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THE IMPACT OF AN ORGANIZATIONAL DOWNSIZING EFFORT ON SURVIVORS' COMMUNICATION NETWORK RELATIONSHIPS AND ATTITUDES

By

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ABSTRACT

THE IMPACT OF AN ORGANIZATIONAL DOWNSIZING EFFORT ON SURVIVORS' COMMUNICATION NETWORK RELATIONSHIPS AND ATTITUDES

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A possible reason for downsizing's meager success in the workplace is related to the lack of attention paid to layoff survivors' communication patterns and relationships. This investigation examined changes among communication network relationships and associated perceptions and attitudes in a hotel company's corporate headquarters to provide additional insight into layoff survivors' responses to downsizing. Through the use of communication network measurement techniques and survey measurements at three points in time, this investigation examined the impact of structural holes on layoff survivors' perceptions of information deficiency, stress, job satisfaction, and organizational commitment both prior to and following the downsizing effort. As a result of downsizing, employees gained or lost a variety of network contacts. Layoff survivors who experienced increases in structural holes perceived higher levels information deficiency as newly formed gaps in their communication network restricted the flow of information and resources. Increases in information deficiency were related to increases in survivors' levels of stress, which negatively impacted their affect toward their job in the measurement period directly following the downsizing. Static and longitudinal

models of survivors' structural hole experiences and attitudinal responses were presented and tested. Results indicated modest support for the static models and revealed differences among subgroups within the sample, while the longitudinal model was not supported.

Dedicated to Eric Lieberman and Bert Landauer in loving memory

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Chapter 1

Introduction

Organizational downsizing is a disruptive process which impacts the communication patterns, perceptions and attitudes of surviving employees. Organizations downsize their workforce in keeping with market and financial shifts in an attempt to remain competitive (Cascio, 1993). In 1993 a record number of job cuts were announced. This trend continued through 1994 when approximately 460,000 workers were laid off from major U.S. companies, and it is expected to persist (Gottlieb & Conkling, 1995; Uchitelle & Kleinfield, 1996).

Layoff survivors face many changes in their work environment, including: (a) loss of ties to information sources, (b) loss of direct and indirect links to individuals with power and influence, and (c) a loss of connection to and social interaction with dismissed employees. These losses create voids in an organization's communication network known as structural holes. According to Burt (1992a, p. 2), structural holes create "entrepreneurial opportunities for information access, timing, referrals and control." On one hand, structural holes force employees to seek new linkages which can provide unique sources of and/or new opportunities for the brokerage of information. On the other hand, structural holes create disruptions when members lose valued network connections. As a result of structural holes, layoff survivors experience stress and information deficiency which ultimately impact employee commitment and job satisfaction.

A number of investigations examine the effects of organizational downsizing on surviving employees (see reviews by Brockner, 1988; Kozlowski, Chao, Smith, & Hedlund,

1993). Research by Brockner and colleagues (Brockner, Wiesenfeld, Reed, Grover, & Martin, 1993; Davy, Kinicki, & Scheck, 1991; Brockner, 1988) indicates that layoff survivors' reactions are mediated by a number of factors, including coworkers' perception of justice for laid-off employees and their prior organizational commitment. While these studies provide valuable insight into the effects of downsizing on individuals' attitudes, few existing studies examine the connection between changes in communication network structure and the behavioral and attitudinal effects on surviving employees over time. A lack of attention to downsizing's long term effects on organizational network configurations is particularly surprising since: (a) observable physical reconfigurations are likely to have considerable impact on work processes and employee attitudes; (b) a considerable number of often cited downsizing studies are laboratory versus field based (e.g., Brockner, Davy, & Carter, 1985; Brockner, Grover, Reed, Dewitt, & O'Malley, 1987); (c) it is unclear how organizational members cope with lost linkages and the need to form new linkages; (d) resulting role changes may have a considerable impact on power and influence structures; (e) longitudinal studies of task related networks in organizations appear essential to understanding organizational efforts at efficiency and development (Kozlowski et al., 1993); and (f) few, if any, investigations examine the influence of organizational downsizing on the emergence of the ever-fluctuating configuration of employee communication networks.

Just as survivors' reaction to layoffs are impacted by numerous factors, this study proposes that changes in employees' communication networks as a result of downsizing mediate the relationship between the downsizing event and layoff survivors' attitudes and

perceptions. As illustrated in Figure 1, structural holes in a communication network influence organizational members' perceptions of information deficiency which then impacts their experience of stress. Stress subsequently impacts their degree of job satisfaction which in turn affects their commitment to the organization. Structural holes represent a restriction of access to information contacts, and create disruptions in the flow of communication and work processes. In essence, this study proposes that downsizing does not affect surviving employees in the same way. Instead, a downsizing's impact on employee attitudes and perceptions depends on their relationship to structural holes. Employees who experience structural holes in their networks should report greater changes in their attitudes and perceptions than employees not experiencing structural holes due, in part, to the perceived loss of established coworker support and work facilitation information (Ray & Miller, 1991).

While Burt (1992a, 1992b) primarily focuses on economic and sociological applications of structural holes and their use to bring advantage to network members and organizations, this investigation extends structural hole research into the domain of organizational downsizing and its impact on individual behavior, creating a link between macro- and micro-level elements. To this end, I overview the relationship between organizational change, downsizing, and communication networks. In particular, I describe the relationships between structural holes and organizational networks and how structural holes impact on employees' perceptions and attitudes. Chapter two reports the methods used to measure structural holes and employee attitudes and perceptions in a hotel organization's corporate office during an organizational downsizing. In the third and fourth chapters,

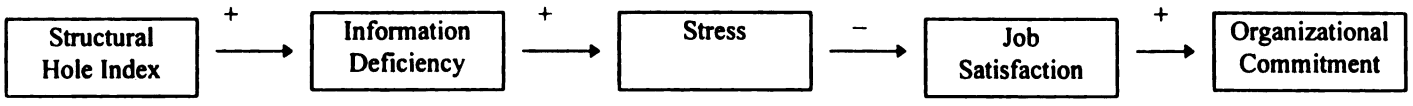


Figure 1. Hypothesized Static Causal Model

respectively, I present the results of the study and a discussion of their implications and directions for future research.

Organizational Change and Downsizing

Employees' responses to organizational change reflect the degree of acceptance of planned organizational change (Lewis & Seibold, 1996; Miller, Johnson & Grau, 1994) and contribute to its successful implementation and acceptance in organizations (Farmer, 1990). The study of organizational change is central to an understanding of evolving organizational structures and employee behaviors and attitudes (Berger & Cummings, 1979; Goodman, Bazerman & Conlon, 1980; Levy & Merry, 1986; Porras & Robertson, 1992). To this end, investigations examine employee responses to organizational development (e.g., Beer, 1980; Cummings & Huse, 1989), organizational transformation (e.g., Levy & Merry, 1986; Tushman & Romanelli, 1985), and organizational diffusion of innovation (e.g., Kanter, 1988; Lewis & Seibold, 1993, 1996; Rogers, 1983).

The Nature of Organizational Change

In general, researchers classify organizational change as planned or unplanned and as a first-order or second-order event (Levy, 1986; Levy & Merry, 1986; Porras & Robertson, 1992). Planned change is a deliberate, progressive decision made to improve organizational functioning (Levy & Merry, 1986; Porras & Robertson, 1992). In contrast, unplanned change is adaptive and evolutionary and is the result of the organization's reaction to extra-organizational or environmental stimuli (Porras & Robertson, 1992; Tushman & Romanelli, 1985). Whether change is planned or unplanned, it may result in first-order or second-order changes. First-order changes are minor adjustments which do not

alter the basic "core" of the organization and occur as the system grows and develops (von Bertalanffy, 1968). Second order changes are more drastic modifications to the organization's mission, structure, or processes and may be accompanied by potentially disruptive jolts to a relatively stable set of internal organizational configurations (Levy, 1986; Levy & Merry, 1986).

