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**SOCIAL NETWORKS AND THE EMBEDDEDNESS
OF AFFECTIVE ORGANIZATIONAL COMMITMENT**

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A Thesis
In
the John Molson School of Business

Presented in Partial Fulfilment of the Requirements
for the Degree of Master of Science in Administration at
Concordia University
Montreal, Quebec, Canada

March 2002

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0-612-68417-2

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ABSTRACT

Social Networks and The Embeddedness of Affective Organizational Commitment

Jody Engel

Organizations spend millions of dollars every year selecting and recruiting high performing employees. While hiring good employees is an essential part in assuring performance goals and dollar figures, if the company is unable to retain these employees, then they are wasting their time. One of the ways organizations seek to retain their employees is to increase their levels of organizational commitment. If employees are involved in, attached to, and can identify with the organization, this increases their likelihood of remaining with the organization. The present study focused on the impact of the relationships between employees in the organization and their levels of organizational commitment. Using the concept of network analysis, the study examined two measures of commitment: similarity of commitment between individuals and the individuals' amount of commitment. Examining the relationship between network structures and commitment demonstrated three main findings: a) individuals involved in friendship and work relationships have high levels of commitment; b) individuals who are close to and can interact quickly with someone without having to go through other people have high levels of commitment; and c) individuals in homogenous groups have higher levels of commitment than individuals in heterogeneous groups.

Acknowledgements and Dedications

I would like to dedicate this thesis to my family, whose constant and unwavering support made it possible for me to strive to be my best. Their unconditional encouragement throughout both my academic and personal life has been a constant source of motivation to excel at everything I do.

I would like to thank Professor Kai Lamertz for providing me with the incentive to go farther than I ever thought possible. This labour of hard work would never have been accomplished without his constant help, support and insight.

I would like to thank David Lemcovitch for standing by me and reminding me of my strength and ability to get through anything, even a master's degree.

Table of Contents

Introduction.....	1
Organizational Commitment.....	2
Affective Commitment.....	4
Continuance Commitment.....	5
Normative Commitment.....	6
Social Networks.....	8
Social Influence.....	10
Dyads and Multiplexity.....	12
Triads.....	12
Prominence.....	13
Structural Equivalence.....	14
Similarity of Commitment.....	15
Dyads and Social Contagion.....	15
Triads and Group Pressure.....	16
Structural Equivalence and Adaptation.....	16
Individual Level of Analysis.....	20
Prominence.....	20
Multiplexity.....	24
Sample....	26
Data Collection.....	29
Developing Measures for Similarity Analyses.....	30
Independent Variables.....	30
Dependent Variable.....	31
Control Variables.....	32
Developing Measures for Individual Analyses.....	33
Independent Variables.....	33
Dependent Variable.....	36
Control Variables.....	36
Results.....	37
Similarity Data.....	37
Individual Data.....	40
Discussion.....	45

References.....	60
Appendix I.....	67
Appendix II.....	68
Appendix III.....	69
Appendix IV.....	70
Appendix V.....	71
Appendix VI.....	73
Appendix VII.....	74
Appendix VIII.....	75
Appendix IX.....	76

In today's competitive environment, most organizations seek to obtain and maintain high levels of success. While the success of the organization can be determined through various criteria such as profits, market share, etc., the one common theme is that the employees' performance plays a big role in determining how successful the organization will be in reaching its goals and developing a competitive advantage over rival firms (Gatewood and Field, 2001). People are an essential organizational resource and the key to achieving superior performance (Mitchell et al, 2001b). Without hard-working, competent employees, the likelihood of success is greatly diminished.

Since employees play a big role in the organization's success, one of the company's main objectives is to hire the right employees for each job. Having the "right" employees means having the proper people for each job, making sure they have the knowledge, skills, abilities and tools to perform the job, and providing them with appropriate compensation and benefits. One problem is that while organizations spend millions of dollars developing superior selection and recruiting processes, these efforts are futile if the organization is unable to retain the high quality employees they hire. Organizations need to look beyond finding and hiring good employees and focus on how to keep these employees. An important factor contributing to employees' decisions to leave or stay with an organization is organizational commitment.

Whereas organizations once focused on increasing employees' compliance to organizational rules and regulations, employers are now aiming higher by attempting to obtain voluntary organizational commitment from their employees (Storey, 1995; Shepherd and Mathews, 2000). According to Farnham and Pimlott (1990), the aim of employers "no longer appears to be containment and compliance (oriented), but

competence and commitment,” (354). While compliance results in reactive behaviours generated through externally imposed bureaucratic systems, commitment is a result of internalized employee beliefs and trust in the organization. According to Allen and Meyer (1990), employees possessing a strong sense of commitment are those who are least likely to leave the organization. In addition, highly committed employees may perform better than less committed employees (Mowday, Porter and Dublin, 1974). Therefore, emphasis should be placed on developing ways to increase employees’ commitment to the organization.

ORGANIZATIONAL COMMITMENT

Organizational commitment has been defined and redefined many times over the past few decades. Academic research has been both inconsistent and confusing since there is no reliable or specific model of commitment to guide studies (Coopey and Hartley, 1991). The problem is that organizational commitment is a difficult construct to define. Some view this construct as behavioural, while others define it as an attitude.

Mowday et al. (1982) viewed the behavioural approach as the process through which individuals are bound to behavioural acts. This occurs when an individual identifies with a specific behaviour and adjusts his attitude to fit the behaviour (Salancik, 1977). The behavioural approach integrates the concept of Festinger’s (1957) cognitive dissonance, where the behaviour an individual exhibits results in the development of similar attitudes. Individuals strive to match their attitudes to their behaviours to create consistency in their lives. Research into the behavioural approach has focused on identifying conditions under which behaviour tends to be repeated once it occurs, as well

as the effect of such behaviour on attitude change (O'Reilly and Caldwell, 1981).

According to Guest (1987), the behavioural model of commitment has received less attention than the attitude approach because it is less useful in general human resource management policy formulations.

According to the attitude approach, organizational commitment is defined as a psychological state where individuals reflect on the extent to which their goals and values are similar to the goals and values of the organization (Meyer and Allen, 1991, Mowday et al., 1982). The research in this area emphasized identification of the antecedents that contribute to the development of commitment and the behavioural consequences of this commitment (Buchanan, 1974).

As previously mentioned, there are many definitions of organizational commitment. For the purpose of this study, organizational commitment will be conceptualized as an attitude, where individuals develop a psychological attachment to the organization. In order to clarify this concept, the following definitions have been provided. According to Buchanan (1974), organizational commitment is "a partisan, affective attachment to the goals and values of an organization, to one's role in relation to the goals and values, and to the organization for its own sake, apart from its purely instrumental worth," (533). Mowday et al. (1982) defined organizational commitment as the strength of an employee's identification with and involvement in a particular organization characterized by three factors: a) acceptance of and a strong belief in the organizations' values and goals; 2) a willingness to invest considerable effort for the organization; 3) a strong desire to remain in the organization. Going a step further,

commitment is broken down into three types using Meyer and Allen's (1991) three-component framework including affective, continuance and normative commitment.

Affective Commitment

Affective commitment refers to the individual's desire to stay with the organization. This desire stems from the involvement in, emotional attachment to and identification with the individual and the organization. According to Mowday et al. (1982) there are four categories of antecedents of affective commitment: personal characteristics, structural characteristics, job-related characteristics and work experiences.

Personal characteristics involve both demographic and dispositional characteristics. Research has demonstrated that demographic variables such as tenure, age, job, employment status, etc. have correlated positively with commitment (Meyer and Allen, 1991; Steer, 1977). However the relationship has not been found to be strong or consistent. Personal dispositions such as need for achievement, affiliation, autonomy, locus of control, etc. have been found to correlate modestly with commitment, which suggests that personality differences between employees may lead some to be more predisposed to become affectively committed to the organization (Mowday et al., 1982). According to Meyer and Allen (1991), the impact of structural characteristics on commitment is unclear. Since most of the research collected has focused on the individual rather than organizational level of analysis, it is unclear whether the effect of structural characteristics has been mediated by the employees' work experiences. Finally, work experience has been split into two categories: comfort-related experiences and competence-related experiences. Comfort-related experiences that have been found to correlate positively with affective commitment include organizational dependability

(Buchanan, 1974) and organizational support (Eisenberger et al, 1986). Competence-related experiences affecting affective commitment include job challenge (Buchanan, 1974) and personal importance to the organization (Steers, 1977). Employees whose experiences in the organization satisfy their basic needs and are consistent with their expectations are more likely to develop stronger affective commitment (Meyer and Allen, 1991).

Continuance Commitment

Continuance commitment, also referred to as calculative commitment, concerns individuals remaining with the organization because they feel they need to. This type of commitment often results from individuals feeling that they have invested in the organization and therefore remain in order to avoid losing their investment. Kanter (1968) defined cognitive-continuance commitment as the profit associated with remaining and the costs associated with leaving the organization. There are two antecedents of continuance commitment: the number and/or magnitude of side bets (or investments) and the availability of alternatives.

The number/magnitude of side bets refers to the amount of investment the employee has made in the organization. Employees who have made many side bets such as status, or have invested a lot of time in the organization are more likely to feel the need to remain with the organization to avoid losing what they've already attained. In addition, employees who lack alternative employment options are likely to feel committed to the organization (Meyer and Allen, 1991).

Normative Commitment

Normative commitment involves individuals remaining with the organization because they feel they ought to. Individuals attach themselves to one organization because they believe that is proper behaviour (Weiner, 1982). This component taps individuals' loyalty and obligation to stay with the organization, remaining because they feel it is the moral or right thing to do, as opposed to staying because they want to or need to. There are two antecedents of normative commitment: individuals' experiences prior to entry and experiences following entry. Experiences prior to entry include familial and cultural socializations. Experiences following entry are attributable to organizational socialization, specifically exchanges such as perceived organizational support where the organization gives to the employee and the employee feels obligated to give back to the organization.

It is in the organization's best interest to increase employees' affective commitment since this component has demonstrated the strongest positive correlation with desirable work behaviour (Allen and Meyer, 1996; Meyer and Smith, 2000; Meyer and Allen, 1997). Employees who want to be involved (affective commitment) may be more likely than those who need to be involved (continuance commitment) and those who feel obligated to be involved (normative commitment) to give their time and effort to the organization. Shore et al. (1995) found that employees who are perceived to be affectively committed (willing to work hard, internalize organization's goals) are more likely to be perceived as having high potential.

Continuance commitment is the component organizations should spend the least time and effort cultivating. Remaining with an organization out of need rather than desire

or even obligation may diminish the employees' motivation to work hard (Allen and Meyer, 1990). Shore and Wayne (1993) found that continuance commitment was associated with lower levels of organizational citizenship behaviour, indicating that employees who feel bound to their organization because of accumulation of side bets or investments are less likely to engage in behaviours outside their job roles that help support overall organizational goals. In addition, individuals who are perceived to have continuance commitment are less likely to be given career development rewards than those perceived to have affective commitment since it is believed they are staying with the organization because of accumulation of side bets such as pension, status, accumulation of holidays, etc. (Allen et al., 1994), rather than a desire to remain.

In addition to affective commitment, organizations may seek to increase normative commitment since individuals who feel obligated to stay or develop a sense of loyalty towards the organization may also feel obligated to work hard. While normative commitment may lead to positive organizational outcomes, it is in the organization's best interest to discover ways to increase employees' levels of affective commitment (Meyer and Smith, 2000).

These three commitments are viewed as components rather than mutually exclusive types, allowing individuals to experience varying degrees of each. According to Meyer and Allen (1991), the rationale behind using these three components is that they each conceptualize commitment as a psychological state that both categorizes the individuals' relationships with the organization and affects their decisions to continue or discontinue membership in the organization. However, since affective commitment has

been found to have the strongest correlation with desired work behaviour, the present study will focus only on affective rather than continuance or normative commitment.

As previously illustrated, organizational commitment has often been characterized as an attitude. According to Erickson (1988), “attitudes are made, maintained, or modified primarily through interpersonal processes,” (99). Attitudes such as commitment do not exist in a vacuum. Erickson (1988) gave an example of college students who have more interactions with students on their own campus than with students from other campuses. Because of these increased interactions, student attitudes tend to be generated independently on each campus. Granovetter (1985) has argued that being embedded within concrete personal relationships and structures or “networks” are important for generating trust and discouraging counterproductive behaviours. Therefore, interpersonal interactions that occur within a bounded context influence attitudes.

