Managing workforce diversity: macro and micro level HR implications of network analysis

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Developing diversity within the workforce, that is, facilitating participation by diverse groups, is an issue in every business and culture. The social and political ramifications of inclusion and exclusion are well known to all. What is less well understood is how these practices materially bear on productivity and innovation at the enterprise level. Policy responses to date have been forged around the legal issues[1]. From a conceptual perspective, legislation constitutes one among several key environmental forces that influence the business enterprise, as shown in Figure 1.

From Figure 1 it is also evident that the macro-level regulation of the private sector employment relationship has important implications for micro-level employment processes and outcomes, indeed, for management processes and outcomes more broadly. An evolutionary perspective permits a first phase of combating employment discrimination aimed at eradicating the explicit use by employers of factors such as race, colour and sex in selecting, hiring and promoting employees — so-called overt discrimination. A second phase is more activist – affirming rather than appreciating, realigning rather than reinforcing, diversity. The third phase, “managing diversity”, implies that a firm can gain competitive advantage by enhancing its performance through leveraging human capital not in spite of but because of its racial, sex and ethnic composition. A fourth and more recent phase is to eliminate the legal infrastructure which supports diversity and rely instead on “market” forces[2].

Clearly, however, it is in the third and fourth phases of the movement to combat employment discrimination that the notion of anti-discrimination initiatives influencing business outcomes has taken hold, with the dominant operating phrase having become “managing diversity”. Here, the underlying idea (argument) appears to be that the firm will better be able to serve increasingly diverse customers, meet increasingly severe and diverse competitors, and deal with increasingly complex business and management problems by actively seeking and managing a diverse workforce. Put

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differently, managing diversity implies that a firm can gain competitive advantage – enhance its performance – through human capital by consciously seeking and managing a workforce that is diverse in terms of its sex, racial and ethnic composition. It is also clear that the evolution from employment anti-discrimination to managing diversity represents a change in emphasis from macro- or policy-level outcomes to micro- or firm-level outcomes.

Despite this evolutionary path, macro-level anti-discrimination in employment legislation and micro-level diversity management have followed formal models and practices of organizational design and structure. Chief among these, of course, is the hierarchical model of organization, which emphasizes formal reporting relationships of subordinates to superiors, functional specialization, and the division of labour as the leading principle of job design. There is little question that narrowly designed jobs, in which the worker unquestioningly followed the directives of a supervisor (known in some circles as “Taylorism”), together with pyramidal-structured organizations specifying vertical reporting and one-way behavioural relationships (information flows up, commands flow down), constituted processes which served to enhance the outcomes – performance – of mostly industrialized businesses during the early and middle portions of the twentieth century.

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<th>Environmental forces</th>
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Nevertheless, even during these periods various scholars documented and called attention to the importance and power of informal groups, collectives and cliques within formal business organizations. As examples, Mathewson (1931) and Roy (1952) showed how and analysed why some workers develop group norms which lead to the restriction of output in industrial settings, Roethlesberger and Dickson (1939) showed how and explained why some workers develop group norms which lead to extraordinary output in industrial settings, Kerr and Siegel (1954) showed how unionized workers in isolated industrial settings developed group norms which resulted in strikes and other forms of refusal to work, and Dalton (1959) analysed the development of informal groups among professional and managerial workers in business organizations and showed how such informal groups can contribute to the achievement of business goals and objectives.

The fundamental message of this and related research is that informal organizations, groupings and collectives of people/employees within formal business organizations are of critical importance because they reflect the actual (as opposed to the formally specified) behaviour of real world organizations, and because they can strongly influence the performance of business organizations.
Along these lines but more recently, various researchers have identified and analysed the behaviour of “organizational networks”, which are also collectives and groupings of employees which form in response to certain organizational characteristics, and which can also strongly influence the behaviour and performance of an enterprise (see, for example, Hellgren and Stjernberg, 1987; Krackhardt and Hanson, 1993; Krackhardt and Stern, 1988; Lincoln and Miller, 1979; Nelson, 1989; Stepenson and Zelen, 1989; Tichy et al., 1974). This research and analysis of informal groups, collectives, organizations and networks in business enterprises has largely been ignored in formal legislative attempts to bring about non-discriminatory employment practices[3].

Perhaps this is all that can be expected of macro-level process-oriented legislation, especially national legislation, in the area of employment discrimination, but disregard or ignorance of the aforementioned research on organizational networks and the like also seems to characterize micro-level outcomes-oriented efforts at diversity management. Furthermore, recent and far-reaching initiatives towards flatter organizations and team-based work in business enterprises have similarly and in a very real sense ignored some of the research on informal groups, collectives, organizations and networks in that these initiatives continue to emphasize formal (though fewer) reporting relationships and typically draw on formally specified line, functional and staff groups in forming workplace and organizational teams.

Modern network analysis offers a potentially powerful tool for identifying contemporary communication, information exchange, and decision-making processes as they actually occur in business enterprises. To the extent that such human and organizational behaviour departs from the behaviour specified in formal organizational charts, diagrams and processes, macro-level legislation aimed at achieving the “fair” representation of women, racial minorities, the disabled and other protected groups as well as micro-level initiatives at diversity management, organizational restructuring and team-based work may be misdirected – especially if such initiatives are intended to enhance the outcomes or performance of business enterprises.

In this paper, we present a new method of identifying and analysing informal networks in (US) business enterprises. From an applications or practitioner perspective, the analysis is intended to assist public policy makers in focusing their macro-level anti-discrimination efforts on “real world” organizational behaviour, and to assist business executives in their micro-level efforts to manage workforce diversity in the context of “real world” organizational behaviour. From a conceptual perspective and in the functional and formal organizational

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groupings context of the model presented in Figure 2, the network analysis offered here seeks to enhance our understanding of organizational outcomes, and of how such outcomes can be influenced and perhaps changed through conscious changes in – management of – organizational networks. By providing empirical evidence, we demonstrate that network and hierarchical factors hinder or facilitate participation by diverse groups and that these factors can be “proactively” managed by business leaders to produce expected outcomes.

Issues
In increasingly globalized markets, organizations have adopted cross-functional teaming as one way to reduce internal costs and increase organizational flexibility (Boynton et al., 1993). Decisions regarding the constitution of team membership may prove paradoxical for managers. For instance, diversity in professional and cultural backgrounds may enable innovation. Yet when managers implement their decision to form a team, they often expedite team formation by choosing members based on the criteria of who shares a “common view of the world”. Choices predicated on a common view of the world may, though not always, arise from similar cultural or professional backgrounds. This may result in an unintended lack of diversity among a team of workers in a business organization. Diversity also has political and legal ramifications making team formation a managerial dilemma not easily resolved.

Consider the generalized form of the diversity dilemma. Opposition to diversity takes the familiar form:

You don’t look like me, you don’t dress like me and you don’t think like me; therefore I don’t want to know or understand you.

Such opposition may simply reflect a human preference for the familiar, as indicated in the expressions “like seeking like”, “birds of feather flock together” or, more formally, “homophily” (Ibarra, 1992, 1993a, 1993b; Marsden, 1988; Rogers and Kincaid, 1981). Put differently, interpersonal similarity increases ease of communication, improves predictability of behaviour, and fosters trust and reciprocity in relationships (Kanter, 1977; Lincoln and Miller, 1979). Arguments grounded in expediency or familiarity may veil a darker side of diversity – a fundamental fear of or discomfort with differences in others.

