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**THE NETWORK CHARACTERISTICS, THE DIMENSIONS OF  
NETWORK TIES, THE CHARACTERISTICS OF NETWORK TIES  
AND THEIR IMPACT ON MANAGERIAL EFFECTIVENESS**

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## **Abstract**

### **The types, the structural characteristics, the composition of networks and their impact on managerial effectiveness**

**Marie-Christine Piron**

This study investigates the impact of network characteristics - size and density - on managerial effectiveness as evaluated by 360-degree performance feedback appraisal. It further examines the mediating impact of network types such as information, advice, friendship, career support and cooperation as well as the impact on the relationships between ties of variables such as rank, frequency of interaction and intimacy.

Data was collected from 254 middle-level managers in various organizations in the United States. Surveys were distributed to managers in order to identify the ties within their network, to gather demographic data on each of the ties mentioned and to determine the true nature of these relationships. Several hypotheses were then tested using regression analyses.

Although this study contributes to a general understanding of some of the important issues with respect to the effect of networks on managerial effectiveness, a link was not established between managerial effectiveness and the number of ties within a network, the density of a network, or the dimensions or the structural characteristics of a network. The implications of these results are discussed.

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## INTRODUCTION

Social networks can be defined as the sets of ties or relations between several actors (Meyer, 1994). They encompass all job-related contacts that individuals rely on for access to task-related, career and social support (Ibarra, 1995). These networks permit the exchange of ideas, information, advice, feedback, and various other resources between several actors. Networks are complex clusters of individuals, or ties, that link together in order to benefit from increased resources, opportunities or emotional support. Structural or network analysis is a complex way of looking at the patterns of ties in an intricate social system.

Informal organizational networks are powerful tools that can be used to control and distribute resources. Managers rely enormously on their informal networks for access to task-related information, advice, social support and friendship, career advancement opportunities, and cooperation.

Despite the presence of many structural constraints, such as lack of time or divergent career paths, people invest resources and energy in social networks to help achieve their personal and professional goals. This research will address questions as to the impact of network characteristics, the dimensions of network ties and the characteristics of network ties on managerial effectiveness. According to Burt (1992), each individual brings some social capital to his or her work environment. Social capital, as defined by Tsai and Ghoshal (1998), consists of individuals, friends or colleagues with whom individuals can develop social ties, trusting relations, and value systems that facilitate their actions within a specific context.

The purpose of this study is to assess the impact of networks on managerial effectiveness. More precisely, it looks at the impact on managerial effectiveness of the number of ties that make up a network and the density of a network. The dimensions of network ties, such as information ties, advice ties, friendship ties, career ties and cooperation ties, are also examined. They are then tested as mediators of the relationship between the network characteristics previously mentioned and managerial effectiveness. Rank, interaction and intimacy are tie characteristics that are also studied for their mediating impact on the relationship between the network characteristics previously mentioned and managerial effectiveness.

The true nature of managerial work is subsequently discussed, and managerial effectiveness defined. The different roles that rating sources can play in evaluating this effectiveness are then examined and social networks are reviewed. This study concludes with a more extensive discussion of the dimensions and characteristics of network ties, and of the characteristics of networks.



## **1.0 - LITERATURE REVIEW**

### **1.1 - Managerial effectiveness**

Managerial work is complex and difficult to define (Katz & Kahn, 1978; Lombardo & McCall, 1982); moreover, ambiguities concerning its definition increase as managers move up the company ladder (Jacques, 1961). The following sections will attempt to give adequate definitions of managerial work and managerial effectiveness and to shed light to its inherent complexity. Various leadership and managerial theories describing managerial styles will then be discussed in order to achieve a better understand of different management styles and their impact on managerial effectiveness.

#### **1.1.1 - Managerial work**

Many factors contribute to the complexity and ambiguousness of managerial work such as the variety of roles that are relevant to a manager's job (Mintzberg, 1973) and the discretionary nature of the work involved when making organizational decisions (Kelly & Baba, 1982). An understanding of the manager's job has, however, come a long way since Henri Fayol 1950 first reported that managers are people who plan, organize, coordinate and control. Slowly, over the years, his definition has been enlarged and a broader perspective has emerged. Additional attributes have been added to this definition, including foresight, order, purpose, integration of effort, and effectiveness to the contributions of others (Strong, 1965).

According to Ashford and Tsui (1991) the lack of a generally accepted definition of managerial effectiveness imposes on managers the need to evaluate and regulate themselves.

In other words, “because organizational systems cannot be used to completely regulate managers, those who run organizations are dependant upon managers’ self-regulatory activities in order to achieve control and coordinated action” (Ashford & Tsui, 1991, p. 252). Self-regulation in managerial contexts requires that managers observe their own behaviors, compare them to self-set goals, and finally modify or reward specific behavior (Ashford & Tsui, 1991).

Reddin (1970), on the other hand, states that there is only one realistic and unambiguous definition of managerial effectiveness: the extent to which a manager can achieve the required output of his position. He further states that the concept of managerial effectiveness is the central issue in management, which has to be defined in terms of output rather than input, or by what managers achieve rather than by what they do. The empirical studies of Stewart (1982), Mintzberg (1975) and Kotter (1982), in particular, have led to a realization that there are significant differences between the actual behavior of managers and what had been conceptualized in earlier studies. These more recent studies have revealed the wide variation in behavior among managers in different jobs and even among managers in the same job.

Effective managerial performance, according to Cave and McKeown (1993, p. 126) “involves an activity which ensures that knowledge and skills are used appropriately and this process involves qualities and abilities which are not easy to observe or discover”. Reddin (1970) distinguishes three kinds of effectiveness: apparent, personal and managerial. He describes apparent effectiveness as the extent to which a manager gives the appearance of being effective; personal effectiveness as the extent to which a manager achieves his own

private objectives; and managerial effectiveness as the extent to which the leader influences his/her followers to achieve group objectives.

Top managers have become a very common subject of research in recent years. Although effectiveness is a major goal for modern management (Luthans et al., 1988), empirical and theoretical treatments seem to follow divergent theories, and there is still much disagreement as to what effectiveness actually means. How effectiveness is perceived and effectiveness goals are reached depends mainly on the managerial effectiveness theory to which the researcher adheres. The following section will try to explain some managerial effectiveness and leadership theories and how they can help clarify the managerial theories put forth previously.

### **1.1.2 - Managerial effectiveness and leadership theories**

As stated previously, the true nature of managerial work is hard to define with precision. Managerial work is complex, encompasses many facets, and varies according to different jobs and different situations. Researchers over the years have tried to narrow down or at least identify and define different elements of managerial work. Various theories subsequently emerged which tried to elucidate managerial work. Two kinds of theories, managerial effectiveness and leadership theories, which encompass many elements of managerial work, will now be discussed.

Management effectiveness can be studied with respect to the strategies the managers themselves practice. For example, the managerial style of directing subordinates can be described as an *impression management* style, one in which "individuals attempt to control the impressions that others form of them" (Leary & Kowalski, 1990, p. 34) or can resemble

the *control theory* by which they detect discrepancies in their own actions and are consequently motivated to alter their behaviors (Tsui et al., 1995). Such managerial effectiveness theories aim to understand all of the functions of managers, to differentiate the various roles of managers, and mostly, to discover how to help managers increase their overall effectiveness.

In order to demonstrate their effectiveness, managers need to possess certain leadership qualities. These leadership qualities are essential, because a key role of managers is to manage people. Various leadership theories have therefore been conceived to explain how leadership can enhance effectiveness or at least perceived effectiveness. The *transformational leadership theory*, for example, argues that performance is in part determined by the top manager's transformation of followers (Bass, 1991; Yukl & Van Fleet, 1992). This theory emphasizes charisma, which is the "ability to invoke emotional and cognitive attraction for leaders in followers" (Cannella & Monroe, 1997). In another view, Hershey and Blanchard's (1982) *situational leadership theory* argues that "a leader's task behavior and relationship behavior interact with subordinate maturity to significantly influence leader effectiveness" (Blank, Weitzel & Green, 1990, p. 579). These leadership theories attempt to explain how some personality traits can have a significant impact on people in an environment and why people are attracted to such traits.

The definition of managerial effectiveness that will be used for the purpose of this study stems from a common assessment methodology, mainly 360-degree feedback. Managerial effectiveness is in this instance evaluated, or rated, via multiple others, or "raters". One common practical method of achieving such an evaluation is through multi-source evaluations, using ratings from self, subordinates, superiors and peers to capture

manager's on-the-job performance. 360-degree feedback appraisals are also designed to aid the managers, through feedback, to assess their strengths and weaknesses. The validity of this method of evaluating managerial effectiveness is based on the fact that it encompasses the ratings of people (raters) at many levels in an organization who deal directly with the manager being evaluated (ratee) on a regular basis.

360-degree feedback appraisals can be effective tools to evaluate managerial effectiveness. As stated by Borman (1997, p. 299) "different rating sources have relatively unique perspectives on performance and multiple rating sources provide incremental validity over individual sources". Multi-source evaluations deal directly with multiple others who are in good positions to judge and evaluate a manager's behavior and effectiveness, or at least perceived effectiveness. Multi-source evaluations have the ability to take into consideration managerial qualities, leadership abilities as well as work effectiveness.

The following section will examine multi-source evaluations or 360-degree feedback appraisal and how it allows for the measurement of managerial effectiveness, as well as how raters at various levels in an organization contribute to this measurement process.

### **1.1.3 - Multi-source evaluations – a tool for measuring managerial effectiveness**

Multi-source evaluation, also called 360-degree feedback, is designed to help employees, including managers, improve their performances by using input from themselves and from the people who actually deal with them on a daily basis. "Using 360-degree appraisals provides a broader view of the employee's performance and facilitates greater employee self-development" (Milliam, Zawacki, Norman, Powell & Kirksey, 1994, p. 99).

In this study the focus will be on the first aspect of 360-degree feedback, which consists of assessing managers' performance.

Borman (1997) feels that the use of multiple rating sources to assess managers' strengths and weaknesses on the job can provide unique perspectives on performance, which increase the incremental validity of the measure. He feels that each source of ratings used (e.g., superiors, peers, subordinate or self) provides unique data on the ratee's performance, and that the combination of sources results in a higher validity than ratings from a single source (for example, only supervisors).

The following paragraphs will discuss in more detail the different raters that participate in multi-source evaluations and how their hierarchical level in an organization may influence their perceptions of the ratee, and ultimately their ratings. There are two types of evaluations in multi-source evaluations: evaluations of self and of evaluations from others. Self-evaluations are done by the person being evaluated, while the "other" evaluations are done by people at various levels in the organization. They typically include superiors, peers and subordinates.

### **Self-ratings**

Self-ratings, which are useful for developmental purposes, are an important part of 360-degree feedback. They can for example, they can give managers an opportunity to stop and ponder all facets of their jobs. However, when an individual evaluates himself/herself, various personality and ability factors can influence his/her self-perception (Yammarino & Atwater, 1993); self-evaluations also result in error because of self-enhancement desires or because of a lack of willingness to give accurate information (DeNisi and Shaw, 1977; Levine Flory & Ash, 1977).

In a survey of 360-degree feedback providers, London and Smither (1995) found that 90% of these providers collect and use self-ratings from managers as an integral part of the feedback report. Ashford (1993) found that managers considered feedback cues originating from themselves to be more important than feedback from their co-workers. However, as stated previously, self-ratings can be a poor source of performance evaluation; as stated by people are not consistent when evaluating themselves across different situations and periods of time (Mabe & West, 1982). Another important obstacle to this source of evaluation is that self-ratings and other rating sources often disagree with each other (Harris & Schaubroeck, 1988; Atwater, 1998). Accordingly, few organizations rely solely on managers for the evaluation of their own performances (Murphy & Cleveland, 1995).

### **The “other” raters**

The use of multiple sources for performance ratings has increased over the past two decades, as multi-source ratings allow researchers to observe and measure various job facets (Borman, 1974; Hendersen, 1984). Latham and Wexley (1982) also consider that multiple source ratings permit greater reliability, fairness and ratee acceptance. However, when “other” people rate the ratee, many factors, such as personality, ability, biases, and social environment can influence these “other-perceptions”. Fox, Ben-Nahum and Yinon (1989) found, for instance, that the more familiar a rater is with the ratee, the more accurate the other-perception and the other-rating will be. Factors such as the rater’s level in the organization, closeness between the rater and the ratee, and the self-insights and beliefs of other-raters also influence their perceptions and ratings (Yammarino & Atwater, 1993). Therefore, the different rating sources (supervisor, peer, subordinate and self-ratings) should

not necessarily be given the same weight when compiling an evaluation of managerial effectiveness. The usefulness of these different sources will therefore be reviewed here.

The first source to be examined is *supervisor ratings*. Supervisors' evaluations are rooted in the top-down hierarchy of organizations. Supervisors control rewards and, to a large extent, the career progression of their subordinates. Consequently, since managers often try to please their supervisors, they are likely to regulate and control their actions and goals in order to satisfy them. Another problem with supervisor ratings, according to Yammarino and Atwater (1993), is that superiors often rate the managers according to their perceptions of managers' interactions with subordinates and other individuals, instead of relying on first-hand experience.

*Peer ratings* are another source for evaluation of managers. An important characteristic of peer relationships is the lack of power differential between rater and ratee. Moreover, the relations between peers are different from interactions between supervisors or subordinates within organizations. Bernardin, Dahmus, and Redmon (1993) affirm that because peers are hypothesized to have more direct interactions with managers, they are thought to have more opportunities to observe first-hand their behaviors than supervisors. Murphy and Cleveland (1995, p. 144) conclude that "all sources may have insights regarding an individual's strengths and weaknesses, but peers may represent the single best informed source".

*Subordinate ratings* constitute another source for evaluation of managers. Performance evaluations from subordinates represent a drastic departure from traditional approaches to performance appraisal; they run counter to the traditional flow found in organizations. However, subordinates have unique expectations in terms of their



supervisor's performance and are able to make first-hand observations concerning leadership, task-related behaviors, and interpersonal behaviors which may not be accessible to other raters (Atwater & Yammarino, 1993).

Most feedback instruments used to rate managers were developed by studying managers' roles in organizations and what their jobs consist of (e.g., delegate, plan) (Wilson, 1977; Yukl, 1987) or the qualities they possess (e.g., commitment, charisma, etc.) (Bass, 1985). However, some of these instruments have been criticized as being incomplete. Some authors have stated that they tend to focus on what managers do, therefore omitting the value aspect of the job (McCall, Lombardo & Morrison, 1988). They might also emphasize qualities which cannot be improved (e.g., charisma) (McCauley, Lombardo & Usher, 1989). However, in spite of these drawbacks, 360-feedback can provide useful information on the performance of managers.

For the purposes of this study, the measure of managerial effectiveness was obtained by averaging peer, superior and subordinate performance appraisals of managerial effectiveness. Self-rating evaluations were, however, omitted, due to their lack of validity (see Mabe & West, 1982; Killworth & Bernard, 1976), and to the discrepancies often found when comparing the accuracy of survey responses of an informant to a known standard. Marsden (1990) also affirmed that when self-reports are used to gather network data, some interpretive or subjective viewpoints are used which have an adverse effect on accuracy. Yammarino and Atwater (1993) also bring out the negative influence of various personality and other external factors on self-perceptions. Demographic variables such as race and education can also bias an individual's initial self-perception and self-rating, as stated by Wexley and Nemeroff (1975).