According to Organ (1988), employees interact with other members of their organization and these interactions evolve into relationships. Since employees within organizations spend considerable amounts of time interacting with one another, attitude formation within an organization is influenced by the social context in which employees are bounded. Hence, since our attitudes should not be independent, but influenced by our social networks, it would be worthwhile to examine how these networks affect individuals’ perceptions of organizational commitment.

SOCIAL NETWORKS

A network is a set of ties, or relationships, among individuals or organizations. A tie is composed of both content and form (Powell & Smith-Doerr, 1994). Every social

interaction exists as a tie. While the organizational structure examines formal reporting relationships, network analysis focuses on the informal relationships. Informal networks include advice, friendship, communication, work, etc., relationships that exist outside of the formal hierarchical relationships that are dictated by the organization's structure. Examining the informal structures provides insight as to how employees communicate.

The strength of a tie is a combination of the amount of time, emotional intensity, intimacy, and reciprocal services characterizing the tie (Granovetter, 1973). It is hypothesized that the stronger the tie between two people, the more similar they are. According to Granovetter (1982), weak ties serve as a crucial bridge between two densely knit groups.

Whether formal or informal, strong or weak, these patterns of social relations provide the structural context through which individuals have access to others' information, influence and behaviour (Rice and Aydin, 1991). Rather than examining organizational commitment from the perspective of the independent individual, consideration of the larger impact of the social networks in which employees are rooted can be informative. The connections we have with others may help to cultivate employees' organizational commitment.

Individuals are embedded in concrete, ongoing systems of social relations (Granovetter, 1985). Being embedded means being part of the network, being involved and connected to other individuals within the network. Embeddedness refers to being involved in relationships. Powell (1990) argued that being embedded within a network shifts the focus from pursuing immediate economic gains to enhancing relationships through trust and reciprocity. Ongoing social ties shape the expectations and

opportunities of employees, while the content and structure of the tie affects the employees' levels of embeddedness (Uzzi, 1996). Therefore, many decisions and actions are made within the context of a social system, creating a degree of interdependence among individuals. Since individuals are interdependent, being embedded in these networks may leave individuals susceptible to the effects of social influence.

According to Wellman (1983), people develop shared attitudes through social networks, or patterns of relationships. Individuals have the opportunity to exchange information, develop similar attitudes, and experience each other's behaviours when involved in relationships within a network (Rice and Aydin, 1991; Hackman, 1983). Since networks provide these opportunities, the present study aims to examine how network relationships affect individuals' attitudes towards commitment. The study will first examine the dyadic level where the interest lies in determining the amount of similarity (e.g. agreement) of commitment between two individuals. The second part will focus on the individual level of commitment, examining the impact of different network positions on individuals' amounts of commitment.

Social Influence

The effect of social influences on employee perceptions and attitudes has been defined by Salancik and Pfeffer (1978) as the social information processing model. This model claims that the social environment can provide cues that: characterize individuals' work environments, define the importance of various dimensions (ie. autonomy versus variety of skill), evaluate the work environment on various dimensions, and provide direct evaluation of the individuals' work setting. This model was built on the argument made by Festinger (1954), who claimed that in situations where judgments are important

but difficult to make because physical evidence is non-existent or ambiguous, individuals are motivated to communicate with others to arrive at socially acceptable interpretations of events and their meanings. Therefore, social information provides us with guidelines to interpret situations and to handle them in socially acceptable ways.

While social influence can affect an individual's attitudes, there are various ways in which this influence can be manifested. As previously mentioned there are different types of form and content of social networks. Form refers to the structure of the network, while content refers to the different types of relationships that exist between individuals such as advice, friendship, communication, and work relationships. In order to determine the impact of social influence, an examination of different network concepts is in order. For the purpose of this study, the following concepts will be discussed: dyads, multiplexity, triads, prominence and structural equivalence.

When examining network structures it is important to determine the level of analysis that is being used. The level of analysis refers to the subset of actors being examined in the network structure and the interactions between these actors. There are many different levels: individuals, dyads, triads, subgroups, groups, etc. The level of analysis is determined based on the interest of the study. For example, if a researcher's focus were at the micro level, the unit of analysis would most likely be the dyad (examining pairs of individuals), while if the focus were at the macro level, the unit of analysis would most likely be a group (such as examining an organization). For the purpose of this study, both the individual actor and the similarity between two actors will be examined.

Dyads and Multiplexity

The dyad is a link or relationship that establishes a tie between a pair of actors. Analysis of a dyad focuses on the properties of the relationship between the pair of actors. In most cases, the types of relationships that exist between individuals have more than one content, making the relationship multiplex. The relationship between two individuals is multiplex to the extent that there is more than one type of relation between the first individual and the second (Burt, 1982). For example, two employees who consider each other friends and colleagues have a multiplex relationship because they have both friendship and work-related ties. According to Mitchell (1969), people who are bound together by multiplex ties are more securely bound to each other.

Triads

The next level of analysis is called the triad, which is more complex than the dyad. The triad focuses on a subset of three actors and the links between them. While at first glance the difference between dyads and triads may be obvious, the distinctions go beyond the simple variation in the number of individuals being examined. According to Simmel (1950), the difference between dyads and triads is one of quality, dynamics and stability. Dyads preserve the individuality of both individuals more than triads because there can be no majority within a dyad. In a triad two individuals can outvote the third individual, creating the potential to suppress personal interests. Individuals within a dyad have more bargaining power than individuals in a triad because when dealing with only one other partner, each partner may have equal weight in the relationship. Finally, conflict is more easily managed and resolved in a triad because even in situations with two opposing partners, the third partner can act as a mediator. Individuals within a triad

are less free and independent and therefore are more constrained than individuals in a dyad (Krackhardt, 1999).

The basis of network analysis is the interaction between two actors. Hence, the dyad serves as the foundation for network analysis. Going a step further, triads serve as a more in-depth measure of network involvement. While dyads and triads are important network concepts, equally important is the concept of positions. Individuals within a network can occupy different positions that can affect their attitudes. Two of these positional concepts will be discussed in the next sections, specifically prominence and structural equivalence.

Prominence

Prominence is an individual position and refers to how important an employee is within the social network. Employees who are prominent are most often strategically located within the network, being extensively involved in relationships with other individuals (Wasserman and Faust, 1994). Therefore, an employee who is prominent will be highly embedded within the network. The employees' prominence is a characteristic of the patterns of relationships that defines their positions within the network. There are two aspects of prominence: centrality and prestige.

Centrality refers to individuals who are involved in the network through both sending and receiving ties. This involvement makes the employees more visible to other employees within the network. In centrality, emphasis is placed on being involved in relationships rather than being the sender or receiver of the relationship (Knoke and Burt, 1983). Prestige is concerned with being the object of extensive relationships from others.

Being prestigious requires an asymmetry in relationships where others frequently choose the highly prestigious person.

Structural Equivalence

Structural equivalence differs from prominence in that it examines the similarity of positions of two individuals. Thus it involves a dyadic analysis. Structural equivalence pertains to individuals who are connected to and disconnected from the exact same individuals in the network (Johanson, 2000). When two individuals have connections to the same people, they are interchangeable (Johanson, 2000; Marsden and Laumann, 1984). For instance, referring to Appendix I, in Figure 1, individuals D and E are each connected to three individuals, however, they are not structurally equivalent because they are not connected to the same individuals. On the other hand, in Figure 2, individuals D and E are considered structurally equivalent since they are connected to the same three individuals. People occupying structurally equivalent positions will have similar role expectations and obligations (Burt, 1980). Therefore, individuals who are in structurally equivalent positions adapt to similar social demands and expectations, increasing the similarity of their opinions.

Social network analysis encompasses many different structures that can impact commitment. According to the analysis of the dependent variable commitment, the above network concepts have been categorized into two groups: similarity of commitment and individual level of commitment. *Similarity of commitment* measures the extent to which individuals in similar social structures have similar levels of commitment because they are exposed to the same social influences. Specifically, this study aims to examine

whether influence exists in different structural forms such as dyads, triads and structurally equivalent positions.

The individual level of commitment category examines how prominence and multiplexity affect levels of commitment. Rather than examine the impact of social influence, this category focuses on how commitment levels can be influenced by the patterns of relationships. Specifically this category examines how being involved in relationships, being the object of other people's ties, and the extent to which a relationship has more than one content impacts organizational commitment.

SIMILARITY OF COMMITMENT

While social influence connects communication networks and employee perceptions (Johanson, 2000), according to Meyer (1994), there has been a lack of specification of the sources and mechanisms through which social influence occurs. Johanson (2000) has attempted to rectify this deficit by identifying three sources of social influences: contagion, group pressure and adaptation.

Dyads and Social Contagion

The process through which the patterns of social relationships influence the attitudes and behaviors of an individual is called social contagion (Meyer, 1994; Hartman and Johnson, 1989). Social contagion is often driven by the need to reduce uncertainty among individuals who are proximate to one another in the social structure (Hartman and Johnson, 1989). According to Johanson (2000), direct contact, occurring in dyads represents the best conceptualization of social contagion because direct contact between two individuals is the minimum condition under which social contagion can occur. The

assumption is that when two individuals interact, they begin to develop similar perceptions. The weakness of focusing on direct contact alone is that the influences of other interactions within the organization are not taken into consideration. Since employees interact with many people, examining the impact of dyadic relationships alone is only looking at part of the picture.

Triads and Group Pressure

Group pressure refers to the impact of social influence within a cohesive group. A cohesive group requires a minimum of three individuals, which forms a triad (Wasserman and Faust, 1994). The group, often referred to as a clique, has been defined as a set of individuals where every possible pair of individuals are directly connected to one another and this set is not involved in any other clique (Scott, 1991). While there is no limit to the number of individuals involved in a clique, for reasons of simplicity, cohesive groups will be classified as a triad of three individuals.

Structural Equivalence and Adaptation

The final source of social influence discussed by Johanson (2000) is the concept of adaptation. The term adaptation refers to individuals who are in structurally equivalent positions adapting to similar social demands and expectations by others, thereby increasing the similarity of their opinions.

Johanson (2000) examined two aspects of social influence. The first part focused on the impact of social influence on opinions of one's work versus opinions of the organization, while the second portion focused on the impact of the three sources of social influence (contagion, group pressure, and adaptation) on employees' similarities of opinions. The results from the study demonstrated that employees' opinions of the

organization were more susceptible to social influence than opinions of one's work. In terms of the sources of social influence, it was found that structural equivalence was a stronger mechanism of social influence than both group pressure and direct contagion. While direct contact relationships were found to be a prominent mechanism for explaining similarities of job-related opinions, group pressure was not found to be a source of attitude similarity.

Although Johanson (2000) found that group pressure did not influence attitude similarity, Meyer (1994) discovered different results. In a study performed by Meyer (1994), individuals involved in a clique and direct contact dyadic relationships demonstrated similarity of perceptions. Meyer found that individuals in a dyadic relationship showed similarity on two dependent measures: similar perceptions of the analysis dimension of technology and role conflict. Individuals in a group affiliation (such as a triad) demonstrated similarity on four dependent variables: similar perception of the analysis dimension of technology, the exceptions (task variety) dimension of technology, role conflict and coordination.

The present study aims to determine whether the social influence experienced through involvement in dyad and triad relationships will increase individuals levels of similarity of organizational commitment consistent with Meyer's (1994) findings for similarities of perceptions and attitudes regarding technology and conflict. According to Erickson (1988), the more frequently individuals within a dyad interact, the more opportunity they have to correctly interpret one another's attitudes. By comparing attitudes, each individual has the opportunity to adjust his/her attitude to match the attitude of the other person, making their attitudes more similar. Therefore, being

involved in many dyad or triad relationships gives people the opportunity to compare their opinions with others, increasing the likelihood of social influence.

Research has demonstrated that the social context of networks influences individuals' attitudes and behaviors (Salancik and Pfeffer 1978, Meyer, 1994; Hartman and Johnson, 1989). Since affective commitment is considered an attitude involving an emotional attachment to, identification with, and involvement in the organization (Meyer and Allen, 1991), it is proposed that individuals involved in dyads will have similar levels of organizational commitment.

Hypothesis 1: Individuals involved in dyads will have similar levels of organizational commitment.

