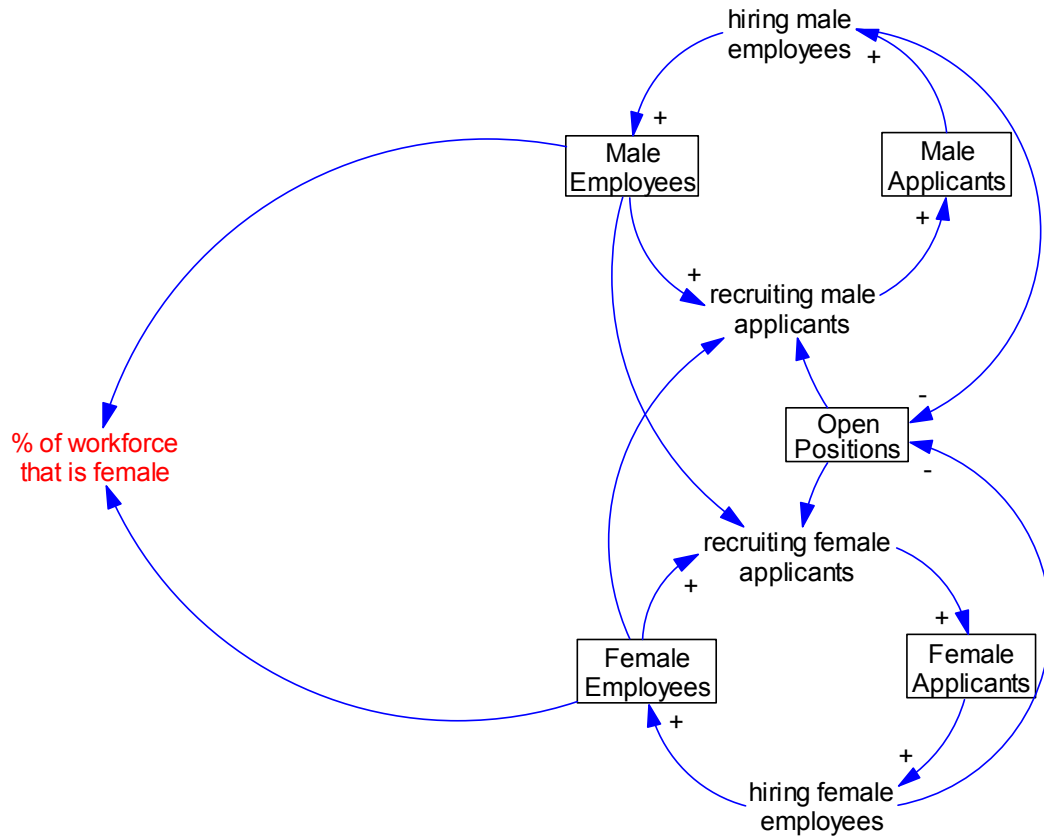


Figure 3. Effect of Gender on Word of Mouth Recruiting and Hiring

To evaluate the effect of gender on hiring, we now split the organization’s employee pool into male and female employees (see Figure 3). As their goal is to increase the percentage of their workforce that is female, because currently it is quite low, we also include this key measurement variable. Here we have duplicated the original hiring loops, creating one structure for recruiting and hiring male employees and a mirror structure for recruiting and hiring female employees.

One result of this structure split is an increased awareness to the fact that as the organization is attempting to recruit female applicants in a male-dominated field, there will be many fewer females available to recruit. Even if the female employees have slightly more access to female recruits than the male employees,

for example through professional networks, the organization will be limited by the number of women in the field their employees know.

The organization's out-of-balance workforce will likely perpetuate itself using the current recruiting process. With this problem identified in the word of mouth recruiting process, the organization will want to consider ways to increase the female applicant pool or change the hiring process so more women are hired. This conclusion is consistent with the literature, as this is one use of affirmative action programs, to increase the applicant pool by using targeted outreach programs and increase the number of women hired by using hiring goals (Cox, 1994).