Multi-source appraisals are becoming increasingly popular in organizations as they are valid sources of evaluation, they are relatively cheap and they provide valuable information on the rates. Therefore, if managers know individuals throughout the whole organization it can provide them with some significant advantages. For example, these contacts may choose to be lenient when evaluating these managers in hope they will reciprocate the favor: they may provide these managers with new opportunities or additional information; or they can help them gain access to exclusive resources. Nonetheless, multi-source appraisals are overall valid sources of evaluations. Even if some individuals are lenient, others may be too harsh in their evaluations. Therefore, for the purpose of this paper, multi-source evaluations will be considered to measure managerial effectiveness in a valid and reliable fashion.

The individuals that managers maintain contact with on a regular basis are the ties that make up their social networks. Networks are necessary in a work environment and they are essential tools who help map out the contacts and the exchange of information and resources between individuals. The following section will examine in more depth the importance of social networks and the ties that make up these networks, the types, as well as the characteristics and structure of these networks.

## **1.2 - Social networks**

In every organizational context, employees form social networks with co-workers which can vary in content, formality, strength and frequency. Social networks are composed of ties or relationships between several actors which permit them to exchange ideas, feedback, and to make contacts. The sum of the individual networks can be used to describe

the interpersonal or inter-group relations within an organization and they map out flows between individuals or organizations (Fombrun, 1982).

Mitchell (1969, p.2), defines networks as “specific sets of linkages among a defined set of persons, with the additional property that the characteristics of these linkages as a whole may be used to interpret the social behavior of the persons involved”. Laumann (1973) describes them as persistent patterns of social relationships that focus on the relationships between the actors. Networks can also be described more generally as any set of job-related contacts that an employee relies on for access to task-related (e.g., information), career (e.g., career, cooperation), and social support (e.g., advice, friendship) (Ibarra, 1995).

In their seminal work on network analysis, Tichy, Tushman and Fombrun (1979) state that the conceptual origins of network analysis can be traced to three broad schools of thought. The first school of thought they mention is the sociological approach, where the process outlook of theorists like Park (1924) and Cooley (1956), and fathered by Simmel (1950) emphasize patterns of interaction and communication as the key to understanding social life. The second school of thought these authors mention is the anthropological approach, in which authors such as Levi-Strauss (1969), Malinowski (1922), and Frazer (1919) highlight the content of relationships joining individuals, the conditions under which they exist. Moreover, this school of thought also takes into consideration the evolution of these bonds over time (Homans, 1961; Blau, 1964; Ekeh, 1974). The third school of thought which network analysis may derive from is role theory, which is, however, limited to first-order sets (individuals directly linked to the focal person) and evidences of individual bias (Kadushin, 1968; Gross, Mason & McEarchern, 1958).

Since then, Kraimer and Siebert (1998) have reviewed studies in the organizational sciences focusing on the effects of informal social relations on work related factors such as organizational decision-making (Crozier, 1964), group performance (Roethlisberger & Dickson, 1946), and access to task advice and support (Kanter, 1977). These empirical studies view the establishment of informal social relations between newcomers and other organizational members as both an important mechanism for newcomer adjustment and as an outcome of the socialization process (Kraimer & Siebert, 1998). The social networks of individuals are dynamic; they evolve as new alliances are formed and other disbanded. The formation of informal social relations within the organization is thus recognized as an important factor in determining the adjustment and career success of the newcomer to the organization (Kraimer & Siebert, 1998).

The contacts individuals make in a network are called ties. A tie is not an intrinsic attribute of an individual, but is the emergent property of the connection between units of observation. Ties have transactional contents that can be instrumental and/or expressive (Fombrun, 1982; Tichy et al., 1979). Expressive ties are those which involve friendship or emotional support. These ties often link individuals who share such commonalities as similarity of attributes, goals, gender or status. The main focus of expressive ties is not to gain specific knowledge or information, but rather to develop emotional relationships among individuals. An example of such ties is when employees encourage each other in periods of high stress or when they are willing to take on additional work to help a co-worker. Instrumental ties involve efforts to secure valuable goods, services or information. Within work organizations, instrumental ties may include those that involve the exchange of information and expertise related to work role performance (Fombrun, 1982; Kanter, 1983)

as well as developmental relationships which foster career growth and professional development (Ibarra, 1993). Through an instrumental tie, for instance, an individual may receive information earlier than he/she would have without this tie, thus making it possible to act on it more promptly than other co-workers without this information. However, it is assumed that individuals will try to combine both expressive and instrumental strategies when adding ties to their networks.

Individuals' social networks influence several aspects of their career including their access to information and other resources, the power they are perceived to have and their possibilities to becoming well integrated into an organization. The impact of these individuals' social networks on their access to information and resources, for instance, is crucial. Kraimer and Seibert (1998, p.3) emphasize that "organizational insiders are a rich source of information and assistance to newcomers as they make sense of their new work roles and organizations". Ibarra and Andrews (1993, p. 280) also state that "the structural context of network relationships, i.e., to whom one is connected via direct and indirect network links, determines access to valued resources". Social networks play a key role in assisting individuals to obtain essential information.

The influence of an individual's social network on perceived power (the power others perceive him/her to have) is also important. This happens because individuals are more inclined to share information and resources with individuals whom they think will be able to help them increase their own effectiveness or reach higher-ranking positions in the future. Therefore, if an individual perceives another as higher-ranking, he/she might give out some information that would otherwise have been kept a secret.

Networks also provide an important socialization mechanism; they allow more experienced members to instill in the newcomers the culture, values, attitudes and appropriate behaviors of the organization, and facilitate interactions with insiders. The social network maintained by an individual is, in essence, the structure of opportunity in which the value of his or her human capital is realized (Burt, 1992). Accordingly, individuals with greater social skills will receive higher returns for these if they have positioned themselves to identify and respond to rewarding opportunities.

According to Burt (1992; 1997), social networks also direct and legitimate information received by others about himself/herself. The information individuals get from their network ties provides them with input as to how to improve their effectiveness within the organization. Specific network contacts provide opportunities for comparing and interpreting perceptions, which in turn influence information and subsequent perceptions (Erickson, 1982).

The following section will take a look at the different types of networks that can be found in an organization and the ties that make up these specific types of networks.

### 1.3 - Types of networks

Although the importance of social network ties in an organization has been studied, extensive research has not really been done to determine which types of ties contribute directly to increasing managerial effectiveness. The types of networks encompass several areas of interest, such as the dimensions of network ties, the characteristics of network ties and the characteristics of networks.

The following sections will try to provide a clearer understanding of the elements of these elements of networks types and determine whether and by what means they may contribute to increasing a manager's effectiveness.

### **1.3.1 - Dimensions of network ties**

*Information ties* consist of people who are valuable sources of information for an individual and for his/her job. The literature on feedback-seeking suggests two primary information-gathering techniques: inquiry and monitoring (Ashford & Cummings, 1983). Shah (1998) defines inquiry as the direct acquisition of information from another person, and monitoring as a more indirect information-gathering activity. Indirect means of acquiring information include observing the behavior and actions of an actor and asking a third party for information regarding that actor.

Information acquisition from "cohesive and structurally equivalent referents" (Shah, 1998, p. 251) (friends and peers) is restricted by the nature of the relationship between the actor and each referent. The literature suggests that a person is likely to receive a "greater diversity and quantity of resources from cohesive referents than from structural equivalents" (Shah, 1998 p. 251) because of reciprocity and exchange among friends. As Rice and Aydin (1991) explain, the proximity and frequency of the contact between two actors will accentuate information exchange.

Social sources of information encompass individuals in the immediate work environment as well as acquaintances and friends in other departments. Co-workers and supervisors are generally primary providers of social information (Burt, 1983). Social networks provide access to information well beyond what any individual alone might

possess through formal organizational channels. They also provide this information earlier than through formal distribution channels, so that individuals may act on the information on a more timely basis. Moreover, social networks also direct and legitimize information received by others about the individual. Consequently, information has a direct impact on increasing managerial effectiveness. Information provides managers with benefits such as personal insights, or tips that may lead to some substantial breakthroughs, or even possible career advancements. Information helps managers to keep in touch with their changing work environment and with changing business practices, as well as with the changing needs of the people they manage and of their clients.

*Advice ties* are created between individuals who are, as Ibarra (1995, p. 683) phrases it, "important sources of professional advice, whom you approach if you have a work-related problem or when you want advice on a decision you have to make". Advice is intentionally sought by individuals when they are unsure of the course of action they should take. Therefore, advice ties are essential for managers to increase their effectiveness. People at different levels in an organization can provide different kinds of advice, and each tie has a unique view and a different perspective as to what action would yield the best results. Managers should filter and sort all this advice given to them and retain what they think could bring positive results. Individuals at lower levels in an organization can mostly provide advice based on their work experience. However, individuals in higher positions may be able to offer advice on ways to improve chances for receiving promotions, as well as insights about imminent events and other work-related tips. All this advice can significantly enhance the chances of managers to increase their effectiveness, as they do not automatically know all facets of an organization or the best way to achieve all their goals.



Advice from co-workers can shed light on some unforeseen aspects of a problem or on the proper steps for bringing a project to term.

*Friendship* ties are those with people considered to be personal friends, that is, those whom an individual sees most frequently for informal social activities such as going out to lunch, dinner, drinks, visiting each other's homes, etc. Friendship implies seeking out others to transmit important information or other benefits (Burt, 1992). Shah (1998) further states that the friends one has will determine the social group to which one belongs. Moreover, the strength of cohesive ties and conformity pressure among friends intensifies the influence of the information exchanged (Ibarra & Andrews, 1993).

Baldwin, Bedell & Johnson (1997) state that individuals who are well integrated in their friendship networks maximize their access to resources that may be important for success in many venues. But even more importantly, positive social relationships are themselves resources and sources of psychosocial support (e.g., Ibarra, 1995) which may help to deal with the stresses and strains of work. Baldwin, Bedell & Johnson (1997) further add that having access to a broad base of psychosocial and social resources will likely enhance an individual's enjoyment, whatever the situation.

Friendship ties tend to develop between people who are similar in a variety of personal characteristics, such as gender, race, age, and religion (Marsden, 1988; Ibarra, 1992), as well as with respect to organizational affiliations. These similar individuals are consequently more likely to have consistent interests. Friendship ties also tend to be characterized by more frequent interactions than other types of ties (Granovetter, 1973; Krackhardt & Porter, 1985); this provides greater repetition of information (Salancik & Pfeffer, 1978) and increases the opportunity for the transmission of social benefits. Finally,

due to their strength and concomitant pressures for conformity, these links carry greater potential for persuasion and influence (Rogers & Kincaid, 1981; Granovetter, 1982; Krackhardt, 1992). Information obtained from friends thus may be more credible or relevant, more easily or frequently available, and more persuasive or influential (Brass, 1992).

*Career support ties* consist of work-related informal contacts, which are defined by Ibarra (1995) as the people who contribute the most to an individual's professional growth and development. In other words, advice ties are the "people who have taken an active interest in and concerted action to advance" (Ibarra, 1995, p. 684) this individual's career. Career ties consider the success of others in an organization to be important issues, and they will do their best to help their ties achieve higher work-related goals. These ties are critical for career success.

*Cooperation ties* are "people whose help, support or cooperation" has been "successfully enlisted towards the accomplishment" of personal objectives (Ibarra, 1995, p. 684). People will cooperate for different reasons. Some may feel pressured to do so, others may believe it is in their best interest or may be willing to cooperate to help out. Since cooperation does not necessarily require trust, the benefits derived from cooperation ties are far less important than, for example, those of career support ties.

These five types of network ties (information, advice, friendship, career support and cooperation ties) determine the nature of the relationships between the ties in a network. However, each relationship will vary also depending on the characteristics of each of these ties. Tie characteristics are, for example, the rank of the ties in the network, the frequency of interaction between ties or the intimacy of the relationships between ties. The structural

characteristics of ties that compose a network have a significant impact on the nature of relationships between ties. For example, a friendship tie with a peer has different implications than a friendship tie with a subordinate. Studying them should bring a better understanding of the dynamics between each tie and consequently of the whole network.

The following section will take a more in-depth look at some important structural characteristics of ties and of networks, and indicate how they help define the nature of the relationships between the ties in various networks.

### **1.3.2 - Characteristics of ties**

Network analysis is concerned with the structure and the patterning of relationships. It therefore seeks to identify both their causes and consequences. The relationships between different people, groups and organizations are not the same, and not all ties are joined in the same fashion. Some linkages may yield properties that provide additional information on the behavior of the people involved. The linkages between pairs of individuals can be described in terms of several characteristics, such as reciprocity, rank, frequency of interaction, and intimacy.

Rank refers to the positions of network contacts (superior, peer, or subordinate) in the relevant status hierarchy (Tichy et al., 1979). Individuals who have high rank status are likely to have access to more resources and more privileged resources. Having access to peers, superiors, and to an organization's "dominant coalition" are critical for power and advancement (Brass, 1984; Kotter, 1982). Individuals with higher rank also have more extensive network connections (Lincoln and Miller, 1979; Miller, 1986); for example, a high-level manager will have more opportunities to share new ideas with a director and

easier access to those in strategic positions than a clerk would. Therefore, when individuals have high-ranking ties in their networks, they can approach them on a more frequent basis for specific information, advice and so on. Moreover, they can hope that these high-ranking ties will put them in contact with other high-ranking ties, which will increase their benefits. Higher-ranking individuals have greater power when it comes to influencing others and their advice is often more valuable than peer advice for example. The advantages these managers reap from having high-ranking ties in their network should have a positive impact on their overall effectiveness.

Frequency of interaction refers to the number of times two individuals repeatedly interact, directly or indirectly, as they process resources and information, in order to construct purposes, goals and attitudes (Ibarra, 1993). Although frequency of interaction is important in helping to determine whom an individual is likely to identify with, it is the strength of that communication that will determine the true impact of this association (Ibarra, 1993). As two individuals meet more frequently, these individuals are likely to share more information, advice and so on. Moreover, the information shared is likely to become more relevant, more personal or more strategic for their career advancement. As individuals have more frequent contact, a steady relationship may develop which can be accompanied by characteristics such as trust and/or friendship. Consequently, the frequency of interaction can bring to individuals an increase in any of the five dimensions mentioned previously and therefore contribute to an increase in their effectiveness.

From a career development perspective, the intimacy of a relationship, according to Kram (1988), may result in affective benefits; these are more likely to fulfill psychosocial functions – those functions that “enhance an individual’s sense of competence, identity, and

effectiveness in a professional role” (Ibarra, 1995, p. 675). Psychosocial functions are distinguished from purely instrumental functions, such as providing exposure to senior management and advocacy for promotion, in that they involve benefits that stem from the nature of the relationship rather than the positional power of the contact (Ibarra, 1995). Such psychosocial functions include serving as a role model, acceptance, and friendship. However, the intimacy of a relationship may also be accompanied by a level of trust that is not present in other relationships. This allows more confidential information to be passed around or information that can have a more significant impact on one’s career. When two people have an intimate relationship, they are more willing to share their knowledge and their resources, and they are more willing to make an effort to help the other. Therefore, the intimacy of a relationship can play a significant role in increasing a manager’s effectiveness.

