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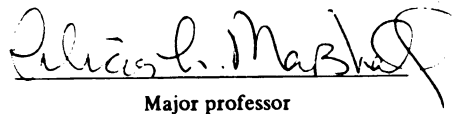
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**GENDER RATIOS AND NETWORKS: A COMPARATIVE STUDY OF TWO  
ORGANIZATIONS**

By

Caroline T. Ethington

A THESIS

Submitted to  
Michigan State University  
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## ABSTRACT

### **GENDER RATIOS IN ORGANIZATIONS: A COMPARATIVE STUDY OF TWO ORGANIZATIONS**

By

Caroline T. Ethington

In *Men and Women of the Corporation*, Kanter proposed that women, as *tokens*, are socially isolated from the informal networks of and suggested that *token dynamics* would be present for male tokens as well. Research in this area has yielded conflicting results, partly because it has focused on gender ratios and ignored the impact of formal position power. This thesis remedies this situation and examines two organizations:

1) gender balanced and balanced gender distribution across levels and 2) female-majority and females concentrated in upper level positions. Data were collected from self-report questionnaires filled out by organizational members. Using the STRUCTURE network analysis software program, density between and among gender groups and prominence indices were calculated. Differences for men and women in network integration and network prominence were hypothesized. Results indicate that 1) men and women are equally integrated in one another's networks and are equally prominent in the gender balanced organization and 2) there is some support that men's and women's networks are segregated and women are more prominent than men in the female-majority organization.

## ACKNOWLEDGMENTS

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## **INTRODUCTION**

Imagine the following scenario: Pat is considering two job offers, one from an organization where women compose the majority group and occupy most formal positions of authority and one from an organization where there are roughly equal numbers of men and women and formal positions of authority are equally distributed. Pat is anxious to have informal communication contacts with both men and women and enjoys being sought out by other organization members. Everything else being equal, which organization should Pat choose?

If you answered “it depends on Pat’s gender,” you are on the right track. It seems intuitive that if Pat were male he would avoid the former organization (female-majority), reasoning that as a minority group member it would be difficult for him to develop informal contacts with the majority group. If Pat were female, she might reason that which organization she chooses would make no difference; in either case she would not be in the minority and would be able to develop informal contacts with both men and women easily. However, one of the claims I will make in this thesis is that in an organization where women are the majority and hold the majority of positions of formal authority, men’s and women’s communication networks will be segregated from one another, due to the tendency of majority groups to exclude minority groups. As a result of the segregation of men’s and women’s networks, women will be more highly sought after, a

reflection of their power. Therefore, what's good for Patricia may not be good for Patrick!

In this thesis I will examine the integration of men's and women's communication networks and men's and women's network prominence in organizations with differing gender ratios and distributions of formal authority. Integration refers to the extent to which men's and women's networks include contacts with members of the opposite gender. Prominence refers to the extent to which an individual is the recipient of communication contacts. Informal network communication refers to the communication relationships that emerge through the activities of an organization. The impact of gender ratios on men's and women's communication patterns in organizations is an important area of study as gender ratios in organizations shift away from male-majority due to demographic trends.

In order to explore the relationship of gender, gender ratios, and gender distribution of formal authority to network integration and network prominence, I will examine an organization that is gender-balanced and an organization that has a female majority. Specifically, I will perform a secondary analysis of data from organizations with the following gender ratios and distributions of formal authority: 1) gender-balanced (approximately 50% male, 50% female with males and females equally distributed through the formal hierarchy) and 2) female-majority (75% or more female with females concentrated in upper level positions). In condition one, I will argue that because there is no majority group, both in terms of gender and formal positions of authority, men and women's informal communication networks will be integrated and there will be no

differences between men's and women's prominence. I will also argue that because minority group members are isolated from the majority group's informal communication networks and because network position is related to power, in condition two men and women will be segregated from one another and women will be more prominent. I will utilize network analysis as a research methodology in order to tap into the informal communication networks of these organizations.

I have organized this thesis into four major sections: 1) Guiding Literature and Hypotheses, 2) Methods/Analysis, 3) Results and 4) Summary and Conclusions. In the following section I will highlight work force demographic history and trends that provide some background and justification for the importance of my research questions. I will then review the literature examining men's and women's interaction patterns in organizations of differing gender ratios. This will lead to a discussion of the concepts of integration and network prominence. The section will culminate with my hypotheses with respect to the relationship between gender, gender ratios in organizations and gender distribution of hierarchical levels to network integration and prominence.

## **GUIDING LITERATURE AND HYPOTHESES**

### **Demographic shifts in the U.S. work force**

In the early 1900s, just over 21% of the work force was composed of women. Currently the rate of participation in the work force is nearly double that at about 40%. A number of factors have contributed to this increase of women in the work force. In the 1960s, the feminist movement brought about great social change in terms of beliefs about appropriate roles for women. A steadily declining fertility rate has enabled more women to work outside of the home. In addition to social change, the rise in single-parent families and the increasing need for dual-income families in order to maintain reasonable living standards led to the economic necessity of working women (Daily, 1993).

Until fairly recently, women were considered to be a reserve work force who either occupied undesirable jobs (in terms of either pay or status) or who worked in times of crisis, such as war. Until the 1960s, most women only held jobs while young or unmarried. (Daily, 1993). Although women are now freer to pursue the career of their choosing, the statistics are less than encouraging. Women are still concentrated in lower level positions (Blau & Ferber, 1987; U.S. Department of Labor, 1979, 1984) and are relatively underrepresented in positions of power (Brown, 1979; Dexter, 1985; Dipboye, 1987).

Although the gap between what men and women earn has been closing, it still remains significant. The annual earning ratio for women to men (adjusted for hours and weeks) rose from 60% in 1971 to 74% in 1988 (Blau, 1992). Occupational differences also narrowed in the 1970s and 1980s as women made inroads into traditionally male managerial and professional jobs. The index of segregation fell from 67% to 57% from 1970 to 1987 (Blau, 1992). This index measures the proportion of women who would have to change jobs for the occupational distribution of men and women to be equal.

### Summary

The dramatic changes in the demographic landscape in recent decades have made it an exciting time to study communication pattern differences between men and women in organizations. The future promises to be just as interesting. The percentage of women in the work force is projected to increase from approximately 40% in 1989 to 50% by the year 2000 (Nelson & Quick, 1992). As the number of educated women entering the work force rises, men will increasingly have to relinquish their position of numerical majority in organizations. The demographic trends of increased numbers of women in the work force and greater numbers of women positions traditionally held by men all point to a need to investigate the impact of more balanced and female majority gender ratios on organizational communication.

### **Theoretical explanations for gender differences**

Inequality between men and women in income and in upper level position representation has prompted researchers to search for causes. Two types of general explanations that have been investigated in the literature are: 1) actual differences in men's

and women's behavior on-the-job and 2) certain aspects of organizational systems and structure impede women (Morrison & Von Glinow, 1990).

#### Actual differences in men's and women's behavior

An actual differences explanation is grounded in the notion that men's and women's behaviors in the workplace are *actually* different from one another and that these differences lead to different outcomes for men and women in organizations. For example, as a result of early socialization experiences, women may be less assertive than men, which in turn might cause them to be less likely to lobby for plum assignments. A man might be more likely to push for new assignments that could lead to greater upward mobility. It should be noted that these differences are not necessarily inborn, but could be the result of influences such as socialization or cultural values.

#### Communication behavior differences

Early research in the area of language uncovered differences between male and female communication behavior, for example in terms of tentativeness (Lakoff, 1975), interruptions (Eakins & Eakins, 1976; Lakoff, 1975; Zimmerman & West, 1975) and talkativeness (Brownell & Smith, 1973; Schultz et. al, 1984). Smythe (1991) observed that early research seemed to support stereotypical gender-based differences in communication behavior, even though it was largely unsubstantiated empirically. She cites critics (Kramer, 1974; Lakoff, 1973, 1975) who contended that previous research was flawed and that observed differences were actually due to sex stereotyping.