If this fear of differences can be overcome, substantial benefits flow from diversity such as organizational learning or product innovation. This approach to diversity may be summarized by:

You don’t look like me, you don’t dress like me and you don’t think like me, therefore I want to know you in order to learn something new.

These potential benefits have been broached but not deeply examined by some organizational network researchers (Burt, 1992), who have studied differences among contacts within a person’s network within one level of a hierarchy or across several levels within a hierarchy (Burt, 1992) or in centrarchies (Ibarra, 1993a, 1993b).
The presence of a broad range of network relationships has several implications for human resource management. First, it can provide greater access to “instrumental” resources for enhancing individual human capital, in particular, access to education, experience or power (Ibarra, 1992). Second, a broad range of network relationships implies an accumulation of contacts and interpersonal exchanges such that members of an individual’s cohort become aware of one’s capabilities and talents, or “social capital”. Third, a manager may require the competence, knowledge and social capital of both hierarchy and network in order to leverage human resources for business objectives.

Advocating methodological approaches in the application of network analysis is both beyond the scope of this paper. In this paper, we make a generalized argument for the interaction effect among networks and hierarchy. We base our argument on three assumptions. First, networks (informal and implicit) and hierarchies (formal and explicit) co-exist and interact in a symbiotic relationship. Second, hierarchies create networks. Networks drive change which in turn change the hierarchies. Finally, networks and hierarchies are measured and managed differently. For example, most policy and organizational practices are predicated on the more visible hierarchy. We suggest human resource practices can be improved by explicitly managing both networks and hierarchies.

Our findings are drawn from two different organizations and serve two purposes. First, our research is supportive of a growing field in inter-organizational and comparative research utilizing network approaches. Second, we hope to persuade practitioners to adopt network analysis as a managerial tool. In so doing, they can measure what they manage and better manage what they measure. We suggest that the adoption of network management enables organizational learning and more effectively leverages the human resource output.

**Theory**

**Hierarchy**

Like any hierarchy, human hierarchies are a response to complexity. Unlike some hierarchies, however, human hierarchies are generally explicit and displayed in organizational charts, flow diagrams, etc. Hierarchical maps of human organizations facilitate solutions to complex problems by defining routes for the transmission of information and by establishing procedures for the settlement of disputes. Rigid hierarchical linkages (chains of authority) are defied when they allow an organization to solve the problems that the hierarchical design anticipates, but the same rigid structures are denounced when they impede creative solutions to unexpected problems.

Hierarchies derive both their value and their limitations from the functions that they serve, namely turning complex problems into simple surrogates, the response to which can be selected with a minimum of effort and thought. A powerful source of simplification comes from the canonization of procedures in written rules and organization charts. These written rules are handed down largely unchanged and can be applied consistently across cases and persistently over time.
From consistency and persistency comes acceptance, and from acceptance comes effortless decision. The coercion, which is indispensable to the smooth and efficient operation of any organization, is present but not “felt” in a hierarchy once the rules are accepted. A breach of the rules is a transgression of the value of authority embodied in the rules and will result in bilateral punishment, for example: “You don’t do what I say, I will fire or punish you”. In this way, resistance is minimized. Indeed a “bureaucrat” carries out the rules without expending any energy questioning them, or typically even allowing co-workers to question them.

Hierarchies regulate and codify organizational procedures. A by-product of this regularization is the presumption of perpetuity. Once the presumption is formulated, the procedures acquire a “venerability”, becoming one of nature’s fixtures. Selective amnesia takes hold and the institutional memory is manufactured through the retelling of stories (Bosk, 1969; see also Crozier, 1964) to make the hierarchy appear old, immutable and above challenge (Douglas, 1986).

Networks

Networks are relationships “typified by reciprocal patterns of communication and exchange” (Powell, 1990, p. 295). A seamless web of differential reciprocity through face-to-face and frequent interactions holds these relationships in place.

Beneath the formal authority structures lies an intricate pattern of personal relationships. Messages and judgements course silently and unseen connecting people and divisions within an organization. These connections are informal and usually bypass the formal reporting procedures. This behaviour pattern can have widely varying results, for example, tasks may be accomplished efficiently and effectively, or an organization’s careful plans may be sabotaged by fomenting opposition to change.

Trust-based, these relationships are the ties that bind people together. Trust is typically conceived of as a “warm and fuzzy” form of social capital. However, it is also highly coercive and used to groom and maintain contacts for monopolizing resources.

Trust-based relationships are initiated by seeking similarity in others, that is, an attribute (education, experience, events) that at least two people may share or have in common. While trust may begin by seeking relationships with similar others, it can result in exclusionary groups. “Closely held” relationships based on trust are powerful in two senses: they concentrate power by galvanizing a group; and they focus vulnerability because that power is so concentrated in the group and its relationships. For example, because of the similarity on which these types of relationship are based, failed relationships are not “firings” but betrayals. Unlike its counterpart in hierarchies, betrayed relationships in networks are rarely reconstituted and the network will strain against competing loyalties as the offending member is stigmatized and expelled from the group. Thus networks, while flexible, have a fragile quality about them.
The network literature distinguishes between expressive networks, which involve friendship, mentorship, and social support (Kram 1988; Thomas 1990), and instrumental networks which typically refer to the ability of someone to access material or job-related resources (Frombrun, 1982; Kanter, 1983; Kotter, 1982). The distinction between instrumental and expressive networks is a theoretical one, utilized more for differentiating theoretical arguments than the practical exigencies of the workplace in which these qualities are typically merged. While we adopt this distinction in the case material, we acknowledge that both instrumental and expressive characteristics require the establishment of trust to catalyse action in networks.

The interaction effect of hierarchies and networks
Assume a market. It could be said that the discipline of economics has markets and industries, but hardly any firms, and no individuals at all. The “people” who inhabit the economist’s models carry out their prearranged tasks with extraordinary concentration and uncanny accuracy. Homo economicus is really a robot. The software varies somewhat, but otherwise people are identical.

Assume a hierarchy. Business organizations in economic models are really no different, that is, they are invariant. They carry out their prearranged tasks with the same single-mindedness and the same degree of accuracy. Here, firms are a hierarchical response to an amorphous market; “islands of planned coordination in a sea of market relations” (Richardson, 1972).

The island metaphor evokes images of a pristine paradise inhabited by tribes of happy and innocent natives. But the myth of the noble savage in “primitive societies” was debunked by a generation of anthropologists who produced map after map of kinship diagrams charting the intricate webs of relationships among tribal societies; theories about the “elementary structures” of kinship resulted.

In like fashion, post-modern explorers debunked the myth of the firm by discovering tangles of communication channels as intricate as kinship. General theories, such as the ABCs of kinship or the XYZs of organizational theory, resulted. Map after map of informal hidden networks (science of the abstract) underlie notions of an organization in much the same way as generation after generation of kin or closely-held relationships (science of the concrete) define tribal or clan-like behaviour.