It is important to understand the characteristics of these network ties. These characteristics can provide important information on the “overall pattern of relationships between the system’s actors” (Tichy et al., 1979, p. 509). Tichy et al. (1979) divided these characteristics of ties into four levels. The first level focuses on the external network and can shed some light as to how ties are linked with external domains. The second level looks at the total internal network and tries to explain how a given set of actors that make up a network are linked. The third level directs its attention to the clusters within the network. More precisely, it examines the areas of the network in which ties are more closely linked to each other than to other parts of the network. Finally, the last level focuses on individuals as special nodes within the network, where all individuals are not equally important. This study will focus more specifically on the fourth level described by Tichy et al. as it deals

with specific individuals and how the particular make-up of their networks impacts their effectiveness in their work environment.

The characteristics of network ties provide an overall view of the interactions within a network. However, in order to fully understand networks, the aspect entitled network characteristics must also be looked at. These network characteristics describe the key nodes that exist within a network which link the unit to other areas within the organization, as well as to areas outside the organization. These aspects of networks, which include size, density, openness, range and centrality, will be discussed in the following section. Size and density are two of the most important network characteristics (explanation in the following sections) and will be tested in this paper. However, characteristics such as openness, range and centrality help understand all the underlying factors that can have impact on networks and therefore will also be described in the next paragraphs.

### **1.3.3 - Network characteristics**

The size of a network refers simply to the number of individuals participating in it or the number of "direct ties involving individual units" (Marsden, 1990, p. 453). The presumption in behavioral research is that large and developed social networks are associated with increased managerial performance (Carroll, Glenn, Theo & Albert, 1996). Other lines of theory, which point to the general roles of networks as social resources (Lin, Ensel, & Vaughn, 1981; Lin, Vaughn, & Ensel, 1981; Lai, Leung & Lin, 1990) and social capital (Coleman, 1988), point out that large and developed networks might lead to positive career outcomes for an individual even if the relationship with performance is weak, because

the network will provide information, access, and support that are not available to those outside it (Carroll, Glenn, Theo & Albert, 1996).

Density (or connectedness) of a network is “the mean strength of connections among units in a network” (Marsden, 1990, p. 453) or the “number of actual links as a ratio of the number of possible links” (Tichy et al., 1979, p. 508). In Burt’s view (1992), those networks which have ties linking individuals to non-redundant or disconnected individuals or groups are the most efficient. When individuals or groups are closely tied to each other, ties to more than one member of the set will likely contain redundant information (Carroll et al., 1996). For example, a manager who has limited time and energy should have a network that consists of ties to individuals who do not have any relationship with or even knowledge of each other.

The openness of a network is the number of actual external links of a social unit, or it can be a ratio of the number of actual links to possible external links. Carroll, Glenn, Theo and Albert (1996) state that an efficient way for a manager to establish an external network of personal ties is through formal membership in various clubs, societies, and charitable organizations. This form of interaction provides managers with many opportunities for communication, especially on a personal basis, with potentially influential members of other organizations.

Range refers to the diversity of group affiliations encompassed and the potential access to information and resources from diverse and distant subgroups afforded by the network (Burt, 1992; Campbell, Marsden, & Hurlbert, 1986; Granovetter, 1973). It provides both useful information and bargaining opportunities based on individuals’ control over their contacts (Ibarra, 1993). Thus people whose network contacts extend beyond their required

work flow interactions and immediate work groups or units tend to be more powerful (Blau & Alba, 1982; Brass, 1984). Reaching diverse others is not sufficient, however, if few contacts are high enough in status to be instrumentally useful (Campbell et al., 1986; Lin, 1982).

Network centrality is "the degree to which relations are guided by the formal hierarchy" (Tichy et al., 1979, p. 508). Network centrality is, however, created by informally derived power, that is, from the actors' positions in the patterns of interaction of a network rather than from their hierarchical positions in the formally defined organization (Ibarra, 1993). Centrality is the key position of an individual in a network, which can be observed by how others revolve around that position. It can be a significant source of power (Brass, 1992) if, for example, a manager is able to use his/her central position in a network to gain access to privileged information. Centrality thus increases an actor's knowledge of a system's power distribution, or the accuracy of his/her assessment of the political landscape (Freeman et al., 1987) and network centrality can be increased by connections to others who are highly central.

The characteristics of network ties provide good insights into the nature of the relationships between the ties in networks. The network characteristics, on the other hand, provide some information on their physical make-up. In summary, social networks have the potential to increase an individual's access to information, they can increase his/her perceived power, and they have the power to influence his/her career potential and mobility. An individual's social network is consequently a crucial element in determining his or her effectiveness.



## **2.0 - HYPOTHESES**

The main hypotheses proposed in this study relate to elements of network types, or more precisely, on network characteristics, the dimensions of network ties and the characteristics of these network ties. In order to assess the importance of the structure of networks, the size of a network and the density of networks were examined. These components of the network structure were tested to see whether they can have a direct impact on managerial effectiveness, which was measured using multi-source feedback appraisals. The next step was to test the mediating impact of the five network dimensions mentioned by Ibarra (1995), which are information, advice, friendship, career support and cooperation on the network-effectiveness relationship. Likewise, three structural characteristics of network were tested as mediators: rank, interaction and intimacy between ties.

The proposed hypotheses aimed at determining whether the structure or the type of a manager's network can have an impact on their effectiveness and whether some variables can have a significant mediating impact on these relationships. It was hoped that the results would help us understand how some network functions for managers could give some insight as to which network strategies may be more useful and which may lead to increased effectiveness.

### **2.1 - Network characteristics**

The two characteristics of managers' informal networks examined in this paper are the size (the number of ties in a network) and the density (the number of ties who know each

other within a network). These two network characteristics were chosen due to their importance in measuring and evaluating networks.

The size of a network, as stated previously, refers to the number of ties participating in it. Size was chosen for numerous reasons. First of all, as Marden (1990) indicates; size is a basic indicator in network measurement. It also gives an indication of the potential access to information and resources from diverse and distant subgroups afforded by the network (Burt, 1992), as well as useful information and bargaining opportunities based on individuals' control over their contacts. Individuals who are able to extend their network contacts beyond their required work flow of interactions and beyond their immediate work groups will therefore tend to be more powerful (Brass, 1984).

It has also been found that large and developed social networks are associated with good managerial performance (Carroll et al., 1996), and that good performance will have an impact on pay increases and promotions. Moreover, large networks which are used as social resources and social capital may contribute to advantageous career outcomes, since networks are able to provide resources such as information, access, and support that are not available to those without these ties (Carroll, et al., 1996). More ties mean more sources from which to obtain information, resources, etc. Size can also help managers by putting them in contact with a large number of potentially useful, helpful, or like-minded people (Burt, 1992). Consequently, the present paper hypothesizes:

***Hypothesis 1:** The number of ties in managers' networks will be positively related to the manager's effectiveness. A manager with a small number of ties will therefore be less effective than a manager with many network ties.*

Marsden (1990, p. 454) stated that density is “the most common index of network structure”. Not only is it one of the most commonly measured indices of network structure, it is also one of the most important characteristics of networks, as it measures the strength of the relations between the ties in a network. Density shows the social interactions within networks, and moreover gives an indication of the redundancy of the ties.

While it is clear that large networks can mean easier access to resources, information, and so forth, it is actually the number of non-redundant ties that can increase an individual’s effectiveness. Maintaining an exceedingly dense network can in fact actually cripple the network in many ways, for example, by demanding increased energy expenditure for maintaining ties which do not bring additional resources. As Burt (1992, p. 74) stated, a dense network will be “a worthless monitoring device, because the strong relations between people in the network mean that each person knows what the other people know”. A sparse network may, however, provide more benefits, as it spreads out in more diverse areas of social activity. For example, if a manager has a network that consists of only five ties, but none of these ties knows another, this network provides the manager with five nonredundant ties. On the other hand, if a manager has a network of fifteen different ties, and each of these ties has contact with each other, no additional information will be brought forth by the fourteen redundant ties. Consequently, the present paper hypothesizes:

*Hypothesis 2: The density of managers’ networks will be negatively related to this manager’s effectiveness. A manager with a high-density network will therefore be less efficient than a manager with a low-density network.*

## 2.2 - Dimensions of network ties

The manner in which managers are connected in their social environments indicates the volume of resources they hold and the volume to which they are connected (Burt, 1992). More contacts mean more exposure to information, advice, friendship, career support and cooperation.

Information sharing is a crucial element in network relationships. It can create contacts that otherwise would not exist, and can permit individuals to discover other members of the organization who share the same goals and values and who want to support each other. Information sharing can help individuals create opportunities for themselves that otherwise would not be thought of. The information in a network defines who knows about opportunities, when they know and who can participate in them (Burt, 1992). It would appear that individuals with higher levels of information in their ties would enjoy higher rates of return on their time investments, as they are more aware of the opportunities at hand.

Advice ties play an important role when people feel they need help solving work-related problems or issues. It is not always easy to find reliable advice ties, but as Ibarra (1995) states, these ties can provide individuals with a tool for making better decisions. Although a manager should not waste time continually seeking advice or depend solely on advice ties for decision-making, a few strategic advice ties should have the potential of increasing his/her effectiveness.

Friendship ties usually develop between individuals with similar social attributes (see Burt, 1986, 1990; Marsden, 1987). As friends introduce each other to new friends, the network grows and encompasses more and more ties, which means accumulating more

redundant contacts (Burt, 1992). Nonetheless, according to Baldwin, Bedell and Johnson (1997) individuals who are part of a friendship network will use their networks to try to maximize their access to any number of resources that may be important to them. Perhaps most importantly, friendship relationships are a source of psychosocial support (e.g., Ibarra, 1995) that may be important in dealing with the stresses and strains of work. However, these relationships, which are easy to maintain, do not necessarily contribute significantly to the network. Burt (1992, p.73) feels that these ties will “weaken (...) effectiveness by increasing contact redundancy and tying up time”. Having access to a broad base of psychosocial and social resources will be likely to enhance individuals’ enjoyment of whatever situation they are in, but will not contribute to increasing their effectiveness. Most importantly, friendship ties are considered to be psycho-social ties which contribute to the affective side of relationships. Close personal relationships can enhance career development and self-esteem by providing individuals with a sense of competence, identity and effectiveness (Ibarra, 1995). Consequently, even though they are important for managers’ development, these ties do not contribute directly to increase managerial effectiveness. Therefore, friendship ties, which seem unlikely to have a significant mediating impact on the relationship between the number of ties in a network and managerial effectiveness, will not be studied here.

Career ties are also essential to the development of employees. These ties provide the support needed for individuals to achieve more, and they have a direct impact on the promotions and recognition individuals receive at work. The career-enhancing potential of well-established networks has been well documented (for example, see Krackhardt, 1990; Lin, Ensel & Vaughn, 1981; Lin, Vaughn & Ensel, 1981). Therefore, managers who are

able to better use their career ties will be more efficient, and individuals with higher levels of career ties in their networks will enjoy higher rates of career opportunities. Career ties should provide managers with the information and the resources needed for a better grasp of the whole situation, which will enable them to make wiser decisions regarding their careers.

Finally, cooperation ties in an organization are job-related contacts that a manager relies on for social support. The more people a manager is able to enlist towards the accomplishment of personal objectives, the more chances this manager has to increase his/her performance and effectiveness. The proposed hypothesis is as follows:

*Hypothesis 3: The relationship between the number of ties in managers' networks and the effectiveness of these managers will be mediated by:*

- a) the proportion of ties with information in these managers' networks*
- b) the proportion of ties with advice in these managers' networks*
- c) the proportion of ties with career advice in these managers' networks*
- d) the proportion of ties with cooperation in these managers' networks.*

Although it is hypothesized that the network characteristics mentioned above mediate the relationship between the number of ties and managerial effectiveness, the same network characteristics can also mediate the relationship between the density of a network and this same managerial effectiveness. It is not only the number of people that compose the network of an individual, but also the uniqueness of each tie and what it contributes to a relationship that matters.

Information does not spread evenly through organizations, because individuals are unevenly connected with each other (Burt, 1992). Individuals try to focus especially on the information that is relevant to themselves and their friends. Burt (1992) states that networks are an important screening device in processing the incessant flow of information.

Managers who have high density networks will be able to access information faster than managers with low density networks, but the information may not be as pertinent or unique. Consequently, when individuals or groups are closely tied to each other, redundant information circulates (Carroll et al., 1996) as well as second-hand information, which is often distorted and inaccurate. In a high-density network it is easier to gather information and easier to find the right person in order to get specific resources. Therefore, if managers have high-density networks with many information ties, their effectiveness should not be decreased. It is not expected that information would mediate the relationship between the density of a network and managerial effectiveness. The variable amount information should not mediate the negative relationship between the density of a network and managerial effectiveness.

Friendship ties can develop between individuals who have similar social attributes (Burt, 1992; Marsden, 1987). So, as friends introduce you to friends, your network will accumulate redundant ties. This happens because, as Burt (1992) states, the factors that make your friends attractive make their friends attractive, since like tend to seek out like. That network will grow, as more friends are included. These are easy and comfortable relationships that are easy to maintain. However, these ties are redundant and may use up valuable time. Moreover, as stated previously, friendship ties are linked to the affective side of relationships. Therefore, for the purpose of this paper, friendship ties will not be assumed to mediate the relationship between network density and managerial effectiveness.

As for advice, career support and cooperation ties, managers whose networks are high in density should benefit more from these ties than managers with low-density networks. Network contacts provide opportunities for managers to compare and interpret

the perceptions around them (Erickson, 1982; Rice & Aydin, 1991), which in turn influences the amount of advice, career support, cooperation and subsequent perceptions they are able to receive and use. Increased density creates closeness between the ties, and it has been found that people who are proximate to each other in a social network will develop shared attitudes and norms (Wellman, 1983; Hartman & Johnson, 1989; Rice & Aydin, 1991) which will lead to reciprocity of actions and increased support. Moreover, close social relations apparently provide certain health benefits, including the ability to cope with stressful life events, an increase in the amount of advice received, increased career support and cooperation among coworkers. Advice ties, career ties and cooperation ties, for example, are useful when managers are faced with dilemmas regarding the right decisions to make. When managers are unsure of the direction they should take, advice ties can shed light on the situation. When individuals' within the same network know each other, stronger bonds are more likely to develop, and these kinds of ties are more likely to have these individuals best interests in mind than ties that do not know each other. Therefore, the present paper hypothesizes:

*Hypothesis 4: The relationship between the density of managers' networks and the effectiveness of these managers will be mediated by:*

- a) the proportion of ties with advice in these managers' networks*
- b) the proportion of ties with career support in these managers' networks*
- c) the proportion of ties with cooperation in these managers' networks.*

The network characteristics of the ties discussed here provide important information as to the different roles of each of the ties in a manager's network. However, the nature of the relationship may alter the significance of the benefits conveyed by this association. The



following paragraphs will discuss in more detail how the characteristics of network ties such as rank, frequency of interaction and intimacy can mediate the relationship between the number of ties in a network and managerial effectiveness, and the relationship between the density of a network and managerial effectiveness.