In her extensive review of the contemporary gender and communication behavior literature, Smythe cites many studies that contradict the gender differences viewpoint and

comments that “the persistence of gender-based stereotypes is almost as striking as the absence of empirically documented differences in the communication of the sexes” (p. 205). She suggests that even though findings that support similarities in behaviors are common, stereotypical descriptions of masculine and feminine behavior remain firmly planted in both popular and scholarly literature. Smythe concludes “stereotypes about the communication behaviors of men and women surpass actual differences in those behaviors in number, direction and certainty (p. 205).”

#### Managerial behavior differences

In the somewhat narrower domain of organizational literature, research positing that there are differences in managerial behavior has also yielded conflicting results. A number of studies indicate that there are not differences between men and women managers (Bartol, 1974, 1978; Inderlied & Powell, 1979; Wexley & Hunt, 1974). However, a number of studies indicate that men exhibit stereotypical masculine traits in their management roles while women exhibit feminine traits (Baird & Bradley, 1979; Bartol & Butterfield, 1976; Welsh, 1979).

Powell (1990) reviewed research concerning four types of possible gender differences: behavior, motivation, commitment and subordinate’s responses. Powell found that there were no differences in men’s and women’s task-oriented behavior, people-oriented behavior, effectiveness and subordinate’s responses to managers. While he did find some ratings of managers in laboratory studies favored male managers, female managers fare better than males in terms of their motivation level as managers. Powell



concluded that his review supports the “no differences view of sex differences in managers” (p. 71).

### Systemic Explanation

Morrison and Von Glinow (1990) concluded that “person-centered theory cannot adequately explain differential treatment in management; other factors must also be considered” (p. 202) and suggest systemic barriers as an alternative explanation. Research investigating systemic barriers operates on the assumption that there are certain aspects of the organization’s system and structure that hinder women from gaining the same status as men. This explanation removes the onus from women and places it on the organization. One systemic barrier that has received wide attention in the literature is women’s lack of access to the informal communication network.

It is widely recognized that informal networks are vital to organizational functioning. For example, network ties are an important source of information for organizational members. Exclusion from influential networks can cause a lack of organizational knowledge and can make it difficult for women to form alliances, which in turn can be associated with a lack of mobility (Ibarra, 1993). Yet, one of the most frequently reported obstacles faced by women in organizations is lack of access to the informal network (See Ibarra, 1993 for review). Limited network access can ultimately affect women’s upward mobility (Brass, 1985).

### Informal communication network

The informal communication network is the system of communication relationships that emerges through the organization’s activities. Research that taps into the informal

communication network is obtained using network analysis techniques. The basic purpose of network analysis is to determine interaction patterns that define organizational communication structure; its focus is on who talks to whom (links) as opposed to attributes of individuals (e.g. attitudes).

Proponents of network analysis cite several reasons for adopting a network approach to organizational communication research. The core belief of network analysis is that the “causal motor behind what people feel, believe and do lies in the pattern of relations between actors in a situation as opposed to the attributes of individual actors” (Burt, 1991). Network analysis does not rely on individuals' perceptions of their environment, but rather examines relationships that develop amongst individuals (Miller, 1975). Lastly, it explores informal communication relationships that emerge as a result of the organization's activities as opposed to the formally prescribed communication flow (Monge & Eisenberg, 1987).

### Summary

Lack of access to the informal communication network is a systemic barrier that can have negative implication for women's success in organizations. However, it is important to realize that this general finding is based primarily on research conducted on “typical” organizations--men compose the majority group and hold the formal positions of power (Irons & Moore, 1985; Kanter, 1977; Lincoln & Miller, 1979; Miller, Labovitz & Fry, 1975). Kanter argued that lack of network access should be seen in the broader context of minority and majority group dynamics. Historically, women have been the minority in organizations and have suffered social isolation as a result of the majority

group exaggerating differences. As demographics in organizations are projected to change, it is important to analyze organizations with differing gender ratios.

### **Gender ratios and informal communication patterns**

Kanter's *Men and Women of the Corporation*, (1977) was a pivotal work in that it suggested that the proportion of organizational members who are women has a bearing on women's ability to achieve a status similar to men. She called attention to the organizational dynamics involving women as the minority group and theorized that men would experience the same dynamics when in the minority. Her ideas about numerical imbalance provided the impetus for this thesis.

In the following sections I will provide detail on the literature examining men's and women's informal network communication in organizations with differing gender ratios. I will begin with Kanter's work on tokenism and numerical imbalance. Next I will detail Fairhurst and Snavely's (1983) research on male tokens. Lastly, I will discuss a study done by Brass (1985) who looked at an organization that was roughly balanced with respect to gender. As part of my review of Brass, I will discuss his conceptualization of network integration and then propose my own.

#### **Tokenism and numerical imbalance**

In an extensive field study examining men's and women's networks in a large sales organization, Kanter (1977) developed the theory of numerical imbalance. Kanter claimed that the successful integration of an organizational member who is a minority relative to the work group majority is inversely related to the imbalance of majority to minority members (minority groups can be defined as a function of race, ethnicity, gender).

The term *token* refers to members of the minority group and implies a heightened visibility. Tokens are obviously different from majority group members and as a result are subject to intense scrutiny. Being a member of the minority group increases the visibility of tokens which in turn causes performance pressures--pressures that are uniquely applied to tokens. Another consequence of being in the minority is that majority group members exaggerate differences between themselves and tokens which results in greater boundaries between the two groups and the isolation of tokens from informal networks.

Kanter's research was conducted on an organization where women were the minority group. Her findings imply that the plight of women in organizations can be improved through structural change as opposed to individual level change. Kanter's work removed the causal impetus from women. Women did not need to change themselves but rather organizations needed to take steps to increase the number of female employees.

As the term *numerical imbalance* implies, equilibrium will be reached once the number of men and women are balanced into more equal proportions. A numerical shift removes the uniqueness of tokens which in turn reduces token dynamics. However, if the pendulum swings too far, and men are the minority group, Kanter suggests that male tokens will be subject to the same pressures as female tokens. This assumption was not supported by work done by Fairhurst and Snavely (1983). In the following section I will detail the findings of Fairhurst and Snavely, who examined an organization where females were the majority group.

### Male token dynamics

Fairhurst and Snavely (1983) argued that although uniqueness of tokens may be highlighted by numbers, it is attenuated by power. They felt it was unclear whether women's powerlessness stemmed solely from their numerical underrepresentation in the organization or whether it was jointly determined by their societal status (relative to men) *and* their token status. As they explained: "The attainment of power causes tokens to be perceived more complexly by majority members, and it shifts the attention away from their uniqueness to their ability to mobilize needed resources for the achievement of their own goals or those of the majority members" (p. 293).

Fairhurst and Snavely (1983) sought to demonstrate that being male can offset token dynamics by studying male tokens in two different nursing institutions. They found that the males did not experience increased performance pressure. They also conducted a network analysis on topics that Kanter identified as topics of exclusion (i.e. personal performance problems, political information) and did not find that the males were socially isolated from the females.

Power differentials as a consequence of gender were offered as an explanation of these results by Fairhurst and Snavely (1983). The greater status afforded men in society enabled the male tokens to leverage themselves by using their social status as a power base. Unlike the women in Kanter's study, the male tokens were not powerless to accept the majority group's assertions of control and did not experience isolation from informal networks.

Fairhurst and Snavely's work casts some doubts on Kanter's assertion that male tokens will have the same experiences as female tokens. It appeared that even if women were the numerical majority they could not expect to reap the same rewards in terms of network access as do men. What if there were equal numbers of women and men? A study by Brass (1985) provided some insight on this issue.