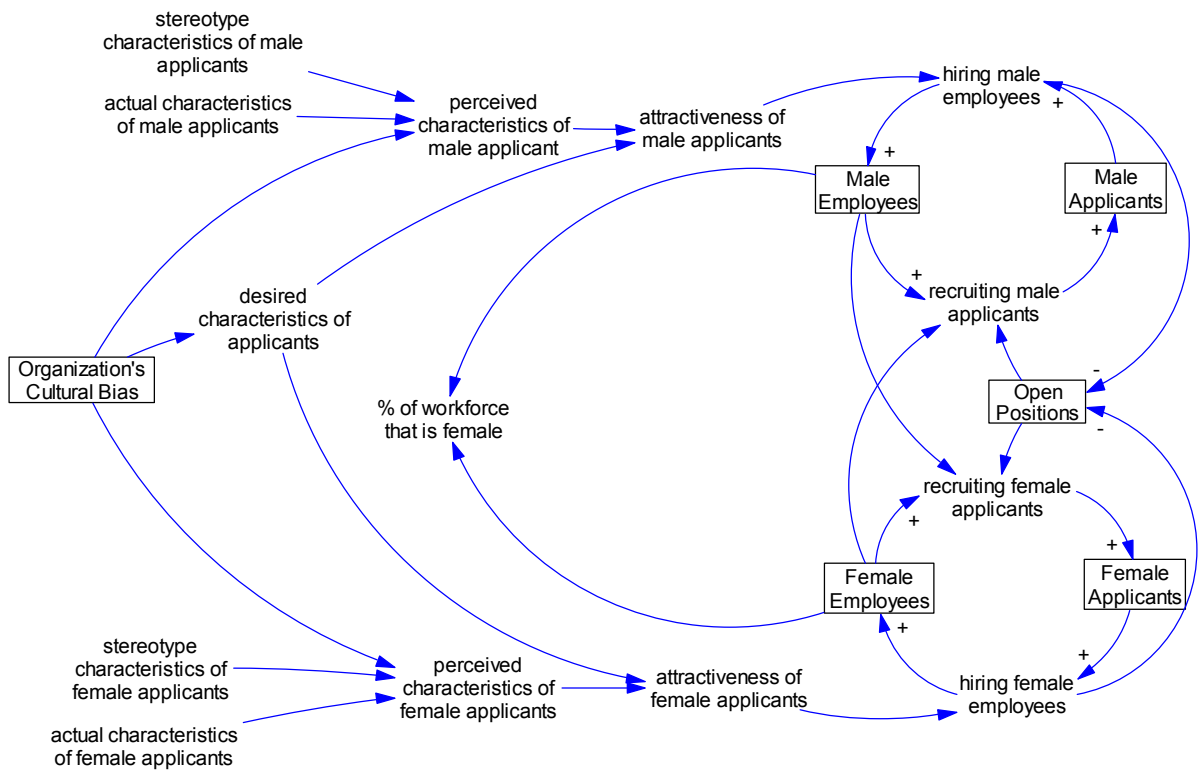


Figure 4. Effect of Gender Bias and Stereotypes on Attractiveness and Hiring

Just as we did in the generic case, let's now look at the impact of attractiveness on hiring (the left side of Figure 4). As before, hiring is driven by the attractiveness of the applicants, based on the match between desired characteristics and perceived characteristics. But now we have something different— the potential for the attractiveness of female applicants to be different from the attractiveness of male applicants. This is due to the possibility of our cultural filtering system manifesting itself as gender-biased stereotypes. These stereotypes, different for men and women as discussed earlier, create differences in

the perceived characteristics of male and female applicants (Johnson, 1997; Cox, 1994). We say this is possible because it is not a given that this will be true or to what degree. It depends, just as it did previously, on the bias of the organization and whether the weight it gives to stereotypes impacts the perception of the applicant's actual characteristics. Let's walk through some various scenarios.

Suppose that an organization's culture is patriarchal, or biased in favor of men. Then the desired characteristics of the organization would map closely to the ideal characteristics of society, or the ideal man. This culture would also reinforce the use of patriarchal stereotypes. A positive male stereotype, automatically reinforcing the view that a male will embody certain attractive characteristics, would increase the attractiveness of the male applicants. And this would be true whether the hiring manager is a man or a woman, because both are socialized to follow the same cultural rules. A negative female stereotype, automatically reinforcing the view that a woman will embody certain unattractive characteristics, would decrease the attractiveness of the female applicants –especially true if the desired characteristics of the organization map closely to the ideal characteristics of society, or the ideal man. Again, this would be true regardless of the gender of the hiring manager (Johnson 1997; Cox, 1994).<sup>4</sup> If stereotypes are in play in this organization, then the possibility exists that a female applicant whose actual characteristics match the desired characteristics of the organization would be overlooked because her desirable characteristics would be filtered out by the stereotype's influence on perception.

Now suppose that the organization has no cultural bias favoring men or women. Then the desired characteristics will reflect a set of inclusive traits, and stereotypes will not play a role in filtering actual characteristics. Stereotypes are only active when bias exists. As a result, both women and men with actual characteristics more closely matching the desired characteristics will be hired.

We could also walk through an example of cultural bias in favor of women – and in the model in Figure 4, the results would be consistent and in favor of women. A positive female and negative male stereotype would be used and weighted by the cultural bias favoring women, and the outcome would be a higher percentage of females hired than males. The next section will explain why feminist theory believes this is unlikely to happen in actuality, by discussing the relationship between an organization's cultural bias and society's cultural bias.