According to Simmel (1950), individuals involved in triads have less individuality, more potential to suppress personal interests and less bargaining power than individuals in dyads. In addition, individuals within a clique tend to be more densely tied to one another than to other people in an entire network (Erickson, 1988), increasing the likelihood of identification and emotional attachment with one another. These findings support the notion that individuals involved in triads may be reasonably susceptible to social influences since they are constrained by their environment and thereby likely to be influenced.

Hypothesis 2: Individuals involved in triads will have similar levels of organizational commitment.

While examining social influence in dyads and triads can shed light on the impact of social influence, this study aims to go one step deeper and examine whether individuals involved in structurally equivalent relationships experience similar levels of social influence.

As previously mentioned, individuals who are structurally equivalent are tied to the exact same other individuals. The purpose of examining this concept is to determine if people who are tied to the same individuals will have identical or different levels of social influence. According to Burt (1978), structurally equivalent individuals are likely to have similar attitudes since they tend to interact with the same people in the same way. Hartman and Johnson (1989) focused on the pressure structurally equivalent individuals experience. Since individuals in structurally equivalent positions are usually the focus of similar information, requests and demands from the individuals they are connected to, this can create an information field in which they become embedded, creating increased pressure to conform to the opinion of others. Therefore, due to the similar experiences and the pressures to conform, it is hypothesized that structurally equivalent individuals will have similar levels of organizational commitment.

Hypothesis 3: Individuals who are structurally equivalent will have similar levels of organizational commitment.

INDIVIDUAL LEVEL OF COMMITMENT

While it is important to measure the degree of attitude similarity for different forms of relationships, the present study also aims to examine the impact of different patterns of ties on individuals' levels of organizational commitment. Two concepts will be examined: prominence and multiplexity.

When examining a network, in essence you are examining how embedded an individual is in the network. When embedded, individuals become part of the network by being involved and connected to others within the network. An employee who interacts with ten people will be considered more involved within the network than an employee who interacts with only five people. When highly embedded within the network, the employee is in a prominent position where he is connected to many people within the social network. Employees who are more prominent engage in more communication, friendship, advice, work, etc., relationships than employees who are less prominent.

Prominence

As previously mentioned, there are two types of prominence: prestige and centrality. Prestige refers to being the object of other people's relationships, receiving ties from others. Centrality refers to the extent of involvement in relationships regardless of whether the individual is the sender or the receiver of ties. Figure 3 in Appendix II demonstrates the difference between prestige and centrality. Individual D is prestigious because he receives ties from three others. Individual E is central because he is connected to three other individuals but has different connections with each individual. He receives a tie from A, has a reciprocal relationship with B and sends a tie to individual C. Therefore, while D and E are connected to the same individuals, they have different

connection making D prestigious because he is the object of others' ties and E central because he is involved with others regardless of the direction of his ties. There are four types of centrality: degree, betweenness and closeness (Freeman, 1979), and eigenvector (Mizruchi, et al., 1986).

Degree centrality pertains to a count of the number of ties an individual has, meaning the number of people the individual is in contact with. Thus, employees with the highest degree centrality are connected to the most people in the organization. An employee's degree is an important indication of the potential for communication activity.

Betweenness centrality focuses on the rate at which an individual falls between other individuals. Specifically, betweenness refers to how often an individual serves as the shortest path connecting other individuals together; therefore being the person that people must go to in order to reach others. A path delineates the sequence of people tied to one another in the network and allows researchers to calculate the distance between people in the network. It is important to note that an individual who has a high level of betweenness has the potential to have high levels of control over resources and information. For example, if an employee needs to go through two other employees in order to reach the manager, then the middle employees may have control over the interaction since they block the direct path to the manager. The employees in the middle have greater interpersonal influence (Wasserman and Faust, 1994).

Closeness centrality measures how close an individual is to the other individuals within the network. Individuals are considered to have high levels of closeness when they can quickly interact with others. Closeness has been linked to the idea of minimum distance such that individuals with high levels of closeness will have the shortest path

between themselves and others. Closeness is inversely related to distance: the greater the distance, the lower the closeness centrality (Wasserman and Faust, 1994). In this type of centrality, individuals do not need to go through others to get to one another, which avoids the potential of being controlled by others. If an individual has a high level of closeness centrality, then there is less dependence on others to relay messages or information (Freeman, 1979).

Eigenvector centrality refers to the extent to which an individual is central because of the ties the individual maintains. Therefore, someone can be central through association because they are connected to someone who is highly central. In fact, individuals can be highly central with only a few ties if the people with whom they are connected to are highly central within the network. An individual can be the central person, which Mizruchi et al. (1986) refer to as the hub, or the bridge that connects to a central person. In this case, centrality is “a function of the centrality of the units to which the unit is tied, the intensity of these ties, and the absolute number of ties,” (45). In this case, centrality is a combination of the actors’ own centrality and that of others.

The concept of prominence illustrates the importance of being in a pivotal position, of being highly involved within the social network. Centrality focuses on the idea of individuals being both the senders and receivers of ties, providing an opportunity to maintain many ties. Prestige refers to being the object of others’ relationships, of being frequently chosen by others. Individuals who are prominent are embedded in the network and become part of the organizational environment (Mitchell, et al., 2001). Hence, these individuals become more involved with others who are part of the organizational environment, and become part of the environment themselves. Therefore, being

prominent allows for more involvement in the environment of the organization leading to increased attachment to the organization itself.

Porter and his colleagues (Mowday, Steers and Porter, 1979; Porter, Steers, Mowday and Boulian, 1974) defined commitment as the strength of an individual's involvement in and identification with an organization. Identification results in a psychological attachment to an individual, group, or organization, when an individual respects the other's values and accomplishments without adopting them as his own (Kagan, 1958; Kelman, 1958). Identification is based on a desire for affiliation. Employees who identify with their organization have self-images that represent the organization's image and values (Cheney, 1983). Identification leads employees to make decisions that are in the best interest of the organization (Simon, 1976). Since identification results in an increased psychological attachment, it is proposed that employees who are prominent will have high levels of organizational commitment.

Hypothesis 4: Individuals who are highly central will have high levels of organizational commitment.

Hypothesis 5: Individuals who are highly prestigious will have high levels of organizational commitment.

Individuals who are highly central can have high degree, betweenness, closeness or eigenvector centrality. While the differences between these types of centrality have been discussed, one issue that has yet to be addressed is whether these centralities differ in their effect on organizational commitment. Would an individual who

has high degree centrality have a different level of organizational commitment versus an individual who has a high betweenness, closeness or eigenvector centrality? Hence, is there a difference in organizational commitment between individuals who either a) have a high number of ties; b) often serve as the shortest path connecting others together; c) can quickly interact with others; or d) are central through their associations to others in the network.

Question 1: Do degree, betweenness, closeness and eigenvector centrality each generate different levels of organizational commitment?

After examining the impact of prestige and centrality on organizational commitment, the next step is to investigate how different types of relationships affect organizational commitment. There are many different types of relationships such as friendship, communication, advice, work, support, etc. The following section addresses the impact of different combinations of ties on organizational commitment, specifically examining the effect of having multiplex ties with people.

Multiplexity

Due to restricted time and resources, the ego has limited opportunities to form ties and therefore often relies on the same ties for multiple content (e.g., friendship, task-related advice, support) (Podolny and Baron, 1997). Maintaining multiplex ties can lead to a strong connection to the organization because of the multiple connections that exist with others. With only a finite amount of time and effort available, there are restrictions to the number of strong ties an individual can maintain at one time. The stronger the tie with a person, the more time and energy is invested in the relationship. In Hansen's

(1999) study of the search-transfer problem, he found teams with strong interunit ties end up spending a significant portion of time helping other teams rather than completing their own tasks.

According to Eisenberg et al. (1983), network involvement is defined as the extent to which individuals establish and maintain direct and/or indirect communication relationships with individuals in the organization. Therefore, since individuals with multiplex ties both establish and maintain multiple relationships with people, they are highly embedded within the network. Hence, individuals who are involved in multiplex relationships are more tightly bound within the social network of the organization and may be more likely to feel as though they have invested themselves in the organization. Consequently, it is hypothesized that the more contents that exist within relationships, the greater the level of organizational commitment.

Hypothesis 6: Individuals involved in relationships that have higher degrees of multiplexity will have higher levels of organizational commitment.

In addition to examining the amount of multiplexity, it is also important to study the different combinations of content that exist. Since individuals can have relationships consisting of various contents, perhaps different combinations of content can breed different levels of organizational commitment. For instance, an employee who is central in the advice work network but an isolate in the friendship network may have lower organizational commitment than an employee who is central in the friendship network but an isolate in the work network. A study by Stephenson and Lewin (1996) found that an employee who was central in the work network but more isolated in the informal

communication network would most likely burnout, grow frustrated and leave the organization. Therefore, looking at network consisting of advice, friendship, communication, and work can yield different combinations of relationships such as friendship and advice, friendship and talk, advice and work, etc. Examining these combinations of relationships will indicate whether different types of multiplex relationships yield different levels of organizational commitment.

Question 2: Will different combinations of multiplex relationships yield different levels of organizational commitment?

SAMPLE

In order to test the above hypotheses, the data used for this study came from a pre-existing dataset that was part of a larger study conducted by Dr. Kai Lamertz between 1996-1998 to complete his doctoral dissertation at University of Toronto. The data were collected from a telecommunications company in Ontario, Canada. The data consist of a sample of 8 different work groups, situated in four different sites. Each work site contained two work groups. Out of the 138 individuals that were surveyed, 120 returned complete and usable data, which results in an overall response rate of 87%. There was one group of 8 employees, one of 15, two of 16, one of 17, two of 19, and one of 28. The lowest response rate was in the large group (78%), and two groups provided a 100% response rate. The sample was composed of 78% women, 75% were Caucasian, and 62% were full-time employees. The average age of the participants was 36.3 years of age and the average length of tenure was 78.2 months.

Of the 8 work groups examined, four groups were operators and four groups were designers. The operators consisted of two cable dispatcher groups and two repair answer groups. The designers included two network planning and implementation groups and two network provisioning and development groups.

The cable dispatch groups, referred to as OC4 and OC5 were responsible for assessing and distributing work orders for underground cable repair to field technicians. OC4 had two senior associates and 17 regular associates while OC5 had one senior associate and 15 regular associates.

The repair answer department was responsible for handling customer complaints and ensuring their resolution. The first group, the Service Team for Assurance Resolution (referred to as STAR Desk) was responsible for handling customer complaints requiring quick and determined action for resolution. Two members permanently dealt with business customer complaints, while 14 dealt with residential customer complaints and rotated through other assignments. The second group in the repair answer department was the Features and Records group, referred to as FR. The 14 employees in this group performed assignments involving the instalment and/or repair of specific telephone services for external customers.

The remaining four groups consisted of designers who were responsible for designing telecommunications systems and circuits that were used to transmit different types of information and data. People within these groups did not interact with external customers and spent most of their time working in front of the computer terminal.

The two Network Planning and Implementation groups (NP1 and NP2) worked on designing the basic building blocks of a telecommunications system. Specifically,

these groups focused on fibre optic cable trunks and systems that enabled data and information transfer. Both groups were formed from an amalgamation of two design functions and had been together for approximately two years at the time of data collection. The NP1 group included 16 regular employees and three senior associates, while the NP2 group was comprised of 10 regular employees and five senior associates.

The Network Provisioning and Development groups (ND1 and ND2) performed network design at a higher level than the previous two groups. These groups designed telecommunications systems and circuits that created connections for individual end-users lines, linking them to the main switching station and then to another locale. The ND1 group consisted of only 9 individuals including the manager and two senior associates, while four years prior there had been over 20 people in this group. The ND2 group consisted of 28 individuals including a manager and a senior associate.

It is important to mention that during the collection of the data, the company was going through the process of downsizing. While the operators were now beginning to feel the impact of the downsizing, the designers had already been affected. In the past, dispatch control centres were distributed within different regions throughout the province, however over the past few years, the cable dispatch function had become centralized. Several employees, particularly in the STAR group perceived managerial support throughout the downsizing as inadequate and apathetic. Both the STAR group and the FR group lost members of their group through transfer of people to other departments. The designers had already undergone several rearrangements in both work and people due to the reduction in the division of labour in the organization and due to the long-term downsizing agenda.

DATA COLLECTION

Data were collected on network relations, commitment and demographic variables. Network data was collected for relations within each group using a recognition-based sociometric questionnaire (Blau, 1955; Marsden, 1990). The recognition-based questionnaire consists of participants being presented with a list of names including all of the people who are part of the participants' social network and choosing the appropriate name(s) when answering several questions such as: do you go to this person for advice?