Charting the formal and mapping the informal organization produce two kinds of representations. These two map-making “guilds” have proceeded sometimes as if they were in competition and sometimes as if they were preparing maps for different purposes. To give an apt analogy, there are maps of a city’s freeway system, and separate maps of the complex web of “surface” streets. Each kind of map has its own market and helps to plan a different set of travel itineraries. But most journeys require both kinds of maps. More importantly, the behaviour of the transportation system depends fundamentally on the interaction of traffic on the freeways and the surface streets. Not only does one system feed the other, but the overload or failure of one system spills over into the other, as drivers innovate to solve unexpected congestion problems.
The view of business organizations. Two kinds of organizational structures exist side by side and interact in important ways to determine the behaviour of the firm. The analogue of the freeway system is the corporate hierarchy; it is apparent, obvious, changes design only infrequently, and tightly controls behaviour. The analogue of the flow of traffic on the surface streets is the informal network. It is apparent, but not obvious; the network is not the system of surface streets, but rather their pattern of use. This network changes organically and frequently as drivers constantly explore new routes, changing overall traffic patterns daily in ways that are beyond the direct control of traffic engineers. The network imposes relatively few formal constraints on behaviour; if manoeuvring becomes difficult, people will drive through parking lots, across lawns and even over pedestrians!

The maps of the freeways provided by business strategists and the maps of the back roads provided by some organizational behaviour scholars are useful, but most travellers rely heavily on another kind of map. This is the set of stories and myths that are passed among the participants. These verbal road maps fundamentally affect how both the freeway hierarchy and the network of back roads are used. Control over the outcome can come from redesigning the freeways, from adding some new back roads, but also by "nudging" the myths that ultimately determine the performance of the overall system.

To that end, our paper represents an initial step towards addressing the complex interactions among hierarchy, network and myth through an examination of diversity and executive teams in organizations. Several methodological perspectives have been offered to explain or predict sex, race or other attributes of organizations and organizational members (Rogers and Kincaid, 1981). Absent (because it is difficult to implement) is the empirical testing of these competing perspectives. Single case analyses have been performed which have focused on informal networks, (for example Ibarra, 1992). We indicate directions for future research in human resource policy and practice by comparing the interaction effect of networks and hierarchy in several organizations; and exploring the ramifications of network-based policy.

Data
Two organizations are studied. Network data were collected using network survey data, personnel records, in-depth interviews and selected public documents. Data collection for each case took approximately six months. Respondents filled out network survey forms and, in all cases, participation was voluntary. All respondents were informed that their individual responses would be kept confidential. Firm and individual identification is disguised to protect confidentiality.

In the network survey, respondents were asked to name the people in their respective divisions or work group with whom they have the most interaction on a variety of dimensions. Questions varied only slightly from case to case and focused on respondents' personal networks regarding work, expertise or competency, career advice and social relations.
Respondents were provided with a form which listed all relevant organizational members in alphabetical order and each respondent self-identified their frequency of interactions with other organizational members. These data were then matched and reciprocal ties were averaged.

**Centrality**

Centrality was operationalized as a function of direct and indirect links using a “closeness” measure (Stephenson and Zelen, 1989). In computing centrality scores, relationships were symmetrized. This is a strategic choice in that we wish to understand total network processes, not individual strategies. Therefore, it matters little whether one individual is the source or destination of the relation.

**Statistical analysis**

The data from the first case were analysed to determine if sex and race have any measurable effect on centrality. Two analyses of covariance were performed. The first analysis allowed sex and race to have separate additive fixed effects on centrality. The second analysis used a “multiplicative” model that sorted the respondents into two categories: white males and all the others.

The data from the second case were analysed to determine if work function or sex had any measurable effect on centrality; race, in this case, was uniform. Two analyses of covariance were performed. Centrality scores were sliced into “self reported” subcategories of headquarters, business and field. We tested to see if the means in the identified subgroups were different from one another. We then estimated the female and male means and tested to see if they were significantly different for the group as a whole.

**Case 1**

The first case is a department of 16 employees in a division of 238 employees in a financial services company. The workforce is comprised of approximately 40 per cent men and 60 per cent women. The racial/ethnic mix is 56 per cent white and 44 per cent people of colour. All workers are relatively high-level knowledge workers in the financial services industry performing similar tasks.

Network data, coded for gender and ethnicity, was sorted on the basis of three activities: work, social relations and support/advice. In the network diagrams presented later in this paper, the lines drawn connecting individuals with each other represent two-way communications/relationships. The thickness of the lines denotes the intensity of a relationship and is coded as a frequency weight. Frequency of communications in the form of daily, weekly and monthly interactions were also analysed. To simplify interpretation, thicker lines represent daily and weekly interactions, thin lines represent monthly communications.

*The organization chart or prescribed network*

Figure 3 presents the formal organization chart or prescribed network. A prescribed network is a formal structure composed of a set of formally
specified relationships between superiors and subordinates who are distributed across functionally differentiated groups. The prescribed network consists of the department of 16 employees (in a division of 238 employees). The chart has been modified to show the gender and ethnicity of the employees; squares denote men and circles denote women. Shaded circles and squares denote the categories of minorities identified in US equal employment laws as Hispanic, Native American, Asian, African-American. The shaded boxes correspond to the functional working departments in the organization.

The executive [Node 16] is a Caucasian male, his administrative assistant [Node 15] is a woman of colour. Out of the five direct reports, three are male managers [Nodes 2, 5 and 10], one of whom is a minority [Node 2]. There are two white female managers [Nodes 8 and 13]. Reporting to the managers on the organization chart are nine professionals [Nodes 1, 3, 4, 6, 7, 9, 11, 12 and 14], two of whom are male [3 and 14]. Of those two, one is a male of colour [Node 14], the other white [Node 3]. Of the seven women professionals, four are Caucasian [Nodes 4, 7, 11 and 12], three are minoritiies [Nodes 1, 6 and 9].

How work gets done. In contrast to prescribed networks, informal or emergent networks involve more discretionary patterns of interaction in which the content of relationships may be work oriented or socially motivated or both. The work network is shown in Figure 4. Employees were asked with whom they interact or work in order to get their job done in their department. This network is very different from the formal organization chart in several respects.

The bulk of the work flows through a white female manager in the lower right-hand corner of the network [Node 8]. All managers are working with their
Figure 4.
The work network

professional subordinates, with the exception of one white male manager in the work group on the right-hand side of the diagram (Node 5). There is no link connecting this manager to one of his subordinates (Node 6).

The grapevine. Figure 5 is the infamous “grapevine”, that is, the informal communication network. This network was determined by surveying employees regarding their involvement in the “rumour mill”, specifically by asking, “With whom do you talk if you want to really find out what’s going on in the organization?”

The white female manager (Node 8) through whom most of the work flows in Figure 4 is not in the thick of things in the informal network shown in Figure 5. This suggests that she is too busy doing her work and perhaps the work of others to hobnob by the watercooler. In any event, she talks mostly to other women of equal or lower rank in the organization.