#### Gender balanced interaction patterns

Brass (1985) investigated men's and women's interaction patterns in a newspaper publishing organization that was roughly balanced with respect to gender. Brass was interested in the extent of integration of men's and women's networks and what effects this might have on perceptions of influence and promotions. Brass made the point that network integration is relative; it may be more valuable to be integrated into some networks and not others. Two individuals may have equal numbers of network links and yet vary significantly in the amount of influence they wield. Brass operationalized network integration as centrality and obtained centrality measures for individuals with respect to the whole organization, subunit, and department as well as all female and all male interaction networks.

Brass (1985) defined centrality as the minimum distance between a focal person and all other persons in the pertinent reference group. The measure reflects both direct and indirect contacts, so an individual who is highly central can reach others in a group with a minimal number of linkages. Brass equated this with integration within a particular group. An individual with a high centrality score has easy access to others in the group and is therefore well-integrated into the group.

Brass found that women were not as well-integrated into men's networks, including the organization's dominant coalition and vice versa. However, in the organization as a whole, women were more central to the interaction network than men. It appeared that there were two informal, segregated interaction networks operating in the organization. In particular, women were less central to the dominant coalition's network (which was all male).

Brass also obtained ratings of perceptions of influence and found that women were rated as less influential than men. Perhaps most interestingly, Brass conducted a follow-up that indicated a relationship between centrality in men's and the dominant coalition's network and promotions. Brass concluded that women's segregation from influential male networks appeared to be preventing women from being promoted through the ranks of the organization.

Density: A measure of network integration

Brass (1985) framed the results of his study in terms of network integration. The term integration suggests that distinct parts (or groups) in an organization are combined to form a unified system. This could apply to different types of groups such as functional subunits, racial groups, and gender groups. As discussed previously, Brass operationalized network integration in terms of network centrality which measures the number of links between an individual and reference group members. While centrality is a good representation of how easy it is for an individual to reach members of another group, it does not reflect how well all the groups are incorporated into a whole. As Brass himself

pointed out “the resulting centrality measures are best interpreted in terms of *ease of access to others* in the reference group” (italics mine, p.332).

The concept of *density* in a network analysis sense is a better match to the concept of network integration as it captures the degree of interconnectedness within and among particular groups. Density can be defined as a proportion that is calculated by dividing the number of all ties occurring by the number of all possible ties (Knoke & Kuklinski, 1982). Density can be a characteristic of an entire network or it can be a characteristic of an individual. It can be calculated at different levels such as the entire organization, functional subunits or, in the case of this thesis, gender groups. Density measures can also be calculated between and among groups, which is necessary to assess network integration.

For example, I can think of density in terms of groups of women and groups of men in an organization. I might discover that in a particular organization the informal networks among men and women are extremely dense, that is there is a high degree of communication among women as a group and a high degree of communication among men as a group. However, without knowing the density between networks of men and women, I have no basis for concluding whether men’s and women’s networks are segregated from one another. If the density of relations between men and women is at a comparable level to density of relations among men and among women, I would conclude that gender groups are integrated into each others’ networks. However, if density of relations between men and women is at a lower level than among men and women, I would conclude that gender groups are segregated. Thus, higher density levels among



gender groups than between gender groups suggests that men's and women's networks are not unified but rather are segregated. No differences in density level among and between suggest that gender groups are integrated.

#### Formal position in organization

Before I can speculate as to the relationship between gender, gender ratios and density of relations between and among gender groups, it is necessary to address the interaction of organizational members' formal position. Two organizations could be very similar in their gender ratios and be drastically different in terms of the distribution of formal authority across gender groups. For example, Organization X might be described as female-majority while at the same time the upper levels of the organization are held primarily by males and Organization Y might be female majority both numerically and in terms of upper level positions. Should we expect the density of informal network communication between and among gender groups to be the same for X and Y? I return to the research on numerical imbalance in organizations, examining it in the context of distribution of formal authority.

Although Kanter (1977) found that female tokens in an organization where men held positions of formal authority experienced social isolation, she did note that "power wipes out sex...People who want to attach themselves to power may not even notice sex" (p.201). Kanter's observations were based on an organization where men occupied the majority of formal positions of power (the few upper level women in the organization occupied what Kanter termed "low-power situations" [p.203]) and thus her notion of power for women was limited to informal sources of power.

Clearly, power can also be associated with formal position in the organizational hierarchy. A primary source of influence in organizations is derived from position power, which refers to the power obtained from formal position in the organization's hierarchy (Yukl, 1981). Position in the organization's hierarchy is related to control over important contingencies such as resources, rewards and punishment, and information. Formal position is also related to network position; several studies (Lincoln & Miller, 1979; Miller, 1986) have shown that high-status individuals have more extensive network connections than low-status individuals.

The token dynamics for women that Kanter (1977) observed may have been exacerbated by the exclusion of women from formal positions of authority in addition to their minority status as females. Kanter defines token status in terms of social categories (e.g., gender, race) however, it would seem logical that token status can also be affected by formal position in the hierarchy.

It is instructive to now re-examine the findings of Fairhurst and Snavely (1983) in the context of formal position as well as numerical imbalance. Although the males were in the numerical minority, they were at an equal level with the females in terms of the formal hierarchy. Fairhurst and Snavely cited gender power differentials due to men's status in society as a possible explanation for the absence of male social isolation. Perhaps the lack of difference in formal position between the men and the women contributed to the lack of social isolation of the men.

A study conducted by Ibarra (1992) lends support to the idea that differences in formal authority between men and women are related to the social isolation of women

from informal networks. Ibarra studied an organization that was roughly balanced with respect to gender but where men occupied the majority of formal positions of authority. Ibarra found that men were more central to the organization-wide network than women but she also found that the effect of gender on centrality to the organization's overall network was completely mediated by differences in background characteristics such as rank, education and department. In other words, men's higher centrality was partially a function of their higher rank in the organization.

### Summary

Kanter's work has been viewed as a breakthrough in understanding the integration of women into organizations because it took the emphasis away from "femaleness" to issues of proportional imbalance. However, it appears that tokenism, by itself, cannot be used to explain interaction patterns in organizations where men are not the majority group. Formal position in the organization's hierarchy must also be taken into account.

The research concerning token dynamics must be re-examined in light of Ibarra's finding that the effect of gender on centrality is mediated by characteristics such as rank and department. It seems clear that in a more typical, male-dominated organization, women will lack network access. Whether this is due solely to women's token status or women's lower formal status in organizations, or a combination of the two is not clear.

Kanter's theory suggests that a balanced organization will eradicate gender differences in network access. This was not supported by Brass (1985) when he examined an organization that was balanced with respect to gender and distribution of formal authority. Ibarra (1992) examined an organization that was gender-balanced but also one

in which men held the majority of positions of formal authority. Like Brass, Ibarra found differences in men's and women's centrality in a gender balanced organization, however, the effect of gender on centrality was entirely mediated by differences in background characteristics, rank and department.

In an organization where men are the minority group, Kanter's theory suggests that men will be socially isolated; Fairhurst and Snavely suggest that tokenism will be eradicated for men due to men's higher status in the societal hierarchy. However, neither of these views takes the distribution of formal position into account. If women also hold the majority of formal positions of authority, does the power afforded women as a result of their higher status on the organizational hierarchy re-employ token dynamics? Ibarra's research implies that it does.

In view of these conflicting findings, the following hypotheses are based on the more general finding that hierarchical level is highly associated with network centrality (Lincoln & Miller, 1979; Roberts & O'Reilly, 1979; Miller, 1986) :

**Hypothesis 1:** In an organization that is balanced with respect to gender composition and formal authority, the density of informal communication among gender groups will equal the density of communication between gender groups.

**Hypothesis 2:** In an organization where women compose the majority and hold the majority of formal positions of authority, the density of informal communication among gender groups will be greater than the density of informal communication between gender groups.