According to Levy and Merry (1986), second order change alters two or more of the following organizational components: (a) the organization's paradigms - the underlying philosophy or "metarules" (p. 276) which shape organizational behavior; (b) its mission and purpose - the explicit goals and policies governing organizational actions; (c) its culture - an organization's beliefs, values, and norms; and/or (d) functional processes - which include organizational structure, communication, and decision making procedures (Levy & Merry, 1986). To date, research investigating second-order change examines the quality of work life (Cummings & Huse, 1989), employee participation in decision making (Beer & Walton, 1987), and organizational restructuring in the form of mergers, acquisitions, and downsizing (Kozlowski, et al., 1993). As such, second order change represents a fundamental change to employee orientation and function and parallels the descriptions of many organizational downsizing events.

Downsizing

Organizational downsizing is defined as a purposive action (planned) initiated to reduce the size of the workforce in an attempt to increase the efficiency or effectiveness of the organization (Freeman & Cameron, 1993; Kozlowski, et al., 1993). Downsizing can also be a planned, second-order change when the reduction in the number of employees

forces a readjustment of work roles and relationships. Regardless of the proportion of employees "let go," significant adjustments in work behavior are usually required on behalf of the remaining or "surviving" organizational members.

For the most part, downsizing efforts are implemented after a noticeable organizational decline (Cameron, Kim & Whetten, 1987; Sutton & D'Aunno, 1989, Whetten, 1980) in an effort to increase profitability and firm performance (McKinley, Sanchez & Schick, 1995). However, organizational downsizing does not necessarily result from attempts to correct decreases in firm performance (Cameron, Freeman & Mishra, 1991; Freeman & Cameron, 1993; Whetten, Keiser, & Urban, 1995). For instance, firms downsize in an attempt to implement less hierarchical and more versatile organizational structures (Cameron, et al., 1991; Cascio, 1993; Whetten & Cameron, 1994; Whetten, et al., 1995).

In investigations of organizational downsizing events, researchers have considered the organization-environment conditions precipitating a downsizing (Cameron, Kim, & Whetten, 1987; Greenhalgh, et al., 1987), the strategies and procedures used to accomplish downsizing (Bruton, Keels & Shook, 1996; Cameron, in press-a, in press-b; Dewitt 1993; Whetten & Cameron, 1994; Whetten, et al., 1995), the impact of dismissal on former employees (Buss & Redburn, 1987; Cobb & Kasl, 1977; Podgursky & Swaim, 1987; Warr & Jackson, 1984), and the reactions of the surviving personnel (Brockner, 1988; Brockner, Davy, & Carter, 1985; Brockner & Greenberg, 1990; Brockner, Grover, Reed, DeWitt & O'Malley, 1987; Gutknecht & Keys, 1993; Larkey, 1993; McKinley, et al., 1995).

Organization-Environment. Organization-environment investigations (Dewitt, 1993; Tushman & Romanelli, 1985; Zammuto & Cameron, 1985) examine downsizing as a function of either: (a) an internal reorganization that requires the shifting or adjustment of human resources based on perceived financial or strategic needs (Whetten, et al., 1995); or (b) a merger or acquisition to regain solvency through the divestiture of their assets or through the acquisition of additional assets believed to be profitable (Bruton, et al., 1996; Gutknecht & Keys, 1993). A common outcome of both internal reorganization and mergers and acquisitions is a reduction in workforce (Gutknecht & Keys, 1993). An internal reorganization normally reduces personnel as processes and positions are reconfigured. Mergers eliminate personnel who have become redundant and unneeded in the merged environment.

Dewitt (1993) highlights the importance of using a "multiple-contingency downsizing strategy model" when examining organization-environment relationships. Key elements in the model are the organization's: (a) domain - needed changes to products, services, or markets to enhance performance; (b) structure - needed changes in decentralization or formalization; (c) reorientation strategy - simplifying or reducing organizational activities by dropping a product line or service; and (d) retrenchment strategy - shifting business focus by developing a new or revised product line. By reporting changes to these elements, researchers are able to provide a more precise description of the nature of downsizing and develop a greater understanding of effective strategies under specific external environmental conditions.

Adapting the Structural Equilibrium Model (Tushman and Romanelli, 1985), Freeman and Cameron (1993) propose that the successful implementation of downsizing be examined as either a convergence or a reorientation transformation. Convergence is characterized by gradual, progressive organizational changes such as redirecting an existing company mission or introducing minor modifications to products and services. In contrast, reorientation is achieved by changes to the management strategy, structure, and basic organizational practices. Both approaches examine the relationship between downsizing, the organizational structure and coordination processes. Yet, convergence downsizing transformations center on the maintenance of organizational stability while a reorientation stresses the shift of internal processes in order to adapt to a new external environment.

As downsizing holds popularity as a strategy for improving organizational competitiveness (Gottlieb & Conkling, 1995; Uchitelle & Kleinfield, 1996), several scholars provide critical appraisal of downsizing proponents' claims of improved organizational performance. Whetten and Cameron (1994) review several studies of downsized organizations. They suggest that the "paradoxical" lack of organizational improvement in financial performance (in terms of overhead and salary) and/or productivity are due to organizations indiscriminately reducing the workforce rather than targeting specific units for improvement. Based on skepticism regarding downsizing's effectiveness as a cost-cutting strategy, in a review of 210 organizations announcing layoffs, McKinley, et al. (1995) report downsizing being promoted, rationalized, and institutionalized through social pressures in three ways: (a) constraining - the acceptance of a vision regarding how their business image and actions should appear to others (e.g., lean and mean as opposed to

bureaucratic); (b) cloning - where companies jump on the "downsizing band-wagon" because they are uncertain about the pursuit of other cost-cutting options and follow the actions of leading firms in their industry; and (c) learning - where cost-cutting behavior is instilled and rewarded in organizational members. Whetten, et al. (1995) argue that human resource units in organizations must become more strategic in their activities in order to compensate for the increase in personnel-related demands associated with a reduced and restructured workforce. Others suggest that the magnitude of the downsizing and the operating characteristics of the firm should be carefully considered prior to developing and implementing downsizing strategies (Bruton, et al., 1996; Cameron, in press-a, in press-b).

Dismissed Employees. The termination of employees through downsizing is often accomplished in one of three ways (Fisher, Schoenfeldt & Shaw, 1990). The most severe approach to layoffs from a human relations viewpoint entails the distribution of dismissal notices to each terminated employee with the distribution severance benefits only as mandated by law or union contract. Second, an organization terminates employees and then voluntarily provides outplacement counseling and guidance. Outplacement counseling typically focuses on job seeking skills, and the identification job/career alternatives. A third approach to downsizing offers early retirement to targeted employees. The organization offers financial incentives to workers nearing retirement age to encourage or induce attrition. In this case, the termination of employment is somewhat voluntary as the worker exchanges financial benefits for their term of employment. A single approach to reducing a workforce is not clearly better than the others (Kozlowski, et al., 1993). The effectiveness of the approach used is dependent upon market conditions, worker characteristics, and the solvency of the organization.