The white male executive (Node 16) is talking primarily with a white male manager in one of the work groups (Node 5). It was determined from interviews that this relationship is regularly reinforced on the golf course. Line drives are not the only topic discussed on the 9th hole, as important work and relationship knowledge is fomented in these and other similarly shared recreational activities. From these informal liaisons executives often find and groom their replacements. With increasing exposure and growing familiarity, the executive may begin to use his junior manager as a source of information and vice versa. What is important here from a productivity standpoint is the integrity of the work knowledge exchanged in their relationship. We can see from the work network in Figure 4, that the executive is receiving from his male colleague (Node 5) information which may be incomplete or compromised because he is
not well connected within the organization. Although Node 5 is connected with other white men in the organization, he is not interacting with female peers or subordinates or minority males who are well-connected in the work network. His relative isolation could not only result in the transmission of unreliable or incomplete information but because of Node 5's positional power in the hierarchy he could also negatively impact productivity. Therefore, Node 5, the executive's right-hand man, may not be as knowledgeable or as informed as the executive thinks. In other words, Node 5's relative importance in the organization may be "over-rated".

Climbing the corporate ladder. Figure 6 is a network of support relationships or, in other words, who informs whom regarding professional career advice and what it takes to succeed or "get ahead" in the organization. The central players in this network are those who "know the ropes". In such a network, informal mentoring relationships may emerge.

The Caucasian female manager [Node 8] through whom most of the work flowed in Figure 4 is not in "the thick of things" here either. She is integrated in the work networks, but socially isolated. A likely scenario is that she may experience "burn-out", grow frustrated and leave the organization. If and when she does leave, she takes with her organizational and work-related knowledge (firm-specific human capital). Executives may commit corporate sabotage by not realising how intellectual capital is tied to the human capital/resources of the firm. Why? Because work-related knowledge resides in heads, not handbooks. This work knowledge is emergent, and is embedded in work relationships which will atrophy should certain key catalysts, like Node 8, leave the firm. What impact will a specific employee's departure have...
on the work flow in a department? Conversely, what happens if the employee becomes embittered and embedded and then strikes back at the organization? These scenarios pose challenges for an executive, and potentially threaten the stability if not the viability of the organization.

Getting back to golf, we had earlier suggested that the executive [Node 16] was informally training an heir apparent [Node 5] on the 9th hole. This initial insight is confirmed in the support network. Certainly these two white males are strongly connected in both networks. On closer inspection, these strong non-work connections overshadow any actual working relationship. This high level camaraderie generated gossip and suspicion among co-workers.

Clearly, isolated are a male professional of colour [Node 14] and a male manager of colour [Node 2]. They are unique in the department because they are the only ones with their particular gender/ethnic mix. They reported in interviews that they felt they had no one to turn to who would “understand their situation” or advise them appropriately.

Table I is a statistical description of centrality measures and relative rankings for each member in the work, grapevine (social) and support networks. In the work network [Node 8], the white female manager ranks first, but falls to seventh and eighth place in the grapevine and support networks, respectively. Her colleague, the white male manager [Node 5], ranks low, in eleventh place in the work network, but rises to second place in the support network, drawing his support largely from the executive.

From interview data, the central female manager in the work network [Node 8] will most likely not be promoted; while productive and well-respected, she is not "networked" for promotion. Furthermore, the white male manager [Node
<table>
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<tr>
<th>Node ID</th>
<th>Ethnic group</th>
<th>Sex (M/F)</th>
<th>Level of hierarchy</th>
<th>Work Rank (C)</th>
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</table>

Note: P = professional, M = manager, E = executive

Table I. Individual centrality rankings for work division as shown in Figures 3-6

51, highly central in the support network (a rank of 2), is targeted for promotion; yet is one of the least central individuals in the work network (a rank of 11 out of 14).

Table II is the statistical analysis of these data. The upper half of the table contains results using the additive model, as shown in (1), while the second panel contains results using the multiplicative model as shown in (2), specified as follows:

\[ C_i = a + b(SEX_i) + c(RACE_i) \]  
\[ C_i = a + b(SEX_i) \times (RACE_i) \]  

where \( C_i \) is the centrality for Node \( i \); \( SEX = 1 \) if male, \( 0 = \) female; \( RACE = 1 \) if white, \( 0 = \) otherwise; and \( a, b \) and \( c \) are coefficients estimated from the database.

The first row in each panel has the mean of the centrality measures for one subgroup. Next are estimated effects of being members of a different subgroup, followed by \( t \)-values indicating if the subgroups are statistically distinguishable.

For example, in the first column and row, the mean of the grapevine measures for the female/non-white subgroup is reported as 0.050. Below this number are the separate additive effects of being male (0.005) or white (-0.004), with corresponding \( t \)-values of 0.14 and -0.12. These \( t \)-values are well below the levels traditionally used to determine the statistical significance of an effect,
<table>
<thead>
<tr>
<th>Additive effect of sex and race</th>
<th>Grapevine network</th>
<th>Work network</th>
<th>Support network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female/non-white male</td>
<td>0.050</td>
<td>0.034</td>
<td>0.072</td>
</tr>
<tr>
<td>Male effect</td>
<td>0.005</td>
<td>-0.070</td>
<td>-0.007</td>
</tr>
<tr>
<td>Male t-value</td>
<td>0.14</td>
<td>-0.65</td>
<td>-0.06</td>
</tr>
<tr>
<td>White effect</td>
<td>-0.004</td>
<td>0.129</td>
<td>0.248</td>
</tr>
<tr>
<td>White t-value</td>
<td>-0.12</td>
<td>1.22</td>
<td>2.33**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiplicative effect of sex and race</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Targeted&quot; mean</td>
<td>0.041</td>
<td>0.065</td>
<td>0.162</td>
</tr>
<tr>
<td>White male effect</td>
<td>0.034</td>
<td>-0.020</td>
<td>0.182</td>
</tr>
<tr>
<td>t-value</td>
<td>0.89</td>
<td>-0.16</td>
<td>1.41</td>
</tr>
</tbody>
</table>

**Notes:**

- Critical t-values for 16 observations: ** (0.05) = 2.13; * (0.10) = 1.75
- Mean for the target group comprised of white females, minority females and minority males

from which we conclude that the male and race effects on grapevine are too small to allow us to say anything conclusive from this data set. The joint effect of being both white and male in the grapevine reported in the next panel is more discernible, with an estimated value of 0.034 and a t-value of 0.89.

The mean of the work centrality measures for the female/non-white subgroup is reported as 0.034. Below this number are the separate additive effects of being male (-0.70) or white (0.129) with corresponding t-values of -0.65 and 1.22. We conclude that being male may be a disadvantage in the work network, but that race, more accurately being white, is statistically significant. The joint effect of being both white and male in the work network in the next panel is not significant.

The largest t-value (2.33) in this table applies to the white effect on the centrality measure in the support network. The joint effect of being both white and male in the support network is also significant, with an estimated value of 0.182 and a t-value of 1.41.

From these data, we conclude that the hiring practices for case no. 1 control for the composition and diversity of the workforce only at the point of organizational entry. Once hired and inside the firm, however, differential access to social and economic resources may result in glass ceilings and walls for many of the organization's members. Such differential access is strongly influenced by sex and race.