### **Power and informal network communication**

By-products of the network segregation experienced by tokens is that they are not privy to the sometimes crucial information that is shared in informal networks and they lack access to influential others. Although empirical evidence supporting the relationship

between an individual's power and his or her position in the informal network has been limited, several researchers have hypothesized that informal contacts are an important source of power (Fombrun, 1983; Mechanic, 1962; Pfeffer, 1981). This issue is exceedingly important when looking at minority groups in organizations, since it is supposed that token status limits organizational contacts.

As mentioned previously, Brass (1985) investigated differences between men's and women's interaction patterns and the relationship of those patterns to influence and promotions. He found that women were rated as being less influential than men and demonstrated that centrality in men's and dominant coalition networks was related to promotions. Even though women were not tokens in this case, they still were perceived as less powerful. Brass's study suggests that perceptions of power or influence are related to one's position in the organizational network. Those who are well-integrated into the organization's key networks are seen as being more influential than those who are not.

Although there has been some research with respect to power and network access, there has not been an explicit investigation of how different gender proportions in organizations contribute to these power differentials. In the following sections I will briefly review the voluminous work on power in organizations and propose a network conceptualization of power (prominence). I will conclude with hypotheses on the relationship of gender, gender ratios, distribution of formal authority, and prominence.

#### Traditional definitions of power

Countless researchers over the decades have looked at power in organizations (Dahl, 1957; Dubin, 1957; Emerson, 1962; French & Raven, 1959; Harsanyi, 1962;

Kaplan, 1964; McClelland, 1975; McMurray, 1973; Mechanic, 1962; Miles, 1980; Parsons, 1951; Pettigrew, 1975; Pfeffer, 1981; Salancik & Pfeffer, 1974, 1977; Swingle, 1976; Tawney, 1952; Tushman, 1977). Most of these researchers agree that power involves influence of one individual (or unit) over another. For example, Parsons (1951) defines power as a person's ability to influence another person or persons to carry out orders. Some of the classical definitions of power include a component addressing the willingness on the part of the receiver by defining power as the ability of an individual to get another individual to do something that he or she wouldn't ordinarily do (Dahl, 1957; Mechanic, 1962; Weber, 1947). Still others stipulate that in addition to having influence over others, power involves an individual's capacity to resist influence (McMurray, 1973; Tawney, 1952).

#### A network approach to power: Prominence

A network approach is the purest way to look at power from a communication perspective; power is defined in terms of communication relationships. These relationships do not occur in isolation of the organization; they are embedded within an organizational context that causes them to emerge.

A definition of power embracing a network perspective was put forward by Burt (1991) who argued that "an individual who is the object of relationships has something of interest to everyone sending the relations. That interest makes the individual *prominent* and gives her power" (p. 188). Instead of relying on others' perceptions of who is powerful, which is how most research studies assess power, Burt's definition uses

something that is clearly observable as an index of power: the number of people who seek out a particular individual.

Burt's (1991) notion of prominence is based on demand. Organization members are in great demand by their co-workers for a reason: they have something that others want or need. That certain something could be something as tangible as the authority to give raises. Or it could be something less concrete, such as the ability to form coalitions to ensure project approval.

Thus, Burt (1991) suggests that when others have to come to you to do things such as obtain information or advice, make requests, or to seek approval, you have achieved a level of prominence in the organization. Prominence tells us more than simply who is highly sought after. Burt proposes that it is an indicator of power when he says that "to the extent that an individual is the object of relations from many others...there is a high demand for the actor and she can use that demand to push others into carrying out her wishes" (p.10).

A network approach to power also offers a different perspective on what exactly constitutes power. Traditional definitions of power imply a coercive element--power is the ability to bend another to one's will. These definitions reflect a somewhat masculine viewpoint, in which a stronger party dominates a weaker party. Burt's (1991) network-oriented approach to power defines power in terms of relationships; weaker parties seek out communication contacts with powerful others. Powerful individuals do not have the need to seek out as many relationships with others. This kinder, gentler definition removes some of the sting of more coercive conceptualizations of power.

Since my interest in power in organizations is communication oriented, a network approach to power as prominence is a logical choice. Prominence takes the concept of power and pares it down to communication relationships; the more members of an organization who seek out a particular individual, the more powerful that individual becomes. Lastly, prominence reflects a viewpoint that is less harsh than some previous definitions, a viewpoint that de-emphasizes coercion and emphasizes an individual's organizational assets. For these reasons I will adopt Burt's (1991) definition of prominence for the purposes of this study.

### **Prominence and gender ratios**

As hypothesized earlier, there is a significant relationship between gender, gender ratios in organizations, distribution of formal authority and network integration. If my hypotheses are correct, men's and women's networks will be segregated from each other when women occupy both the numerical majority and the majority of positions of formal authority. In organizations where men and women are equal in number, men and women's informal communication networks should be well-integrated. Considering the literature linking network position and power, I would expect that when men are segregated from the women's informal network, they will also be less prominent than women. When men and women have equal access to each others' networks, women and men will be equal in prominence. This leads to my second set of hypotheses:

**Hypothesis 3: In an organization that is balanced with respect to gender composition and formal authority, men and women will be equally prominent.**

**Hypothesis 4: In an organization where women compose the majority and hold the majority of formal positions of authority, women will be more prominent than men.**



## **METHODS/ANALYSIS**

In this chapter I will provide more detailed information about the two research sites under investigation in this thesis<sup>1</sup>. The broad issue of nominalist versus realist perspective with respect to participants in network analyses will be discussed and then followed by a description of the participants in the study. Lastly, I will discuss the measures and the analyses that will be used to test my hypotheses.

### **Research sites**

In this thesis I am examining the communication networks of men and women in two types of organizations: 1) gender balanced (roughly 50% men and 50% women) and 2) female-majority (75% or more women). In order to do this, it is necessary to obtain data regarding who talks to whom in organizations meeting these requirements. The two organizations on which I am performing a secondary analysis are: 1) a political lobbying organization and 2) a U.S. government agency. The political lobbying organization is gender-balanced and the U.S. government agency is female-majority. In the following sections I will describe the two organizations and their participants in greater detail.

### **Political lobbying organization**

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<sup>1</sup> The data analyzed in this thesis were drawn from two larger studies. The gender balanced data (political lobbying organization) were derived from a study comparing cohesion and structural equivalence explanations of social contagion in relation to commitment and role ambiguity (see Hartman and Johnson, 1989). The female majority data (U.S. government agency) were obtained from the third collection period in a four year project examining communication networks relating to innovations being implemented by the agency. The third data collection was selected because during the first data collection the participants were familiarizing themselves with the research process and an organizational event that might have affected communication occurred during the second data collection.

Data were collected from an Eastern, state-wide, non-profit political lobbying organization. The organization is made up of six separate offices that are located in five different cities across the state. The organization operates with very little formally prescribed power structure. There is one state-wide director whose role is to coordinate the efforts of the various offices. Each office has its own location director.

The function of the political lobbying organization is to conduct campaigns to influence members of the legislature to vote according to the group's special interests. Accordingly, committees are formed to handle specific campaigns and fund-raising activities on an as-needed basis.

U.S. government agency

The data for the female majority condition were drawn from a U.S. government agency. The agency is one branch of a division that is housed within a large federal research institute. The government agency includes a confederation of 19 regional offices that span the entire United States. The agency's primary responsibilities are to coordinate the efforts of the regional offices, disseminate information and to ensure uniformity in regional programs.

The 19 regional offices provide services to both the public and to the large federal research institute within which it is housed. They are brought together through a negotiated five year contract which hires regional units to work together toward the accomplishment of a common goal. However, the regional offices still retain membership in local organizations and must balance the sometimes conflicting goals of the federal research institute and their parent institutions.