While research has demonstrated the use of different forms of network relationships (Podolny and Baron, 1997; Stephenson and Lewin, 1996), the constant theme has been the focus on relationships based on emotional attachment (e.g. friend) and relationships based on professional requirements (e.g. work). Ibarra (1992) focused on the difference between expressive and instrumental networks. Expressive networks consist of ties that provide support, friendship and trust, while instrumental networks involve ties that provide access to resources such as information, advice, job-related resources. In order to tap into these two types of network relationships, four network relations were chosen: advice, friendship, communication and work networks. The advice network pertained to individuals who the participant would "go to for advice about work." The friendship network involved individuals who the participant considered "is a close personal friend." The communication network involved individuals who the participant would "talk to about things going on at the company." The work referred to individuals who the participant would "work with most often to get the job done." Choosing these four networks allows the researcher to gain information on the impact of

commitment within emotional attachment relationships such as friendships and communication as well as professional relationships such as work and advice.

The dependent variable commitment was measured using Allen and Meyer's (1990) affective commitment scale (Appendix III). The scale consists of seven items measuring the participants' levels of attachment to and involvement in the organization. Finally, demographic information such as age, sex, tenure, education, employment status, race, and job was collected.

DEVELOPING MEASURES FOR SIMILARITY ANALYSIS

Each of the computations described below was performed for each of the four networks within each of the eight groups.

Independent Variables

The first three hypotheses required analyzing similarities of attitudes regarding commitment. In order to measure these hypotheses, variables were created using UCINET (Borgatti, Everett, and Freeman, 1999). UCINET is a network analysis program that computes network variables using dyadic data. Hypothesis 1 required examining similarity of commitment of individuals involved in a dyad. Dyads were measured using both the raw data from the sociometric questionnaire and converting the raw data into two symmetrized datasets.

The raw data was symmetrized using both the maximum and minimum rules. When data is symmetrized using the minimum rule, a relationship exists between two individuals only if they both agree. Therefore, if one individual claims to have a relationship with someone but the other person says that no relationship exists; it cannot

be counted as a relationship. Symmetrizing using the maximum rule allows for a relationship to exist as long as one person says it does. Therefore in this situation, there doesn't need to be agreement on the existence of the relationship. The purpose of symmetrizing the data is to match people's responses about their relationships with one another. Once the datasets are symmetrized by either the maximum or minimum rule, there is equality between individuals regarding their relationships to each other. Therefore both persons A and B have the same relationships to each other.

For Hypothesis 2, triads were computed from dyadic data. In order to operationalize triads at the level of dyads, the clique algorithm was used (Krackhardt, 1999; Meyer, 1994, Johanson, 2000). This analysis gives information on the number of times each pair of actors is in the same clique.

Hypothesis 3 focused on the concept of structural equivalence. This hypothesis measures the similarity of positions between two individuals. In order to develop variables to measure this hypothesis, structural equivalence was computed for the actors in the network using both Euclidean distance and Correlation measures. When using Euclidean distance, the higher the number in the matrix, the greater the dissimilarity of the positions between two people. For Correlation measures, the higher the number, the greater the similarity of the positions between two people.

Dependent Variable

Since the independent variables were in the form of matrices, the correlation and regression analyses needed to be computed in UCINET. There were seven separate items for the dependent variable commitment. The reliability among the items was Crohnbach's coefficient of 0.84, which was considerably high, allowing the researcher to combine the

items into one commitment variable. The commitment variable was then imported into UCINET using the absolute difference rule. Absolute difference gives the degree of difference that exists between two people such that if two people have the same level of commitment the number was 0. The greater the difference between two people's levels of commitment, the greater the number was. Absolute difference provides a proper calculation of the degree of agreement or disagreement between two individuals. It is important to note that for the similarity data, the commitment variable is a measure of the participants' differences in their levels of commitment, rather than a measure of similarity of commitment. Therefore, for most of the computations, the hypotheses predict a negative relationship. For example, it is expected that individuals involved in dyadic relationships will have lower levels of dissimilarity.

Control Variables

The demographic variables included age, sex, tenure, education, job title (associate, senior associate and specialist), work assignment, race and employment status. As with commitment, each of these variables needed to be converted into UCINET. Age and tenure were converted using the absolute difference measure because it was informative to know the degree of differences that existed between two individuals for these variables. The remaining variables were categorical, hence, since it was only relevant to determine whether a difference exists, rather than the degree of difference, thus they were converted using exact matches. This technique gives a 0 when two people are different on a particular variable and a 1 if they are the same. Out of all the control variables, only education, job, and tenure correlated significantly with commitment (please refer to Table 1). Previous research has linked commitment with age and

employment status (Meyer and Allen, 1991; Steers, 1977). While age did not correlate significantly with commitment, it did correlate significantly with tenure within the Star group ($r = 0.84$, $p < 0.05$). Since tenure and age were correlated with one another, employment status was the only additional variable to be included as a control variable. Therefore, the control variables used for the analyses for the first three hypotheses were: tenure, job, education and employment status.

Table 1. Significant Correlations between Commitment and Control Variables.

	FR	ND1	ND2	NP1	NP2	OC4	OC5	STAR
<u>Commitment</u>	Education (0.12)	Tenure (0.68)			Job (0.14)			Education (0.14)
	Tenure (0.37)							

DEVELOPING MEASURES FOR INDIVIDUAL LEVEL ANALYSIS

Independent Variables

The remaining five hypotheses focus on the individual level of commitment rather than the similarity between two people. As opposed to the previous hypotheses, the correlation and regression analyses were not performed in UCINET. Rather the variables created in UCINET were transferred to Excel and SPSS spreadsheets.

Hypotheses 4 and 5 as well as Question 1 focused on the concept of prominence, specifically centrality and prestige. In order to evaluate these hypotheses, measures such as degree, betweenness, closeness and eigenvector were computed. There were three datasets from which the degree, betweenness, closeness and eigenvector centrality were computed: raw, maximum symmetrized and minimum symmetrized data.

When computing degree centrality from the raw data, which is not symmetric, two measures were computed: indegree and outdegree. Indegree measures the number of

ties that are received by the actor and outdegree measures the number of ties the actor sends to others. Since the data for both the maximum and minimum datasets were symmetric, there were no separate indegree and outdegree measures, only one degree measure. For betweenness centrality, the raw and symmetrized datasets each had one measure. With the closeness raw dataset, there were two measures recorded of in closeness and out closeness, while the symmetrized datasets had only one closeness column. In closeness refers to how close you are to others, based on incoming ties (the ties you receive from others). Out closeness refers to how close you are to others, based on outgoing ties (the ties you send to others). Eigenvector was computed with only the maximum and minimum symmetrized datasets, each of which had only one measure.

Hypothesis 6 and Question 2 focused on the concept of multiplexity. While these hypotheses focus on the individual level, in order to measure these variables, a number of manipulations had to be done at the dyadic level. As previously noted, the relationship between two individuals is multiplex to the extent that there is more than one type of relation between the first individual and the second (Burt, 1982). Hence, the next step consisted of computing a multiplex matrix for each group. Using the add function from UCINET, the four matrices advice, friendship, communication and work were added together.

Hypothesis 6 focused on the degree of multiplexity. In order to measure different degrees of multiplexity, the multiplex dataset was dichotomized. Dichotomizing the dataset required determining a cutoff value, so that every number greater than the cutoff value was given a one, while every number less than the cutoff value was given a 0. For instance, if the dataset was dichotomized to a value greater than 2, each relationship that

had three contents (e.g. advice, friend, and work) was given a 1, indicating the existence of a multiplex relationship. Dichotomizing the datasets makes the matrix equal for all individuals with a certain degree of multiplexity. The datasets were dichotomized greater than 1, greater than 2 and greater than 3 for each group. As the cutoff values increased, the number of relationships in a given matrix decreased. The degree centrality, indicating the number of multiplex ties each individual has, was then taken for the three dichotomized matrices. This was computed as an individual indicator.

Once the degree centrality was computed, the next step was to determine the number of people with whom each person had at least one relation. Therefore, every person with whom a respondent had at least one relationship with was counted. In order to get this information the multiplex matrix was dichotomized greater than 0 for each group. The degree centrality of this dichotomized matrix was also taken.

In order to calculate the proportion of relationships that were multiplex for each individual, the degree centrality for the number of relationships greater than 1 was divided by the degree centrality of the number of relationships that was greater than 0. This step was repeated for the degree centrality greater than 2 and 3. These proportions indicated the percentage of relationships at each level of multiplexity. It was important to provide this standardized measure due to group size and ego network size.

Question 2 concentrated on different combinations of multiplex ties. In order to measure this hypothesis, the steps for Hypothesis 7 were repeated, however this time instead of using the multiplex matrix with the four networks, different combinations of multiplexity networks were computed. Specifically, every grouping of the four networks was computed including combinations of two and three networks.

Dependent Variable

As previously mentioned, commitment was measured on a seven item scale, which was combined into one commitment variable. As opposed to the previous similarity measures, commitment was not measured as a difference between two people. Rather, at the individual level, commitment was measured in terms of the strength of each individual's level of commitment.

Control Variables

In order to determine which control variables would be used for the independent analyses, the demographic variables were correlated with commitment. Age ($r = 0.25$, $p < 0.01$) and tenure ($r = 0.29$, $p < 0.01$) were the only variables that correlated significantly with commitment (refer to Appendix IV). However, since previous research linked commitment with job and employment status (Meyer and Allen, 1991; Steers, 1977), these variables were also included. Employment status was represented by two variables: *rftdum* and *rptdum*. *Rftdum* refers to regular full time status, while *rptdum* refers to regular part time status.

As opposed to the similarity analyses, the regression analyses for the independent measures were not done separately for each group. Therefore, two sets of dummy variables were created: one to control for research site, the other to control for the work groups. The site variables pertained to the four different sites from which the data was collected: Scarborough, Etobicoke, London and Downtown. Two groups were located within each of the four sites: Scarborough (ND1, ND2), Etobicoke (FR, STAR), London (NP1, NP2), and Downtown (OC4, OC5). The purpose of using these control variables is to determine whether the environment in which these sites were located had a significant

impact on the analyses. Out of the four site variables, only Scarboro ($r = 0.34$, $p < 0.05$) correlated significantly with commitment (refer to Appendix IV).

Going a step further, dummy variables were created for the work group variables. Creating these variables provide more detailed information by controlling for differences between the groups and determining if a significant relationship is due to the independent variable or to group membership. The dummy variables that correlated significantly with commitment were FR ($r = -0.19$, $p < 0.05$) and ND2 ($r = 0.30$, $p < 0.01$) (refer to Appendix IV).

Hence, there are three sets of control variables: demographic, group and site. The constant control variables included in every computation include: age, tenure, job, rftdum and rptdum. The group control variables include FR and ND2, while the site control variables include Scarboro, Etobicoke and London. Separate regression computations were done with group and site control variables, however the constant control variables were included in both.

RESULTS

Similarity Data

For each of the regressions performed below, the dependent variable was disagreement in commitment and the control variables were education, employment status, job, and tenure. In addition, the independent variables were the network variables: advice, friendship, communication and work. Each regression was performed for each network within each of the eight groups.

In order to test the first hypothesis, regressions were computed with the raw data and symmetrized data. Using both data sets provides two measures of attitude similarity

in dyads (refer to Table 2 below). The results from the analyses indicate that two people involved in friendship and work relationships have increased differences of commitment. This finding is opposite of the proposed hypothesis that individuals involved in dyads would have similarity of commitment. Therefore, Hypothesis 1 is not supported.

The second regression equation was computed using data from the clique algorithm. The clique data included information on two people who are involved in many mutual third party ties. Results from Hypothesis 2 (refer to Table 2) are similar to the previous hypothesis in that the significant variables indicate a mostly positive relationship with commitment. Hence, as the number of mutual third parties to whom two actors have communication and friendship relationships increases, their perception of commitment becomes different. This result is the opposite of the proposed hypothesis that two individuals involved in mutual third party ties would have similarity of commitment. Therefore, Hypothesis 2 is not supported.