### 2.3 - Characteristics of ties

An individual who has a network that extends beyond the required workflow and which encompasses contacts within every hierarchical level of the organization should tend to be more powerful and in a better position for advancement than individuals with ties that are not high enough in status to be instrumentally useful (Ibarra, 1995). Access to peers, superiors, and the organization's higher echelons are critical for power and advancement (Brass, 1984; Kotter, 1982). If an individual has more ties, he/she has more opportunities to gain access to higher-ranked ties.

The rank of managers' ties in their networks can have an impact on these managers' opportunities and benefits. The more high-ranking ties individuals have in their networks, the more opportunities they have to show their worth to superiors, and the more pertinent information, privileges and opportunities they will have access to.

Moreover, the density of these high-ranking ties can have a significant impact on the benefits managers can gain from them. If a manager has a high-density network, which includes many high-ranking ties, the benefits obtained from these high position ties will contribute more than high-density networks with very few or no high-ranking ties. This happens because these high-ranking ties who are part of this same network may know each other therefore will be able to communicate to each other this manager's worth, skills and

aptitudes and therefore increase his/her chances of getting recognized and ultimately his/her chances of a promotion.

The frequency of interaction measures the average frequency with which managers talk to each other. This variable can have a significant impact on the acquisition of new opportunities for managers. As managers' networks grow in size, there will be some ties with whom they will interact on a more frequent basis. These ties will be able to provide more up-to-date information or resources than ties with whom they have less frequent contact. Therefore, the frequency of interaction between two ties can play a significant mediating role in the relationship between the number of ties in a network and managerial effectiveness. A manager will not necessarily increase the frequency of interaction with all his/her ties, but may increase in the frequency of interaction with some specific ties in the network. It is this increase with these specific ties that will increase his/her effectiveness.

If managers have dense networks, an increase in their frequency of interaction with their ties should decrease their effectiveness. Even if these managers have more frequent interactions with their ties, it will be the same redundant information that will be circulating among the ties. It is the time spent to increase their frequency of contacts with ties that will cause a loss of managerial effectiveness. Therefore, the variable frequency of interaction should have a significant impact in the predicted direction of the relationship between density of a network and managerial effectiveness.

The literature has emphasized the importance of close bonds of loyalty and trust that ensure reliability when there is uncertainty (Kanter, 1977). The closeness, or the intimacy, of a relationship will determine whether a particular benefit will be transmitted from one individual to another (Burt, 1992). The intimacy of network ties can have a significant

instrumental value for managers. Intimacy is closely related to trust, or rather whom one trusts. Therefore, if a manager has many ties in his/her network, the chances are higher that this manager will be able to form close and trusting relationships.

However, for networks with high density, a high proportion of intimate relationships between ties may be detrimental, because it can reduce autonomy (Ibarra, 1995). However, as networks increase in density and the intimacy increases between ties, these relationships are more likely to fulfill psycho-social function, instead of gathering and circulating information useful for these individuals to increase their effectiveness. Therefore, the mediating impact of the intimacy variable on the relationship between the density of a network and managerial effectiveness will not be studied. It is therefore proposed that:

*Hypothesis 5: The relationship between the number of ties in managers' networks and the effectiveness of these managers will be mediated by:*

- a) the rank of the ties in these managers' networks*
- b) the frequency of interaction between the ties in these managers' networks*
- c) the intimacy between the ties in these managers' networks.*

*Hypothesis 6: The relationship between the density of managers' networks and the effectiveness of these managers will be mediated by:*

- a) the rank of the ties in these managers' networks*
- b) the frequency of interaction between the ties in these managers' networks.*

## **3.0 - METHOD**

### **3.1 - What is network analysis?**

The underlying purpose of this paper is to study the specific characteristics of social networks that contribute to managerial effectiveness. Tichy, Tushman and Fombrun (1979) describe network analysis as being concerned with the structure and patterning of relationships within a social network and the identification of both their causes and consequences. These authors state that it is a method of conceptualizing organizations that captures the intersection of the static and dynamic aspects of organizations by focusing on the linkages between social objects over time.

Fombrun (1982, p. 280) states that "network analysis is a powerful means of describing and analyzing sets of units by focusing explicitly on their inter-relationships". The units or nodes of the networks can be individuals, or virtually any aggregation of individuals such as a group, an organization, a community, or even a nation-state. Moreover, network analysis is consistent with the idea that individual-level outcomes may be influenced by social structure and that outcomes, at all levels, may be dependent on the social structure (Baldwin, Bedell & Johnson, 1997).

Network analysis explores the actual relationships that evolve among individuals, rather than their feelings or their perceptions of their social involvement (Miller, 1975) or their membership in categories used as proxies for likely interaction patterns (Wellman, 1983). A central tenet of social network theory is that any set of social relationships is embedded within a larger structural context. This precludes or makes possible various kinds of social contacts (organizational, demographic, inter-group relations, etc.) (Ibarra, 1995).

According to Freeman (1984), social network methods aim to formally state social properties and processes. Social network analysts are convinced that the pattern of relations among a set of actors explains outcomes beyond the attributes of either the individuals or the set that unites them (e.g., Wasserman & Faust, 1994).

A substantial body of work has been devoted to the analysis of networks in and between individuals, groups, and organizations (Fombrun, 1982). Fombrun (1982) mentions two factors that help to account for the eclectic nature of the field. First, there is the diversity of disciplines that contribute to the conceptual development of a network perspective. These include sociology, anthropology, political science, and organizational theory (Tichy & Fombrun, 1979). Second, sophisticated analytical methodologies are surfacing that offer to researchers feasible strategies for handling data of large networks (Burt, 1980).

Network analysis relies for the most part on sociometric data, which ascertains the relationship between units (Tichy, Tushman & Fombrun, 1979). The degree - often merely the presence or absence of a relationship - to which each unit is related to all other units is mapped. When the relationships between all units are mapped, a graph or sociogram displays the network of relationships.

When collecting data on networks, surveys, questionnaires, and solicited self-reports are the methods most frequently used (Marsden, 1990). Within self-report questionnaires, the presence or absence of social ties is the most common information gathered. This kind of data can be "obtained with single-item questions that ask a respondent to enumerate those individuals with whom he or she has direct ties of a specific kind" (Marsden, 1990, p. 441). Ibarra (1992) states that network analysis requires that the data be collected from all

members of a system, because no technique can yet sample accurately within a network (Rogers & Kincaid, 1981).

### 3.2 - Design

Kraimer and Siebert (1998) states that data regarding ego networks are usually collected directly from the individual (ego), who is asked to indicate the others (alter) within the specified social context with whom he/she has a specified type of relation. Within these personal networks, researchers look for properties which they can use to classify these networks and then analyze them. As discussed previously, these properties can include network size, network composition, centrality, and so forth. As Burt (1984) states, name generator queries are often used to set boundaries for egocentric network data. These queries "elicit the names of elements with which a unit is in direct contact" (Marsden, 1990, p. 439). "Egocentric network data provides information on the local social environment surrounding an actor (usually, though not exclusively, a respondent to a social survey)" (Marsden, 1993, p. 400).

Numerous studies have looked at the various techniques for collecting egocentric network data. Marsden (1990) states that the typical procedure used is "to determine membership in a respondent's network via one or more name generators and then to obtain additional data via name interpreter items" (p. 441). Marsden further states that three kinds of reports can be obtained on the members of a network. First there are reports on attributes of the persons enumerated (e.g., education, race/ethnicity). Secondly, reports on relations between pairs of alters (links between other ties in a network) can be collected in order to study the structure of the network (e.g., density). Finally, there are reports on properties of

the ties between the respondent and the ties (e.g., frequency of contact, duration of acquaintance, intensity).

Name generator exercises “place boundaries on an egocentric network by identifying a set of ties included in it” (Marsden, 1993, p. 400). Delimitation of the network is followed by gathering information about some of the attributes of the ties (e.g., gender, race), the features of the relationship (e.g., intimacy, duration) and the features of the relationships linking ties to one another (Marsden, 1993).

Many researchers have used name generator exercises. Among the first of such studies is the Detroit Area Study (Laumann, 1973), in which respondents were asked to name their three best friends. McAllister and Fischer (1978) studied the social worlds of respondents by using name generators about specific social exchanges. Ibarra (1995) also used name generator exercises in her study of managerial networks. She asked participants to name people that fell into the five network dimensions mentioned previously and used these responses as a basis for open-ended interview questions about the respondents’ network development strategies and approaches.

The data for the present research was collected with the help of the Center for Creative Leadership (CCL) in North Carolina. In order to collect the data on social networks, questionnaires were distributed to various groups of managers who took part in leadership development courses offered by CCL. Before the beginning of data collection, each subject completed a consent form (Appendix 1). Network ties were solicited by self-reporting (independent variable) using a Name Generator Exercise. The questionnaire was based on Ibarra’s (1993, p. 481) sociometric questionnaire in which she asked participants to name people in their organization with whom they “discuss what is going on in the

organization”, “who are important sources of professional advice” and whom they can count on, view as allies, or are “dependable in times of crisis”. Information was then gathered about each of the names collected. Participants were asked to name up to twenty individuals with whom they associated at work. Questions included information on the characteristic dimensions of the relationship, gender of the ties, ethnicity, rank, frequency of interaction, intimacy of the relationships and the range between each pair of contacts, as well as dimensions such as information, advice, friendship, career or cooperation that each tie brings.

In order to collect data on managerial effectiveness, Benchmarks, a 360-degree performance appraisal measure, was used. The managers who had agreed to participate in the Name Generator Exercise had also agreed to have the results of previous 360-degree performance appraisals evaluations used for research purposes. Their managerial effectiveness at work was therefore evaluated by their peers, their superiors, their subordinates, and themselves. The purpose of this questionnaire was to obtain a network composite from each participant (Appendix 2). Traditionally, this is done with the help of interviewers, but in order to incorporate the data collection effort within a training module, a streamlined approach was used whereby a “trainer” walked the participants through the whole process.

This study was conducted with a cross-sectional design. Surveys measuring informal network characteristics were administered to middle-level managers participating in a leadership development program. A multi-source evaluation instrument was the basis for the performance data.



## 3.2 - Participants

Most previous organizational research on social networks used samples restricted to particular organizations or groups (Ibarra, 1993). This sample was, however, constituted of two hundred and fifty-four (254) managers from different organizations, geographical regions and demographics in the United-States. The sample of participants studied consisted of middle-level managers from different organizations who participated in courses at the CCL. Although specific information about this sample is not available, it give a fairly accurate description of a typical group of managers taking part in a CCL course.

## 3.3 - Measures

Measures of the structure and the type of networks hypothesized to affect managerial effectiveness are described below.

### 3.3.1 - Network structure

**Size** was measured by asking individuals to name up to twenty ties existing within their network in any of the five domains mentioned previously. The limit of twenty ties was imposed for convenience. This method has already been used by other researchers, such as Ibarra (1995) to compute the total number of ties in an individual's network.

After completion of this part of the questionnaire, participants were asked to give some demographic and organizational information about each contact. For example, in order to gather more information on network structure, the respondents were asked to comment on the density of their network. **Density** was measured as the extent to which ties

know each other, or the proportions of possible ties among an individual's network contacts who know each other. Density was represented by 0 when none of an individual's contacts knew another contact, and by 1 when each contact knew all the others. Other researchers such as Marsden (1990), Ibarra (1995), and Campbell, Marsden and Hulbert (1986) have used this method to measure density.

Density is based on the observation of several ties by each respondent, which follows a hierarchical design because the ties are studied only with the respondents (Bryk & Raudenbush, 1992). Different ties appear in the networks of different individuals. There is no correspondence between the ties in one individual's network and the ones in another's. In order to estimate the reliability of density based on egocentric network data, Marsden (1993) suggests that it can be evaluated using the analysis of variance. Moreover, he states that "generalizability theory allows one to examine the way in which the reliability of measurement for a given object of measurement (here respondents) is affected by any measurement facet". Using this method, Marsden (1993) states that it can be shown that the reliability of this measure of density increases to the extent that the ties are homogeneous (all ties come from a larger population) and to the extent that the measures are based on a large enough number of ties per respondents.

### **3.3.2 - Network characteristics**

In order to gather information on the appropriate dimension(s) provided by each of the names collected, participants were asked to circle the appropriate one (information, advice, friendship, career or cooperation). Moreover, definitions of these five dimensions

were projected on overheads in order to help the participants understand them (see Appendix 2). These dimensions were taken from Ibarra (1995).

Thereafter, information on the rank, the frequency of interaction and the intimacy between ties was gathered. The first variable, rank, seeks to identify the hierarchical rank of the network ties. To compute this variable, a tie with a hierarchical position above the participant was given a value of 1. A tie hierarchically equivalent was given a value of 2, and last, a tie hierarchically inferior the participant was given a value of 3.

The second variable, frequency of interaction indicates how often the participants have contact with their ties. Daily interactions reported by participants were given the value 1, weekly interactions were given a value of 2, monthly interactions were given a value of 3, and interactions less frequent than monthly were given a value of 4.

The last variable tested was intimacy. This variable was designed to help determine how close a participant is to his/her ties. Participants were asked to estimate how close they felt to the ties they had enumerated. To compute this intimacy variable, very close intimacy was given a value of 1, close intimacy was given a value of 2, less than close intimacy was given a value of 3, and distant ties were given a value of 4.

### **3.3.3 - Managerial performance**

Finally, performance as a measure of overall average performance was evaluated using Benchmarks, a tool used to measure 360-degree performance feedback appraisal. Benchmarks is designed to provide information on the potential of an individual for advancement to higher ranks in the organization. This instrument was first researched by McCauley, Lombardo and Usher (1989) who wanted to understand which experiences

mattered the most to managers and the sort of development to which they led. They aimed to develop an instrument that could systematically measure managerial developmental needs and subsequently feed this information back to managers.

Ratings on the Managerial Skills and Perspectives section of Benchmarks comprises 16 scales (see Appendix 3) and 106 items. A two-step aggregation procedure yields four ratings for each manager. First, the ratings on the 16 scales are averaged for each individual rater, and second, the average of the 16 scales are further aggregated within sources to derive an average performance rating for self, subordinates, peers, and supervisors. The Ratings of Managerial Skills and Perspectives section of the Benchmarks 16-scale rating instrument (from self, subordinates, peers, and supervisors) was used.

The validity of Benchmarks lies in the fact that it measures dimensions important for continued effectiveness in managers. Each scale of this instrument represents one or more of the original scale categories, which are skills, perspectives and flaws blocking managers' careers. McCauley et al. (1989) established the validity of this instrument correlating Benchmark ratings obtained from superiors with other criteria, such as an overall assessment by the supervisor of the manager's promotability on a 6-point scale, and an independent rating of the manager's performance by the corporate management committee at the time Benchmarks data was collected. As McCauley, Lombardo and Usher (1989) stated, "overall, Benchmarks represents successful attempts to reliably measure dimensions of managerial development found to be important from earlier qualitative studies of executive development".