Downsizing usually elicits numerous negative responses from involuntarily dismissed employees. Financial strain occurs for terminated workers when they are unable to quickly find stable alternative employment (Buss & Redburn, 1987; Warr & Jackson, 1984) or if they must accept lower paying or part-time jobs which do not match their previous earnings (Kozlowski, et al., 1993). Yet, the impact of job loss on involuntarily dismissed employees far exceeds the problem of income stability. Job loss creates psychological and physiological reactions which lead to stress and strain for the terminated worker (Cobb & Kasl, 1977; Kozlowski, et al.). Some reported reactions to job loss are high blood pressure and headaches (Cobb & Kasl, 1977), lead to poorer psychological health (i.e., depression, anxiety, tension, anger) (Cobb & Kasl, 1977; Dooley & Catalano, 1988), and create negative attributions or attitudes such as external locus of control, poor life satisfaction, and low self-esteem (Burke, 1984; Liem & Liem, 1988). As unemployment persists for an involuntarily dismissed worker, the intensity and inability to cope with the consequences of downsizing increase (Kinicki, 1985; Kinicki & Latack, 1990).

Layoff Survivors. An organizational downsizing may also influence layoff survivors' work behaviors and attitudes (Brockner, 1988). On a beneficial note, a reduced workforce can bring a new sense of efficiency, effectiveness, or relief to an organization and its members (Brockner, 1988; Gutknecht & Keys, 1993). For example, if a less productive employee who constantly requires assistance to reach average performance is terminated, the surviving workers may experience a sense of relief and increased work performance. Additionally, as layoffs are announced, the surviving workers may be relieved once they know they have not been laid off (Brockner, 1988). However, layoffs can produce

uncertainty, guilt or anger among survivors in the reconfigured work environment (Gutknecht & Keys, 1993; O'Neill & Lenn, 1995). Brockner, Wiesenfeld, Reed, Grover and Martin (1993) report that employees' attitudes toward a downsizing effort depends on (a) how fairly the survivors feel the layoffs were handled and (b) their perceptions of their coworkers' reactions to the layoffs. If survivors sense that the downsizing was handled in an unfair manner, they are likely to define their new work context as unfair, to harbor feelings of distrust and uncertainty toward the organization (Brockner et al., 1993), and to be less accepting of the changes to their work environment (Goodman, Bazerman & Conlon, 1980).

Survivors of a laboratory-simulated downsizing perceiving the procedure used to terminate workers to be unfair also have negative responses to downsizing (Brockner, et al., 1985). Other laboratory and case study research suggests that layoff survivors' *proximity* to terminated employees are negatively related to their perceptions of equity, the extent that they can control the layoff process, and job security, but positively related to feelings of guilt (Brockner, et al., 1985; Brockner, et al., 1987; Gutknecht & Keys, 1993). In addition, survivors' perceptions of their control of the layoff process, job security, and the fairness of the downsizing are positively related to employees' job satisfaction and organizational commitment, but negatively related to intent to withdraw from the organization (Davy, Kinicki & Scheck, 1991).

Survivors' positive or negative perceptions may be reinforced by impressions they receive from their fellow survivors (Ray & Miller, 1991; Salancik & Pfeffer, 1978). As employees are dismissed from a work environment, the remaining employees may

positively or negatively characterize the downsizing depending on their gain or loss of connections to valuable information and resources (Burt, 1992a). Certainly, the news media emphasize downsizings' harshest outcomes - the dismissal of valuable colleagues, increased workloads, and the perceived lack of strategy employed by the executives (Kleinfield, 1996; Uchitelle & Kleinfield, 1996). Regardless of their reaction to the downsizing, layoff survivors often need to acquire a different set of skills to perform their jobs in the post-downsizing environment. Surviving employees may undergo training to facilitate the addition of duties or responsibilities (job enlargement) or a modification to their existing position (job enrichment) (Noe, 1986).

In sum, downsizing is a prevalent organizational change practice, may lead to considerable changes in an organization's mission and structure, and is commonly framed by surviving employees in a negative light (Brockner, et al., 1993; Gutknecht & Keys, 1993). While researchers have devoted considerable attention to organizational downsizing and its effects, Kozlowski, et al. (1993) argue that our understanding of downsizing-related phenomena would be improved by longitudinal field research investigations (versus laboratory experiments with student participants). In addition, Kozlowski et al. point out that micro-macro integrative approaches are uncommon in this research domain and the nature of downsizing highlights the need for more specific attention to the survivors' attitudes and perceptions of the multi-level process. For instance, survivors' reactions to a downsizing may be considerably influenced by changes in communication network patterns and the loss or gain of new task network members. Communication networks are the primary mechanism through which employees send and receive work-related information.

Unexpected changes to patterns of communication relationships may disrupt the information flow and negatively shape their perceptions and attitudes. However, improvements in information flow through new network linkages may positively influence employee reactions.

Communication Networks

Communication networks can be viewed as relatively stable configurations of relationships in an organizational context (Johnson, 1993). Organizations formally divide their members into departments or functional group structures, and a variety of communication links exist within and between formal work groups. Members maintain task and social communication with other members in their network within the same hierarchical levels, different hierarchical levels, and across varying departmental and geographic locations. Each member of an organization contributes to a communication network as: (a) a member of the groups, clusters or cliques that comprise the network, (b) the individuals who link the clusters or groups together as a liaison or bridge, or (c) those individuals who are not a part of a group or do not link groups together (non-participants) (Monge & Eisenberg, 1987). The nature of message exchanges between members determines their status as a participant or a non-participant as well as their formal and informal roles in the network.

In any communication network analysis, the linkages between all possible pairs of members are of interest to researchers and indicate the presence or absence of relationships between network members. Network linkages have four main properties: (a) strength or intensity - representing the amount of information and affect that flows through the linkage, (b) symmetry - representing the degree to which both parties enter into similar relations

with one another, (c) reciprocity - the extent to which two linked members report the same relationship to one another, and (d) multiplexity - the degree to which the same players are involved in different networks in the organization (Johnson, 1993). Together, these properties provide the basis for understanding an employee's role in the network system. The strength, symmetry, reciprocity, and multiplexity of any employee's network role are unlikely to be an exact match with any other member's role. Some employees have more unique information contacts and coordinate their work efforts with a greater set of members than others. Downsizing potentially places a particular strain on the availability of members' information and resources. Changes or disruptions to the access of information and resources in a network may create structural holes.

Structural Holes. According to Burt (1992a, pp. 1-2), structural holes are "disconnections or nonequivalencies between players in an arena." As such, a structural hole represents a separation between non-redundant contacts in a network (Burt 1992a) and may be measured on a continuum representing the extent that structural holes are prevalent in an organization network (Susskind, 1996). Non-redundant contacts represent a unique source of information and resources not available from other network contacts. An employee's separation from non-redundant ties represents a loss of unique information or resources. In contrast, redundant ties are linkages through which a network member gains similar information or resources from two or more people. Burt (1992a) suggests that network members have a greater proportion of redundant ties than non-redundant ties in their immediate work group and non-redundant ties occur more frequently outside a member's immediate work group.

Structural holes exist in a functioning organizational network as part of its normal state, but can increase as a result of voluntary turnover of personnel and transfers. The proportion of structural holes in a network is likely to increase as organization-wide downsizing occurs. However, downsizing may also remove structural holes from a network. Employees who were once denied access to vital personnel may find themselves with access to additional information or resources unavailable in the pre-downsizing network. It is possible that an organizational downsizing can simultaneously close and open structural holes in a network and create advantages for some members and disadvantages for others. Burt (1992a) primarily focuses on the competitive advantages that structural holes create and suggests that members open and close structural holes by their own actions to maximize their personal position in a network. In the case of organizational downsizing, structural holes open and close as a function of the reduction in network personnel. Downsizing removes much of the choice involved in manipulating structural holes for personal gain.