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<sup>4</sup> Cox cites a specific example of women using gender-biased stereotyping that is illustrative. He describes interviewing six women randomly chosen for a focus group. All six stated that men made better supervisors than women. When asked why, they described stereotypical characteristics of women they felt limited a woman's ability to be a good supervisor (too emotional, unable to be objective, etc.) (Cox, 1994, p. 97).

## 5.2 Effect of Gender Bias on Collegiality and Turnover

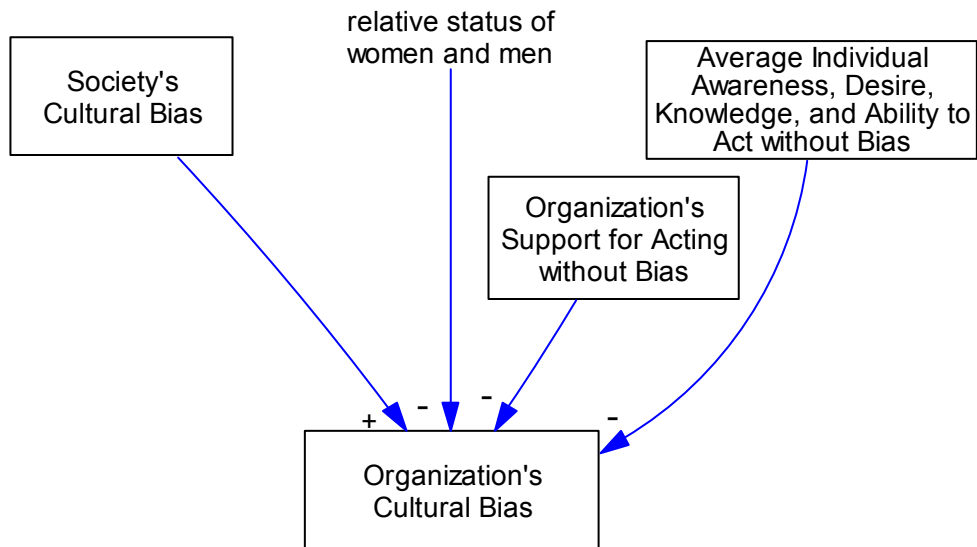


Figure 5. The Origins of an Organization's Cultural Bias

So where does an organization's cultural bias come from? Denison defines organizational culture as the “*underlying values, beliefs and principles that serve as a foundation for the organization's management system, as well as the set of management practices and behaviors that both exemplify and reinforce those principles*” (quoted in Cox, 1994, p. 161). Cox goes on to describe organizational cultures as microcultures within larger societal cultures, saying that, for example, American companies have organizational cultures that are distinctly American. If we focus on the gender aspects of organizational culture, we can see from Figure 5 that an organization's cultural bias regarding gender could easily be the same as its society's cultural bias regarding gender, if neither the organization's management systems or the individuals within the organization were attempting to create any different behavior. (In this case the relative status of women and men would also be stable, as will be shown in a moment.)

There are four important influences on an organization's cultural bias: society's cultural bias, the relative status of women and men in the organization, organizational support for acting without bias, and the average individual's state of awareness, desire, knowledge and ability to act without bias (based on Johnson, 1997; Cox, 1994). This relationship is key to the systemic description of feminist

theory, because it helps us describe the persistent nature of gender bias even while individual attitudes have changed. The causal effect of society's cultural bias and the current relative status of women to men on the organization's cultural bias represents the status quo. Society's cultural bias and the relative status of women and men act as controlling forces to keep the organization's cultural bias within an acceptable range of variation from society's cultural bias (based on Johnson, 1997). "*Institutions ... control human conduct by setting up predefined patterns of conduct, which channel in one direction as against the many other directions that would theoretically be possible*" (Berger and Luckmann, quoted in Lane, 2001, p. 295). To affect change requires the increased awareness, desire, knowledge and ability to act of *many* individuals as well as the organizational support for them to act (Cox, 1994).

For example, progress has been made in the last 30 years in raising the average individual's awareness to sexual harassment and acts of blatant gender bias. As there has been organizational support as well, through the creation of institutions like the Equal Employment Opportunity Commission, policy programs like Affirmative Action, and laws in support of both, cases of sexual harassment have decreased and blatant workplace discrimination has stabilized (U.S. Equal Employment Opportunity Commission, 2004). But gender bias is much more than sexual harassment or the number of women in leadership positions. Gender bias is incredibly complex, subtle, and ubiquitous in our culture, manifesting itself in our everyday language, our everyday interactions, and our self-concepts, without us being aware of it. Addressing gender bias in organizations is like peeling an onion. It takes a critical mass of individuals with awareness, desire, knowledge and ability to act, plus organizational support, to begin removing a particular layer, a particular component of gender bias. The organization will need to go through this process on each successive layer. In the meantime, resistance from society's cultural bias, in the nature of customers or competitors or suppliers who put pressure on the organization to abide by society's rules, makes it difficult to change. It is the ubiquitous nature of gender bias in society, embedded within the institutions of our patriarchal culture (in our definitions of family, of economics, of politics and religion), that makes this a chronic, systemic problem, even for organizations (Johnson, 1997).