As mentioned previously, the data for the female-majority condition were obtained from a larger study focusing on innovations being implemented in the government agency (see footnote 1). The program project staff is a consortium of researchers who banded together to facilitate and coordinate communication research within the government agency's network. Although not a formal part of the agency hierarchy, per se they were included in data collection, as they were part of the communication process with respect to the innovations being implemented in the government agency.

For the purposes of this study, the formal organizational chart was collapsed into seven hierarchical levels. The top two levels of the hierarchy are composed solely of employees of the government agency. The third level is composed of the remaining government agency employees and the top regional office employees. The next three levels are made up of regional office employees. The members of the program project made up the last level in the hierarchy.

### **Participants**

Perhaps the most well known, and at times the most difficult, issue associated with the context of networks is where to draw the boundaries around them--who should participate in the study and who should be excluded. This is especially problematic since boundaries imply some discontinuity in relationships, that relationships across boundaries are in some sense qualitatively different than those within the network's boundary (Monge & Eisenberg, 1987). In one of the more extended discussions of this issue, Lauman, Marsden, and Prensky (1983) distinguish between nominalist and realist views of this problem. In the realist approach, the researcher adopts the vantage point of the actors in

defining boundaries, while the nominalist imposes a conceptual framework that serves his/her own analytical purposes. A nominalist approach was taken to the political lobbying group while a realist perspective was adopted for the U.S. government agency. In the following sections I will provide greater detail and justification on the choice of approach for each organization.

#### Political lobbying organization

All six office locations were included in the study, however, responses were only accepted from participants who remained with the organization for all four weeks of the data collection period. As mentioned earlier, the political lobbying organization forms committees as needed. Committees are formed by hiring temporary members to handle campaigns and fund-raising. When the goals of the committee are met, it is dissolved. Membership in the political lobbying organization fluctuates, partly due to these temporary committees. As a result of this membership fluctuation, a nominalist approach was taken and the researchers decided whom to include.

Each office location had a varying number of employees: location 1, (19); location 2, (16); location 3, (1); location 4, (10); location 5, (13); and location 6 (2). The overall gender ratio of the organization was 52% male and 48% female employees (see Table 1 for gender distribution by location). Although the organization had a designated statewide director and six location directors, no formal organizational chart existed and organization members viewed themselves as equals.

U.S. government agency

From a nominalist perspective, the core of the government agency's network is composed of the agency staff and members of the 19 regional offices at the four highest hierarchical levels. However, in a realist sense, some members of the other branches of the division of the federal research institute have recurring relationships with the regional offices focusing on a variety of work-related matters, including the innovations being implemented. Also, some members of the government agency do not have as strong a tie to the regional offices. Lastly, while traditionally the top level employees of the regional offices have had a periodic, strategic role in the network, some of them under the most recent contract have expressed a desire to have a more active role in the ongoing operations of the agency. For these reasons a realist perspective was adopted. Members of the government agency and the top level employees in the various regions were permitted to self-nominate for inclusion in this research project after explaining its purposes to them. Since a major focus of this project involves analyzing the communication between program project staff and regional offices relating to innovations, it was decided to include only those members who were likely to communicate on a regular basis with the government agency personnel.

As discussed previously, using the formal organizational chart, hierarchical positions were grouped into seven levels. The top two levels were made up entirely of women (see Table 2 for the hierarchical distribution by gender). The overall gender ratio of the was 23% male, 77% female.

## **Measurement**

As this thesis is investigating the informal communication patterns of men and women using network analytic techniques, it is necessary to gather data on communication relationships within the two organizations. The basic datum of network analysis are links, or the relationships between members of the political lobbying group and the U.S. government agency (Rogers & Kincaid, 1981).

Network data were gathered for the two organizations using somewhat different self-report instruments. The political lobbying organization data were collected by asking participants to estimate how often they communicate with organization members in a typical week. U.S. government agency data were collected using a diary format in which participants were asked to record their face-to-face and telephone communication contacts over a three-day period. Some of the follow-up steps taken to ensure high response rates (e.g. telephone calls, electronic mail) recommended in the literature (e.g., Dillman, 1978, 1991) were common to both studies. Also, participation was voluntary and respondents were assured of confidentiality in both studies. In the following sections I will provide rationale for the self-report method used and then describe the data collection instruments and procedures for both studies in greater detail.

### **Self-report methods**

Although self-reports of communication behavior have been questioned because of their effect on accuracy (e.g., Bernard & Killworth, 1977), many still assert their validity on a conceptual level. As Richards (1985) maintains, since self-report reveals a person's perceptions of social reality, it often provides richer types of information than mere

reliance on observations and researchers who have reanalyzed the Bernard and Killworth data have come to the opposite conclusion (Kashy & Kenny, 1990). Even Bernard and Killworth have seen the utility of self-report for some problems (see Killworth, Bernard, & McCarty, 1984). Indeed, while the accuracy of self-report network data has been questioned on many grounds, for pragmatic reasons it has been the predominant method used for network analysis (Marsden, 1990). Some have also argued, from balance theory perspectives, that self-reports of behavior are more meaningful than actual behavior, since they more closely reflect the individual's perceptions and thus are more closely linked to their attitudes about and reactions to a particular social system (Kilduff & Krackhardt, 1994). In addition, while self-reports are often inaccurate, because of memory problems, in detailing what occurs for specific events, they can be very accurate in detailing the typical structural relationships in systems (Freeman, Romney, & Freeman, 1987). Therefore, in the case of both organizations, self-report data is used because it reflects organizational members' perceptions of reality and it is the most practical method to gather data for a network that covers large geographic areas.

#### Political lobbying organization

One of the researchers explained the purpose of the survey and the procedure for filling out the survey to the state-wide director. The state-wide director passed this information on to the location directors at a state-wide meeting. Each location director explained the survey instructions to the employees at the location offices. Questionnaires were mailed to the offices and were returned by mail. The researchers placed two follow-up telephone calls to each location and achieved a response rate of 97%.

In the questionnaire, respondents were asked to estimate how often they communicate with members of the organization in a typical week with respect to the following four content areas: 1) work satisfaction, 2) job duties, 3) organizational goals and 4) topics that are not work-related. The questionnaire included the names of all organization members on a roster by geographic location to ease respondent burden. Respondents were not asked to indicate the mode of communication used (e.g. telephone, face-to-face).

As mentioned previously, this data was collected for a larger project (Hartman & Johnson, 1989) and the content areas were identified accordingly. As the distinction between the content areas are not relevant to this thesis, the first three were combined to form a work-related network of communication contacts.

#### U.S. Government Agency

Questionnaires were mailed to members of the network and were returned to the researchers by mail. Data were collected from quarterly data collection number three of a four-year study. The researchers instructed the respondents via telephone on how to fill out the questionnaire and mailed an informational packet explaining the project prior to the first data collection. Each subsequent data collection, new network members also received a telephone call and informational packet. Respondents were warned of the upcoming data collection period and were also reminded to return their questionnaires by electronic mail. Follow-up telephone calls were made to those who did not return their questionnaires. Through these efforts, a response rate of 93% was achieved.



Respondents were asked to record communication contacts over a three-day period in a diary format. Respondents were instructed to record only interpersonal contacts in the diary, either face-to-face or by telephone, which were initiated or received during the sampling interval. In practice, because of geographic dispersion, interpersonal contacts were primarily by telephone. Respondents were also given the option of marking a space on the cover sheet if they did not communicate at all during the survey period. Separate, predated forms were provided for each day of the data collection period and an undated form for photocopying was contained in the communication log in case individuals had more than seven contacts in any given day. Detailed examples were provided on how to fill out the log in the packet.

A directory was provided of all members of the network, organized by functional role and regional offices. This approach reduced respondent burden associated with paging through a complete roster, while also providing a means for securing some of the advantages of rosters. Often this is the only practicable means of recording data for larger social systems (Marsden, 1990). Thus, individuals were asked to record the complete names of individuals with whom they had contact. They also recorded their name, region, and position on every page of the log. They checked whether each contact dealt with innovations, work-related content, or both. If no communication occurred in a given day, participants were asked to mark the appropriate space to indicate this.