Burt (1992a) identifies three kinds of "capital" (p. 8) or opportunities which may arise out of the formation of structural holes: social, human, and financial. *Social opportunities* concern the formation of new social relationships with others, and are available to all network members. *Human opportunities* are the individual qualities a network member shares with others. Each network member possesses individual talents which may be valued by other network members. *Financial opportunities* represent tangible resources which are needed and essential to work functioning. Financial resources are not necessarily available to all network members as some network members have greater access to funding, equipment, and supplies. In short, employees can benefit from structural holes

with increased access to social, human and financial resources from a network. Conversely, structural holes can reduce an employee's position power and access to resources through the losses of social, human, and financial capital. Losses may be difficult to recover in the new network and can isolate employees in the post-downsizing network.

Network research focusing on structural holes to date is limited. In a longitudinal study, Burt (1992a) examines structural holes in producer-supplier-consumer markets under stable market conditions. Specifically, he examines the relationships between structural holes and producers' ability to negotiate prices with both suppliers and consumers. The results suggest that producers' profit margins increase as they experience fewer structural holes as evidenced by a decrease in structural autonomy. However, as suppliers and consumers experience fewer structural holes, their autonomy and profit both decrease (Burt, 1992a) indicating a different impact of structural holes for different network participants.

In a second investigation, Burt (1992a) contrasts the promotion rate of managers based on their adjacency to structural holes. Using a measure of constraint to indicate the presence of structural holes, Burt assesses the "closeness" with which each manager perceives other hierarchically similar network members. Comparing closeness to the number of days since each manager's last promotion, Burt reports that managers' experience of structural holes is related to a rapid promotion. However, the promotion effects of structural holes on promotion rates are less pronounced for sample groupings such as women and older workers.

In a similar vein, Ibarra (1995) uses indicators of structural autonomy (e.g., density and number of contacts) to investigate the impact of minority interaction in informal managerial networks. Ibarra (1995) suggests that managers encounter varying effects from structural holes due to structural constraint present in their network relationships. As access to information or resources appears limited, structural constraint inhibits minorities' network relationships (Ibarra, 1995).

Structural Hole Measurement. Structural holes can be identified in a network analysis through measures of structural autonomy and prominence (Meyer, 1996; Susskind, 1996). Structural autonomy indicators identify the structure of network relationships which lead to the gain or the loss of access to sources of capital (Burt, 1992a). These indicators primarily examine horizontal relationships in a network and gauge the breadth of a member's network contacts (Burt, 1991). Prominence considers a network member's hierarchical influence and the extent to which they are considered central or valuable in a network (Brass & Burkhardt, 1992; Burt, 1991).

Previous research on structural holes focuses primarily on measures of structural autonomy. In Burt's research (1992a), a combination of eight individual autonomy indicators are used in varying combinations, with little explanation as to why some indicators are used and others are not. Susskind (1996) suggests that (a) the use of autonomy indicators in research to date is sample-specific and lacks a theoretical explanation for the use or exclusion of each indicator in the measurement of structural holes and (b) a rationale for the use of the indicators is wanting. Prominence examines the value of relationships to others members in a network and explains network interaction as

members compete for resources and information. Investigations considering structural autonomy and prominence measures together in the study of weak ties (Meyer, 1996) and structural constraint (Ibarra, 1995) suggest that the combination of autonomy and prominence measures are useful in describing organizational communication behavior.

In an initial test of 6 structural autonomy measures used by Burt (1992a) and 2 theoretically pertinent prominence measures (Burt, 1991) as a combined index, Susskind (1996) performed a confirmatory factor analysis of Burt's (1991, 1992a) structural autonomy and prominence indicators at three time periods in an organizational network. His results suggested that a unified structural hole index comprised of two structural autonomy measures (non-redundant contacts and constraint) and two prominence measures (extensive ties and exclusive ties) demonstrated sound psychometric properties to measure structural holes on a continuum. Table 1 describes the indicators which, when summed, create an index with scores ranging from "many holes" to "few holes."

As suggested by the factor analysis and subsequent tests of the structural autonomy and prominence indicators as predictors of chaos and openness to change, these autonomy and prominence indicators provide a complimentary measurement of structural holes (Susskind, 1996). While autonomy examines how unique information and resources are limited by network relationships (Burt, 1992a), autonomy does not specifically consider hierarchical influence in network as a means of access to resources. In contrast, prominence explicitly considers how hierarchical influence inherent in network positions. The combination of autonomy and prominence in an index emphasizes a network's impact on the individual by allowing network properties to be associated with

Table 1
A Description of the Structural Hole Index Items

Index Item	Definition	Measures	Relationship to Structural Holes
Non-Redundant Contacts	An autonomy item which represents non-duplicated, unique sources of information or resources obtained through other network members.	The efficiency of a member's network in terms of access to others.	Negative
Constraint	An autonomy item which indicates to what extent a member's interaction is dependent on a few members.	The contact limitations experienced by a member.	Positive
Extensive Ties	A prominence item which indicates the degree to which a member receives numerous cohesive relations from other members in the network.	Other network members' demand upon the member.	Negative
Exclusive Ties	A prominence item which represents the extent to which a member is the object of unshared relations from other members in the network.	A member's value to others in the network.	Negative

individual-level perceptions and attitudes in organizations. The measurement of structural holes' influence on employees is particularly important in understanding the impact of downsizing. Given the description of information flow and the loss of resources when a work group member is dismissed, it is anticipated that structural holes will occur most prominently in work groups with the greatest number of layoffs. While all organizational networks have structural holes to some extent (Burt, 1992b), a downsizing is likely to create a greater proportion of structural holes in the recently reconstructed communication network.

At the present time, the impact of structural holes on individuals' perceptions and attitudes is largely conjectural. In particular, little is known regarding the stability of structural holes among employees over time and how they may change as a result of an organizational downsizing. Consequently, this investigation begins with the following questions:

RQ 1: How prevalent are structural holes in an organizational network?

RQ 2: How do employee structural hole experiences change as a consequence of an organizational downsizing?

Perceptions and Attitudes of Downsizing Survivors

Structural holes are a consequence of employees' links to employees throughout an organization, span the confinement of work group membership, and are, therefore, a macro-level phenomenon (Miles, 1980). However, rather than having a generalized impact, each member's structural hole experience is likely to be unique and reflect the individual's role

and the member's task network. Of interest in this investigation is the relationship between structural holes and employee attitudes and perceptions and an integration of micro- and macro-levels of analysis (c.f. Rousseau, 1988). Calls for the integration of micro and macro organizational processes are not new (Jablin, 1987; Krackhardt & Porter, 1985, 1986; Staw & Sutton, 1993; Weick, 1993), especially with regard to organizational networks (Indik, 1965).

To date, few macro-micro integrative studies using network analysis exist. Krackhardt and Porter (1985) identify the relationships among workers' friendship networks as an influence on employees' attributions of dissatisfaction and organizational commitment. They report that employees attribute dissatisfaction as a cause of turnover for their peers, but do not attribute peers' commitment to the organization as leading to turnover. Hartman and Johnson (1989) investigate the communication network structure property of contagion to explain individual reactions and report structural equivalence to be a better indicator of organizational commitment than cohesion. This study extends the work of Krackhardt and Porter (1985) and Hartman and Johnson (1989) by examining the linkages between formal organizational communication network relationships, individual reactions, and an organizational reconfiguration. Specifically, this investigation seeks to identify the impact of the presence of structural holes on individuals' levels of information deficiency, stress, job satisfaction, and organizational commitment as a result of an organizational downsizing.