**Case 2**

An executive team of 24 members of an insurance company comprises case no. 2. Two or 8 per cent of the 24 are white females and the remaining 22, or 92 per
cent, are white males. Twenty-three executives completed the network survey (96 per cent) and agreed to participate in lengthy interviews. These executives' tenure with the company ranged between ten and 20 years of service. Together, they are responsible for the marketing and sales activities of some 30,000 people and are themselves individually employed in headquarters, the field, or stand-alone businesses.

Unlike Case 1, the set of individuals studied in Case 2 has a very low percentage of females, and thus one might conclude that it is not possible to analyse gender diversity within the context of network analysis in this case. However, the lower representation of females in the executive ranks of Case 2 is in itself an accurate reflection of the lack of gender diversity in the senior ranks of not only this business but in business organizations more broadly. Further, and irrespective of the gender composition of the executive team, network analysis is still fundamentally relevant to assessing these executives' abilities to work as a team and to determine the extent to which the revealed network departs from the prescribed network or hierarchy. From this analysis, moreover, one can objectively demonstrate and persuasively argue for the enhancement of gender or other dimensions of diversity within senior executive ranks.

Network survey questions were designed to assess these executives' ability to work as a team when making decisions by responses to the following questions:

(1) "With whom do you talk in order to start thinking about or formulate ideas?" [formulation].

(2) "With whom do you make decisions regarding the business, that is, who is in the room with you when a decision is made?" [commitment].

(3) "With whom do you talk in order to get buy-in or support for the decision?" [solicitation and support].

(4) "With whom do you talk in order to take action on a business decision previously made?" [execution].

Only two (formulation and execution) of the possible four networks are shown in Figures 7 and 8 for brevity.

**Formulation**

Figure 7 is a network diagram of the formulation network showing strong ties only. In order to illustrate cross-functional communications, the lead executive [Node 14] is placed above his 23 direct reports.

Interaction among cohorts is relatively dense in the group labelled headquarters. While there is substantial communication between the field and headquarters, there is scant communication among those in the field with each other. The most active participant in the network is the lead executive [Node 14] who is explicitly seeking consensus from his team.
Execution

In Figure 8 all communications pass through the lead executive [Node 19], who provides the “final word” in terms of responsibility for a decision and its attendant details. However, the sparseness of communications in what is acknowledged to be an executive team is symptomatic of dysfunctional behaviours.

In the absence of peer co-operation, work and communication processes occur only along functional lines. Executives, once having been given or otherwise determined the decisions of their superiors, return to their respective areas of responsibility and attempt to implement the decisions in their own ways.

In terms of organizational morale, this lack of co-ordinated effort among the executives and their willingness to learn from each other was noted by the executives in the network survey and also by other employees in response to this organization’s most recent morale survey which was distributed to a random sample of some 3,000 employees. Specifically, employees reported that
they avoided formal hierarchical control, relied on informal communications and had low confidence in their management team.

Table III lists the centrality scores for the executive team in all four networks. The executive [Node 14] is a one-person team in every aspect of decision-making. But his frequent communications with his executive team are met with minimal inter-functional communication and little teamwork on the part of the other executives. Headquarters reports relatively high centrality rankings for its constituency, with little or no cross-functional communication in terms of field operations and stand-alone businesses.

In-depth interviews with all executives confirm the limited co-operation, with little or no evidence of teamwork. While teamwork was a formally stated value, the organization had a 30-year history of operating its businesses along

<table>
<thead>
<tr>
<th>Node</th>
<th>Level in hierarchy</th>
<th>Sex (M/F)</th>
<th>Formulation Rank (C)</th>
<th>Commitment Rank (C)</th>
<th>Support Rank (C)</th>
<th>Execution Rank (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>H</td>
<td>M</td>
<td>1 (0.364)</td>
<td>2 (0.337)</td>
<td>2 (0.269)</td>
<td>3 (0.341)</td>
</tr>
<tr>
<td>02</td>
<td>H</td>
<td>F</td>
<td>6 (0.311)</td>
<td>5 (0.315)</td>
<td>5 (0.255)</td>
<td>8 (0.298)</td>
</tr>
<tr>
<td>03</td>
<td>H</td>
<td>F</td>
<td>9 (0.267)</td>
<td>9 (0.292)</td>
<td>8 (0.237)</td>
<td>12 (0.255)</td>
</tr>
<tr>
<td>04</td>
<td>H</td>
<td>M</td>
<td>3 (0.350)</td>
<td>4 (0.318)</td>
<td>2 (0.269)</td>
<td>5 (0.333)</td>
</tr>
<tr>
<td>05</td>
<td>H</td>
<td>M</td>
<td>5 (0.329)</td>
<td>5 (0.315)</td>
<td>9 (0.219)</td>
<td>11 (0.264)</td>
</tr>
<tr>
<td>06</td>
<td>H</td>
<td>M</td>
<td>1 (0.364)</td>
<td>3 (0.326)</td>
<td>3 (0.264)</td>
<td>2 (0.350)</td>
</tr>
<tr>
<td>07</td>
<td>H</td>
<td>M</td>
<td>4 (0.333)</td>
<td>10 (0.289)</td>
<td>6 (0.252)</td>
<td>3 (0.341)</td>
</tr>
<tr>
<td>08</td>
<td>H</td>
<td>M</td>
<td>6 (0.311)</td>
<td>13 (0.199)</td>
<td>10 (0.201)</td>
<td>10 (0.267)</td>
</tr>
<tr>
<td>09</td>
<td>H</td>
<td>M</td>
<td>9 (0.267)</td>
<td>13 (0.199)</td>
<td>10 (0.210)</td>
<td>6 (0.315)</td>
</tr>
<tr>
<td>10</td>
<td>H</td>
<td>M</td>
<td>11 (0.194)</td>
<td>15 (0.000)</td>
<td>11 (0.194)</td>
<td>13 (0.193)</td>
</tr>
<tr>
<td>11</td>
<td>B</td>
<td>M</td>
<td>11 (0.194)</td>
<td>14 (0.192)</td>
<td>11 (0.194)</td>
<td>13 (0.193)</td>
</tr>
<tr>
<td>12</td>
<td>B</td>
<td>M</td>
<td>11 (0.248)</td>
<td>10 (0.289)</td>
<td>9 (0.219)</td>
<td>11 (0.264)</td>
</tr>
<tr>
<td>13</td>
<td>B</td>
<td>M</td>
<td>10 (0.248)</td>
<td>12 (0.267)</td>
<td>9 (0.219)</td>
<td>14 (0.000)</td>
</tr>
<tr>
<td>14</td>
<td>E</td>
<td>M</td>
<td>8 (0.301)</td>
<td>11 (0.275)</td>
<td>7 (0.250)</td>
<td>9 (0.286)</td>
</tr>
<tr>
<td>15</td>
<td>B</td>
<td>M</td>
<td>7 (0.308)</td>
<td>6 (0.304)</td>
<td>11 (0.194)</td>
<td>6 (0.315)</td>
</tr>
<tr>
<td>16</td>
<td>Z</td>
<td>M</td>
<td>7 (0.308)</td>
<td>7 (0.301)</td>
<td>4 (0.257)</td>
<td>14 (0.000)</td>
</tr>
<tr>
<td>17</td>
<td>Z</td>
<td>M</td>
<td>7 (0.308)</td>
<td>7 (0.298)</td>
<td>6 (0.252)</td>
<td>7 (0.308)</td>
</tr>
<tr>
<td>18</td>
<td>Z</td>
<td>M</td>
<td>10 (0.248)</td>
<td>12 (0.267)</td>
<td>9 (0.219)</td>
<td>11 (0.264)</td>
</tr>
<tr>
<td>19</td>
<td>Z</td>
<td>M</td>
<td>11 (0.194)</td>
<td>14 (0.192)</td>
<td>11 (0.194)</td>
<td>13 (0.193)</td>
</tr>
<tr>
<td>20</td>
<td>Z</td>
<td>M</td>
<td>8 (0.301)</td>
<td>4 (0.318)</td>
<td>9 (0.219)</td>
<td>4 (0.337)</td>
</tr>
<tr>
<td>21</td>
<td>Z</td>
<td>M</td>
<td>11 (0.194)</td>
<td>14 (0.192)</td>
<td>11 (0.194)</td>
<td>12 (0.255)</td>
</tr>
<tr>
<td>22</td>
<td>Z</td>
<td>M</td>
<td>11 (0.194)</td>
<td>14 (0.192)</td>
<td>11 (0.194)</td>
<td>13 (0.193)</td>
</tr>
<tr>
<td>23</td>
<td>B</td>
<td>M</td>
<td>11 (0.194)</td>
<td>15 (0.000)</td>
<td>11 (0.194)</td>
<td>13 (0.193)</td>
</tr>
<tr>
<td>24</td>
<td>B</td>
<td>M</td>
<td>2 (0.359)</td>
<td>1 (0.350)</td>
<td>1 (0.272)</td>
<td>1 (0.373)</td>
</tr>
</tbody>
</table>