In order to test Hypothesis 3, regression equations were computed with structural equivalence data. The structural equivalence data allows the researcher to determine if two people connected to the same others have similar levels of commitment. As with the two previous hypotheses, results from Hypothesis 3 (refer to Table 2) reveal a positive relationship between friendship and work relationships and differences in commitment. Particularly for individuals involved in the work networks, those in similar positions have greater differences in commitment. This finding is the opposite of the proposed hypothesis which stated that two people who are connected to the same others within a network were more likely to have similarities in commitment levels. The results

demonstrate that as two people's position in the work network becomes more similar, their level of commitment becomes more different.

Table 2. Independent Network Variables with Significant Regression Coefficients.

Data	Variable	Group	St. Coefficients	Significance
H1 Raw	Friend	STAR	0.17	0.03
H1 Symmetrized	Friend Maximum	ND2	-22.29	0.04
	Work Minimum	NP2	0.17	0.04
	Friend Minimum	STAR	0.23	0.02
	Work Minimum	STAR	0.25	0.01
H2 Triad	Friend	NP1	-0.160217	0.04
	Talk	NP2	0.195931	0.03
	Friend	STAR	0.293973	0.02
H3 Structural Equivalence	Work Correlation	FR	0.202579	0.05
	Work Euclidean	FR	-0.259978	0.01
	Work Correlation	NP1	-0.142027	0.02
	Work Correlation	NP2	0.157172	0.04
	Friend Correlation	OC4	0.239563	0.001
	Work Correlation	STAR	0.225163	0.006

*This table contains only the independent network variables with significant regression coefficients. The total number of network variables analyzed through regression equations includes: 32 for the raw data, 64 for the symmetrized data, 32 for the triad data, and 64 for the structural equivalence data.

Some interesting findings regarding the control variables were found from the computations for the first three hypotheses (refer below to Table 3). Firstly, tenure was the control variable that had the strongest relationship with commitment. It was found that the greater the difference in tenure, the greater the difference in organizational commitment. Education and job were also significant with commitment. Each of the three control variables were consistent within the same groups for each of the regressions. Tenure was significant in groups FR and ND1, education was significant in the STAR group and job was significant in the ND2 group.

Table 3. Control Variables with Significant Regression Coefficients.

Control Variable	Group	Network	Data	Average St Coefficient	Average Significance
Tenure	FR	A, F, T, W	Raw	0.36	0.01
	ND1	W	Raw	0.71	0.03
	FR	A, F, T, W	Symmetrized	0.36	0.01
	ND1	W	Symmetrized	0.71	0.03
	ND2	F maximum	Symmetrized	-18.54	0.04
	FR	A, F, T, W	Triad	0.36	0.01
	ND1	F	Triad	0.67	0.05
	ND1	W	Triad	0.71	0.03
	ND2	W	Triad	0.3	0.04
	FR	A, F, T	Structural Equivalence Correlation	0.35	0.01
	FR	A, F, T	Structural Equivalence Euclidean	0.36	0.01
	STAR	A, F, T, W	Raw	0.14	0.002
Education	STAR	A, F, T, W	Dyad	0.13	0.005
	STAR	A, F, T, W	Triad	0.13	0.009
	STAR	A, F, T, W	Structural Equivalence Correlation	0.15	0.002
	STAR	A, F, T, W	Structural Equivalence Euclidean	0.14	0.004
	STAR	A, F, T, W	Structural Equivalence Correlation	0.14	0.002
Job	ND2	F, T, W	Raw	0.43	0.01
	ND2	F maximum	Symmetrized	-12.98	0.03
	STAR	A, F, T, W	Symmetrized	0.14	0.002
	ND2	A, F	Triad	0.42	0.04
	ND2	F	Structural Equivalence Correlation	0.51	0.02

*Network: A = advice, F = friend, T = talk (communication), W = work

Individual Data

Regression analyses were performed twice, once with the control variables including the group variables and once with the control variables including the site variables. These control variables were used for the remaining five hypotheses.

In order to test Hypothesis 4, commitment was correlated with centrality. Specifically, commitment was correlated with degree, closeness, betweenness and eigenvector centrality measures. Since centrality measures the extent to which individuals are embedded within the network, the data was computed using the symmetrized datasets. In addition to the correlations, regression equations were computed with the dependent, control and independent variables.

Results from the correlational analyses illustrated below by Table 4, indicated that two independent variables, closeness friend minimum and closeness work minimum correlated significantly with commitment, out of 8 possible closeness variables. This partially supports the hypothesis, indicating a positive significant relationship between people who are close to others within the friendship and work networks and their commitment levels. Therefore the closer an individual is to others in the friendship and work networks, the higher the individual's commitment. There appears to be no relationship with the other measures of centrality since neither degree, betweenness nor eigenvector variables correlated significantly with commitment.

In terms of the regression analyses, the regression coefficients for closeness friend minimum and closeness work minimum were not significant in the regressions performed with the group control variables, the site control variables and different combinations of group and site control variables (refer to Appendix V). Thus, since the regression analyses were not significant only partial support for this hypothesis was found: closeness appears to be the only centrality measure that correlated positively with commitment. Specifically, a positive significant relationship between commitment and closeness was found for people who are close to other individuals within the friendship and work networks. Therefore, Hypothesis 4 is partially supported.

4. Significant Correlations Between Commitment and Prominence Variables

	Variable	Pearson Correlation	Significance
Hypothesis 4	Close Friend Minimum	0.218	0.017
Hypothesis 4	Close Work Minimum	0.292	0.001
Hypothesis 5	WorkIn	-0.183	0.046
Hypothesis 6	WorkIn	-0.183	0.046
Hypothesis 6	Close Friend In	0.182	0.046
Hypothesis 6	Close Work In	0.24	0.008
Hypothesis 6	Close Work Out	0.277	0.002
Hypothesis 6	Close Friend Min	0.218	0.017
Hypothesis 6	Close Work Min	0.292	0.001

*This table contains only the independent network variables with significant correlation coefficients. The total number of network variables correlated with commitment includes: 16 for the degree measures, 16 for the closeness measures, 12 for the betweenness measures, and 8 for the eigenvector measures.

Hypothesis 5, which stated that individuals who are chosen by others would have high levels of commitment, was tested in a similar manner to the previous hypothesis. The difference between these two hypotheses is that prestige is concerned with the difference between sending and receiving ties. Since prestige focuses on individuals receiving many ties from others, the independent variable used to compute the regression analyses was indegree centrality, which was computed from the raw data.

Results from the correlational analyses (refer to Table 4 above) indicate that one variable (out of a total of four variables), correlated significantly with commitment: work indegree. This correlation was negative, indicating that individuals who receive ties from others in the work network have weaker amounts of organizational commitment. In terms of regression analyses, the regression coefficient for the work indegree variable was not significant in any of the regressions performed with the group control variables, the site control variables and different combinations of both the group and the site variables (refer to Appendix VI). While the regression coefficient was not significant, the

correlation analysis was. Therefore, since work indegree correlated negatively with commitment, the findings contradict the proposed hypothesis and demonstrate that individuals who are chosen by others for work relationships have low rather than high levels of commitment. Therefore, Hypothesis 5 is not supported.

Question 1 required computing correlation and regression analyses with the different centrality measures: degree, closeness, betweenness and eigenvector using both raw and symmetrized datasets. The results from the correlation analyses are illustrated in Table 4. Based on the results, it appears that closeness had the strongest correlation with commitment since close friend in, close work in, close work out, close friend minimum and close work minimum all correlated significantly with commitment. As for degree, only work indegree was correlated with commitment and none of the betweenness or eigenvector variables were correlated with commitment. Therefore, there appears to be a difference between closeness and the rest of the centrality measures in friendship and work networks. People who are close to others within the work and friendship networks appear to have high organizational commitment.

Hypothesis 6 required correlation and regression analyses with the degree data obtained from the dichotomized multiplex matrices. The independent variables included both the dichotomized and proportional measures. Since the matrices were built upon the raw data, there were both indegree and outdegree measures taken for the four matrices dichotomized greater than 0, 1, 2 and 3 and the proportional measures based on the dichotomized matrices. Results from the analyses found none of the variables to be significantly correlated with commitment as well as none of the regression coefficients to be significant. Therefore, Hypothesis 6 is not supported.

Question 2 raised the issue of whether individuals involved in different types of multiplex relationships would have different levels of organizational commitment. Correlation and regression analyses were done with the following combinations of networks as the independent variables: advice/friend, advice/talk, advice/work, friend/talk, friend/work, talk/work, advice/friend/talk, advice/friend/work, advice/talk/work, and friend/talk/work.

Results from the correlations (refer to Appendix VII) indicate that only one combination of networks was significant with commitment: friendship and work. While the regression coefficient for this variable was not significant under different combinations of control variables, and the correlation was negative, based on the patterns exhibited throughout the analyses of the six hypotheses and two questions, there appears to be a relationship between commitment and work and friendship networks. At times the relationships were positive, other times the relationship were negative. Potential reasons for why these relationships may have been negative in some instances will be addressed in the discussion section of the paper. In terms of this final question, it appears that a difference in commitment levels exists between work and friendship networks versus the other combinations of networks.

DISCUSSION

Organizational commitment is a complex concept and in order to increase employees' commitment to the organization, we need to understand how commitment is generated. There are many different definitions for organizational commitment. This paper has focused on a few of these definitions such as Meyer and Allen's (1991) three-component model, Buchanan's (1974) definition of commitment as an affective attachment to the goals and values of the organization, Mowday et al. (1982) behavioural versus attitudinal commitment and Porter et al. (1974; 1979) definition of commitment as the identification with and involvement in the organization.

While these definitions cover various aspects of commitment, they fail to examine organizational commitment generated through interactions between individuals. This study has attempted to address this issue by examining whether commitment is affected by the way relationships are structured. Specifically, this study has examined the impact of social influence and network position in advice, friendship, communication and work relationships on individuals' commitment.

The results from this study indicate interesting relationships between organizational commitment and network embeddedness. There are four main findings from these results: a) results from the similarity analyses contradicted the hypotheses; b) friendship and work networks consistently correlated with commitment; c) there was an overall pattern of closeness centrality correlating with commitment; and d) the control variables demonstrated interesting findings that may have affected the network variables.

When measuring social influence in dyads, triads and structural equivalence, the results demonstrated that rather than have similar attitudes towards commitment;

individuals involved in these relationships had different levels of commitment. While past research has supported the notion that individuals in these relationships will be susceptible to social influence (Burt, 1978; Erickson, 1988; Johanson, 2000), the results from this study demonstrated the opposite effect. Not only were individuals in these relationships not influenced to agree with one another, something was causing them to disagree with one another. Examination of the demographics within each group has helped to understand these results.

The demographic information on age, sex, job, work assignment, education, and employment status were examined within each group. In addition, differences between the largest and smallest measures of age, tenure and commitment were also computed to determine which groups had the largest differences (refer to Appendix VIII). As previously mentioned, since commitment was a measure of difference in commitment, the network variables were expected to correlate negatively with commitment. Of the 6 groups that were significant for the first three hypotheses, ND2 and NP1 were the only groups that had negative correlations. Specifically, both ND2 and NP1 were significant for the friendship network indicating a relationship between friendship ties and similarity of commitment. NP2, OC4 and STAR all correlated positively indicating a relationship between friendship and work relationships and dissimilarity of commitment.

While there were eight work groups, only six of the eight groups demonstrated significant results. In examining the differences between the six significant groups, two patterns emerged regarding ND2 and NP1. Both groups were the only ones made up solely of women and these two groups had the smallest age difference between the youngest and oldest members. Most of the other groups were made up of both men and

women and had greater age differences between the youngest and oldest members. Other demographic variables such as education, job, work assignment, differences in tenure and commitment did not seem to differ between groups.

Ibarra (1992) discussed the concept of homophily, which is the tendency to interact with others similar in traits such as sex, race, and education. There are two theoretical perspectives of homophily. The first perspective concerns interpersonal attraction, the preference for individuals to interact with comparable others, while the second structural perspective counters that individuals opportunity for contact precedes and constrains individuals preferences for contact.

Individuals within groups ND2 and NP1 interacted with similar others in both age and gender and were the only ones with similar levels of commitment. On the other hand, the STAR group had an almost even split between men and women as well as the greatest difference in age between the oldest and youngest employee, and they had the greatest differences in commitment. It is important to note that the conclusions based on differences in age refer to the differences between a pair of individuals, not the average difference in age between all individuals. In addition to age, ND2 and NP1 groups were more homogenous in terms of employment status than the STAR group, which demonstrated a more heterogeneous split in employment status. In addition to being the most heterogeneous group, the STAR group was the most affected by the downsizing that occurred during the data collection process. Many individuals within the STAR were reassigned to new positions, were given new responsibilities, and were feeling a lack of support from their supervisors.