We have discussed the potential impact of patriarchy and the resulting organizational gender bias on the recruiting and hiring process, and now we discuss the potential effect of patriarchy on women already in the organization. For this we have developed a separate diagram from our recruiting and hiring model that connects to that model as we describe below (see Figure 6).



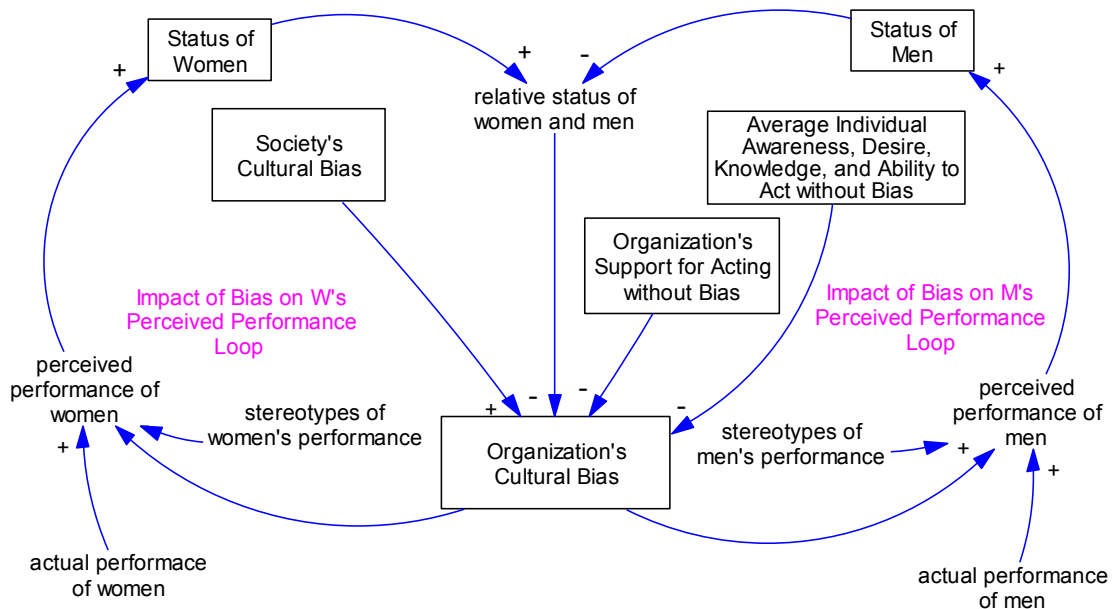


Figure 6. Effect of Gender Bias on Perceived Performance

This portion of the model is connected to the hiring portion of the model by the variable Organization's Cultural Bias. The organization's cultural bias affects the way women's and men's actual performance is perceived by weighting the stereotypes of performance when the bias is high or low and removing the impact of stereotypes if the bias is neutral, much like it does to the stereotypes in the hiring portion of the model. If an organization's cultural bias favors the perception of men, the research of Deaux and Emswiler demonstrates that stereotypes are used in the performance evaluation process, and one of these stereotypes is what a person's accomplishments are attributed to, their own ability or external circumstances. They "*found that successful performance by women on tasks traditionally done by men was attributed to luck, whereas for men it was attributed more to ability*" (quoted in Cox, 1994, p. 96). Since performance ratings based on ability rather than external circumstance are more likely to lead to promotion, these attribution stereotypes negatively impact a woman's potential for promotion. Stereotypes impact not only the perceived performance of past accomplishments, but the "*preconceptions about the ability or suitability of persons of certain culture groups [including women] to lead*" (Cox, 1994, p. 97). This may be based on or reinforced by the finding that "*both men and women define good management in ways that are decidedly biased toward traditional male traits*" (Cox, 1994, p. 221).

The perceived performance variables influence the respective status variables of the men and women, which represent concepts like average job level, amount of training, and percentage of promotions (based on Frohman, Morgan, and Pugh, 1978). And finally, as mentioned before, the relative status of women and men in the organization influences the organization's cultural bias. These loops, the impact of bias on perceived performance loops, are reinforcing. Therefore, the organization's cultural bias (whether it is high, low, or neutral) is self-perpetuating.