Benchmarks was then used to evaluate managerial effectiveness. The manager's peers, subordinates, superior and himself/herself evaluated his/her managerial effectiveness

on a 5 point rating scale, where 5 is the most effective and 1 the least effective. Then an average overall effectiveness measure was calculated by averaging all the performance ratings, without including the self-rating. Self-ratings were not used in the overall measure due to their low validity. As stated earlier, Mabe and West (1982) found that self-ratings had low validity because of self-enhancement desires and low reliability of individuals when evaluating themselves. Furthermore, these authors found that self-evaluations of ability involve "more of a relative measure than an absolute one" (p. 290); that the lack of anonymity often promotes self-enhancement; and finally, that the lack of comparison of self-evaluations with other criteria reduces their validity.

The following section will explain in more detail the results obtained by testing hypotheses proposed previously on network characteristics, on the dimensions of networks and on network types. First, the descriptive results will first be presented, and then the results of the tests of these hypotheses proposed previously.

## **4.0 - RESULTS**

### **4.1 - Analysis of data**

This analysis of data includes descriptive statistics consisting of frequencies, range, means, standard deviations, correlations, and multiple regressions.

#### **4.1.1 - Descriptive results**

Numbers, means, standard deviations, minimum and maximum values and intercorrelations of the variables of interest for managers are now presented. The sample consisted of two hundred and fifty-four managers. However, when the results were computed, the participants with missing data for the variables of interest were omitted.

Table 1 gives the descriptive statistics for the networks that are part of this study.

**TABLE 1**  
**Descriptive statistics of the networks ties**

	N	Min	Max	Mean	SD
Ties	234	2.00	21.00	12.09	4.71
Density	205	21.54	100.00	23.80	18.53
Rank	232	1.00	2.82	1.96	0.35
Interaction	233	1.00	4.00	2.13	0.60
Intimacy	234	1.11	4.00	2.30	0.42

Table 1 starts by showing that these managers have, on average, listed twelve ties, with some managers having as few as two ties and others stating that they have at least twenty-one ties. Managers were asked to state a maximum of twenty ties; however, three participants added a twenty-first tie. These three participants are a notable exception, and

they represent only a very small proportion of the managers surveyed. Moreover, only 7% of the full sample mentioned the maximum of twenty ties. Therefore, it is possible to assume that for most participants, the ceiling of twenty ties was appropriate.

Next, Table 1 presents the descriptive characteristics of the density of the ties. It shows that, on average, the density of a network is 71%, while in some cases it can reach 100% and in others it can be as low as 22%. The first network characteristic – *rank* - seeks to identify the hierarchical rank of the network ties. Table 1 indicates that, on average, most ties are peers, as the mean rank is 2, which was the numerical value given to peers. The second variable is *frequency of interaction*. Table 1 indicates that, on average, the participants in this study are in contact with most of their ties on a weekly basis. The third variable presented in Table 1 is *intimacy*. This table indicates that on average, the participants considered their ties as being close to them.

Table 2 presents the descriptive statistics for the dimensions of the networks used in this study.

**TABLE 2**  
**Descriptive statistics of the dimensions of the networks**

Dimension	N	Min	Max	Mean	SD
dim 1: Information	234	0	21	8.35	5.10
dim 2: Advice	234	0	16	6.07	3.78
dim 3: Friendship	234	0	20	4.71	3.51
dim 4: Career	234	0	13	3.22	2.72
dim 5: Cooperation	234	0	20	6.27	4.70

This table indicates that, on average, the individuals had about 8 ties which they consider to bring them some information, an average of 6 ties which bring them advice, 5

bringing them friendship, about 3 bringing them career support and almost 5 bringing them some cooperation. Some managers considered that all the ties in their networks brought them information (21), friendship (20) or cooperation (20).

Table 3 presents the descriptive statistics for managerial effectiveness used in this study according to the source of evaluation superior, peer and subordinate.

**TABLE 3**  
**Descriptive statistics on managerial effectiveness**

Evaluator	N	Min	Max	Mean	SD
Superior	263	2.10	4.56	3.75	0.35
Peer	212	2.86	4.6	3.76	0.37
Subordinate	156	3.20	4.42	3.77	0.24
Average(no self)	158	3.07	4.44	3.75	0.29

Table 3 shows that the average mean for ratings by superiors is 3.75, for peers, 3.76, and by subordinates 3.77, which are all pretty similar. However, as slight as the difference between these three means may seem, we can see that raters who are hierarchically higher than the ratee give lower performance ratings than peers, and peers give lower ratings than subordinates. Moreover, the smallest evaluation score (2.10) was given by a superior, while the highest evaluation score (4.56) was also given by a superior, which shows the wide range of ratings. Finally, the standard deviation of the evaluations given by subordinates (0.24) shows the lowest variance, which indicates that hierarchically lower employees tend to give similar evaluations to all higher-ranked individuals.

Table 4 now presents a correlation matrix between the dependent, the independent and the mediating variables.



**TABLE 4**  
**Correlation matrix**

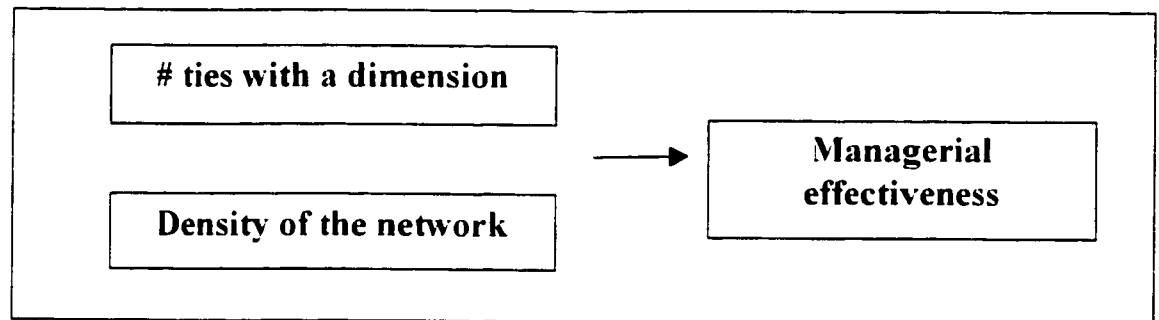
Variable	N.	Mean	S.D.	Min.	Max.	1	2	3	4	5	6	7	8	9	10	11
1. PERFORM																
2. TIE	118	12.09	4.71	2.00	21.00	0.00										
3. DENSITY	118	23.80	18.53	21.54	100.00	-0.09	-0.08									
4. INFO	118	8.35	5.10	0.00	21.00	0.05	0.83	-0.11								
5. ADVICE	118	6.07	3.78	0.00	16.00	0.03	0.75	-0.10	0.71							
6. FRIEND	118	4.71	3.51	0.00	20.00	0.05	0.54	-0.12	0.50	0.56						
7. CAREER	118	3.22	2.72	0.00	13.00	0.00	0.64	-0.10	0.49	0.71	0.50					
8. COOP	118	6.27	4.70	0.00	20.00	-0.35	0.72	0.09	0.59	0.69	0.48	0.53				
9. RANK	118	1.96	0.35	1.00	2.82	-0.13	-0.09	-0.10	0.17	-0.87	-0.05	-0.05	-0.05			
10. INTERACT	118	2.13	0.60	1.00	4.00	-0.07	-0.05	0.00	-0.07	0.02	0.00	0.06	-0.13	0.07		
11. INTIMACY	118	2.30	0.42	1.11	4.00	-0.06	0.05	0.02	-0.17	0.08	-0.09	0.04	0.07	-0.02	0.05	

## 4.2 - Results of tests of the hypotheses

### 4.2.1 - Network characteristics

Figure 1 presents the general model used to test the two hypotheses related to the characteristics of networks.

**FIGURE 1**  
**Network characteristics number of ties and density**  
**with managerial effectiveness**



Tests of network characteristics were done using multiple regressions. This kind of analysis is used "whenever a quantitative variable (dependent variable) is to be studied in function of, or in relationship to, any factors of interest (independent variables)" (Cohen & Cohen, 1983, p. 3). Multiple regression analysis is frequently used for analyzing data pertinent to behavioral, social and biological sciences (Cohen & Cohen, 1983).

In order to test the first two hypotheses, the effect of the variation of the dependent variable (X: number of ties in a network or density of a network) was tested on the independent variable (Y: managerial effectiveness). Consequently,  $Y=f(X)$ , the variation in Y is a function of the controlled variation in X (Cohen & Cohen, 1983). The purpose of multiple regression analysis is to discover relationships between the variables tested.

Therefore, the regression tests for hypotheses 1 and 2 should provide information as to whether the size and/or the density of a network have non-zero linear relationships with respect to the effectiveness of an individual. The coefficient of multiple determination ( $R^2$ ) is used to explain how much of the variation in an individual's effectiveness is explained by an increase in the number of network ties or the density of the network.

### **Hypothesis 1**

Hypothesis 1 posed that the number of ties within a network was positively related to a manager's effectiveness, which means that as the number of ties within a network increases, this manager's effectiveness should increase proportionally. In order to test this hypothesis, a linear regression ( $a + bx = y$ ) was performed between the number of ties in a manager's network ( $x$ ) and managerial effectiveness ( $y$ ). The results of this analysis are presented in Table 5. They indicate that the relationship between the number of ties in a network and managerial effectiveness was not significant ( $p < 0.05$ ). Thus, hypothesis 1 was not supported.

Although previous theories on social networks seemed to indicate that an increase in the number of ties in a network increased the resources available to an individual (see for example Alderfer, 1986; Blau, 1977), these results of the present study indicate that in some cases it is not essential to have many ties. Moreover, an individual might actually benefit by having fewer, but non-redundant, ties – ties that do not provide him with repetitive information (Burt, 1992). The present results could have been different if data had been collected in a different manner. For example, individuals were given a limit in the number of ties they could list. Some individuals might therefore have felt pressured to add ties

which were not really part of their networks in order to approach the limit of twenty. This could have contributed to the finding here that additional ties do not increase managerial effectiveness.

## **Hypothesis 2**

Hypothesis 2 seeks to determine whether the density of a manager's network relates positively and linearly to managerial effectiveness. It was hypothesized that an increase in the density of managers' networks would increase these managers' effectiveness. In order to test this hypothesis, a linear regression was also done between the density of a network (x) and managerial effectiveness (y). The results of the impact of the density of a network on managerial effectiveness are presented in Table 5. Table 5 presents the dependent variable: type of effectiveness, which in this case consists of only overall effectiveness and the predictor variables: number of ties in a network and density of a network. Also, in this table it is possible to find the B which gives the value of the coefficient, the T which gives the value of the T-test, and the p which gives the p-value. Moreover, for each regression, the number of variables used (N), the value of the F-test (F) and the value of the coefficient of multiple determination ( $R^2$ ) are presented in this table.

**TABLE 5****Regression results for the structural characteristics of networks and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Overall effectiveness N=118 F=0.01 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
Overall effectiveness N=118 F=0.728 R <sup>2</sup> =0.007	Density	-0.08	-0.85	0.40

The relationship between the density of a network and managerial effectiveness was not significant. The results suggest that a dense network puts the individuals of a network into contact with the same individuals, therefore not providing additional benefits. Hypothesis 2 was therefore not supported. However, some individuals may not always be aware of who knows whom and whether or not some individuals are actually in contact with certain others. When the participants were asked which individuals in their networks knew each other, they might have wrongly assumed relationships between ties which did not exist. This could have given the results that in this sample a high-density network did not increase managerial effectiveness.

**4.2.2 - Dimensions and characteristics of network ties****Testing mediation**

The hypotheses related to the types of networks introduce eight variables (information, advice, friendship, career support, cooperation, rank, interaction and intimacy) that mediate the relationship between the number of ties in a network and the density of networks and the effectiveness of managers. These mediating effects were tested using

regression analyses. The tests performed show if the effects of these mediators are significant. The tests are significant when network dimensions have non-zero linear relationships to the effectiveness of an individual when mediated by information, advice, friendship, career support, cooperation, rank, frequency of interaction and intimacy.

To test for mediation, three regression equations must be estimated. First, the mediator has to be regressed on the independent variable. Second, the dependant variable has to be regressed on the independent variable. Third, the dependent variable must be regressed on both the independent variable and the mediator (Baron & Kenny, 1986). "These three regressions provide the tests of the linkages of the mediational model" (Barron & Kenny, 1986, p. 1177).

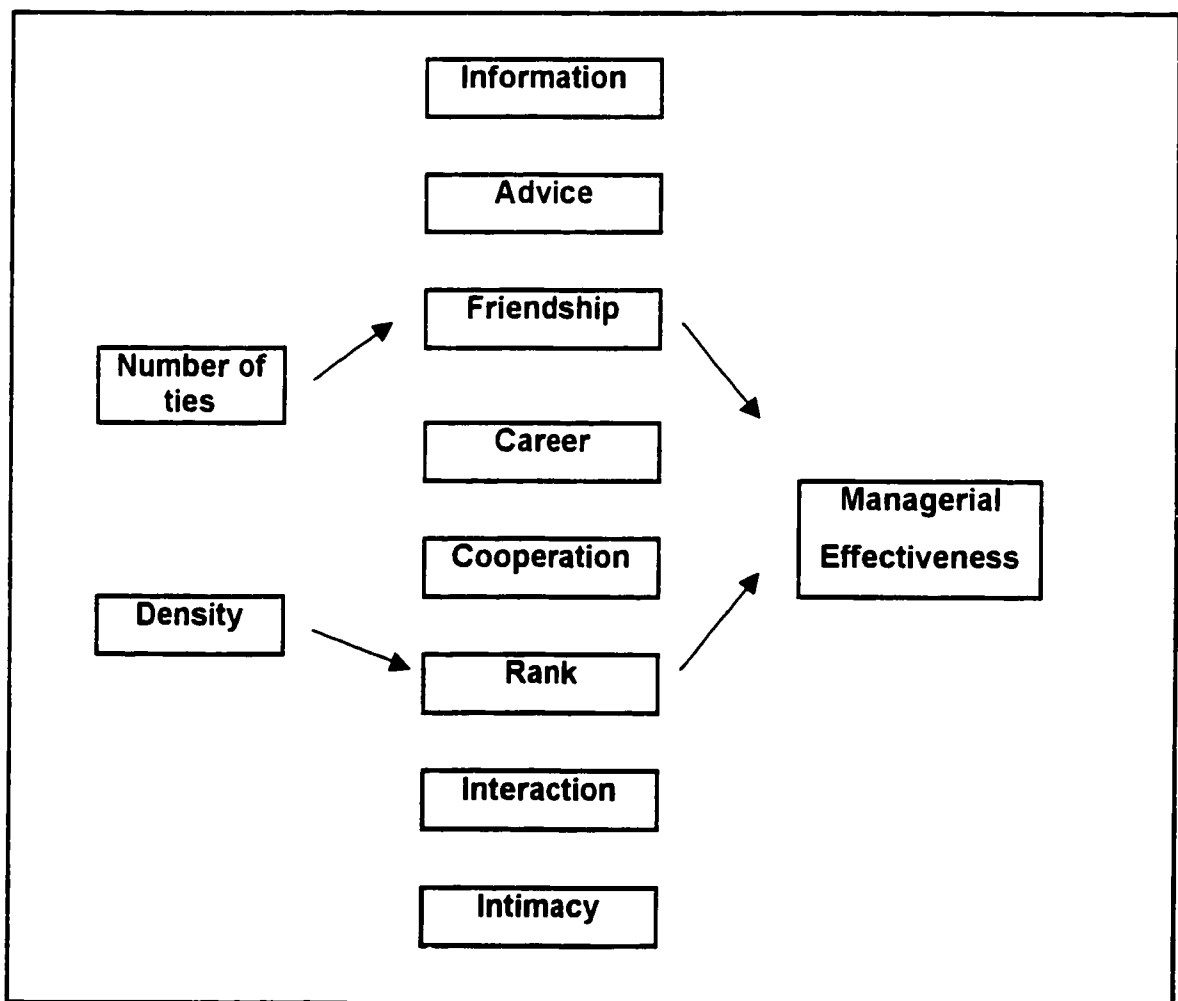
In order for there to be a significant mediating effect, Benny and Kenny (1986) state that three conditions must hold. First, the independent variable must affect the mediator in the first equation. Second, the independent variable must affect the dependent variable in the second equation. Third, the mediator must affect the dependent variable in the third equation. If these conditions all hold in the predicted direction, the impact of the independent variable on the dependent variable must be less in the third equation than in the first equation. "Perfect mediation holds if the independent variable has no effect when the mediator is controlled" (Baron & Kenny, 1986, p. 1177).