Since STAR was the most heterogeneous group, and individuals prefer interacting with similar others, it makes sense that the STAR group would most likely be split into different groups: men, women, young, old, or a combination between age and gender groups leading to different groups having different attitudes. For instance it is unlikely that the attitude of a 54-year-old man will be similar to the attitude of a 33-year-old woman, even if they have a working relationship with each other. These two individuals differ in age, gender, and tenure and most likely have experienced the organizational environment differently. Someone with many years of experience working at the company is more likely to have gained seniority, as well as job security and had an opportunity to maintain long-term ties with others at the company compared to an individual with only a few years experience. Hence in a situation where the company is undergoing downsizing, these two individuals are likely to interpret the situation differently based on these experiences. Therefore, since the 54-year-old man had been working at the company for over eight years, it makes sense that his level of commitment was almost twice as high as the 33-year-old woman who had been working at the company for a little over two years.

The impact of the downsizing may have caused individuals to have different levels of commitment depending on how secure they perceive their job to be, or how fair they feel the managements' actions are. Therefore, more secure individuals may have higher levels of commitment, while less secure individuals may feel threatened, thereby lowering their levels of organizational commitment. When feeling a lack of security, it is unlikely that two individuals would exchange information with one another since it is more likely that they would consider each other rivals for the same position. Hence

individuals in dyad and triad relationships may feel wary around one another and instead of being susceptible to social influence may purposely distance themselves from the ideas and opinions of their peers due to feelings of competition. In terms of structural equivalence, if two people are tied to the same others, it is likely both people want to be liked and favoured by the mutual others. Hence if two managers are tied to three of the same subordinates and one manager is going to be laid off, both managers are competing against each other for the same position making it unlikely for them to have the same opinions and attitudes. In this instance, it is likely that individuals would lack agreement on many issues including their attitudes regarding organizational commitment.

It is important to note that there appear to be no specific patterns regarding gender. None of the differences found in the STAR group are being attributed to gender, only group homogeneity. In fact, OC4 had the second largest percentage of male employees (37.5%), and had only one positively significant variable; while NP2 had a smaller percentage of males (14%) and had three positively significant variables.

It is difficult to measure the extent to which availability for contact precedes and constrains preferences. Individuals in ND2 and NP1 had no choices, while it is unknown how or even if the STAR group split into different groups. However, based on the findings from Appendix VIII, there appears to be some support for Ibarra's (1992) perspective of interpersonal attraction. Individuals within the most homogeneous groups had similar attitudes while individuals in the most heterogeneous group demonstrated the greatest differences in attitude.

The second major finding from this study concerns two reoccurring patterns that emerged throughout the data collection: the friend and, especially, work networks were consistently significant versus advice and communication networks.

In terms of the work network, organizations usually situate similar and interdependent activities near each other (Conrath, 1973; Allen, 1977), leading individuals within one's work network to be proximate to one another. Hence, one explanation for why the work network has been significant with commitment is because daily interactions with proximate others increases the likelihood of interaction, leading to exposure to social information and other individuals' attitudes (Festinger, Schacter, and Back, 1950). Face-to-face communication is highly influenced by physical proximity and drops off quickly at distances greater than 75-100 feet. (Rice and Aydin, 1991).

As opposed to the advice, friend and communication networks, the work network is not voluntary. Rather individuals within ones work network are the people whom one must interact with to perform the job. The advice, friend and communication networks involve individuals that are specifically sought out and therefore may be more difficult to maintain on a daily basis. According to Salancik and Pfeffer (1978), individuals need to be proximate to the attitudes, information or behaviour of others in order to be exposed to social information. Since individuals in the work network have regular face-to-face interactions, they have a greater likelihood to share information and opinions. Therefore, having relationships with the people who you interact with on a daily basis affects commitment more than having relationships to the people with whom you interact less frequently.

While the work network variable had the strongest correlation with commitment, to a lesser degree the friend network also demonstrated a significant correlation with commitment. According to Homans (1950), the more frequently people interact with one another, the stronger their feelings of friendship should be. As previously mentioned, affective commitment refers to an emotional attachment resulting from involvement and identification. Identification occurs when an individual establishes and maintains a satisfying relationship (Kelman, 1958) hence people who frequently interact and maintain friendship relationships are likely to identify with one another. Since identification results in a psychological attachment to an individual (Kagan, 1958; Kelman, 1958), it makes sense that friendship, which is based on a strong relationship between two people, has been significantly correlated with commitment.

The above research supports the idea that individuals in friendship and work relationships would have similar attitudes because there is increased opportunity for interactions within these networks leading to exchanges of information and exposure to others attitudes. The problem is that the results from the study found the opposite effect: individuals with friendship and work relationships were found to have different levels of organizational commitment.

As previously mentioned, since the company was undergoing downsizing at the time of data collection, the effects of this organizational change may have led individuals to feel threatened and therefore consider each other rivals for positions within the company. Since individuals in friendship and work relationships interact with each other on a frequent day-to-day basis, it is possible that one tries to publicly convince the other that the organization is uncaring or that it treats people poorly, thereby trying to lower the

other's commitment and privately hoping the other may lose his/her job because of poor attitude (i.e., something really competitive). Individuals in advice and communication relationships are more distant and therefore may not engage each other in conversations about insecurity and fear. Since individuals in work and friendship relationships are exposed to such negative feelings as insecurity, rivalry and fear, it makes sense that it would transcend throughout these relationships, making these individuals less likely to share their opinions with one another, leading to different levels of organizational commitment.

The third major finding from this study is that closeness centrality was the only centrality measure to demonstrate a consistent relationship with commitment. As previously mentioned, closeness centrality measures how close an individual is to the others within the network such that high levels of closeness indicate they can interact quickly with others. If an individual has a high level of closeness centrality, then there is less dependence on others to relay messages or information (Freeman, 1979). Individuals with work relationships are situated near one another providing an increased opportunity for interactions and people with friendship relationships interact frequently, making it less likely for individuals with both these network relationships to have to go through other people. The less often people have to go through others to get to you, and the shorter the distance between you and others, the higher your commitment with those individuals in the friend and work networks.

In addition to the network variables, some interesting findings emerged from the control variables. The overall pattern of the control variables demonstrated that tenure was consistently the strongest variable that correlated with commitment. Results from the

study illustrate that the control variables such as tenure, age and employment status add explanatory value to the regression equation over and above network variables while the network variables do not add much explanatory value themselves (see Appendix IX). Therefore, control variables such as tenure explain more of the variation in commitment than the network variables. These findings suggest that the control variables are likely to lead to the development of network variables. For instance, it makes intuitive sense that the longer an individual's tenure, the stronger their network would be since individuals with longer tenure has more time and opportunity to develop their networks. Support for a link between commitment and control variables such as age, tenure, education, gender and employment status have been demonstrated in previous research (Meyer and Allen, 1991; Steers, 1977), although these relationships have not been strong or consistent. For instance Allen and Meyer (1991) suggest that the positive correlation between commitment and tenure may in fact be due to tenure-related differences in job status, quality, or the need for a senior employee to justify why they have remained with the organization for so long. While the research regarding the relationship between commitment and control variables is inconclusive, since tenure, age and employment status consistently correlated with commitment and the control variables added predictive power to the regression equation, it is important to note that the findings from the present study may have been influenced by these demographic variables.

In addition to the demographic control variables, the effect of the group control variables on the site variables was noted. The site variables provided an overall measure of the differences between different environments, while the group variables gave a more detailed measure indicating the differences between each group. The results from the

analyses demonstrated that a significant result from one group could be overpowered by a non-significant result from another group. For instance, FR and ND2 correlated significantly with commitment while the only site variable that correlated significantly with commitment was Scarboro. FR and STAR were both located within Etobicoke. Since Etobicoke was not significant with commitment, the STAR group levelled out the effect of the FR group to make Etobicoke not significant. Both ND1 and ND2 were located in Scarboro, and since ND2 was not significant but Scarboro was, significance was due to only one variable.

As previously mentioned, prior to and during the data collection, the organization was downsizing. According to McKinley et al (1995), downsizing has many negative consequences affecting the morale, commitment and work effort of the remaining employees. These structural changes may have affected the relationship between multiplexity and commitment.

The only significant finding in terms of multiplexity is that individuals involved in a combination of friend and work networks had higher levels of commitment than individuals involved in any other combination of networks. The results from this study indicate that while individuals may be more embedded within the network due to the multiple content of their multiplex ties, this increased involvement did not increase their levels of organizational commitment. The downsizing may have affected the relationship between multiplexity and commitment since individuals with multiplex ties may move departments, making their multiplex ties uniplex. For instance, suppose two individuals had both advice and friend ties, if one of the individuals moved departments, their advice relationship may no longer be relevant due to the change in job structure, making their

once multiplex relationship now uniplex. Since there were ongoing organizational changes prior to and during the data collection, it is difficult to determine the true impact of multiplexity on commitment.

The results of this study have provided interesting groundwork for further investigation into the concepts of closeness centrality, friendship and especially work relationships and their relationship with commitment. It is important to note the limitations of the study. First, the data used in this research were not collected for the specific hypotheses developed in this thesis. While the use of Allen and Meyer's (1990) affective commitment scale is considered a reliable measure of commitment, perhaps in addition to the affective scale, using normative and continuance measures may provide additional insight. In addition to the commitment measure, the organization used for this study was undergoing structural changes at the time of the data collection. This reorganization may have affected the ways in which the employees answered the questions, thereby affecting their commitment. A replication of certain aspects of this study, using a newly designed questionnaire in a stable organization may help solidify some of the patterns discovered in this study. Specifically future studies can focus on: a) the impact of social influence on homogeneous and heterogeneous groups of employees; b) examining the relationship between closeness centrality and commitment using different network relationships such as helping, social support, and trust; c) examining the relationship between commitment and friendship and work relationships through different network concepts such as structural holes; and d) examining the impact of multiplexity on commitment within a stable environment. While examining the relationship between commitment and network concepts is likely to provide more insight.

perhaps in order to gain more in-depth knowledge about organizational commitment, researchers should change their focus.

Most of the research to date has focused on employees' commitment to the organization. Perhaps instead of focusing on the different types of attachment to the 'organization', researchers should examine commitment between employees.

Commitment not only exists between employees and the organization itself, but can also exist between peers, supervisors, peers and supervisors, etc. In fact, many companies use teams to provoke attachments (Cohen and Bailey, 1997). Reichers (1985) labelled these attachments "constituent attachments", which includes attachments to teams, work groups and unions. Therefore, rather than examine the different types of commitment to the organization, emphasis should be placed on determining the different types of commitments that exist between the individuals within the organization.

Examining the different types of commitment generated through varied interactions between individuals involves looking at commitment among different groups such as peers, supervisors, departments, divisions, etc. (Becker, 1992). Discovering whether each group of individuals has a different level or type of commitment can be an asset for the organization. This information may provide the organization with sufficient insight to derive methods to help retain their high performing employees. For instance, if such a scale were developed demonstrating that commitment to peers is a greater indicator of an employee's decision to maintain membership with an organization as opposed to commitment to supervisors, the organization could focus on ways to increase peer commitment.

In order to study commitment between individuals rather than between individuals and the organization, researchers need to identify the influence employees have on one another. Rather than classifying everyone simply by networks, researchers need to identify the importance that people place on one another. Knowing the weight given to the opinions of each individual can identify those in the organization who garner the most influence. According to Rice and Aydin (1991), individuals are influenced by such factors as others' credibility, status, etc. Therefore, measuring a relationship by either the presence or absence of a tie or the number of ties is an inadequate measure.

According to Becker (1992), there is a need to reconceptualize employee attachment as a phenomenon with multiple foci and bases. Therefore examining organizational commitment without taking into account the potential for individuals to be involved in different types of commitment to one another may provide an incomplete and less than accurate picture of commitment. Thus, extending the analysis of organizational commitment to include the various types of commitment generated through interpersonal attachment as well as the impact of various concepts such as social network analysis may help clear up some of the uncertainty surrounding this issue.

The present study examined how the network in which an individual is embedded influences organizational commitment. The purpose of doing this study was to find ways for organizations to retain their high performing employees through increasing their affective commitment. While this study focused on individuals being embedded in the organization because they feel attached to and involved in the organization through their own desire, Mitchell et al. (2001a, 2001b) went a step further and looked at the concept of job embeddedness as a factor of employees' retention.