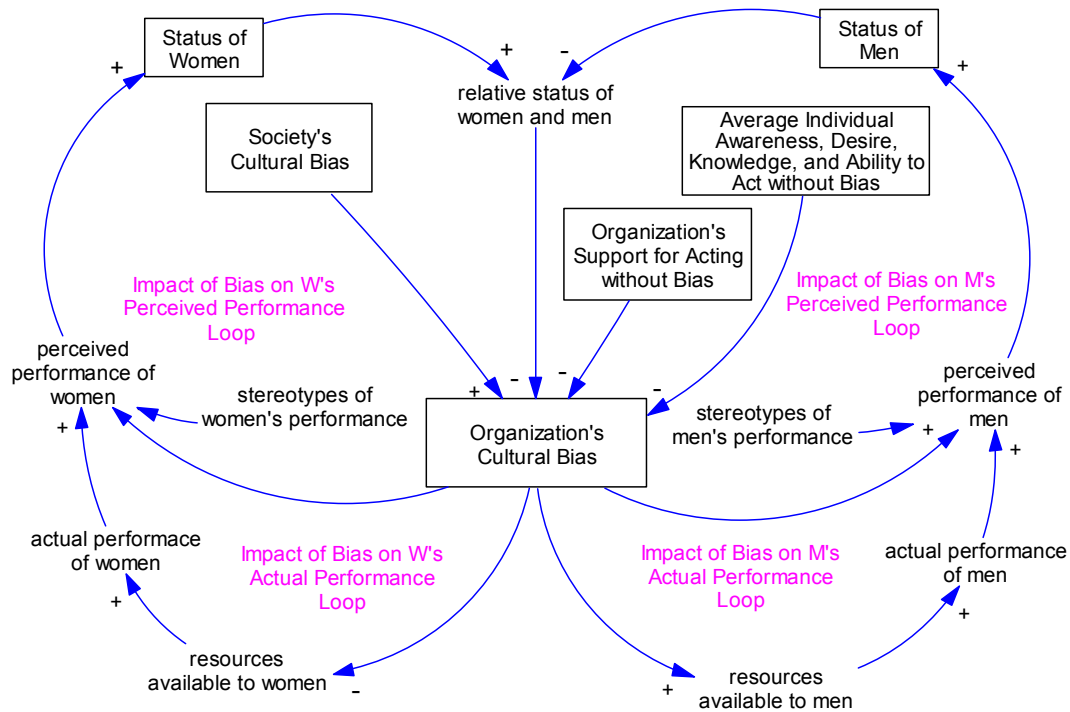


Figure 7. Effect of Gender Bias on Actual Performance

In addition to the organization's cultural bias and its influence on the use of stereotypes, perceived performance is based on actual performance, which is heavily impacted by the availability of resources (see Figure 7). Resources within an organization can range from tangible resources such as money and people, to the intangible but equally important resources such as cooperation, mentoring, and access to informal networks. Inequitable resource allocation has been a long-standing outcome of gender bias throughout the world (see for example, Jacobson, 1992). Exclusion from informal networks or the old boys network is a widely acknowledged barrier to women's career success (Cox, 1994).

Allocation and availability of resources to men or women in the organization is based on the organization's cultural bias, which is reinforced by their status

within the organization. But, their status within the organization is based on their perceived performance, so again, we have dynamics that are strongly self-perpetuating. These loops, the impact of cultural bias on actual performance loops, are also reinforcing. This structure, when societal and organizational cultural biases are not neutral, is a success to the successful structure (Senge, 1994). As a result, if women begin with a low(er) status in this organization, without deliberate action by the organization their status will not change over time no matter how well they perform. The structure is designed to reinforce the status quo. Additionally, even if the status of women were to be rapidly increased (by rapidly promoting women or hiring into management from the outside, for example), if the organization's cultural bias remains high (due to society's cultural bias or time delays) it would continue to negatively influence the perceptions of performance. This, as we describe next, would have repercussions on the goal to increase the number of women in the organization.