Moreover, since the independent variable is presumed to cause the mediator, those two variables should be correlated. This correlation will result in multicollinearity "when the effects of the independent variable and mediator on the dependant variable are estimated" (Baron & Kenny, 1986, p. 1177). This will result in reduced power when testing

the coefficients in the third equation. It is therefore essential to examine the absolute size of the coefficients rather than only their significance.

Figure 2 now presents the general model used to test the hypotheses related to the mediating effect of the types of networks. In this figure the predictors (dependent variables) are the number of ties and density. The eight mediating variables are information, advice, friendship, career, cooperation, rank, interaction and intimacy. The dependant variable is the average rating of managerial effectiveness.

**FIGURE 2**  
**The mediating effect of the types of networks on the relationship between the structural characteristics of networks and managerial effectiveness**



The following section will discuss in more detail the results pertaining to the mediating hypotheses of the network types on the two hypotheses analyzed here above.

### **Hypothesis 3**

Hypothesis 3 pertains to the mediating effect of information, advice, career support or cooperation on the relationship between the number of ties in a network and managerial effectiveness. The tests of these mediating effects are presented in the next few paragraphs.

The results of hypothesis 3a will be examined first. It sought to determine whether the number of ties with information mediated the relationship between the number of ties in a network and managerial effectiveness. In order to test this hypothesis, the test for mediation, as mentioned above, was performed. First, the mediator: the number of ties with information, was regressed on the independent variable: the number of ties in a network. Second, the dependent variable: managerial effectiveness, was regressed on the independent variable: the number of ties. Finally, the dependent variable: managerial effectiveness, was regressed on the independent variable: number of ties in a network, and the mediator: the number of ties with information. These regressions were performed to determine whether the mediator number of ties with information, had a significant impact on the relationship between the number of ties in a network and managerial effectiveness. The results for this mediating impact are presented in Table 6.



**TABLE 6**  
**The number of ties with information mediating**  
**the relationship between the number of ties**  
**and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Information N=118 F=0.001 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
Overall effectiveness N=118 F=0.150 R <sup>2</sup> =0.001	Number of ties	0.04	0.39	0.70
Overall effectiveness N=118 F=0.167 R <sup>2</sup> =0.003	Number of ties	-0.06	-0.43	0.67
	Information	0.08	0.58	0.57

Table 6 indicates that when the variable, number of ties with information is regressed on the variable number of ties in a network, there is no significant result ( $p > 0.05$ ). When the managerial effectiveness variable is regressed on the number of ties variable, there is no significant result either. Finally, when the managerial effectiveness variable is regressed on the number of ties variable in a network, or number of ties with information, still no significant results are found. Therefore, it is possible to conclude that no significant relationship was found for the mediating effect of the number of ties with information on the relationship between the number of ties in a network and managerial effectiveness. Hypothesis 3a was therefore not supported. These results indicate that maintaining ties with individuals that provide mostly information does not increase the total amount of information received from this network.

Next, hypothesis 3b will be discussed. This hypothesis aims at determining whether the number of ties with advice mediates the relationship between the number of ties in a network and managerial effectiveness. In order to examine this hypothesis, the test for

mediation as mentioned above was performed. The similar three regressions were done, as in hypothesis 3a, when testing the mediating impact of the variable number of ties with information. The results for this mediating impact are presented in Table 7.

**TABLE 7**  
**The number of ties with advice mediating**  
**the relationship between the number of ties**  
**and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Advice N=118 F=0.001 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
	Overall effectiveness	0.01	0.10	0.92
Overall effectiveness N=118 F=0.010 R <sup>2</sup> =0.000	Number of ties	-0.01	-0.04	0.97
	Advice	0.01	0.10	0.92
Overall effectiveness N=118 F=0.006 R <sup>2</sup> =0.000				

The three regressions yielded similar results as those pertinent to hypothesis 3a. When the variable, number of ties with advice is regressed on the variable number of ties in a network, there is no significant result ( $p > 0.05$ ). When the managerial effectiveness variable is regressed on the number of ties variable, there is no significant result either. Finally, when the variable managerial effectiveness is regressed on the variable number of ties in a network or number of ties with information, still no significant results are found. Therefore, it is possible to conclude that no significant relationship was found for the mediating effect of the number of ties with information on the relationship between the number of ties in a network and managerial effectiveness. Therefore, no significant relationship was found for the mediating effect of advice on the relationship between the number of ties in a network and managerial effectiveness. Hypothesis 3b was not supported.

These results also indicate that maintaining ties with individuals that provide mostly advice does not increase the total amount of advice received from this network.

In hypothesis 3c, the aim was to test whether the number of ties with career support mediates the relationship between the number of ties in a network and managerial effectiveness. In order to examine this hypothesis, the test for mediation - which included three same three regressions mentioned above - was performed. The results for the mediating impact are presented in Table 8.

**TABLE 8**  
**The number of ties with career support mediating**  
**the relationship between the number of ties**  
**and managerial effectiveness**

IV	DV	B	T	p
Career N=118 F=0.001 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
Overall effectiveness N=118 F=0.010 R <sup>2</sup> =0.000	Number of ties	-0.01	-0.10	0.92
Overall effectiveness N=118 F=0.008 R <sup>2</sup> =0.000	Number of ties	0.01	0.08	0.94
	Career	-0.01	-0.13	0.90

The three regressions performed all brought forth non-significant results. Therefore, there was no significant mediating impact of the variable number of ties with advice on the relationship between the number of ties in a network and managerial effectiveness. Consequently, hypothesis 3c was not supported. As with previous results of hypotheses on the dimensions of networks, an increase in ties that provide career support in a network does not increase the total amount of career support received from the whole network.

Hypothesis 3d aims at understanding whether the number of ties with cooperation mediates the relationship between the number of ties in a network and managerial effectiveness. In order to evaluate this hypothesis, the same tests for mediation as in previous mediating hypotheses were performed. The results for the mediating impact of the variable number of ties with cooperation when mediating the relationship between the number of ties in a network and managerial effectiveness are presented in Table 9.

**TABLE 9**  
**The number of ties with cooperation mediating**  
**the relationship between the number of ties**  
**and managerial effectiveness**

IV	DV	B	T	p
Cooperation N=118 F=0.001 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
Overall effectiveness N=118 F=0.375 R <sup>2</sup> =0.003	Number of ties	-0.06	-0.61	0.54
Overall effectiveness N=118 F=0.356 R <sup>2</sup> =0.006	Number of ties	0.07	0.58	0.56
	Cooperation	-0.31	-0.84	0.40

No significant relationship was found in any of the three regressions which helped to test the mediating effect of the number of ties with cooperation on the relationship between the number of ties in a network and managerial effectiveness. Consequently, hypothesis 3d was not supported. Therefore an increase of the number of ties that provide cooperation to an individual will not have a more significant mediating impact on the relationship between the number of ties in a network and managerial effectiveness.

#### **Hypothesis 4**

Hypothesis 4 is aimed at determining whether the density of a network with some of the dimensions mentioned previously (advice, friendship, career support or cooperation) mediates the relationship between the number of ties in a network and managerial effectiveness.

First, hypothesis 4a seeks to find out whether the number of ties with advice has a significant mediating impact on the relationship between the density of a network and managerial effectiveness. Mediation was tested here as previously and the results are presented in Table 10.

**TABLE 10**  
**The number of ties with advice mediating the relationship**  
**between density and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Advice N=104 F=0.728 R <sup>2</sup> =0.007	Density	-0.08	-0.85	0.40
Overall effectiveness N=118 F=0.010 R <sup>2</sup> =0.000	Density	0.01	0.10	0.92
Overall effectiveness N=104 F=0.407 R <sup>2</sup> =0.008	Density	-0.09	-0.87	0.39
	Advice	-0.03	-0.30	0.76

None of the three regressions used to test mediation was significant ( $p > 0.05$ ) therefore no significant relationship was found for the mediating impact of the number of ties with advice on the relationship between the density of a network and managerial effectiveness. Hence, hypothesis 4a was not supported. Therefore an increase in the

number of ties with advice does not have a significant mediating effect impact on the relationship between the density of a network and managerial effectiveness.

Second, hypothesis 4b involves determining whether the number of ties with career support in a network mediates the relationship between the density of a network and managerial effectiveness. The tests for mediation mentioned above were performed. The results for the mediating impact are presented in Table 11.

**TABLE 11**  
**The number of ties with career support mediating the relationship between density and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Career N=104 F=0.728 R <sup>2</sup> =0.007	Density	-0.08	-0.85	0.40
Overall effectiveness N=118 F=0.010 R <sup>2</sup> =0.000	Density	-0.01	-0.10	0.92
Overall effectiveness N=104 F=0.478 R <sup>2</sup> =0.009	Density	-0.09	-0.91	0.36
	Career	-0.05	-0.48	0.63

No significant relationship was found for the mediating effect of career support on the relationship between the density of a network and managerial effectiveness, as the three regressions performed were all non-significant. Therefore, hypothesis 4b was not supported. This means that an increase in the number of ties with career support does not mediate the relationship between the density of a network and managerial effectiveness.

Third, hypothesis 4c seeks to determine whether the number of ties with cooperation mediates the relationship between the density of a network and managerial effectiveness. In

order to evaluate this hypothesis, tests for mediation, as mentioned above, were performed. The results are presented in Table 12.

**TABLE 12**  
**The number of ties with cooperation mediating the relationship**  
**between density and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Cooperation N=104 F=0.728 R <sup>2</sup> =0.007	Density	-0.08	-0.85	0.40
Overall effectiveness N=118 F=0.375 R <sup>2</sup> =0.003	Cooperation	-0.06	-0.61	0.54
Overall effectiveness N=104 F=0.648 R <sup>2</sup> =0.013	Density	-0.08	-0.75	0.45
	Cooperation	-0.08	-0.76	0.45

No significant relationship was found for the mediating effect of the number of ties with cooperation on the relationship between the density of a network and managerial effectiveness. Hypothesis 4c was not supported. Here again, the number of ties with cooperation do not mediate the relationship between the density of network ties and managerial effectiveness.

In conclusion, these results indicate that the dimensions of network ties tested in this study do not mediate the relationship between the number of ties in a network or the density of a network and managerial effectiveness. It is possible that for this specific sample these dimensions are simply not significant mediators. However, it is also possible that if the data on the relationships between network ties had been gathered in a different manner, the results could have yielded different results. For example, if both the participants and the ties mentioned had been asked to describe the dimension of their relationship, different data could have been collected. Some individuals might characterize a particular relationship as

friendship-based, whereas another individual might consider that the relationship brings him/her information instead of friendship. Moreover, some individuals who might be looking specifically for information ties might consider most of their ties as being informational even if they provide more cooperation than information.

### **Hypothesis 5**

Hypothesis 5 poses that the types of network ties - rank, interaction and intimacy - have a significant mediating effect on the relationship between the number of ties in a network and managerial effectiveness.

First, hypothesis 5a seeks to determine whether the rank of the ties in a network mediates the relationship between the number of ties in a network and managerial effectiveness. In order to examine this hypothesis, the same tests for mediation as in previous mediating hypotheses were performed. The results of this mediating impact are presented in Table 13.

**TABLE 13**  
**Rank mediating the relationship between**  
**number of ties and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Rank N=118 F=0.001 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
Overall effectiveness N=118 F=1.944 R <sup>2</sup> =0.016	Number of ties	-0.13	-1.40	0.17
Overall effectiveness N=118 F=0.990 R <sup>2</sup> =0.017	Number of ties	0.02	0.22	0.82
	Rank	-0.13	-1.41	0.16



No significant relationship was found in any of the three regressions which helped to test the mediating effect of rank on the relationship between the number of ties in a network and managerial effectiveness. The rank of individuals within a network does not have a significant mediating impact on the relationship between the number of ties in a network and managerial effectiveness. Consequently, hypothesis 5a was not supported.

Second, hypothesis 5b aims at determining whether the frequency of interaction of the ties in a network mediates the relationship between the number of ties in a network and managerial effectiveness. In order to examine this hypothesis, a test for mediation, as mentioned above, was done. The results for the mediating impact are presented in Table 14.

**TABLE 14**  
**Interaction mediating the relationship between**  
**the number of ties and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Interaction N=118 F=0.001 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
Overall effectiveness N=118 F=0.440 R <sup>2</sup> =0.004	Interaction	-0.06	-0.66	0.51
Overall effectiveness N=118 F=0.220 R <sup>2</sup> =0.004	Number of ties	0.01	0.06	0.42
	Interaction	-0.06	-0.66	0.51

No significant relationship was found in any of the three regressions used to test the mediating effect of the frequency of interaction on the relationship between the number of ties in a network and managerial effectiveness. The frequency of interaction between individuals within a network does not have a significant mediating impact on the

relationship between the number of ties in a network and managerial effectiveness. Hypothesis 5b was not supported.

Finally, hypothesis 5c seeks to determine whether the intimacy between ties mediates the relationship between the number of ties in a network and managerial effectiveness. In order to examine this hypothesis, the same tests for mediation were used. The results for of this mediating impact are presented in Table 15.

**TABLE 15**  
**Intimacy mediating the relationship between**  
**number of ties and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Intimacy N=118 F=0.001 R <sup>2</sup> =0.000	Number of ties	0.00	0.03	0.98
Overall effectiveness N=118 F=0.393 R <sup>2</sup> =0.003	Intimacy	-0.06	-0.63	0.53
Overall N=104 F=0.196 R <sup>2</sup> =0.003	Number of ties	-0.00	-0.03	0.97
	Intimacy	-0.06	-0.63	0.53

No significant relationship was found for the mediating effect of intimacy of ties on the relationship between the number of ties in a network and managerial effectiveness. The intimacy between individuals in a network does not have a significant mediating impact on the relationship between the number of ties in a network and managerial effectiveness. Hypothesis 5c was not supported.

## **Hypothesis 6**

Hypothesis 6 is aimed at determining whether the types of network ties mentioned previously (rank, interaction and intimacy) mediate the relationship between the density of a network and managerial effectiveness.

First, hypothesis 6a aims at finding whether there are significant results when testing the mediating impact of the rank of the ties in a network on the relationship between the density of a network and managerial effectiveness. In order to evaluate this hypothesis, tests for mediation as previously described, was performed. The results for this mediating impact are presented in Table 16.