Respondents did not record all communication contacts that occurred during the three day period. As noted earlier, this thesis is part of a larger study evaluating innovations being implemented within the agency. Therefore, two content areas were

identified: innovations and work-related. Respondents were advised that social, or non work-related contacts were not to be recorded. Again, since the distinction between innovations and work-related content is not relevant to this thesis, the two content areas were combined to form one work-related network of communication contacts.

#### Comparison of political lobbying organization and U.S. government agency

The issue of the comparability of the two organizations used to perform the secondary analysis is an important one. Ideally, the two organizations should only vary with respect to gender ratio and gender distribution of formal authority. While this is not completely the case, the two organizations and the methods used to collect the data were similar enough to warrant comparison.

Both organizations are similar in function in that they both are not-for-profit and service oriented; neither produces a tangible product. They are both involved in government--the political lobbying group on a local level and the U.S. government agency on a federal. They are also similar in terms of geographic dispersion. Although the various locations of the political lobbying organization are not as widely separated as the 19 regional offices of the U.S. government agency, both are dispersed enough to require a great deal of telephone communication.

The two organizations were also relatively comparable in terms of other demographic variables, namely education and tenure. The political lobbying group was fairly educated at 35% with bachelor's or beyond. At 95% with bachelor's or beyond, the U.S. government agency was highly educated. In both organizations the average tenure of individuals was relatively short. In the political lobbying organization the average length

of employment was 12.6 months. For the U.S. government agency the average length of employment was 5 years.

Data were collected from both organizations with respect to communication relationships amongst members. Although it is true that data were collected using different techniques (data from the political lobbying organization were based on estimates of communication in a “typical week” and data from the U.S. government agency were collected via a diary format) both methods provide information about the informal communication relationships in the organizations. Respondents in both studies were provided with a roster of participants (the roster for the political lobbying group was five pages, for the U.S. government agency it was two pages) and follow-up actions were taken in both cases. Also, particularly since this was a secondary analysis of data, neither set of subjects were aware of my research questions regarding communication between and among genders.

### **Density**

Network integration was operationalized as the density of communication relationships between and among gender groups. Equally dense relations between and among gender groups suggests integrated networks. Greater density among gender groups than between gender groups suggests that communication networks are segregated by gender.

Before describing the density measure utilized it is necessary to discuss network analysis notation and some issues related to direct and indirect links. In network analysis notation,  $z_{ij}$  represents the relationship from individual  $i$  to individual  $j$  and is a function of

the length of direct or indirect connections from  $i$  to  $j$  (Burt 1991). One way to measure relationships is to only consider direct choices. For example, if  $i$  cites  $j$  directly as a communication contact, the relationship between  $i$  and  $j$  is presumed to be strong. However, limiting relations to direct choices ignores indirect links in networks. For example,  $i$  could cite  $k$  as a communication contact while  $k$  cites  $j$ ;  $i$  is linked to  $j$  through  $k$ . While  $i$  still has a relatively strong relationship with  $j$  in the second example, it is not as strong as in the first. The longer the indirect connection, the weaker the relationship (Burt, 1991).

Burt (1991) recommends including indirect links as it is more realistic. In order to do this, I used a frequency decay function to assign values to the indirect links. A frequency decay function is based on the supposition that strength of a relation decreases with the increasing number of indirect links. As the number of links needed to reach another individual increases; the strength of the relationship decays. The formula for  $z_{ij}$  is as follows:

$$z_{ij} = \begin{cases} 1, & \text{if } i = j \\ 1 - f_{ij}/N_i, & \text{if } i \text{ can reach } j \\ 0, & \text{if cannot reach } j \end{cases}$$

where  $N_i$  is the number of individuals that  $i$  can reach in any number of links and  $f_{ij}$  is the number of individuals that  $i$  can reach in the minimum number of links needed to connect with  $j$  (Burt, 1991). While the maximum possible number of indirect links in any network equals  $N-1$ , it is intuitive that after a certain number of links a relationship is relatively non-existent. Therefore, I chose to set the maximum number of links to be considered at four.

The preceding discussion explains how the individual measure  $z_{ij}$  is determined, which is key in calculating density. Density can be defined as the average relation between and among groups. In network analysis notation the density (or average relation) from group A to group B is represented by  $z_{AB}$ . Thus, while  $z_{ij}$  represents an individual measure of relationships,  $z_{AB}$  is a group measure and averages the relations of the individuals who make up the groups in question. The density measures used in this thesis included indirect links up to four steps and utilized a frequency decay function as discussed previously.

In this study there were two groups: group A = men and group B = women. Density values were calculated between and among groups and accounted for the direction of relations (who sent relations and who received). The four following categories were obtained: 1) average relations sent from men to women, 2) average relations sent from men to women, 3) average relations sent from women to men and 4) average relations sent from women to women.

### **Power**

Power was operationalized as “Prominence” (Burt, 1991). The most basic measure of prominence is based on *choice status*, sociometry’s early measure of popularity (Burt, 1991). An individual’s choice status is simply the number of organizational members who have a relation with that individual divided by the number of organizational members who could have done so. However, this measure does not differentiate at all amongst the organizational members who have sent the individual relations.

One differentiating factor is the exclusivity of relations. An individual could be the object of strong relations, but we know nothing about whether the organizational members are sending relations exclusively to this individual or if the organizational members send relations to every individual in the network. For example, two individuals could have equal numbers of organizational members who seek them out (choice status), but one individual is the object of exclusive relations and the other is not. When organizational members seek out an individual to the exclusion of others, it implies that the individual has something special to offer and is in a position of power.

Burt's (1991) *exclusive relations* measure remedies this situation by assessing the extent to which the relations are directed solely to the individual. Specifically, the formula used to calculate this index is (Burt, 1991):

$$\text{exclusive relations to } i = \sum_j [z_{ji} / \sum_k z_{jk}] / (N-1), j \text{ not equal to } i, k$$

where N is the number of members in the organizational system, i represents the individual who is the object of the relationships, j represents an organizational member directing a relationship to i, k represents all others in the organizational system, and z represents the relation (from j to i or j to k). The bracketed portion of the equation contains the proportion of j's relations that are sent to i (individual) versus relations that are sent to k (other members of the organization). The proportion varies from 0 (when i receives no relations) to 1 (when i is the only contact for every other actor) (Burt, 1991).

## **Analysis**

This thesis is investigating the relationship between gender, gender ratios, network segregation and power. Hypotheses 1 and 2 concern the degree to which men's and women's informal network communication are segregated. Segregation between men and women is operationalized as the density of communication between and among men and women. A 2x2 density matrix will be generated using Burt's (1991) network analytic software program, STRUCTURE, version 4.2. The 2x2 matrix will contain the following cells: 1) density of communication from men to men, 2) density of communication contacts from men to women, 3) density of communication contacts from women to men and 4) density of communication contacts from women to women (see Figure 1). Density values among gender groups will be compared to density values between gender groups.

One of the underlying assumptions of network analysis is that relationships between actors is the causal impetus of what people do, feel and believe (Burt, 1991). It is this very assumption that makes it difficult to use traditional statistical measures to test hypotheses. Standard statistical tests of network data are not really appropriate because the observations cannot be assumed to be independent (Kilduff & Krackhardt, 1994). The interrelatedness of subjects violates the statistical assumption of independent samples. In the case of density, the evidence that I will be using to determine whether there is support for my hypotheses will be in the form of the distribution of values in the density tables. I have predicted in which quadrants I expect to see higher or lower values and will compare the overall distribution of values in each quadrant.