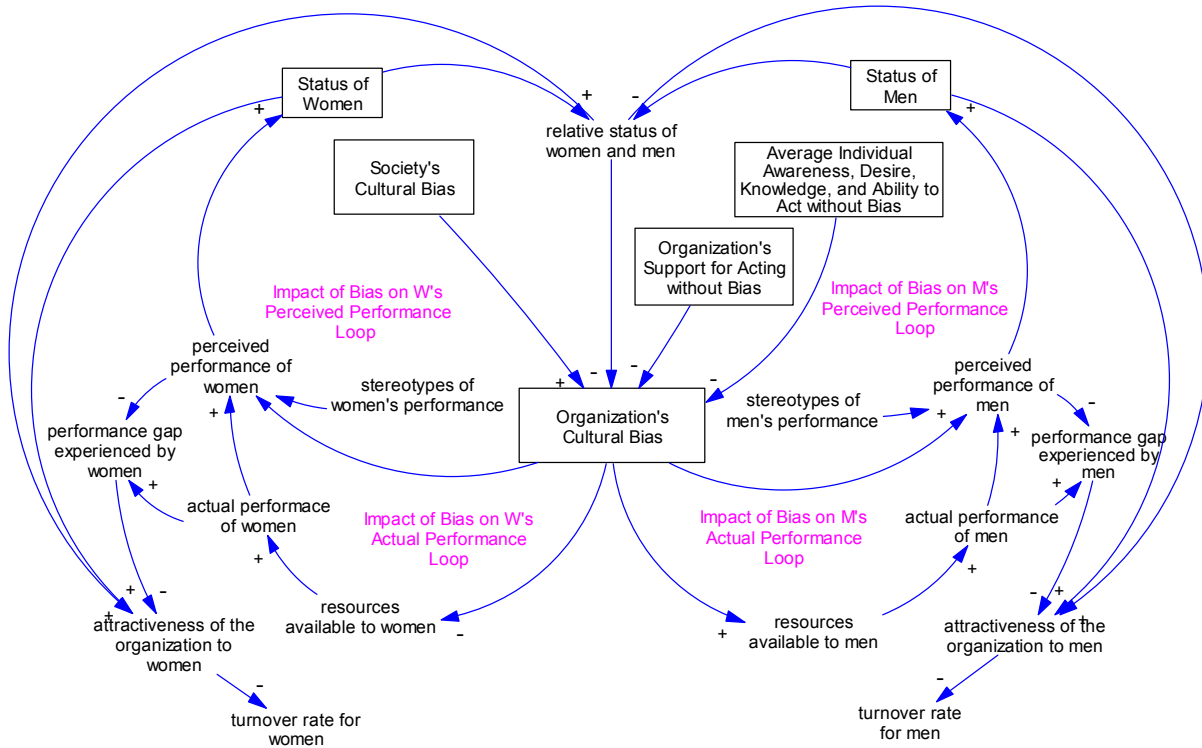


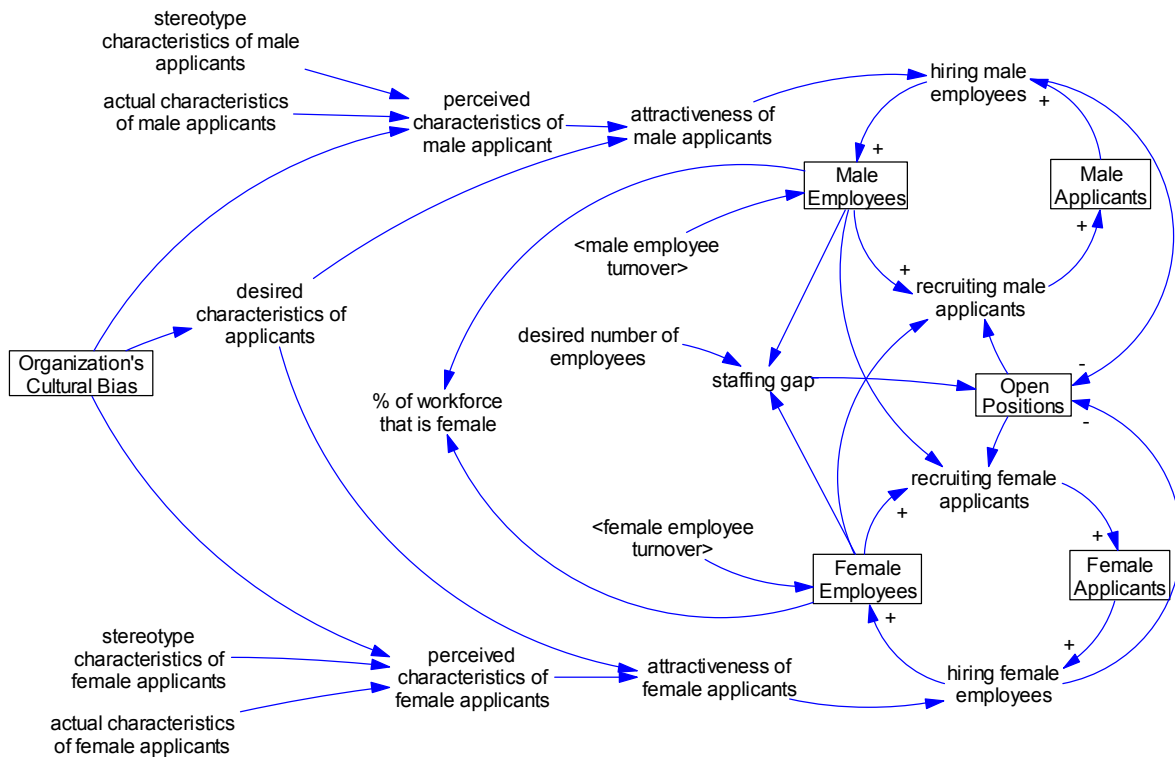
Figure 8. Effect of Gender Bias on Collegiality and Turnover

In addition to the reinforcing structure, there are measurement variables that employees use to evaluate the attractiveness of the organization to them: performance gap experienced by women, performance gap experienced by men, status of women, status of men, and relative status of women and men (see Figure 8). If an employee perceives a large gap between his actual performance and the perception of his performance by management, and this gap continues over time, he will be dissatisfied. If another employee sees big differences between her status and the status of others in the organization, especially if she perceives there are no performance differences, she will be dissatisfied.