**TABLE 16**  
**Rank mediating the relationship between**  
**density and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Rank N=104 F=0.728 R <sup>2</sup> =0.007	Density	-0.08	-0.85	0.40
Overall effectiveness N=118 F=1.944 R <sup>2</sup> =0.016	Rank	-0.13	-1.39	0.17
Overall effectiveness N=104 F=0.751 R <sup>2</sup> =0.015	Density	-0.07	-0.66	0.51
	Rank	-0.09	-0.88	0.38

No significant relationship was found for the mediating effect of rank on the relationship between the density of a network and managerial effectiveness. The rank of individuals does not have a significant mediating impact on the relationship between the density of a network and managerial effectiveness. Hypothesis 6a was not supported.

Next, hypothesis 6b aims at determining whether the frequency of interaction of the ties in a network mediates the relationship between the density of a network and managerial effectiveness. In order to examine this hypothesis, tests for mediation as previously described, was performed. The results are presented in Table 17.

**TABLE 17**  
**Interaction mediating the relationship between**  
**number of ties and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Interaction N=104 F=0.728 R <sup>2</sup> =0.007	Density	-0.08	-0.85	0.40
	Interaction	-0.06	-0.66	0.51
Overall effectiveness N=118 F=0.440 R <sup>2</sup> =0.004	Density	-0.12	-1.20	0.23
	Interaction	-0.14	-1.36	0.18
Overall effectiveness N=118 F=1.296 R <sup>2</sup> =0.025				

No significant relationship was found for the mediating effect of frequency of interaction on the relationship between the density of ties in a network and managerial effectiveness. The frequency of interaction between individuals in a network does not have a significant mediating impact on the relationship between the density of a network and managerial effectiveness. Hypothesis 6b was not supported.

Finally, hypothesis 6c determines whether the intimacy between ties mediates the relationship between the density of a network and managerial effectiveness. In order to examine this hypothesis, tests for mediation were performed. The results for the mediating impact are presented in Table 18.

**TABLE 18**  
**Intimacy mediating the relationship between**  
**number of ties and managerial effectiveness**

Effectiveness	Predictor	B	T	p
Intimacy N=104 F=0.728 R <sup>2</sup> =0.007	Density	-0.08	-0.85	0.40
Overall effectiveness N=118 F=0.393 R <sup>2</sup> =0.003	Intimacy	-0.06	-0.63	0.53
Overall effectiveness N=104 F=0.927 R <sup>2</sup> =0.018	Density	-0.10	-1.04	0.30
	Intimacy	-0.11	-1.06	0.29

No significant relationship was found for the mediating effect of the interaction of ties on the relationship between the density of a network and managerial effectiveness. The intimacy between individuals in a network does not have a significant mediating impact on the relationship between the density of a network and managerial effectiveness. Hypothesis 6c was not supported.

In conclusion, these results indicate that the rank, the interaction and the intimacy between network ties do not mediate the relationship between the number of ties in a network or the density of a network and managerial effectiveness. Here again, it is possible that for the sample used in this study these dimensions are simply not significant mediators. Methods of data collection on the relationships between network ties could also have been improved. For example, to increase the reliability of the data on frequency of interaction, individuals could have been asked beforehand to keep track of all the individuals with whom they had any interactions during the two weeks prior to their course. Data could also have been collected by both the participants and their ties in order to get a better understanding of the network as a whole.

All the hypotheses tested in this study were found to be non-significant. These results can be interpreted in different ways and may lead to various results. The next section will focus on these results and try to explain and discuss their significance.

## **5.0 - DISCUSSION**

As the social structure of the work environment changes, and the requirements and expectations of employees increase, the understanding of social networks become more and more important. Since individuals work longer hours, are less involved in their communities and less present in their families lives, their social network ties become the main people with whom they interact (Pak Sunoo, 1999). This gradually increases the importance of these networks in people's lives.

However, maintaining social networks requires valuable time and energy. Consequently, managers must select and regulate the individuals who will be part of their networks and they will tend to maintain and give precedence to those ties which provide them with certain benefits. Self-regulation allows managers to decide whom they want to be part of their networks, or vice versa, in whose networks they wish to be. In this way they do not waste time and energy maintaining less useful ties – energy that could be put to use in more profitable ventures. However, it is important to remember that maintaining network ties is a two-way process. If managers cannot give back minimum benefits to their ties, these ties are not likely to make efforts to keep these managers in their networks.

It is also important to note that not all relationships in organizations confer the same benefits. Moreover, it is essential to be able to evaluate and understand the output of the contribution of a manager's social capital, which is hard to perceive to its full extent and complex to measure. That is why multi-source ratings are becoming increasingly popular in organizations and seem to provide the widest range of opinions and performance appraisals. This happens because many individuals with divergent opinions, who see different sides of a

manager are asked to evaluate him/her. This brings an overall evaluation that takes into account many aspects of a manager's functions.

From this research, it has not been possible to uncover a relationship between the structure and the type of network and the effectiveness of managers in the sample analyzed. The following section will look in greater detail at the results of this research and attempt to explain the reasons for these results. First, the sample and the performance data will be examined; the results stemming from analysis of the structural characteristics of networks will then be looked at, and finally the impact of network types as mediators will be discussed.

## 5.1 - Discussion of the variables used

### 5.1.2 - Network characteristics

As stated previously, the results of this study failed to establish that either of the two characteristics of networks – size and density – had a significant impact on managerial effectiveness as tested with 360-degree performance feedback appraisals. The following section will discuss these results.

**Number of ties** - In this study, an increase in the number of ties in a network were hypothesized to increase managerial effectiveness. However, the results show that the number of ties in a network were not found to affect managerial effectiveness. Previously, social network theories affirmed that any set of social relationships embedded within a larger structural context precluded or made possible various kinds of social contacts and facilitated relations and the distribution of valued resources within a social system (Alderfer,



1986; Blau, 1977). It was also thought that when it came to networks, bigger was better. However, the findings of the present study suggest that not every additional tie contributes to a manager's effectiveness.

These findings seem to be in accord with Burt's (1992) study, which found that while an increase in the size of a network can provide, among other things, more exposure to information, size can also cripple the network in significant ways. Burt states that it is not the actual physical size of the network that contributes to enhancing performance, but rather the number of nonredundant contacts. It is these nonredundant contacts that lead to different people and different sources of information, advice, friendship, career support and cooperation. Size can, in fact, be a mixed blessing. As stated by Carroll, Glenn, Theo and Albert (1996), it could be that in order to maintain larger networks, managers must sacrifice intimacy or a high level of interaction.

**Density** - In this study, a decrease in the density of a network was hypothesized to have a significant impact on managerial effectiveness. The results show, however, that the density of a network is not found to be related to managerial effectiveness. As mentioned previously, the problem with a dense network is that each tie puts you in contact with the same people other ties have already put you in contact with. It would seem that, that in accord with the findings of Burt (1992) and Carroll and al. (1996), it is not the number of ties that matters, but rather the number of nonredundant ties. Burt (1992) first stated that although more contacts can mean more exposure, more contacts without any diversity can cripple a network in terms of lack of new benefits. This dense network might even impede performance. However, the results of the present research did not confirm this hypothesis either. Perhaps the density of the ties in a network is simply not a crucial factor in

managerial effectiveness. More research is needed to determine conclusively the relationship between density and managerial effectiveness.

### **5.1.3 - Dimensions and characteristics of network ties**

In this study, it was hypothesized that the dimensions of network ties had a significant mediating impact on the relationship between the number of ties in a network and managerial effectiveness or the density of a network and managerial effectiveness. The results of this study show that neither of the five domains or dimensions mentioned by Ibarra (1995) – information, advice, friendship, career support and cooperation – nor the three characteristics of network ties - rank, interaction and intimacy - had a significant mediating effect on the relationship between network structure and managerial effectiveness. These eight variables of network types were tested as mediators in the relationship between the number of ties in a network and managerial effectiveness and between the density of networks and managerial effectiveness as evaluated by 360-degree performance feedback appraisals. This result will be further examined here. First, Ibarra's domains that were tested will be looked at more carefully, and then the variables of rank, interaction and intimacy will be discussed.

The results show that within our sample of participants, Ibarra's domains – information, advice, career and cooperation – do not mediate the relationship between the number of ties in a network or the density of a network and managerial effectiveness calculated using 360-degree performance appraisals. There are several possible reasons for this.

Specific network contacts provide individuals with some of the necessary resources for improving their effectiveness. However, our results seem to indicate that maintaining many ties within each domain will not necessarily increase an individual's effectiveness; perhaps an individual needs only one tie in each of these domains in order to achieve increased effectiveness. An in-depth study focussing on a comparison of the effectiveness of two groups of managers - managers with very few ties in each network dimensions versus managers with many ties in each network dimension - would perhaps reveal more conclusively whether few non-redundant ties lead to more effectiveness than many redundant ties. However, in none of the hypotheses tested here did these dimensions mediate the relationship between the number of ties in a network and managerial effectiveness. Overall, many ties within a network do not seem to provide more information than a network with only one or two tie. The same holds true when density of a network is used as a predictor variable. The number of ties do not seem to have an impact on any of the dimensions tested.

This study also hypothesized that the rank, the frequency of interaction and the intimacy between ties in a network would mediate the relationship between the size or the density of a network and managerial effectiveness. Rank, interaction, and intimacy have been found to affect direct information exchange between cohesive actors (see section 1.3.2). Between people of the same hierarchical level there are norms of reciprocity and exchange. Therefore, an individual is likely to receive a greater diversity and quantity of resources from these hierarchically similar individuals. Moreover, as the density of a network increases, direct information exchanges are facilitated and accentuated by the

proximity and the frequency of contact and interaction between ties. Unfortunately, as these exchanges are accentuated, the same information gets passed around, not creating additional benefits. Intimacy between actors is also a factor that increases interactions and exchanges of resources. However, in the present research, the rank, interaction and intimacy variables failed to show a significant mediating relationship between the structural characteristics of networks (number of ties and density) and managerial effectiveness. These results will be discussed in more detail in the following sections.

**Rank** – As concluded by Blau and Alba (1982) and Brass (1984), people whose network contacts extend beyond their required workflow interactions and immediate work groups tend to be more powerful. However, Campbell et al. (1986) and Lin (1982) have found that reaching diverse others is not sufficient if few contacts are high enough in status or rank to be instrumentally. Brass (1984) and Kotter (1982) also state that individuals must have access to dominant peers, as well as many superiors in order to be in a better position for power and advancement.

However, the results obtained here do not support the hypothesis that the rank of the ties in a manager's network has a significant mediating impact on the relationship between the number of ties in a network or the density of a network and managerial effectiveness. The managers in this sample with many high-ranking ties in their networks were not found to be more effective than managers with few high-ranking ties in their networks. Moreover, managers having lower-density networks with high-ranking ties were not rated either as being more efficient.

These results have been influenced by the collection method for the rank variables. Future research could therefore focus more precisely on this dimensions by collecting all data from managers of only one organization since variations among organizations could influence the rank factor. In some organizations for instance, the ranking system might be more accentuated than in others. Also, in some firms, small promotions could result in a new title, while in others, promotions might be associated with only other incentives. The reliability of the data on rank could presumably be greater if collected from managers from only one organization.

**Interaction** - Burt (1992) states that members of a manager's core discussion networks are not likely to know each other, and that the most efficient networks are those consisting of ties linking an individual to nonredundant or disconnected individuals or groups. Because of managers' limited time and energy, their optimal networks would therefore consist of infrequent contacts with individuals who have no relationship with or even knowledge of each other. Mintzberg (1973) also supports this point of view, stating that managers engage primarily in short and disconnected interactions and that, as a consequence, increased levels of interaction do not necessarily contribute to their effectiveness.

The results obtained in the present study show that for this sample of middle-level managers, an increase in the levels of frequency of interaction between the ties in the networks observed does not have a significant mediating impact on the number of ties in a network or the density of a network and managerial effectiveness. These results tend to support Burt's (1992) and Mintzberg's (1973) points of view when they state that frequent

interactions were not an advantage for the managers in question; once information is passed along, repetitions of the same information is not useful. More research would be required to find out if frequent interactions could actually have an adverse impact on managerial effectiveness.

**Intimacy** - An important component of tie strength is intimacy, that is, the interpersonal closeness of a network relationship (Granovetter, 1973). The intimacy of the relationships between ties determines the true nature of the relationship. As mentioned previously, it is the closeness of a relationship that will allow certain benefits to be transmitted. From a career development perspective, close relationships are more likely to fulfill psychosocial functions (Kram, 1988). Psychosocial functions are, according to Ibarra (1995), various aspects of a relationship that enhance an individual's sense of competence, identity, and effectiveness in a professional role. These functions involve benefits that stem from the nature of the relationship rather than from the positional power of the contact.

Our results showed that within our research frame, the intimacy variable did not have a significant mediating relationship between the structural characteristics of networks observed and managerial effectiveness. It is possible that the method of collection of this data influenced its impact. Participants were asked about the closeness of their relationship with the ties they mentioned. However, an individual's perception of the intimacy of a relationship affects his/her reporting of this factor. The accuracy of this data could perhaps have been increased, therefore, by having the intimacy of each ties evaluated independently by both individuals involved, and by averaging their responses in order to obtain the assessment of the degree of intimacy. Also, clearer definitions of the different levels of

intimacy could have been given to the participants as well as examples of what these levels of intimacy should comprise.

We can conclude by stating that networks with similar characteristics do not necessarily provide access to the same benefits for their members. Moreover, perceptions regarding the attributes of a useful network are important, because they are likely to affect network strategies for balancing competing network requirements.

## **5.2 - The contributions and limitations of this research**

Networks are complex structures which encompass many facets of organizational life. In this research, the dimensions of ties such as information, advice, friendship, career support or cooperation ties, as well as the characteristics of these ties such as rank, interaction and intimacy failed to show a significant mediating impact on the relationship between the number of ties or density and managerial effectiveness in the sample analyzed. The results also indicate that the relations between ties are multidimensional and that it is difficult to isolate the true nature of a single tie.

The complexity of the phenomenon at hand undoubtedly requires further in-depth research. Our results cannot be generalized to all networks, as individuals modify their behaviors, pursue different interests and modify their organizational goals. Nonetheless, it has been shown here that in some cases network effects might have been over-rated or wrongly interpreted by previous researchers.

The size of the sample used in this study is also different from those used in other studies. Our sample consists of two hundred and fifty-four (254) middle-level managers from different organizations and from different backgrounds, which is significantly larger

than Ibarra's 1993 sample, consisting of 94 employees from one firm, or her 1995 sample, consisting of 63 middle-level managers from only four firms. It is, however, much smaller than Carroll and Teo's (1996) sample of over 600 participants. The sample used here could have lacked the power necessary to uncover the hypothesized effects. Moreover, there is not enough data on the participants. Additional information on the participants should have been asked, such as their seniority and their age, as well, additional information on their networks would have been useful, such as the hours spent on average maintaining their ties or whether they value some dimensions more than others. However, this sample is unique in its diversity, since the managers included in it come from very different backgrounds, different companies and different geographical locations. This diversity has advantages and recreating such a diverse sample could be hard to accomplish and time-consuming. The sample size should have included some of the ties mentioned by these participants, which would have provided some additional information on the networks studied and would have also increased the sample size.