Information Deficiency

The access to information is necessary to perform work-related functions and is critical to making sense of organizational developments (Weick, 1979, 1993). The perception of receiving inadequate amounts of information affects employees' willingness to participate in organizational changes (Miller, Grau & Johnson, 1994) and downsizing survivors' certainty about their career futures (Johnson, Bernhagen, Miller & Allen, 1996). As a consequence of downsizing, emerging structural holes can disrupt the flow of information among survivors and, subsequently, impact their perception of a deficiency of work-related information.

Perceptions of information deficiency are likely to vary among layoff survivors. In general, employees who are well connected in a network are likely to be more aware of the formal and informal decision making processes and current developments within the organization (Ibarra, 1993). Yet, a downsizing is likely to decrease the perceived amount of information received by network members. Members who are disadvantaged in their network connections and affected by structural holes are likely to have greater difficulty obtaining information about the organizational changes and will be more aware of losses of information sources and resources. Further, the loss of information associated with structural hole experiences are likely to have both short and long term consequences.

Stress

Stress is believed to be a natural consequence of downsizing (Kahn & Byosiere, 1992). Organizational stress can result in physiological harm (e.g., cardiovascular and gastrointestinal symptoms) (Fried, Rowland & Ferris, 1984), psychological strain (e.g.,

burnout, job dissatisfaction and depression) (Cooper & Payne, 1988) and inappropriate behavioral responses (e.g., absenteeism, drug and alcohol abuse, and accidents) (Davidson & Cooper, 1986; Cobb & Kasl, 1977). Layoff survivors experience stress in the downsized environment as a result of increased work requirements, the loss of valuable links to informational resources, an increased sense of uncertainty, and/or a fear that they may be laid off themselves. The potential impact of stress on employees experiencing an organizational downsizing is exemplified in an investigation of the threat of job loss on employee attitudes in manufacturing plants that closed and did not close. Cobb and Kasl (1977) report the threat of job loss to be psychologically damaging to employees, in the form of increased stress and anxiety, in plants both experiencing and not experiencing layoffs. However, employees in plants which had experienced layoffs reported greater psychological damage than those in plants not experiencing layoffs.

While increased levels of stress may be an inevitable result from downsizing (Cobb & Kasl, 1977), the uniformity of the experience and the duration of increased stress is less clear. As posited earlier, the emergence of a structural hole is likely to be localized to certain network linkages and unlikely to affect all employees equally. While the threat of job loss (Cobb & Kasl, 1977) or the perceptions of the fairness of a downsizing (Brockner & Greenberg, 1990; Davy, et al., 1991) may increase surviving employees' levels of stress, with the experience of structural holes the loss of information and resources will have a disproportionate influence on employees' level of stress. In addition, employees' levels of stress are likely to continue until new relationships are formed and proven reliable in

providing information. In contrast, those employees who experience fewer structural holes will perceive lower information deficiency and, consequently, lower levels of stress.

Job Satisfaction and Organizational Commitment

As depicted in Figure 1, information deficiency and, consequently, increased stress result from organizational downsizing. Several studies link employee stress with job dissatisfaction (Ivancevich, Matteson & Preston, 1982; Jackson, 1983; & Howell, Bellenger & Wilcox, 1987) and organizational commitment (Vredenburgh & Trinkaus, 1983). Further, stress and job satisfaction are strongly correlated and in some cases act as moderators of measures of organizational commitment (Mathieu & Zajac, 1990; Tett & Meyer, 1993), implying that stress impacts affective responses and perceptions of workers in relation to their jobs.

Job satisfaction is an attitudinal measure which relates past events and rewards to current feelings about a job (Lawler, 1986). Changes in job satisfaction are particularly relevant in regard to organizational downsizing due to its strong empirical relationship to organizational outcomes such as turnover intention and organizational commitment (Tett & Meyer, 1993; Davy, et al., 1991), and job performance (Meyer, Paunonen, Gellatly, Goffin & Jackson, 1989; Iaffaldano & Muchinsky, 1985). It is anticipated that when dealing with increased levels of stress, employees find it more difficult to comfortably perform normal work functions. Difficulties in job performance related to downsizing are likely to lead to a decrease in job satisfaction.

Organizational commitment consists of: (a) a strong belief in and acceptance of the organization's goals and values; (b) a willingness to exert considerable effort on behalf of

the organization; and (c) a strong desire to maintain membership (employment) in the organization (Mowday, Steers & Porter, 1979). Research indicates that layoff survivors are less committed to the organization when they perceive their jobs to be less intrinsically interesting, they perceive organizational changes to be unfair, they have solid attachment to layoff victims, and their coworkers harbor a negative attitude (Brockner et al., 1993). Organizational commitment may also mediate the relationship between job satisfaction and employees' behavioral intent to withdrawal (Davy, et al., 1991). Evidently, when workers are satisfied with their employment relationship, they perceive it as an advantage to remain employed (Lawler, 1986; Locke & Latham, 1990). Other research investigations support job satisfaction's positive impact on organizational commitment (Davy et al., 1991; Meyer et al., 1989).

In sum, while numerous studies have established the overall link between downsizing survivors' job satisfaction and commitment, to date little is known regarding the impact of employees' network position on their perceptions of information adequacy, stress or their job satisfaction and commitment. Consequently as depicted in Figure 1, the general static model hypothesizes that a greater proportion of structural holes in a member's network is positively related to the perception of information deficiency. The perception of information deficiency is then positively related to higher levels of stress. Subsequently, stress is negatively associated with job satisfaction, which is positively related to organizational commitment.

As a result of a downsizing event, layoff survivors will continue to redefine communication relationships, establish new linkages, and acquire and provide information

to new or different sources. Structural holes emerging (or disappearing) from network reconfigurations can affect layoff survivors' levels of stress, information deficiency, job satisfaction, and organizational commitment in the downsizing aftermath. While downsizing events continue to be used as a means for improving organizational survival rates, efficiency, and profitability, a limited number of studies examine the effects of a downsizing on surviving employees. Given potential changes to network structures and the emergence (or disappearance) of structural holes, it is necessary to identify changes in organizational networks and employee attitudes and perceptions over time.

In addition to the static model, it is hypothesized that longitudinal relationships will exist among the variables. As presented in Figure 2, each of the preceding variables will exhibit autocorrelation in its subsequent time period. In other words, structural holes prior to the downsizing should predict structural holes shortly following (e.g., 2 months) which should then predict structural holes at a more distant time from the downsizing (e.g., 5 months). In the absence of information about the extent to which structural holes open or close around downsizing survivors, it is predicted that individuals beset with a higher preponderance of structural holes will likely find themselves with a similar network circumstance following the downsizing. Likewise, employees experiencing few structural holes are more likely than not to find themselves surrounded by few structural holes post-downsizing. In general, following a downsizing employees are likely to continue their normal work functions with possible changes in the magnitude of their tasks but with somewhat similar sets of task connections. The contention that employees' network configurations are likely to remain relatively stable despite a downsizing finds