This is where we are pressed to wonder, how can 'collegiality' exist in an organization with any cultural bias favoring the perception of men? The answer, of course, is that it cannot. These models make clear that in an environment with a cultural bias favoring the perception of men, it will be difficult for women to feel harmonious and congenial with their male counterparts and certainly impossible for them to feel they have equal power and authority. Therefore, any gender bias in an organization reduces that organization's collegiality, regardless of whether the bias is intentional or unintentional (based on Johnson, 1997; Cox, 1994).

In addition to the negative impact of an organization's cultural bias on the collegiality in the organization, there are implications to the organization's

strategic goal of increasing the number of women in the organization. If the organization's cultural bias favors the perception of men and it stays the same, it maintains an unattractiveness of the organization to women that has an impact on the number of women leaving, or the female employee turnover. Thus, the organization's cultural bias favoring the perception of men can also have an impact on turnover, which connects the two model portions together again (see the middle of Figure 9).



*Figure 9. Effect of Gender Bias on Recruiting, Hiring and Turnover*

This leads us to recognize that the organization needs to be concerned not only about how its gender bias may affect the inflow of women to the organization, but also how it will affect the outflow. And it appears, as the feminist literature on the systemic basis for gender bias posits, that the organization's cultural bias is a key leverage point to addressing this problem.