This study is, first of all, limited by the fact that causality cannot be inferred from cross-sectional designs as used here. This study focused on the impact of network characteristics and network types on managerial effectiveness. However, both variables were measured together. The reverse reasoning could also be true: more effective managers may have more opportunities to increase their networks than less effective ones. This may take place if other members of the organization wish to associate with successful managers who are believed to possess greater knowledge, to give better advice, or who are more noticed by superiors and are in some instances in a better position to find the support needed. It may therefore be self-serving for these coworkers to initiate ties with successful



managers. Managerial effectiveness could also have an impact on network characteristics and the types of networks. A true test of causality would however, require a longitudinal approach or an experimental design. The presence of this reverse effect should also be investigated in future research.

The low reliability of the variables used also has to be taken into consideration. However, as stated by Marsden (1993, p. 399) "owing to the design used to collect such data, the reliability of these measures cannot be evaluated with internal consistency methods based on classical test theory". The measurement of most of the variables tested is very subjective. For example, the measurement of the interaction variable is subjective due to the fact that if an individual had frequent interactions with a distant tie in the weeks before completing the survey, he/she could have rated their interactions as being frequent even if they generally were not. The reliability of the interaction variable could possibly have been improved also by comparing ratings given by the managers with ratings their ties would have given. Any individual response on any form of ratings could always be challenged, but averaging out the responses of many people still will give an idea of the trends.

The scope of this study is limited also by the fact that the gender and ethnic composition of these social networks were not examined, although they have been found to have a significant effect on the ease of individuals to integrate in influent social circles (see for example Ibarra, 1992 or Daley, 1996). It has been found, for example, that individuals tend to form heterophilous ties (Ibarra, 1992) and that people from minority groups have not yet acquired status and influence comparable to that of their male counterparts in organizations (Brass, 1985). Moreover, women and minorities are sometimes excluded from one of the most significant components of successful power acquisition – the

development of informal relationships (Brass, 1985). Thus, they may not always receive the valuable information, resources, or support that comes with inclusion in such networks.

In this research, no control was added for organizational variables such as culture, size, geographical region, and so on. This lack of control could have a significant impact in the cases where different organizations have different views on networks, for example, if some companies emphasize individual performance over teamwork. In some organizations knowing people will help career development, whereas in others it may be detrimental to the image projected. Another example stems from the concept of corporate culture. In some companies knowing people and socializing is part of the culture of the organization, individuals who do not take place in this socialization mechanism can be seen as outsiders.

The data used in this study was collected in the manner generally used for personal networks, or ego networks, where the configuration of ties directly involves a single individual within a specified social context. As mentioned previously, Kraimer and Siebert (1998) describe this collection technique in their social networks by stating that data regarding ego networks are usually collected directly from individuals, who are asked to indicate the others within a specified social context with whom they have any specified type of relation. Therefore, the method used to collect the data in this study does not lack validity.

The data was then collected here only from the participating managers and not from other members of their organizations or networks. However, additional data from the ties mentioned by the managers could have added another dimension to the study. The ties could, for instance, have been asked about the nature of their relationship with this manager (the degree of intimacy, the frequency of interaction and so on). This would have made it

possible to corroborate information given by the manager. For instance, in a situation in which a managers might qualify his/her relationship with another tie as purely informational, the tie in question would define it as only friendship-based.

It is important also to note that networks change over time, as does performance. In this study, there was a time lag between the measurement of performance (a few weeks before the training program) and the measurement of networks (during the courses).

When measuring performance, Benchmarks were used (see Appendix 3 for the dimensions tested). However, more emphasis could have been put on evaluating the variables that are most related to network characteristics, for example dimension number eight which is work team orientation, dimension number ten which is building and mending relationships, or even dimension fourteen which is self-awareness. Moreover, other criteria more specific to the network characteristics included in this research could have been tested, such as stress and satisfaction at work, and additional affective dimensions. These additional dimensions could, for example, have justified testing the mediating impact of the friendship dimension.

The differences between the results of the study and Ibarra's 1995 results could be attributable to several factors. In this study, for example, there is little variance between the performance of the managers sampled. All of the managers involved in this study were average to high performers, and no managers were deleted from the sample due to their performance. This is quite different from Ibarra's research, in which the participants from each organization were selected expressly for their high-achieving potential or for their lack of potential, and where great care was taken to obtain perfectly balanced samples. Moreover, Ibarra's method of evaluating managerial effectiveness was not based on a formal

evaluation process such as 360-degree feedback instrument used here, but only on a subjective evaluation made by human resources representatives. Consequently, performance evaluations vary greatly between the two studies. The sampling method used in the present study also differs from by Carroll and al.'s 1996 research which compared two sampling groups: managers and nonmanagers.

### 5.3 - Future research

Network ties, as well as the various tactics that influence the formation of informal social relations at work, deserve more attention. Further research should deal with the specific content of interactions, how they develop and how they affect career development. Understanding how networks can impact some individuals' careers could help employees increase their likeliness of getting promoted as well as help others play a more active role in achieving their career-goals and objectives. Moreover, understanding the whole impact of networks on employees' careers could help companies guide the career-progression of their employees.

Network differences among groups should be investigated, as well as reciprocity rates among actors, and the causes of these disparities (Meyer, 1994). Moreover, as Ibarra (1995) states, few studies have included significant numbers of minority group members. Moreover, there may exist advantages and disadvantages to weak as well as strong network ties (Granovetter, 1982). Research is therefore needed to explore the conditions under which these strong or weak ties provide network benefits or disadvantages and to investigate the optimal combinations of each which would be represented in curvilinear relationships (Brass, 1992). Moreover, as Bell (1990) states, "similar issues are likely to come into play

for racial minorities and majority group members, since network contact with both minorities and majority group members is required to obtain access to social support and instrumental resources”.

Alternative methods, such as data collection by observation, could be used in a future study. Observation could, for instance, be used to collect data. Daily interactions between members of organizations could be observed, and the nature of each interaction determined through interviews. Managers could be asked to list the people with whom they talk during a determined period of time and the frequency of interaction, and their interlocutors could then be asked to do the same. This would make it possible to understand the full extent of the information travelling within a network, as well as its origins.

Finally, the reverse effect hypothesis should be looked at. The present study examined whether certain network dimensions structural characteristics or network characteristics had a significant effect on managerial effectiveness. Future research should determine whether the reverse hypothesis holds true: whether managerial effectiveness can have a significant impact on any of these three network variables.

## **6.0 - SUMMARY AND CONCLUSION**

In conducting this research, three goals were pursued. The first goal was to determine whether the size or the density of networks had a significant impact on managerial effectiveness. The second goal was to see if network dimensions such as information, advice, friendship, career support or cooperation had a significant mediating effect on the relationship between network size and density, and managerial effectiveness. The third was to determine if characteristics of networks, such as rank, frequency of interaction and intimacy, can have a mediating effect on the relationship between the network characteristics size and density, and managerial effectiveness.

Although further research is needed, this study raises doubts as to the impact of network characteristics on managerial effectiveness. Obviously, there is more to effective management than whom you know and what they know. Managerial effectiveness was previously described as the extent to which a manager can achieve the outputs of his/her position. Therefore, effective management encompasses more than the physical composition of a network or the five dimensions tested. Effective managerial work has always been and remains a very complex activity which cannot always be fully explained by these variables.

Nonetheless, social networks remain a crucial factor in any organizational environment. Within their networks, individuals try to influence their positions and to develop specific ties (information, advice and so on) which benefit them and help them reach higher levels of effectiveness. "To the extent that people play an active role in shaping their relationships, a player who knows how to structure a network to provide high opportunity knows who to include in the network" (Burt, 1992, p. 69).

In conclusion, we can see how social networks may help map out persistent patterns of social relationships. Although this study has failed to find a significant relationship between network characteristics and managerial effectiveness or an important mediating impact of network types or tie characteristics on these same two relationships, studying networks remains useful, as it contributes to an understanding of why some individuals perform better than others and how various contacts can affect the development of employees.

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## Appendix 1

## **Consent form to participate in research**

I hereby state that I agree to participate in a program of research being conducted by Marie-Christine Piron of MSc. Management of Concordia University.

### **A. Purpose**

I have been informed that the purpose of the research is to determine whether personal life history and/or work history information can be useful in predicting networks and efficiency of managers.

### **B. Procedures**

You will be sent a questionnaire that comprises a "Name Generator Exercise", which will take approximately one hour to complete. The questionnaire will comprise questions about your network relationships, whereas the "Name Generator Exercise" will ask you to explicitly map out your network ties. Once completed, you should forward it to the Center for Creative Leadership where your name will be removed and replaced with a number. The researcher will not be able to associate any responses with a name, only with a number. This is to ensure your anonymity.

### **C. Conditions of participation**

- I understand that I am free to withdraw my consent and discontinue my participation at any time without negative consequences.
- I understand that my participation in this study is anonymous.
- I understand that the results of this study may be published.
- I understand the purpose of this study and know that there is no hidden motive of which I have not been informed.

**I HAVE CAREFULLY READ THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.**

NAME (please print) \_\_\_\_\_

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

## Appendix 2



## NAME GENERATOR EXERCISE

The purpose of this exercise is to obtain a network composite from each participant. Traditionally, this is done with the help of interviewers. However, in order to incorporate this data collection effort within a training module, a streamlined approach is proposed.

- The trainer will be able to walk the participants through the whole process.
- The number of names generated will be limited to 20 to keep the exercise short.
- The types of relationships recorded will be work-related relationships only. Although this does not preclude discussion of networks that extend beyond work in the training module, I am primarily interest in work relationships.

This report contains:

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1. Instructions to trainers.
2. A copy of the NAME GENERATOR answer sheet.
3. A copy of a transparency to be shown to participants.
4. A brief summary of the feedback that could possibly be computed in a short period of time.

## INSTRUCTION TO TRAINERS

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### Step 1.

The trainer distributes the Name Generator answer sheet to each participant at the beginning of the training module.

### Step 2.

Participants are asked to write their names on the top part of the answer sheet. The participants are told that the information collected is strictly confidential and will be used for training and research purposes.

### Step 3.

The participants are asked to approximate the percentage of minorities in their organization. Since some people will be guessing more than others, a percentage of confidence is also asked.

### Step 4.

The first part of the process consists in generating names. The trainers ask the participants 5 probing questions. The participants need to write down the names in the appropriate space on the answer sheet. They do not have to worry about the other responses on the questionnaire yet; at this point we are only interested in names. The trainer asks participants the following questions:

#### QUESTIONS

##### **(1) Information**

Name people who have been valuable sources of information for you in your job.

##### **(2) Advice**

Name people who are important sources of professional advice, whom you approach if you have a work-related problem or when you want advice on a decision you have to make.

##### **(3) Friendship**

Name people whom you consider to be personal friends, that is, those people you see most frequently for informal social activities such as going out to lunch, dinner, drinks, visiting one another's home, and so on.

##### **(4) Career**

Name people who you feel have contributed most to your professional growth and development. Please include people who have taken an active interest in and concerted action to advance your career.

##### **(5) Cooperation**

Name people whose help, support, or cooperation you have successfully enlisted towards the accomplishment of your objectives.

The trainer should pause between each question and let the participants think and write down the names for each category. If a name comes up for more than one question, ask participants not to write it down again.

### Step 5.

At this point all the names have been collected. This step consists in gathering information about each of the names collected. The trainer should define the categories found on the answer sheet.

#### DIM

Ask participants to circle the dimension(s) that is appropriate for each name that was generated (Circle as many as they feel appropriate).

To help participants categorize their ties with the names that were generated the trainer should put up the overhead with the 5 questions.

**1** Information

**2** Advice

**3** Friendship

**4** Career

**5** Cooperation

**GEND**

Ask participants to code their names by gender:

**M** for male

**F** for female

**ETHN**

Ask participants to code their names by ethnicity:

**W** for white

**B** for Black or African-American

**A** for Asian

**H** for Hispanic

**O** for other

**?** for don't know

#### **RANK**

Ask participants to code their names by rank with the organization:

**A** for those above their level (i.e., direct supervisors, or any other at higher levels)

**P** for those at the same level (i.e., peers)

**B** for those below their level (i.e., direct report, or any other at lower levels)

#### **INTER**

Ask participants to code their names according to their amount of interaction

**D** for daily

**W** for weekly

**M** for monthly

**L** for less than monthly

**?** for do not know

#### **INTIM**

Ask participant to code their name according to the intimacy of the relationship.

**VC** for very close

**C** for close

**LTC** for less than close

**D** for distant

#### **RANGE**

Ask participants to code if pairs of names actually know each other. It is important that this is done for each pair of contacts.

**1** Yes, they do know each other

**0** No, they do not know each other

## FEEDBACK TO PARTICIPANTS

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1. Proportion of African-Americans to whites in each of the five categories.

For example, "the Information ties were 35% African-American and 65% white".

	<b>African Americans</b>	<b>Whites</b>
<b>Information</b>	%	%
<b>Advice</b>	%	%
<b>Friendship</b>	%	%
<b>Career</b>	%	%
<b>Cooperation</b>	%	%

2. Proportion of males to females in each of the five categories broken down by gender.

For example, "the Information ties were 35% male and 65% female for the females in this group, and 65% male and 35% female for the males in this group".

### For male participants

	<b>Males</b>	<b>Females</b>
<b>Information</b>	%	%
<b>Advice</b>	%	%
<b>Friendship</b>	%	%
<b>Career</b>	%	%
<b>Cooperation</b>	%	%

### For female participants

	<b>Males</b>	<b>Females</b>
<b>Information</b>	%	%
<b>Advice</b>	%	%
<b>Friendship</b>	%	%
<b>Career</b>	%	%
<b>Cooperation</b>	%	%

## DIMENSIONS

### **(1) Information**

People who have been valuable sources of information for you in your job.

### **(2) Advice**

People who are important sources of professional advice, whom you approach if you have a work-related problem or when you want advice on a decision you have to make.

### **(3) Friendship**

People whom you consider to be personal friends, that is, those people you see most frequently for informal social activities such as going out to lunch, dinner, drinks, visiting one another's home, and so on.

### **(4) Career**

People who you feel have contributed most to your professional growth and development. Please include people who have taken an active interest in and concerted action to advance your career.

### **(5) Cooperation**

People whose help, support, or cooperation you have successfully enlisted towards the accomplishment of your objectives.

1. Name: \_\_\_\_\_

2. Percentage of minorities in your organization (0-100%): \_\_\_\_\_

3. How confident are you of this estimate: (0-100%): \_\_\_\_\_

4. Percentage of women in your organization (0-100%): \_\_\_\_\_

5. How confident are you of this estimate: (0-100%): \_\_\_\_\_





## Appendix 3

## **Benchmark dimensions**

1. Resourcefulness
2. Doing whatever it takes
3. Being a quick study
4. Decisiveness
5. Leading employees
6. Setting a developmental climate
7. Confronting problem employees
8. Work team orientation
9. Hiring talented staff
10. Building and mending relationships
11. Compassion and sensitivity
12. Straightforwardness and composure
13. Balance between life and work
14. Self-awareness
15. Putting people at ease
16. Acting with flexibility