Note: H = headquarters; B = separate but wholly owned business; Z = geographical zones of business; E = Executive

Table III. Individual centrality rankings for the four networks in Case 2.

Two networks (formulation and execution) are shown in Figures 7 and 8 respectively.
strictly functional, hierarchical lines. In such an environment, certain behaviours are rewarded. One executive [Node 20], the most central of the field executives (a relative rank of fourth place in both the commitment and execution networks), said the following:

[We] are a complete environment. What happens in management is that people at the bottom of a hierarchy are forced to comply. They rise to the top of the hierarchy where they have more freedom. It is exactly the opposite of what it should be. People at the top of the hierarchy need compliance. People at the bottom need the freedom to experiment. What we don’t need is the freedom to be autonomous at the top of the hierarchy.

Table IV summarizes the formal statistical analysis of these data. The table contains results using the additive model, as shown in (3), specified as follows:

\[ C_i = a + b(\text{GROUP}_i) + c(\text{SEX}_i) \]  
(3)

where \( C_i \) is the centrality for Node \( i \); \( \text{SEX} = 1 \) if male, \( 0 = \text{female} \); \( \text{GROUP} = 2 \) if field, 3 if business, 4 if headquarters; and \( a, b \) and \( c \) are coefficients estimated from the database.

The first row in each panel has the mean of the centrality measures for each subgroup. Next are estimated effects of being members of a different subgroup, followed by \( t \)-values indicating if the subgroups are statistically distinguishable for each of the four networks.

For example, in the first column and row, the mean of the formulation network measures for the headquarters subgroup is reported as 0.064. Below this number are the separate effects for being the executive (0.050) and of being male (0.025), with corresponding \( t \)-values of 3.039, 0.919 and 0.601. The \( t \)-values are significant only for the subgroup of headquarters and insignificant for the other subgroups of field and business, from which we conclude that most of the formulation activity in decision making was performed by headquarters. The same conclusion may be drawn regarding the execution network. Significance drops in the solicitation and support network and is not significant in the commitment network.

The largest \( t \)-value (3.039) in this table applies to the headquarters effect on the centrality measure in the formulation network. Controlling for the behaviour of executive, the \( t \)-value is still large (2.741) and controlling for sex, the \( t \)-value is 2.738.

The significance of the headquarters subgroup in decision making decreases in the subsequent stages of formally making the decision (commitment) and soliciting support for the implementation of the decision. However, in the execution of the decision, the effect of the headquarters subgroup on centrality is significant.

This case directly bears on the difficulty of implementing effective executive teams. Socialised over long careers to expect "freedom at the top", executives who support teamwork in word counteract it in deed. Teamwork requires individuals to express divergent opinions, but ultimately to conform to group consensus.
<table>
<thead>
<tr>
<th>Subgroup mean</th>
<th>Formulation network</th>
<th>Commitment network</th>
<th>Support network</th>
<th>Execution network</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Headquarters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.064</td>
<td>0.029</td>
<td>0.025</td>
<td>0.087</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>3.039**</td>
<td>0.777</td>
<td>2.273**</td>
<td>2.440**</td>
</tr>
<tr>
<td><strong>Headquarters</strong>b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.060</td>
<td>0.022</td>
<td>0.022</td>
<td>0.080</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>2.741**</td>
<td>0.545</td>
<td>1.967*</td>
<td>2.170**</td>
</tr>
<tr>
<td><strong>Executive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.050</td>
<td>0.091</td>
<td>0.035</td>
<td>0.077</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>0.919</td>
<td>0.923</td>
<td>1.267</td>
<td>0.639</td>
</tr>
<tr>
<td><strong>Headquarters</strong>c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.065</td>
<td>0.010</td>
<td>0.019</td>
<td>0.085</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>2.738**</td>
<td>0.244</td>
<td>1.613*</td>
<td>2.107**</td>
</tr>
<tr>
<td><strong>Executive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.045</td>
<td>0.102</td>
<td>0.037</td>
<td>0.072</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>0.806</td>
<td>1.013</td>
<td>1.309</td>
<td>0.761</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.025</td>
<td>-0.056</td>
<td>-0.011</td>
<td>0.024</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>0.601</td>
<td>-0.740</td>
<td>-0.531</td>
<td>0.338</td>
</tr>
<tr>
<td><strong>Business</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.030</td>
<td>-0.040</td>
<td>-0.020</td>
<td>-0.063</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>-1.436</td>
<td>-0.909</td>
<td>-1.505</td>
<td>-1.409</td>
</tr>
<tr>
<td><strong>Field</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.041</td>
<td>0.000</td>
<td>-0.011</td>
<td>-0.048</td>
</tr>
<tr>
<td>Mean t-value</td>
<td>-1.569</td>
<td>0.010</td>
<td>-0.892</td>
<td>-1.118</td>
</tr>
</tbody>
</table>

Notes:

aCritical t-values for 24 observations: ** (0.05) = 2.07; * (0.10) = 1.71
bMean and t-value for the target group, Headquarters, with the lead executive removed. This analysis was performed to ensure significance was not due solely to executive’s behaviour.
cMean and t-value for the target group, Headquarters, with the lead executive removed and controlling for sex. The only two females in the sample were in the Headquarters subgroup. However, sex was not significant.

We also suggest that in addition to long periods of socialization, current compensation practices discourage teamwork and encourage decision-making behaviour aligned along functional or hierarchical lines. For example, each field and business executive's reported revenue for their areas of responsibility are circulated in a comparative list among the executive cohort of 24 members. This encouraged sharp competition and undermined the team values espoused by the lead executive[4].