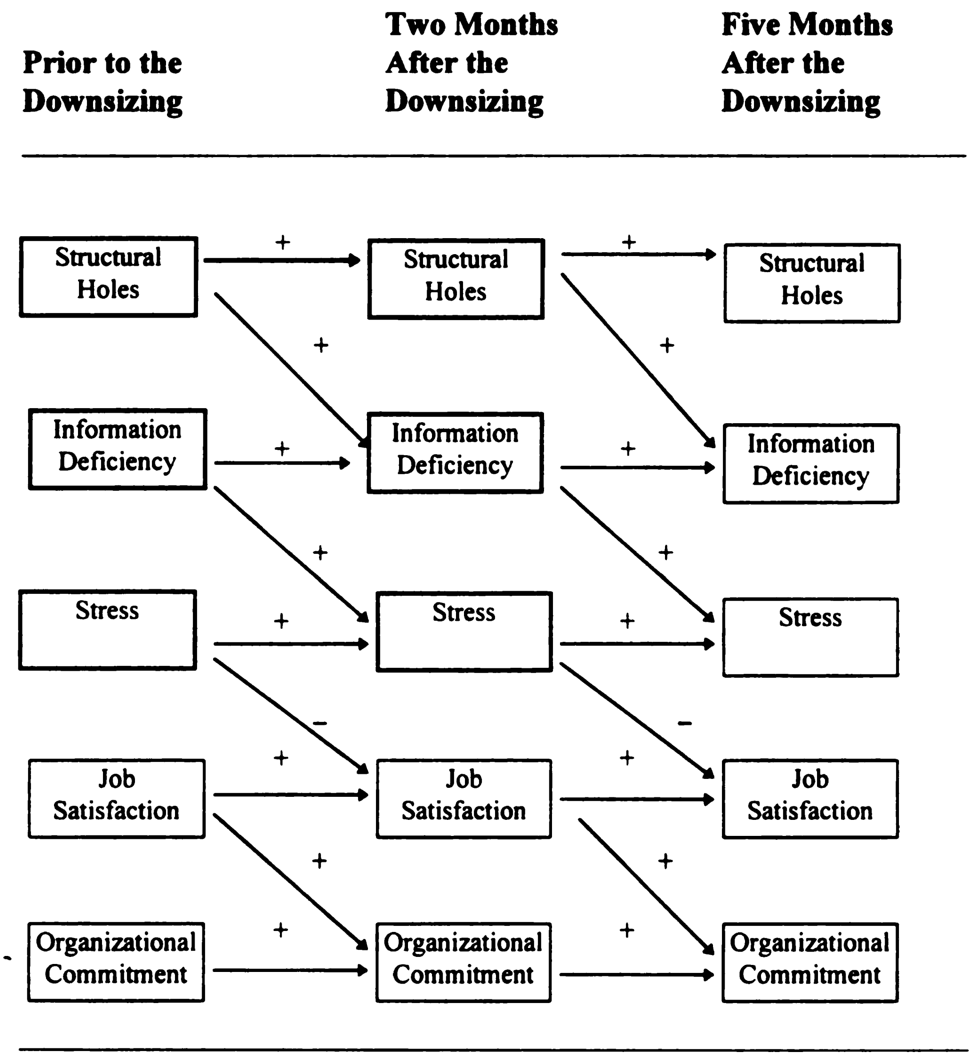


Figure 2. The Hypothesized Longitudinal Model

support from research indicating that (a) network positions such as liaisons and bridges are associated with employee communication abilities (Johnson, 1993) and (b) network positions remain fairly stable over time (Monge & Eisenberg, 1987). While it is anticipated that a downsizing will create more structural holes for some employees and reduce some for others, these changes are predicted not to override an employee's overall structural hole circumstance. It is also predicted that autocorrelation will be present among information deficiency, stress, job satisfaction, and organizational commitment.

Given the enduring effect of an organizational change, whether it is manifested in a convergence or reorientation intervention (Cameron & Freeman, 1993; Tushman & Romanelli, 1985), it is also predicted that the impact of structural hole experiences on employees' perceptions and attitudes will continue over time. As indicated in Figure 2, the cross-lagged relationships among the variables act as a causal force in the subsequent time period. Specifically, structural hole experiences prior to the downsizing will positively impact information deficiency shortly following the downsizing and information deficiency prior to the downsizing will lead to increased stress shortly after the downsizing. In turn, the experience of stress prior to the downsizing will negatively influence employee job satisfaction following the downsizing, and job satisfaction prior to the downsizing will lead to organizational commitment in the interim following the downsizing. Two months following the downsizing, structural hole experiences will predict information deficiency five months after the downsizing just as information deficiency will lead to stress, stress will be negatively related to job satisfaction, and job satisfaction will lead to organizational commitment five months after the downsizing.

Chapter 2

Methods

Procedure

Employees' network relationships and perceptions and attitudes were measured 60 days prior to the downsizing event (T1), 60 days after the downsizing (T2), and 150 days after the downsizing (T3). Subjects completed demographic information at T1 only. Due to the nature of reporting communication network relationships, anonymity was not possible. However, each participant was assured strict confidentiality in their responses and guaranteed that their name or the name of the organization would not appear on any report generated from the data.

Participants

One hundred and thirty employees at a large international hospitality company's corporate headquarters surveyed at T1 are described as 56 % male and 44 % female and between the ages of 20 and 57 (M = 32.42). Regarding the tenure of the participants at T1, approximately 12 % (N=17) had been employed one year or less, 23 % (N=30) between 1 to 2 years, 36 % (N=46) between 2 to 5 years, and 29 % (N=37) for 5 or more years. The demographic characteristics of the sample remained relatively stable at the next two time periods. The surviving 98 employees surveyed at T2 and T3 were 58 % male and 42 % female and between the ages of 20 and 57 (M = 32.92). Among surviving participants, 11 % (N=12) had been employed for one year or less, 21 % (N=20) between 1 to 2 years, 37% (N=35) between 2 to 5 years, and 31 % (N=29) from 5 years or more. At all three data

collection points, subjects represented accounting, finance, marketing, rooms, engineering, administration, and personnel units.

Nature of the Downsizing

In keeping with DeWitt's (1993) recommendations, the downsizing of the company's corporate headquarters focused on a structural reorientation and domain retrenchment. Specifically, the organization attempted to remove redundancy from the corporate headquarters by decentralizing a number of corporate functions to the operational unit level while simultaneously modifying the offering of and evaluation of primary services provided to guests.

Structural Hole Measurement

Network Relationships. The survey initially asked participants to specify "all the people you talk to within the corporate office on a regular basis during the course of a normal work week." Prior to completing the survey, they were given specific oral instructions to report formal work relationships related to the performance of their job. Formal work relationships were targeted instead of formal and informal relationships in an effort to satisfy the organization's requirements and reduce the survey's complexity. Participants were provided with an alphabetized directory of all employees listed by functional unit and were asked to report their formal work relationships only by indicating which organizational members they had spoken with during the course of a normal work week. This self-report data gathering technique represents one of several techniques available to assess participants network relationships (Monge & Contractor, 1987). Due to the extreme density within the network sample, only participants' report of direct

linkages were used in the analyses. Each participant had an extensive number of indirect linkages evidenced by the small number of step linkages separating all network members (each member in the network could be reached within four step linkages). This extreme network density confounded the interpretation of the network data. Consequently, only direct linkages were used in the identification of structural holes in this sample.

While the original intent was to use both direct and indirect linkages in the network analysis, the use of only direct linkages made the network data easier to interpret. With indirect linkages, it is not possible to determine the content transferred through the relationship. Indirect linkages commonly involve gatekeeping, blocking, filtering, and innuendo which are less present in communication sent through direct linkages (Huber & Daft, 1987; Stohl & Redding, 1987). Further, the organizational change may exaggerate the number of indirect linkages due to speculation and the uncertainty of future outcomes. See Susskind (1996) for further details on the use and implications of only direct linkages in a network analysis.