As opposed to taking an affective and attitudinal approach to organizational attachment, Mitchell et al. (2001a, 2001b) defined job embeddedness as the accumulated, generally non-affective reasons why an individual would choose to remain at their job: a sort of stuckness or status quo bias. Job embeddedness refers to a broad constellation of factors that influence an individual's retention, focuses on the embedding forces that keeps individuals on the job rather than the negative forces that prompt them to leave. Consider one's life as a web of connections where one's job is in the middle of that web. Being part of these connections leads an individual to feel embedded within their environment, leading their decision to remain with or leave a job to be influenced by this web. Job embeddedness has both on-the-job and off-the-job components that influence why people stay. Specifically, there are three dimensions of job embeddedness: links, fit and sacrifice. Links refer to the formal and informal connections between individuals, such that the greater the number of links between the individual the organizational environment, the greater the embeddedness. In addition to the organizational links, individuals also maintain off-the-job links that can influence their decision to remain with an organization such as their ties to their families, church, community, etc. Fit refers to the employee's perceived compatibility with the organizational environment such that the greater the fit, the higher the likelihood of feeling attached to the organization. The concept of fit surpasses simply fitting into the organizational environment and looks at the individual's fit within the community such as the weather, community, culture of the location in which one resides. Finally, sacrifice refers to the perceived cost of material or psychological benefits that may be forfeited by leaving one's job. Off-the-job sacrifices such as leaving a safe, attractive community where one is respected must also be

considered. Sacrifice is similar to Allen and Meyer's (1991) concept of continuance commitment in that individuals remain with the organization to avoid losing the side bets they have accumulated such as job effort, skills, and seniority. Sacrifice differs from continuance commitment in that it does not focus on lack of alternatives and it assesses specific entities that people feel they would have to give up if they leave their job such as freedom, compensation, perks, etc. as opposed to the continuance commitment's more general definitions of side bets.

While job embeddedness differs from the notion of affective commitment used in this study, there are similarities between job embeddedness and the concept of closeness centrality. Job embeddedness examines the broad constellation of factors that influence individuals' retention, considering one's life as a web of connections. The concept of closeness centrality taps into job embeddedness because it examines the connections to all individuals in the network and how close they are to a focal actor. Therefore, an individual may feel embedded within their job because this individual is close to others within the network.

The new focus of job embeddedness indicates that attachment to the organization can be assessed by more than just attitudinal concepts such as affective commitment. In fact, Mitchell et al. (2001) found that job embeddedness was a better predictor of intention to leave than both commitment and job satisfaction. This indicates that individuals' intentions to leave an organization may be attributed to multiple factors due to different types of attachment to the organization. Thus, concepts such as organizational commitment and job embeddedness demonstrate that there are different ways in which an individual can feel embedded within the network. In addition to examining the different

types of attachments that exist between individuals, it would be beneficial to examine the source of individuals' feelings of embeddedness. Knowing why individuals feel part of the organization can help determine the best way to increase their embeddedness/involvement and subsequently their feelings of attachment to the organization.

While finding ways to ensure the retention of high performing employees can help organizations maintain a successful competitive advantage, as demonstrated by the literature and the results from this study, increasing employee retention is a tricky task for which we have yet to discover the magical solution. Further research is needed to provide employers with the proper information to give them the tools needed to increase an individual's likelihood of remaining at their job. Individuals who remain with their organizations are more satisfied and cultivating a satisfying environment can eventually lead to greater productivity, increasing the organization's competitive advantage. Therefore, the benefits of establishing a committed environment extend beyond the immediate issue of retention, making organizational commitment both a tool for the present and a strategic weapon for the future.

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Appendix I. Structural Equivalence Diagrams

Figure 1

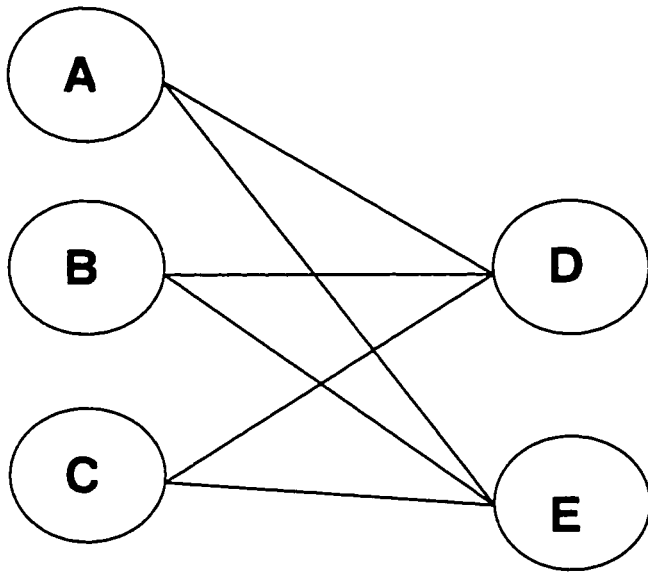
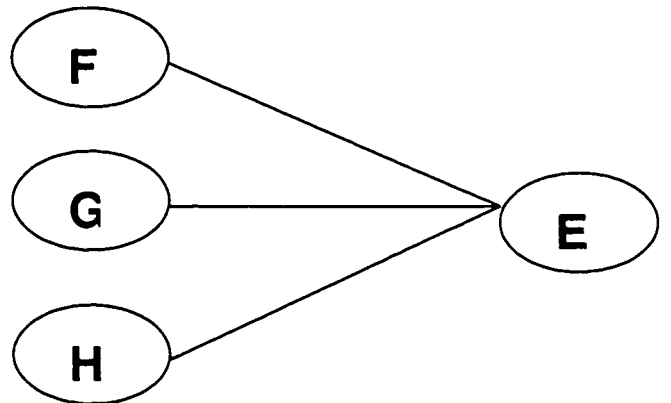
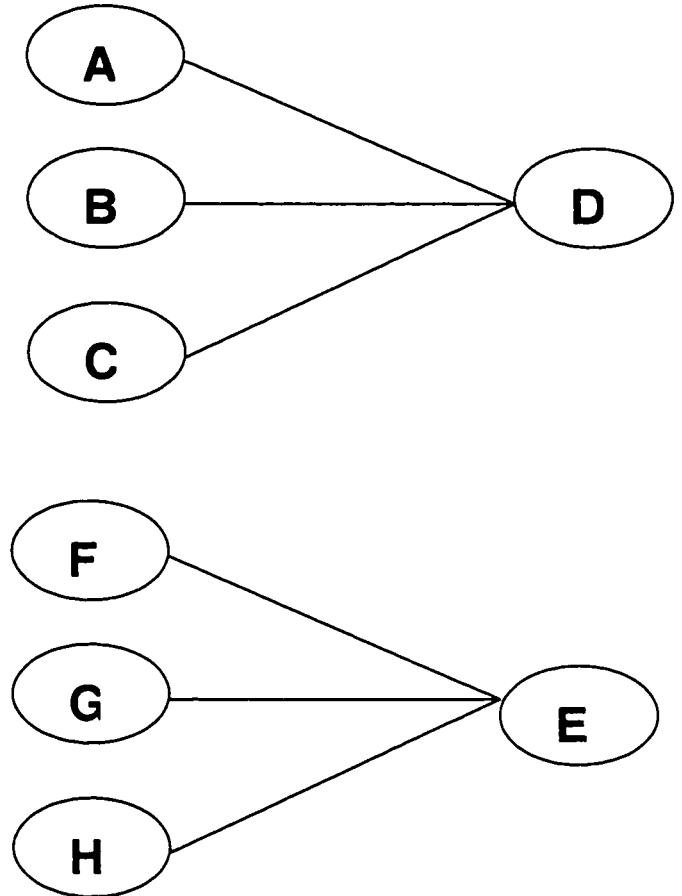
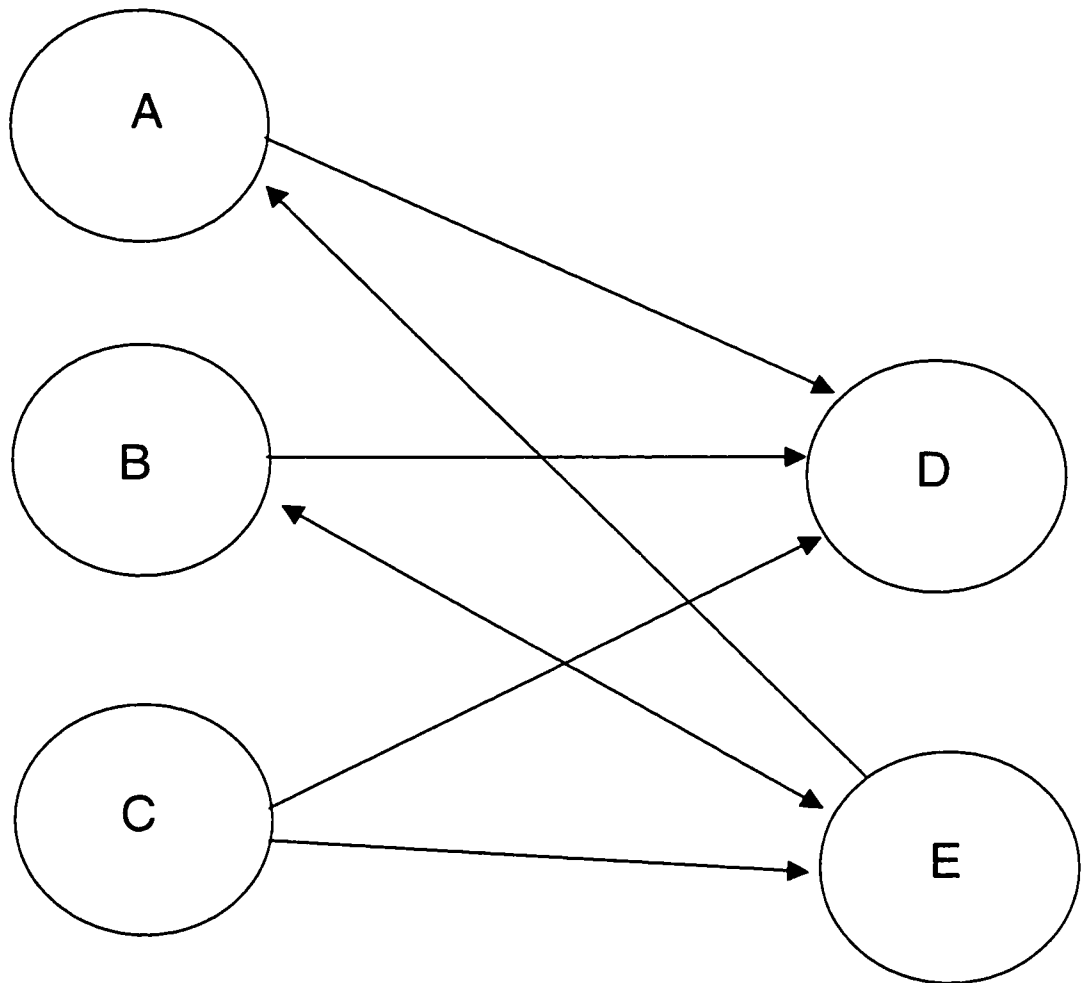


Figure 2



Appendix II

Figure 3. Prominence Diagram



Appendix III

Allen and Meyer's (1991) Affective Commitment Scale

Items	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. I would be very happy to spend the rest of my career with this organization	1	2	3	4	5
2. I do not feel a strong sense of "belonging" to this organization	1	2	3	4	5
3. I really feel as if the organization's problems are my own	1	2	3	4	5
4. I do not feel like "part of the family" at this organization	1	2	3	4	5
5. I do not feel "emotionally attached" to the organization	1	2	3	4	5
6. Working at this organization has a great deal of personal meaning to me	1	2	3	4	5
7. I am proud to tell others that I am part of Bell	1	2	3	4	5