From these data, we conclude that teamwork or teaming practices across functions are absent. Very little cross-functional collaboration or communication
occurs. Furthermore, within the executive cohort, most activity occurs within the staff function, or headquarters. Whether and to what extent these conclusions would be modified if a larger proportion of senior executives in Case 2 had been women is of course unknowable. However, and as suggested in the beginning of the analysis of Case 2, the lack of gender diversity in the senior ranks of the company and other companies more broadly may be among the factors which inhibit rather than promote the true teamwork as revealed in this network analysis.

Discussion

Micro-implications at the firm level

The relationship between personal network structure and outcomes, such as career mobility, managerial effectiveness, and job satisfaction, is a new area of research (Burt, 1992; Ibarra, 1992, 1993a, 1993b) the results of which pose interesting dilemmas for practitioners. The example, the findings reported in this paper suggest that there is indeed reason to believe that personal networks differ sufficiently to account for differences in intraorganizational opportunities. A related implication is that because structural constraints differ by race and gender, network characteristics associated with success and effectiveness for white males may not be the same as those associated with success and effectiveness for women and minorities. Further research is needed to test the proposition that women and minorities must develop the ability to attain results similar to those of white males by using different means or by pursuing different approaches to access the same channels (Stephenson and Krebs, 1993).

Organizational research has indicated that persons who become part of key networks and information flows in organizations tend to be more committed to, and successful in their organizations (Burt, 1992; Putti et al., 1990; for a more technical approach, see Bienenstock and Bonacich, 1992). In contrast, surveys have found that exclusion from these same networks and the information contained therein is a major reason given by women and people of color for exiting the organization.

A careful evaluation of the percentages of women and minorities throughout the hierarchy will yield a picture of diversity in the formal organization. In case No. 1, network analysis readily revealed the glass ceiling (see also anecdotal evidence in Ellis, 1988; Taylor, 1986). The more difficult challenge is to manage the networks proactively once they have been measured to correct what statistics can only passively report and what public policy and company management can only programmatically address.

On this point, human capital theory attempts to explain continued sex and race-related differences in management by suggesting that individuals are rewarded in their current jobs for their past investments in education and job training. However, this explanation assumes that investment pays off equally for all groups. Recent studies suggest that investment yields higher returns for white males than for women and minorities.
A second theory is the rational bias explanation. This psychological theory suggests that discrimination is influenced by contextual circumstances in which sexual or racial bias results in career rewards and punishments (Larwood et al., 1988a). In this case, a manager's decision to discriminate is based on whether or not such discrimination will be viewed positively or negatively by relevant stakeholders, and on the possibility of receiving rewards for discriminating. Rational bias theory illustrates why discrimination continues to occur and even has a resurgence (backlash effect) despite substantial regulations against it (Larwood et al., 1988a, 1988b).

A third set of theories highlights structural discrimination. Intergroup theory (Thomas and Alderfer, 1989) suggests that two types of groups exist in organizations - identity groups (based on race, ethnicity, family, gender, or age) and organizational groups (based on common work tasks, work experiences, and position in the hierarchy). When the pattern of group relations within an organization mirrors the pattern in society as a whole, then evaluations of members of low-status groups are likely to be distorted by prejudice or anxiety, as “racist” assumptions go unquestioned (Nkomo, 1992).

**Macro-implications at the firm level**

A subset of the structural approach is that interaction patterns which are embedded in the organizational context generate, or at the very least influence, race and gender differences in network patterns (Ibarra, 1993a, 1993b). The structural perspective argues that organizational characteristics in society, not individual traits, account for most observed differences in behaviour and organizational experiences. Therefore, it is postulated that there is generalized preference for interacting with same-sex or same-race individuals. Because white males tend to dominate in positions of power and authority, their group identity or network homophily is not in direct competition with access to their instrumental resources in the organization, that is, the networks of similar others (white males) and instrumental resources overlap or are identical.

This theoretical assertion does not hold for women and minorities within the firm. Their networks consist of weaker and sparser ties than their white male counterparts. Thus, personal networks are bolstered by structural arrangements in the organization that accrue advantages to white males and impose significant limits on women's and minorities' abilities to develop instrumental ties with dominant white males.

These theories are embedded in a structural epistemology which has its roots in the sociological and anthropological disciplines. Essentially, the body politic, be it a corporation or a tribe, is organized around norms of inclusion and exclusion (Barnes, 1969; Douglas, 1986; see also “ascending and descending individualization” in Foucault, 1979). There will always be subdominant categories of people excluded from privilege or security based on some set of societal or organizational attributes. Normative principles of inclusion and exclusion virtually guarantee that certain groups of people will be systematically excluded and judged to be politically ineffectual, dispensable,
and disadvantaged. These individuals in turn will seek out one another and form networks which are homogeneous in that they share the common characteristic of exclusion. A problem for the firm is early detection: recognizing the formation of exclusionary groups while attempting to reverse this tendency.

**Implications**

Networks are subtle forms of trust-based communication which require equally subtle forms of management. For example, promotion is a management technique of the hierarchy, not the network. To promote a key player in a network (node 8 in case no. 1) can effectively catapult them out of their network into the very different world of hierarchical authority. In this brave new world, old friends become suspicious and remote. With diminished moral support from the network and little familiarity with executive networks, the newly promoted narrowly escape failure.

Proper preparation for a promotion is required to ready the incumbent for the emotional ramifications of decreased effectiveness in their networks. This loss can be offset by the gain of new contacts and positional authority within the hierarchy. Some hierarchical incumbents would rather trade their perks for the promise of a nurturing network. Networks and hierarchies are not mutually exclusive, although they do compete for the time and resources of their incumbents. People usually strike a personal balance between the two organizational constraints. What is less well understood is how to use the two organizational structures to manage a firm’s human resources proactively.

For example, the executive in case no. 1 suggested a promotion for his female manager [Node 8]. However, an immediate promotion for retention purposes could be just as damaging to the firm (and to her) as her exit. Because networks are based on trust, a promotion introduces hierarchical authority into the trust relationship. Like immiscible liquids, the oil and water of trust and authority if left on their own, separate from each other. Node 8’s increased authority in a hierarchy will threaten and may ultimately compromise her trust relationships. A promotion, if not properly augmented with new networking opportunities for her, could actually make her less, not more effective in the workplace. To determine what is best for the firm may mean, in addition to assessing skills, also assessing employees’ abilities to navigate between two organizational structures the requisite and management styles.

**Macro-implications at the policy level**

Equal employment opportunities have provided equal access to organizational entry and litigation at organizational exit, with no real controls for promotion within an organization (Morrison and Von Glinow, 1990). What this means is that targeted groups (women, people of colour, the disabled) have entered through the corporate doors but have not really moved up the corporate ladder in a substantive way. This is because most legislation is targeted at the
hierarchy: top-down programmes which are implemented in organizations and generally emphasize activity in the other direction, namely, bottom up. That is, most firms bring women and minorities into the organization but are not succeeding in moving them up into higher tiers of the organization. As a result, the major movement or flow of women and people of colour in organizations is “in and out”.