The Structural Hole Index. The Structure 4.2 network analysis program (Burt, 1991) determined the communication patterns in the communication network at each data collection period. The responses of the surviving 97 participants were used in the analyses at all three time periods. The Structure 4.2 output summarized the distribution of autonomy and prominence across individual relationships in the network by considering the proximity and equivalence of each network member's direct relationships.

Prior analyses revealed that non-redundant ties, constraint, extensive relations, and exclusive relations indicators provided an appropriate measure of autonomy and

prominence elements (Susskind, 1996). In a test of the index, autonomy (i.e., non-redundant ties and constraint) and prominence (i.e., extensive ties and exclusive ties) network output were converted to a similar numerical format and standardized. This procedure entailed multiplying constraint, extensive ties, and exclusive ties (which appeared in decimal form) by a constant to yield an integer which was then converted to a z-score. Non-redundant ties, extensive relations, and exclusive relations were reverse coded since they were hypothesized to be negatively related to structural holes (Susskind, 1996). As a consequence, a positive structural hole score indicated the presence of structural hole experiences while a negative score indicated the absence of structural hole experiences.

In keeping with the criteria identified by Hunter and Gerbing (1982), the index was judged to be unidimensional as its indicators loaded primarily on the specified factor, did not exceed their specified confidence interval at the $p < .05$ level, and sum of squared errors for tests of internal consistency for the index was non-significant at the $p > .05$ level (χ^2 (6) = .30, χ^2 (6) = .41, and χ^2 (6) = .31, at T1, T2, and T3, respectively). Furthermore, the index demonstrated criterion validity as evidenced by the correlations between the index and its hypothesized outcomes across three time periods. Table 2 reports the final factor loadings and the index's reliability for each time period.

Summated Measurements

In the survey participants also responded to established scales to assess their perceived levels of stress, information deficiency, job satisfaction, and organizational commitment. Participants were asked to indicate their level of agreement with each scale item question on a five choice metric (strongly agree, agree, neutral, disagree, and strongly

Table 2
Final Factor Loadings and Reliabilities for Variables at Time1, Time 2, and Time 3.

	Time1	Time 2	Time 3
Structural Hole Index			
Non-redundant Contacts (R)	.79	.79	.78
Constraint	.96	.96	.94
Extensive Ties (R)	.91	.95	.96
Exclusive Ties (R)	.88	.89	.88
Cronbach's Alpha	.94	.94	.94
Information Deficiency			
I am thoroughly satisfied with the information I receive about what's going on at this company. (R)	.75	.86	.98
I feel like no one ever tells me anything about what's going on around here.	.79	.97	.97
The people who know what's going on here at this company do not share enough information with me.	.79	.91	.80
Cronbach's Alpha	.82	.94	.94
Stress			
I feel like I cannot satisfy the conflicting demands of my superiors at work.	.73	.79	.90
I just don't know what people expect of me	.77	.92	.95
I am unsure what my immediate supervisor thinks of me and how he or she evaluates me.	.64	.96	.96
The amount of work I have to do interferes with how well I am able to do it.	.64	.85	.93
Cronbach's Alpha	.78	.93	.97
Affect Toward Their Job			
I frequently think of quitting this job. * (R)	.79	.88	.75
I am generally satisfied with the kind of work I do in this job. *	.83	.82	.86
Most people on this job are very satisfied with the job. *	.77	.92	.65
For me this is the best of all possible companies to work for +	.60	.91	.89
I am proud to tell others that I am part of this company. +	.67	.86	.89
Deciding to work for this company was a definite mistake on my part. + (R)	.80	.87	.85
I would accept almost any type of job assignment in order to keep working for this company. +	.72	.86	.70
I really care about this company. +	.76	.86	.65
Cronbach's Alpha	.91	.93	.93

Note: "(R)" denotes items that were reversed coded for the analyses; "*" represents items from the job satisfaction instrument; and "+" represents items from the Organizational Commitment Questionnaire.

disagree). To assess the dimensionality of the scales, confirmatory factor analysis tests of internal consistency and parallelism (Hunter & Gerbing, 1982) were also applied to the scales for each data collection period (T1, T2, and T3). Based on the results of the confirmatory factor analyses, scale items at each time period were retained or dropped in keeping with the recommendation that (a) less than 5% of items exceed their confidence interval and (b) chi-square tests on the sum of squared errors for tests of internal consistency and parallelism be non-significant. The final factor structure retained at T1 was applied and tested for both T2 and T3 factor structures. Items dropped at any one time period were excluded from the other time periods, and the factor analyses were repeated for the other time periods. The final retained scale item factor loadings and scale reliabilities for T1, T2, and T3 appear in Table 2.

Information deficiency was measured using a four-item instrument from Miller, et al. (1994) and assessed respondents' perceptions of receiving sufficient amounts of job-related information. Based on the results of confirmatory factor analyses, one item was excluded from the analyses. The sum of squared errors for the tests of internal consistency were non-significant at a $p > .05$ level (χ^2 (3) = .03, χ^2 (3) = .01, and χ^2 (3) = .08 at T1, T2, and T3, respectively).

Employees' stress (or job-related tension) was assessed using a nine-item scale by Kahn, Wolfe, Quinn, and Snoek (1964). The items from this scale assessed the participants' perceived job and supervisory demands. Four of the nine items were retained for use in all three time periods following tests of internal consistency and parallelism. The sum of

squared errors for tests of internal consistency were non-significant at $p > .05$ level (χ^2 (6) = .18, χ^2 (6) = 4.56, and χ^2 (6) = .22 at T1, T2, and T3, respectively).

The five-item, general job satisfaction scale (Hackman & Oldham, 1975) was used to assess participants' general level of satisfaction with their job and perception of their coworkers satisfaction. Organizational commitment was measured using the 15-item Organizational Commitment Questionnaire (Mowday, Steers, & Porter, 1979). Factor analytic tests revealed that although the scales were internally consistent, the lack of parallelism showed the scales to measure one underlying construct. After combining these scales eight items were judged to measure employees' affective commitment to their job in a manner similar to other affective commitment instruments (e.g., Allen & Meyer, 1990; Meyer, Allen & Gellatly, 1990; Mowday, et al., 1979). The final eight-item scale was composed of three job satisfaction items and five organizational commitment items. The sum of squared errors for the tests of internal consistency were non-significant at the $p > .05$ level (χ^2 (28) = 3.70, χ^2 (28) = 12.19, and χ^2 (28) = 9.84 at T1, T2, and T3, respectively). Tests of the static model (Figure 1) and the longitudinal model (Figure 2) were modified in keeping with the factor analytic results.

Tests of parallelism indicated that the structural hole index, information deficiency, stress, and the revised affective commitment scale items loaded primarily on the theoretical factor of choice and produced non-significant sum of squared errors at $p > .05$ level (χ^2 (128) = 63.34, χ^2 (128) = 89.80, and χ^2 (128) = 36.82 at T1, T2, and T3, respectively).

Statistical Analyses

In testing the first research question, the means and standard deviations for structural holes at each time period were calculated based on scores from the structural hole index. The distribution of structural holes were assessed by comparing individual aggregate structural hole scores with their network position as determined through Structure (Burt, 1991). For the second research question, pre- and post-downsizing structural hole index scores were compared through t-tests of standardized scores.

The static path models for T1, T2, and T3 (Figure 1) and the longitudinal path model (Figure 2) were tested using Hamilton and Hunter's (1995) PACKAGE path analysis program. Path models were assessed for fit based on the recommendation that within each time period: (a) less than 5% of items exceed their confidence interval; (b) global chi-square tests on the sum of squared error for model be non-significant; (c) each link be tested for significance by calculating a confidence interval around the observed correlations; and (d) the static model remains consistent in all three time periods.