Hypothesis 2 is concerned with whether there are differences between men's and women's power in organizations of differing gender ratios. Burt's (1991) prominence measure will be used to operationalize power. As mentioned previously, the basic assumptions of network analysis violate the assumption of independent samples necessary for significance testing. However, the t-distribution is relatively robust and will be used in an attempt to frame the results in a manner that is familiar to most scholars. An independent samples t-test will be performed to test the significance of a difference in mean prominence for samples of men and women.



Table 1

Gender Distribution by Location for the Political Lobbying Group

| Location   | Gender |         | Total |
|------------|--------|---------|-------|
|            | Males  | Females |       |
| 1          | 7      | 12      | 19    |
| 2          | 8      | 8       | 16    |
| 3          | 4      | 3       | 7     |
| 4          | 5      | 5       | 10    |
| 5          | 10     | 3       | 13    |
| Total      | 34     | 31      | 65    |
| % of Total | 52%    | 48%     |       |

Table 2

Hierarchical Distribution by Gender for Government Agency and Program Project

| Level      | Gender |         | Total |
|------------|--------|---------|-------|
|            | Males  | Females |       |
| 1          | -      | 4       | 4     |
| 2          | -      | 3       | 3     |
| 3          | 14     | 15      | 29    |
| 4          | 2      | 17      | 19    |
| 5          | 5      | 19      | 24    |
| 6          | 3      | 24      | 27    |
| 7          | 6      | 16      | 22    |
| Total      | 30     | 98      | 128   |
| % of Total | 23%    | 77%     |       |

| Gender | Men   | Women   |
|--------|---|---|
| Men    | Density of<br>communication contacts from<br>men to men<br>(Quadrant 1)   | Density of<br>communication contacts from<br>men to women<br>(Quadrant 2)   |
| Women  | Density of<br>communication contacts from<br>women to men<br>(Quadrant 4) | Density of<br>communication contacts from<br>women to women<br>(Quadrant 3) |

Figure 1. 2 X2 Density Matrix

## **RESULTS**

The purpose of the analyses reported in this chapter is to determine if there is support for the following four hypotheses:

Hypothesis 1: In an organization that is balanced with respect to gender composition and formal authority, the density of informal communication among gender groups will equal the density of communication between gender groups.

Hypothesis 2: In an organization where women compose the majority and hold the majority of formal positions of authority, the density of informal communication among gender groups will be greater than the density of informal communication between gender groups.

Hypothesis 3: In an organization that is balanced with respect to gender composition and formal authority, men and women will be equally prominent.

Hypothesis 4: In an organization where women compose the majority and hold the majority of formal positions of authority, women will be more prominent than men.

### **Density of communication contacts between and among gender groups**

No variation in the density of communication contacts between and among gender groups in the gender-balanced condition was observed (see Table 3). The density of communication contacts were as follows: 1) from men to men = .391, 2) from men to women = .366, 3) from women to men = .377 and 4) from women to women = .375. Men and women sent communication contacts to members of their own gender group as well as members of the opposite gender group. The results reported in Table 3 provide

strong evidence that, men and women were highly integrated in each others' networks, providing support for Hypothesis 1.

Table 3

Density of communication by gender in gender balanced organization

| Gender | Gender |       |
|--------|--------|-------|
|        | Men    | Women |
| Men    | .391   | .366  |
| Women  | .377   | .375  |

Note. The density between any two individuals in the network is .378.

In the female-majority condition there does appear to be some variation in the density of relations between and among gender groups (see Table 4). The density of communication contacts were as follows: 1) from men to men = .015, 2) from men to women = .035, 3) from women to men = .030 and 4) from women to women = .044. Communication contacts among women were the most dense while communication contacts among men were the least dense. It appears that men are just as likely to send communication contacts to women as women are to men. The density of relations from men to women and from women to men was higher than the density of relations of men to men. The results presented in Table 4 suggest that while women tended to form a fairly segregated network of communication contacts, men did not. The overall results reported

in Table 4 demonstrate at least partial support for Hypothesis 2 in that network relations among women were the most dense.

Table 4

Density of communication by gender in female-majority organization

| Gender | Gender |       |
|--------|--------|-------|
|        | Men    | Women |
| Men    | .015   | .035  |
| Women  | .030   | .044  |

Note. The density between any two individuals in the network is .038.

**Gender differences in prominence**

An independent samples t-test was performed to evaluate the null hypothesis, namely, there are no differences between men's and women's prominence. Tables 5 and 6 report the mean exclusive relations measure of prominence, t-value, observed significance and degrees of freedom for the gender-balanced organization and the female-majority organization, respectively. In the gender-balanced condition (see Table 5), men's mean exclusive relations value was .0157 while women's was .0156. A t-value of .04 and an observed significance level of .49 (1-tailed) was calculated. There is a failure to reject the null hypothesis as the observed significance level of .49 is too large at  $p < .05$ . These data suggest that there is no significant effect of gender on prominence in an organization that

is balanced with respect to gender and hierarchical distribution and provide support for Hypothesis 3.

Table 5

Differences between men and women in prominence in gender balanced organization

| Prominence index    | Means           |                   | T-value<br>d.f. = 63 |
|---------------------|-----------------|-------------------|----------------------|
|                     | Men<br>(N = 31) | Women<br>(N = 34) |                      |
| Exclusive relations | .0157           | .0156             | .04                  |

\*p<.05; \*\*p<.01

In the female-majority condition (see Table 6), men's mean exclusive relations value was .0026 while women's was .0049. A t-value of -2.37 and an observed significance of .01 was calculated. This time the null hypothesis is rejected as the observed significance level of .01 is statistically significant at p<.05 and p<.01. These data suggest that there is a significant effect of gender on prominence in a female-majority organization, thus Hypothesis 4 was supported. It is important to consider, however, that the network data for the U.S. government agency is sparse when compared to the political lobbying group. A large number of respondents report zero communication during the data collection period which results in a much lower standard deviation for prominence in the

government agency as compared to the political lobbying group ( e.g., men's standard deviation = .02 for the government agency versus .19 for the political lobbying group).

Table 6

Differences between men and women in prominence in female majority organization

| Prominence index    | Means           |                   | T-value<br>d.f. = 63 |
|---------------------|-----------------|-------------------|----------------------|
|                     | Men<br>(N = 31) | Women<br>(N = 34) |                      |
| Exclusive relations | .0026           | .0049             | -.2.37**             |

\*p<.05; \*\*p<.01



## **SUMMARY AND CONCLUSIONS**

### **Summary of purpose and findings**

The purpose of this thesis was to perform a secondary analysis to investigate the relationship of gender, gender ratios, and distribution of formal authority to network integration and network prominence. In particular, two types of organizations were examined: 1) an organization that was balanced with respect to gender and distribution of formal authority and 2) an organization that had a female majority and where women held the majority of formal positions of authority.

I hypothesized that in the gender-balanced condition 1) men's and women's informal communication networks would be integrated and 2) that men and women would be equally prominent. Both of these two hypotheses were supported. The hypothesis that men's and women's informal communication networks would be segregated in the female-majority with females concentrated in upper level positions condition was partially supported. Lastly, the hypothesis that women would be more prominent than men in the female was supported. Overall, the analyses reported confirm the proposition that gender ratios and gender distribution of formal authority in organizations are related to differences in men's and women's informal communication patterns. These findings paint a picture of tokenism that is more complex than simple group membership based on gender or race that has been posited previously in the literature.

### **Network integration: gender ratios and gender distribution of formal authority**

In the search for answers to the question why do men and women experience different organizational outcomes, systemic explanations have been offered. This thesis advances the understanding of systemic explanations for differences in men's and women's communication patterns by taking the distribution of formal positions into account in addition to gender ratios in organizations. The inclusion of distribution of formal authority helps to clarify the literature on men's and women's informal combination networks in organizations.