Equal opportunity legislation is focused on organizational entry and as such can legislate access to employment opportunities by “targeting” under-represented groups. Wrongful termination legislation is focused on organizational exit. However, while inside the organization, there is little law can do to ensure continued equitable access to career and professional opportunities. Limited legislation creates another problem: frequent voluntary turnover of “targeted” groups. This results in the high indirect costs associated with the recruitment, training and development of replacements.

It is a never ending story: the targeted groups are recruited, but are excluded from key aspects of organizational life, become frustrated and leave or exit in what is “single loop learning” by management. The bottom line is simple: preserving the thin white line of management requires that corporations continuously recruit in “designated” categories, and yet such recruiting is costly to the shareholder.

Not only is this vicious cycle a waste of money and resources, it perpetuates at least two false stereotypes:

1. Women and minorities not being able to “cut it” in organizations (e.g., women, people of colour, the disabled, and other minorities are “in” but not “of” the corporation (Kanter, 1977; White, 1992).

2. The golden rule is made by and for white males. In the USA, this is reflected in the glass ceilings in organizational hierarchies, in which senior white males adjudicate promotions.

For instance, while targeted groups comprise 65 per cent of the total workforce, women occupy only 3 per cent of the top corporate jobs and minorities hold about 2 per cent. A typical rationale used to explain these low percentages is historical artefact. The conciliatory promise is that the targeted groups are “in the pipeline” for promotion. Research in informal groups using network analysis is unravelling this myth. Women and minorities have been in the corporate pipeline for some time and they still are not getting promoted because of exclusionary networks which block access to resources, most notably, that of social capital (Gilligan 1982; Schwartz 1989). The bitter irony of diversity programmes is that “by the numbers” many firms “show well” but miss the mark in terms of substantive change.

Conclusion
From a business strategy perspective, competition through product differentiation may be enhanced by an understanding of how human networks work. Competitive advantage in an information economy may translate into the quick
and effective combination of different information streams into new products and services. Therefore, a company which can leverage the incipient diversity in its human resources may well have the upper hand in terms of market competition.

Network analysis is now a powerful and practical tool for identifying contemporary communication, information exchange, and decision-making processes as they actually occur in business enterprises. Legislation aimed at achieving the “fair” representation of racial minorities, women, the disabled and other protected groups, may be well-conceived but poorly implemented. This is because new laws must force hang on the structural conveniences of organizational hierarchies. Routine use of network analysis to measure and monitor team performance could be integrated into more formal appraisal and compensations systems.

Failure to understand the power of networks has led to well meaning but misguided efforts in affirming diversity. To the extent that human and organizational behavior departs from the behavior specified in affirming diversity and EEO laws, such behavior may now be redirected through the management of networks. Of course, such redirection can be better informed by additional network studies of a more experimental nature in which the diversity composition—male/female, black/white, domestic/foreign—is manipulated or controlled so as to better understand how changes in such a composition affect productivity and competition. In part, more experimental studies are needed because of limited or low diversity composition especially in the senior executive ranks in companies of the type which were studied in Case 2. The results from such studies will bear on the formation and use of work units and executive teams.

Many countries and companies have optimized on homogeneity by default, leaving heterogeneity as a latent strength. In reshaping the firm to meet the challenges of globalization, competitive advantage may increasingly rely on integrating and leveraging that latent strength in internal organizational networks (Peters, 1991a, 1991b).

Notes

1. In the USA alone, several laws aimed at overcoming employment discrimination in US businesses have been enacted by the federal government during the past three decades. The first of these public policy initiatives, the 1964 Civil Rights Act, banned the use of race, sex, religion, colour and national origin by employers in making selection, hiring and promotion decisions, and created the Equal Employment Opportunity Commission (EEOC) to enforce the law's provisions. Subsequent legislation, ranging from the 1967 Age Discrimination in Employment Act to the 1993 Americans with Disabilities Act, expanded the groups to be “protected” from private sector employment discrimination as well as the role of the federal government in regulating private sector employment processes and outcomes.

This “macro-level” focus of federal legislation on the private sector employment relationship in the US has a certain historical consistency. Beginning with the 1890 Sherman Act and continuing with the 1914 Clayton Act, the 1932 Norris-LaGuardia Act, the 1935 Wagner Act, the 1935 Social Security Act, the 1938 Fair Labour Standards Act, the 1947 Taft-Hartley Act, the 1959 Landrum-Griffin Act, the 1970 Occupational Safety and Health Act (OSHA), and the 1974 Employee Retirement Income Security Act (ERISA),
the role of the US Federal Government in private sector employment relationships has long been to seek certain politically supported (or perhaps "politically correct") national public policy objectives, such as union recognition, collective bargaining, workplace safety, pension protection and, most recently, discrimination-free employment policies and practices (see Lewin and Mitchell, 1995).

2. To illustrate with an example from the USA, in the first phase of the "movement" to combat employment discrimination, the notion of a "level employment playing field" prevailed in the sense that employers were to provide equal employment opportunity (EEO) to all labour force groups. Here, the emphasis of the law's enforcement and of management's actions was on modifying certain internal, firm-level processes, especially selection and hiring processes.

In the second phase of the movement to combat employment discrimination the concept of affirmative action (AA) supplanted that of EEO. Spurred by the EEOC and the courts, employers developed numerical goals and timetables for increasing the proportions of certain protected groups, notably women, Afro-Americans and, later, Hispanics, in their workforces, and pledged to take affirmative actions to achieve the goals and timetables. These actions included the development of new recruitment, job advertising (help wanted), college relations and community relations programmes which were intended to increase the pool of minority and female job applicants to the firm. While the main emphasis of this phase continued to be on (changes in) management's employment processes, the idea that AA could be managed to achieve more than just the eradication of explicit employment discrimination carried with it the implication that AA could also have a positive influence on business outcomes, that is, on the performance of the firm (see Figure 1).

This "performance enhancement" at the level of the firm became the dominant rationale underlying phase three of the movement to combat employment discrimination, as discussed in the text below. The fourth phase of this movement addresses the question whether anti-discrimination employment legislation should be repeated if market forces can achieve the same objectives.

3. That is, macro-level anti-discrimination legislation in the USA has followed the formal organizational lines and structures of businesses enterprises, and has focused on the relative proportions of protected groups - racial minorities, women, the disabled - in vertically structured occupational, functional and formal organizational groupings.

4. Two recent findings (Labor Letter, 1993a, 1993b) suggest that the diversity of the team may also play a role in productivity. An investment firm found that the 20 per cent of companies rated highest for hiring women and minorities outperformed the stock market by 2.4 per cent from 1988 through 1992. For the same time period, the worst 20 per cent trailed the market by eight points. In addition, research on the task effectiveness of diverse teams versus homogeneous work groups showed that although diverse work groups lag in the early stages of a task, they obtain superior results at the completion of the effort. While Case 2 does not specifically address overall organizational performance, it should be noted that all respondents are white and only two are female.

References and further reading


Mathewson, S.B. (1931), Restriction of Output among Unorganized Workers, Viking, New York, NY.


Roethlesberger, F. and Dickson, W.J. (1939), Management and the Worker, Harvard University Press, Cambridge, MA.