Appendix IV – Correlations between Commitment and Control Variables

		DUMYIND2	DUMYIFR	CRASH	SCARBORO	ETOBICOKE	LONDON	RFTDUM	JOB	AGE	TENURE	EDUCATE
DUMYIND2	Pearson Correlation	1.600	.172	.298(**)	.821(**)	.261(**)	.280(**)	.303(**)	.122	.334(**)	.475(**)	.210(*)
	Sig. (2-tailed)		.060	.001	.000	.004	.002	.001	.183	.000	.000	.022
DUMYIFR	Pearson Correlation	.172	1.000	.191(*)	.210(*)	.659(**)	.214(*)	.278(**)	.066	.156	.034	.116
	Sig. (2-tailed)	.060		.017	.021	.000	.019	.002	.473	.100	.709	.209
CONH	Pearson Correlation	.298(**)	-.191(*)	1.000	.339(**)	.156	.038	.145	.045	.250(**)	.295(**)	.099
	Sig. (2-tailed)	.001	.037		.000	.089	.684	.114	.628	.008	.001	.282
SCARBORO	Pearson Correlation	.821(**)	.210(*)	.339(**)	1.000	.319(**)	.341(**)	.383(**)	.296(**)	.391(**)	.614(**)	.163
	Sig. (2-tailed)	.000	.021	.000		.000	.000	.000	.001	.000	.000	.076
ETOBICOKE	Pearson Correlation	.261(**)	.659(**)	.156	.319(**)	1.000	.326(**)	.463(**)	.100	.290(**)	.204(*)	.203(*)
	Sig. (2-tailed)	.004	.000	.089	.000		.000	.000	.275	.002	.025	.027
LONDON	Pearson Correlation	.280(**)	-.214(*)	.038	.341(**)	.326(**)	1.000	.313(**)	.162	.217(*)	.117	.044
	Sig. (2-tailed)	.002	.019	.684	.000	.000		.000	.077	.178	.205	.634
RFTDUM	Pearson Correlation	.303(**)	.278(**)	.145	.383(**)	.463(**)	.313(**)	1.000	.082	.520(**)	.263(**)	.302(**)
	Sig. (2-tailed)	.001	.002	.114	.000	.000	.000		.372	.000	.004	.001
RPTDUM	Pearson Correlation	.243(**)	.389(**)	.045	.296(**)	.445(**)	.162	.699(**)	.020	.213(*)	.046	.136
	Sig. (2-tailed)	.007	.000	.628	.001	.000	.077	.000	.827	.024	.621	.141
JOB	Pearson Correlation	.122	.066	.063	.057	.100	.217(*)	.082	1.000	.154	.013	.041
	Sig. (2-tailed)	.163	.473	.493	.539	.275	.018	.372	.827	.106	.887	.658
AGE	Pearson Correlation	.334(**)	.156	.250(**)	.391(**)	.290(**)	.128	.520(**)	.154	1.000	.431(**)	.261(**)
	Sig. (2-tailed)	.000	.100	.008	.000	.002	.178	.000	.024	.106	.000	.005
TENURE	Pearson Correlation	.475(**)	.034	.295(**)	.614(**)	.204(*)	.117	.263(**)	.013	.431(**)	1.000	.166
	Sig. (2-tailed)	.000	.709	.001	.000	.025	.205	.604	.887	.000	.166	.071
EDUCATE	Pearson Correlation	.210(*)	.116	.099	.163	.203(*)	.044	.302(**)	.041	.261(**)	.166	1.000
	Sig. (2-tailed)	.022	.208	.283	.076	.037	.614	.001	.658	.005	.071	

Appendix V- Regression Tables for Centrality and Control Variables

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
Age	0.168		0.149
Tenure	0.208*		0.188
Job	-0.075		-0.063
Rftdum	0.016		0.003
Rptdum	0.023		0.035
Close Friend Min		0.218*	0.112
R-Square	0.106	0.048	0.117

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
Age	0.168		0.162
Tenure	0.208*		0.154
Job	-0.075		-0.049
Rftdum	0.016		-0.015
Rptdum	0.023		0.038
Close Work Min		0.292*	0.184
R-Square	0.106	0.086	0.133

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
ND1	0.127		0.094
ND2	0.259		0.371
FR	-0.156		-0.174
OC5	-0.108		-0.105
NP1	0.022		0.040
NP2	-0.039		-0.026
OC4	-0.037		-0.007
Close Friend Min		0.218*	-0.129
R-Square	0.142	0.048	0.144

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
ND1	0.127		0.136
ND2	0.259*		0.219
FR	-0.156		-0.148
OC5	-0.108		-0.098
NP1	0.022		0.015
NP2	-0.039		-0.029
OC4	-0.037		-0.024
Close Work Min		0.292*	0.051
R-Square	0.142	0.086	0.142

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
Scarboro	0.362*		0.341*
Etobico	-0.014		-0.001
London	0.081		0.082
Close Friend Min		0.218*	0.049
R-Square	0.122	0.048	0.123

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
Scarboro	0.362*		0.281
Etobico	-0.014		-0.031
London	0.081		0.056
Close Work Min		0.292*	0.097
R-Square	0.122	0.086	0.126

Appendix VI- Regression Tables for Prestige and Control Variables

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
Age	0.168		0.167
Tenure	0.208*		0.195
Job	-0.075		-0.059
Rftdum	0.016		-0.015
Rptdum	0.023		0.018
Work In		- 0.183*	-0.086
R-Square	0.106	0.033	0.112

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
ND1	0.127		0.128
ND2	0.259*		0.260*
FR	-0.156		-0.160
OC5	-0.108		-0.111
NP1	0.022		0.023
NP2	-0.039		-0.042
OC4	-0.037		-0.045
Work In		- 0.183*	0.013
R-Square	0.142	0.033	0.142

Variable	Regression Coefficient	Regression Coefficient	Regression Coefficient
Scarboro	0.362*		0.344*
Etobicoke	-0.014		-0.023
London	0.081		0.069
Work In		- 0.183*	-0.026
R-Square	0.122	0.033	0.122

Appendix VII- Correlations between Commitment and Multiplexity Measures

		COMM	DEGREEAF	DEGREEAT	DEGREEAM	DEGREEFT	DEGREEFW	DEGREETW	DegreeAPT-2	DegreeAPW-2	DegreeATW-2	DegreeFTW-2
COMM	Pearson Correlation	1.000	.122	.053	.083	.150	.187(**)	.051	.138	.166	.044	.172
	Sig. (2-tailed)		.183	.567	.370	.102	.041	.577	.113	.070	.636	.060
	N	120	120	120	120	120	119	120	120	120	120	120
DEGREEAF	Pearson Correlation	.122	1.000	.471(**)	.458(**)	.603(**)	.607(**)	.409(**)	.962(**)	.882(**)	.481(**)	.742(**)
	Sig. (2-tailed)			.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	183										
DEGREEAT	Pearson Correlation	.053	.471(**)	1.000	.717(**)	.265(**)	.307(**)	.528(**)	.490(**)	.485(**)	.751(**)	.324(**)
	Sig. (2-tailed)		.000		.000	.003	.001	.000	.000	.000	.000	.000
	N	120	120	120	120	120	119	120	120	120	120	120
DEGREEAM	Pearson Correlation	.083	.458(**)	.717(**)	1.000	.284(**)	.391(**)	.697(**)	.449(**)	.565(**)	.946(**)	.407(**)
	Sig. (2-tailed)		.000	.000		.002	.000	.000	.000	.000	.000	.000
	N	170	120	120	120	120	119	120	120	120	120	120
DEGREEFT	Pearson Correlation	.150	.603(**)	.265(**)	.284(**)	1.000	.914(**)	.272(**)	.612(**)	.566(**)	.325(**)	.665(**)
	Sig. (2-tailed)		.000	.000	.002		.000	.003	.000	.000	.000	.000
	N	102	120	120	120	120	119	120	120	120	120	120
DEGREEFW	Pearson Correlation	.187(**)	.607(**)	.307(**)	.391(**)	.934(**)	1.000	.398(**)	.616(**)	.649(**)	.410(**)	.751(**)
	Sig. (2-tailed)		.000	.001	.000	.000		.000	.000	.000	.000	.000
	N	119	119	119	119	119	119	119	119	119	119	119
DEGREETW	Pearson Correlation	.051	.409(**)	.528(**)	.697(**)	.272(**)	.398(**)	1.000	.422(**)	.496(**)	.740(**)	.480(**)
	Sig. (2-tailed)		.000	.000	.000	.003	.000		.000	.000	.000	.000
	N	577	120	120	120	120	119	120	120	120	120	120
DgreeAPT-2	Pearson Correlation	.138	.962(**)	.490(**)	.449(**)	.612(**)	.616(**)	.422(**)	1.000	.881(**)	.504(**)	.761(**)
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	120	120	120	120	120	119	120	120	120	120	120
DgreeAPW-2	Pearson Correlation	.166	.882(**)	.485(**)	.565(**)	.566(**)	.649(**)	.496(**)	.881(**)	1.000	.588(**)	.854(**)
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	070	120	120	120	120	119	120	120	120	120	120
DgreeATW-2	Pearson Correlation	.044	.481(**)	.751(**)	.946(**)	.325(**)	.410(**)	.740(**)	.504(**)	.588(**)	1.000	.464(**)
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	636	120	120	120	120	119	120	120	120	120	120
DgreeFTW-2	Pearson Correlation	.172	.742(**)	.324(**)	.407(**)	.665(**)	.751(**)	.480(**)	.761(**)	.854(**)	.464(**)	1.000
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	060	120	120	120	120	119	120	120	120	120	120

Appendix VIII – Demographic Information within Significant Group Variables

		FR	ND1	ND2	NP1	NP2	OC4	OC5	STAR
Positive Coefficient		0	0	1	2	0	0	0	0
Negative Coefficient		1	0	0	0	3	1	0	5
Gender	Women	11	8	22	16	13	10	12	5
	Men	3	0	0	0	2	6	2	8
Percentage	Women	78.5%	100.0%	100.0%	100.0%	86.0%	62.5%	85.7%	38.5%
	Men	21.5%				14.0%	37.5%	14.3%	61.5%
Job	Associate	13	6	21	13	8	14	13	12
	Sen Associate	1	2	1	3	5	2	1	1
	Specialist					2			
Assignment	Sys		6	6					
	Sup		2	1	4	1	2	1	
	All	14		15					11
	Np519							6	
	Np613							4	
	Np705							3	
	Bus								2
	Toll				7	5			
	Loc				5	6			
	Net					2			
	Np416						6		
	Np905						8		
	Specialist					1			
Education	2	5	3	13	8	7	5	5	3
	3	4	3	7	5	5	9	8	5
	4	5	2	1	3	3	2	1	5
Empstat	Rft	4	8	22	14	14	5	8	2
	Rpt	9	0	0	2	1	5	2	6
	Tpt	1	0	0	0	0	6	4	5
Largest difference in age		28 yrs	14 yrs	24 yrs	22 yrs	27 yrs	30 yrs	25 yrs	34 yrs
Average difference in age		9 yrs	6 yrs	6 yrs	8 yrs	9 yrs	10 yrs	8 yrs	7 yrs
Largest difference in tenure		195 mo	173 mo	195 mo	210 mo	282 mo	322 mo	108 mo	89 mo
Average difference in tenure		59 mo	66 mo	72 mo	76 mo	77 mo	66 mo	28 mo	19 mo
Largest difference in commitment		16	13	17	29	13	22	18	18
Average difference in commitment		6	4	6	7	5	8	6	6

Appendix IX – Hierarchical Regressions
with Significant Network Variables and Control Variables

Regression	Model	Variables Entered	R Square	Adjusted R Square
1	Model 1	Rfidum, Age, Tenure	0.101	0.076
	Model 2	Scarboro, Etobicoke, London	0.14	0.091
	Model 3	Work Minimum	0.143	0.085
2	Model 1	Rfidum, Age, Tenure	0.101	0.076
	Model 2	Scarboro, Etobicoke, London	0.14	0.091
	Model 3	Work In	0.144	0.087
3	Model 1	Rfidum, Age, Tenure	0.101	0.076
	Model 2	Work Min	0.114	0.081
	Model 3	Scarboro, Etobicoke, London	0.143	0.085
4	Model 1	Rfidum, Age, Tenure	0.101	0.076
	Model 2	Work In	0.117	0.084
	Model 3	Scarboro, Etobicoke, London	0.144	0.087
5	Model 1	Work In	0.058	0.05
	Model 2	Rfidum, Age, Tenure	0.117	0.084
	Model 3	Scarboro, Etobicoke, London	0.144	0.087
6	Model 1	Work Min	0.027	0.018
	Model 2	Rfidum, Age, Tenure	0.114	0.081
	Model 3	Scarboro, Etobicoke, London	0.143	0.085