As mentioned earlier, one type of systemic barrier that has been widely investigated in the literature is women's lack of access to influential networks. Kanter (1977) proposed that tokens, those in the numerical minority with respect to race or gender, are excluded from influential networks. Kanter's arguments were based on her observations of an organization where women were the tokens and where men held the majority of upper level positions, however, she predicted that token dynamics would be present for male tokens as well. Fairhurst & Snavely (1983) did not find that male tokens were socially isolated and speculated that this was due to men's higher status in society. Using Kanter's rationale, I would predict that men's and women's networks would be segregated in an organization where men are the minority; using Fairhurst's and Snavely's, I would predict that men's and women's networks would not be segregated. By introducing the distribution of formal authority to token dynamics, I have provided a way to make sense of conflicting results in the literature. Tokenism is moderated by the power

derived from formal positions of authority, therefore I would predict that men's and women's networks would be segregated.

Of course, the results in this study did not completely support the hypothesis that men's and women's networks would be segregated in an organization where women are in the majority and hold the majority of upper level positions. There appeared to be a segregated network of women, yet communication ties among men was not nearly as dense. This could possibly be explained by the extreme geographic dispersion of the members of this particular organization. Recall that members of this organization are dispersed across the entire United States. In particular, the position that has the highest concentration of men is a regional office position, which means that most of the men are scattered across the country. Even if men in this organization would prefer to communicate with members of their own gender, the opportunity to do so may be constrained by location. By virtue of the sheer number of women in the organization and the location of other men in the organization, men are more likely to have informal communication with women than with men.

Brass's (1985) study provides some support for this contention. Brass investigated the effect of proximity on network interactions when he observed some exceptions to the rule of gender segregated networks. Brass noted that membership in either an integrated or segregated workgroup seemed to explain why some men and some women were integrated into the opposite gender's network. When compared to women in all-female workgroups, women and men in integrated workgroups were equally central in the men's network. Men in integrated workgroups were more central to the women's

network than men in segregated workgroups, however they still were less central to the women's network than were women in integrated workgroups. Brass concluded that although these findings did not completely explain the exception, they did emphasize the importance of proximity on network interactions.

What do the results from this thesis imply for organizations? Kanter's theory of numerical imbalance suggests that a state of equilibrium will be reached in organizations when there are equal numbers of men and women. If simply changing the gender ratios in organizations would truly remedy barriers to informal communication networks, demographic projections of increasing numbers of women entering the work force would offer some measure of hope. However, from a policy standpoint, this research suggests that organizations that are committed to equality must be concerned with more than just the sheer number of women; organizations must also be concerned about the advancement of women.

### **Network integration and prominence**

In addition to incorporating formal authority with gender ratios to better understand men's and women's informal network communication, this thesis also makes a case for the relationship between network integration and network prominence.

Prominence indices are one way to measure the informal power wielded by organizational members. The results of this thesis suggest that segregation from the majority group's informal communication network has detrimental implications for the minority group's prominence.

In light of these findings, what strategies would I suggest for men and women in organizations in terms of their network contacts? Brass (1985) concluded that encouraging women to form informal communication relationships with other women “may be unnecessary, or at worst, nonproductive” (p. 340). Ibarra (1992) also concluded that “women are likely to benefit from the development of greater ties to their male colleagues” (p. 441). Again, the gender distribution of formal authority has bearing on this issue. Although women would probably profit from informal communication relationships with men in “typical” organization where men are in the majority and occupy most formal positions of power, this research suggests more broadly that individuals should consider majority group membership and formal authority when choosing network contacts.

### **Limitations**

The cross sectional design of this study is one of its most important methodological limitations. It makes it difficult to determine causality. Are women in a particular organization more prominent because they occupy the majority of formal positions of power or do they occupy formal positions of power because they are more prominent? It would be interesting to examine network prominence of men and women while tracking their movement through the formal hierarchy over time.

Another potential limitation of this study stems from the fact that it was a secondary analysis of data that was collected to investigate other research propositions. While performing a secondary analysis of existing data can be a very convenient way to assess the viability of research propositions, it can pose problems in terms of research

design. For example, in order to have greater confidence about the relationship of gender, gender ratios, and distribution of formal authority to network integration and network prominence, it would be necessary to ensure that the organizations under investigation are more comparable in terms of characteristics such as size, type, etc.

### **Implications for future research**

The research undertaken in this thesis provides several contributions to the field of organizational communication. First, it provided further elaboration of the concept of tokenism by including formal position authority as a variable. Explicitly including formal authority as a moderator of tokenism helps explain conflicting results. Second, it investigated communication patterns in organizations that do not represent the status quo in terms of demographics, but instead looked at organizations that better represent future trends.

This thesis has merely scratched the surface in terms of the effect of formal position on token dynamics. Future research needs to be done to further test the relationship in organizations with different gender ratios and distributions of formal authority (e.g., male majority with females in upper level positions of female majority with males in upper level positions). Researching organizations with a variety of gender ratios and distributions of formal authority will help assess the strength of formal position as a moderator.

It would also be interesting to do further research on what variables are associated with integration or segregation. Particularly since some demographic characteristics are highly correlated (e.g. tenure and hierarchical level) it would be important to also consider

the effects of variables like tenure or education on network integration and network prominence.

One of the goals of this thesis was to provide a very broad picture of token dynamics in organizations with different gender ratios and to delineate the influence of formal position on token dynamics. Although this has been accomplished to a certain extent, future research attempts should introduce a level of complexity that has been demonstrated by other network studies. For example, Brass (1985) and Ibarra (1992) differentiated between topics in her network analysis. The network content areas Brass identified were work flow and informal interaction. Ibarra identified communication, advice, support, influence, and friendship as important content areas. Ibarra found that women obtained social support and friendship from other women and instrumental access through ties to men. Perhaps there are gender differences in integration depending upon the content of communication.

Another issue that this thesis did not address at all was the outcomes associated with network integration or segregation. While there appeared to be a relationship between network integration and prominence, nothing is known about the causal ordering of the process. Future research should include a follow-up to assess the impact of network integration on promotions (or some other important outcome variable). This information would serve to strengthen the argument that network ties in organizations are important determinants of organizational success.

Lastly, as indicated in the literature review, the research on power in organizations has been quite extensive. Ragins and Sundstrom (1989), who were interested in power

differences between men and women conducted a review of the literature on power.

Ragins and Sundstrom concluded that power has usually been defined as a property of the individual, of interpersonal relationships, or of the organization. They proposed that these three approaches can be combined to suggest the following working definition of power: "influence by one person over others, stemming from a position in an organization, from an interpersonal relationship or from an individual characteristic" (p. 51). The network approach to power that was proposed in this thesis had the ability to address the issues of interpersonal relationships and organization position, however, it did not address the issue of personal characteristics. Future studies of gender power differentials should address perceptions of individual's power by other organizational members.

### **Summary**

Let us return for a moment to the dilemma that Pat faces with regard to which job offer to accept. Bear in mind that Pat would like to work for an organization where men's and women's networks are integrated and Pat would like to be a prominent member of the organization. There are two job offers under consideration: one from an organization where women compose the majority group and occupy the majority of upper level positions and one from an organization that is balanced with respect to gender and distribution of formal authority.

The results of this thesis suggest that Pat's choice will depend on Pat's gender. Assuming Pat is a woman, she is presented with a difficult decision. If she truly desires informal communication contacts with members of the opposite gender she should choose a gender balanced organization. Unfortunately, working in the gender-balanced



organization means that she will not have an advantage with respect to network prominence. If she wishes to maximize her prominence (reasoning that greater prominence will lead to advancement in the organization) she should choose the female-majority organization. If Pat is a man, he should choose the gender-balanced organization because he will have informal communication contacts with members of both genders and he will be equal to women in terms of prominence. If he were to choose the female-majority organization he would not only be segregated from the women's informal communication network, he would also suffer a decrement in prominence relative to women.

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