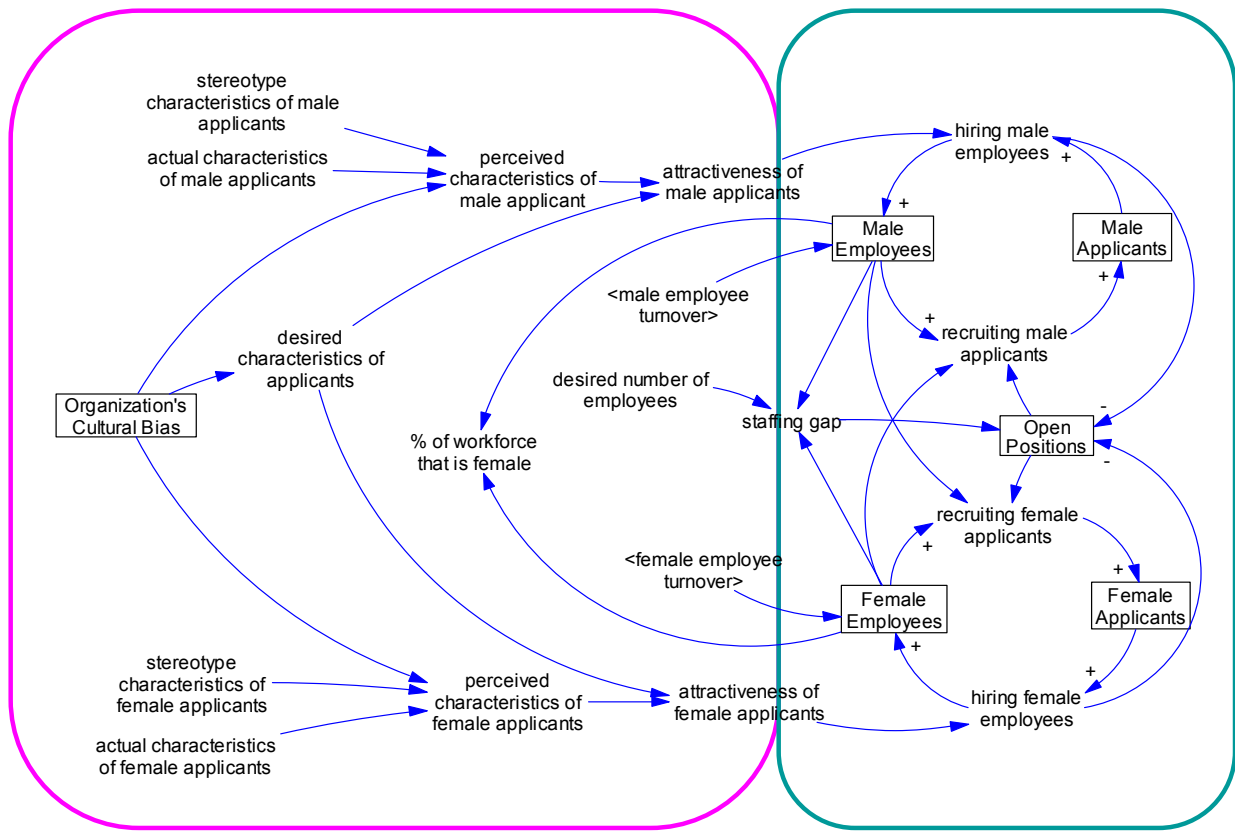


Figure 10. Two Main Leverage Points

One of the most important insights of modeling this case is the clarity with which we see the two main leverage points of addressing gender bias as described by feminist theory – there are numbers and norms. In the right-hand box of Figure 10 we have the numbers portion of the model – the place where most emphasis is traditionally placed in organizations for bringing about change. “We need more women in our organization.” And yet, if only the numbers are addressed and not the norms, not the culture, all we succeed in doing is increasing the number of women flowing through the organization, not staying and contributing. For all our effort, we would be right back where we started. And so we must also address the left-hand box, the norms portion of the model, the organization’s cultural bias.

## 6 Conclusion

In section 1, we articulated two goals for this paper. First, a research goal: to determine if the social structure driving gender bias, as described by feminist theory, can be represented using system dynamics. Second, a professional and personal goal: to raise awareness of the systemic nature of gender bias as described by feminist theory – and the significant barrier it is to collegiality. We conclude by reviewing our progress in achieving these goals.

So what were some of the issues that arose when trying to represent feminist theories in system dynamics for understanding the problem of job discrimination? What might be some of the possibilities and limitations of using system dynamics for developing better feminist social theories? The dynamics described in this paper have been written about extensively in feminist literature, diversity literature, and government documents on civil rights. However, in the process of developing these causal loop diagrams, it became apparent that many terms within the literature were more ambiguous than expected and subject to multiple, conflicting interpretations. Terms like ‘patriarchal culture’ or ‘sexism’ did not lend themselves easily to operational definitions within a causal loop diagram. There were also times when the theory suggested retaining distinctions between concepts that tended to be indistinguishable in their operational definitions. For example, we often wanted to distinguish individual bias from organizational bias and cultural bias, but ran into difficulties when we tried to develop distinct operational definitions. Both of these issues raise questions about the extent that one can adequately represent social theory using system dynamics.

The problem here could be (a) the terms being problematically ambiguous, (b) us (the authors) not adequately grasping the definitions of the terms, or (c) the additional constraints imposed by system dynamics in an effort to develop a more rigorous mental model of job discrimination. That there is not a single unified framework within feminist theory makes it even more difficult to assess to what extent one is using the terms correctly within a particular discourse. Describing job discrimination, one writer might emphasize ‘patriarchal culture’, and another might stress the dynamics of ‘sexism’ and ‘oppression’. One might hope that there is a way of synthesizing these different terms within a unified system dynamics model. However, it appears that there are enough differences to make such a synthesis difficult if not impossible.

It is entirely possible that we did not get the feminist theory right. It could be that if one has a clear understanding of a term like ‘patriarchal culture’, then the problems we mentioned disappear. For example, one might then be able to readily provide operational definitions for ‘patriarchal culture’ and ‘sexism’ that are distinct from each other. This is always a risk and the topic of frequent critiques. What is perhaps more interesting here is how we become aware of our need to define terms more precisely or resolve confusions as the authors trying to formulate a feminist theory within system dynamics. That is, one does not know how ambiguous one’s concepts are until one really tries to model them more formally. And this seems very much in line with one of the strengths of system dynamics.

But, one should be cautious and recognize that a model that results from creating operational definitions that do not exist in the literature is no longer a representation of the original theory. Rather it's something else, namely, a revised or new theory. Though it would be unreasonable to expect feminist theory to be expressed in systems of differential equations, one could hope that there would be a reasonable correspondence between system concepts in feminist theory and system dynamics. What we found in this exercise, though, was that the very process of developing a system dynamics model of job discrimination essentially led us to develop a different theory with a basis in feminist scholarship and other literature. This would suggest that social theories cannot be meaningfully tested and compared using system dynamics unless they have already been specified within the language of system dynamics.

Perhaps the more interesting issue for future research is then to develop and explore feminist theory using system dynamics. That is, instead of using system dynamics as a tool for comparative analyses of social theory, which relies on being able to adequately represent one theory within another framework, one should focus on developing social theories as system dynamics models. Thus, one might have a feminist system dynamics theory of job discrimination, or a feminist system dynamics theory of domestic violence. Such approaches seem both more to the point of solving specific problems and more promising in terms of opening up new insights and terrain for future studies.

What progress have we made with our second goal? We cannot know for a while. Yet, if the systemic effect of gender bias enters the discourse on collegiality at the conference this week, we will know we are on the right track.



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