Chapter 3

Results

Tests of the Research Questions

The first research question sought to discover the extent to which structural holes were prevalent in the organization's corporate headquarters. Measures of the overall mean, standard deviation, and range for the standardized structural hole index scores across the three time periods are reported in Table 3. In keeping with the effect of standardization, overall index scores maintain a mean of zero and a standard deviation of one[1]. A positive structural hole score indicates an above average presence of structural holes for employees, while a negative structural hole score indicates a below average presence. An examination of the dispersion of overall structural hole index scores (e.g., standard deviation, range) revealed variability in structural hole experiences among employees.

In an effort to better understand the extent of structural hole experiences among employees in the headquarters, the structural hole means, standard deviations, and range for each department were examined. As presented in Table 4, the descriptive statistics show considerable differences in structural hole experiences among units. For instance, at T1 prior to the downsizing, the mean of the structural hole index scores ranged from

[1] The standard deviations of the structural hole index in this case should not be zero due to the way in which the standardized scores were combined. Each structural hole indicator (in this case 4) was standardized independently. The structural hole index was then calculated by combining each of the four indicators per subject and dividing the sum by four. As they were combined into the structural hole index they were not restandardized. The means of the structural hole index items remained at zero (within rounding error) because they are additive. In contrast, the standard deviations are not additive. Therefore, the standard deviations reported for the index are the deviations of the combined index, not the individual standardized items (which have a standard deviation of one within rounding error).

Table 3
Mean, Standard Deviation, and Range of Overall Structural Hole Index Scores

	$T_{1\ total}$[a]	T_1	T_2	T_3
Mean	.004	-.002	-.006	-.005
Standard Deviation	.65	.60	.44	.42
Maximum	1.42	1.42	1.15	1.08
Minimum	-1.72	-1.50	-1.12	-1.11
N	130	97	97	97

[a] $T_{1\ total}$ reports structural hole scores for the entire sample prior to the downsizing

Table 4
Mean, Standard Deviation, and Range of Overall Structural Hole Index Scores By Functional Unit

	Accounting	Finance	Marketing	Rooms	Engineering	Administration	Personnel
Time One							
Mean	-.29	.02	.41	.60	-.20	-.07	.09
Standard Deviation	.43	.66	.79	.65	.36	.53	.67
Maximum	.22	.45	1.22	1.35	.97	.60	1.42
Minimum	-1.39	-1.27	-1.16	-.80	-.80	-1.50	-1.37
N	19	9	8	9	21	15	17
Time Two							
Mean	-.20	.13	.38	.28	-.18	-.09	.11
Standard Deviation	.34	.50	.65	.43	.34	.33	.42
Maximum	.33	.53	1.15	.92	.37	.24	.66
Minimum	-1.12	-.88	-.75	-.45	-.97	-.80	-.71
N	19	9	8	9	21	15	17
Time Three							
Mean	-.20	.11	.33	.31	-.18	-.10	.14
Standard Deviation	.32	.46	.61	.43	.31	.32	.36
Maximum	.23	.51	1.08	.95	.26	.25	.83
Minimum	-1.11	-.85	-.63	-.35	-.92	-.78	-.60
N	19	9	8	9	21	15	17

M = .60 for Rooms to M = -.29 for Accounting. Regarding employees' structural hole experiences within unit, their structural hole experiences ranged from 1.42 to -1.37 in Personnel to .22 to -1.39 in Accounting. Although not as disparate, similar variability exists in unit structural hole scores at two months (T2) and five months (T3) following the downsizing.

Individual employee structural hole index scores are reported in Table 5. The variability in structural hole scores suggested that employees experience unique levels of structural holes in their network, and their experience of structural holes is embedded within their work group which differs from other work groups in its coordination needs at the corporate headquarters.

The second research question inquired into the impact of downsizing on employees' structural hole experiences. As such, t-tests were conducted to assess the significance of change among participants. In a comparison of the overall means of structural hole index scores of T1 and T2 means and T2 and T3 means, no significant differences were present in the mean scores. When examining structural hole index scores at the unit level, the results of t-tests revealed significant differences for 2 of the 7 groups between T1 and T2. Accounting unit mean structural hole scores were significantly different at T1 (M = -.29) and T2 (M = -.20) ($t(18) = -3.28$, $p = .004$). The structural hole mean score for the Rooms unit for T1 (M = .60) was also significantly different ($t(8) = 2.26$, $p = .039$) at T2 (M =.28). No significant differences were found in any of the work groups between T2 and T3.

Table 5
Individual Structural Hole Index Scores For Participants At Time One, Time Two, And Time Three

ID	Unit	Time 1 Structural Hole Index	Time 2 Structural Hole Index	Time 3 Structural Hole Index
1	Accounting	0.09	0.17	0.00
2	Accounting	0.22	0.33	0.23
3	Accounting	-0.26	-0.16	-0.04
4	Accounting	-0.12	-0.03	-0.01
5	Accounting	-0.23	-0.12	-0.19
6	Accounting	-0.01	-0.10	-0.10
7	Accounting	-0.25	-0.22	-0.16
8	Accounting	-0.42	-0.34	-0.28
9	Accounting	-0.28	-0.14	-0.17
10	Accounting	-0.12	-0.02	-0.02
11	Accounting	0.06	.	.
12	Accounting	-0.14	-0.01	-0.01
13	Accounting	-0.18	-0.16	-0.20
14	Accounting	-1.39	-1.12	-1.11
15	Accounting	-0.14	.	.
16	Accounting	-0.31	-0.31	-0.31
17	Accounting	-0.25	-0.08	-0.20
18	Accounting	-0.12	-0.07	-0.13
19	Accounting	-0.49	-0.43	-0.37
20	Accounting	0.20	0.05	0.12
21	Accounting	-0.32	.	.
22	Accounting	-1.38	-0.96	-0.88
23	Accounting	-1.73	.	.
24	Finance	0.40	0.34	0.33
25	Finance	0.44	.	.
26	Finance	0.40	.	.
27	Finance	0.38	0.36	0.36
28	Finance	0.41	0.21	0.47
29	Finance	0.68	.	.
30	Finance	0.45	0.53	0.51
31	Finance	-0.94	-0.88	-0.85
32	Finance	0.37	0.36	0.19
33	Finance	0.41	0.43	0.35
34	Finance	0.12	.	.
35	Finance	0.40	0.16	0.32
36	Finance	-0.05	0.43	0.25
37	Finance	-1.27	-0.57	-0.49
38	Marketing	1.07	1.01	0.96
39	Marketing	1.22	1.15	1.08
40	Marketing	0.67	.	.
41	Marketing	-0.32	.	.
42	Marketing	0.82	0.70	0.67
43	Marketing	0.52	0.76	0.73
44	Marketing	0.80	-0.09	-0.06
45	Marketing	0.98	.	.

Table 5 continued

ID	Unit	Time 1 Structural Hole Index	Time 2 Structural Hole Index	Time 3 Structural Hole Index
46	Marketing	0.01	.	.
47	Marketing	-0.30	-0.13	-0.09
48	Marketing	0.33	0.41	-0.02
49	Marketing	-1.16	-0.75	-0.63
50	Marketing	0.78	.	.
51	Rooms	0.46	0.31	0.23
52	Rooms	0.41	0.02	-0.02
53	Rooms	1.18	0.92	0.89
54	Rooms	1.00	0.77	0.95
55	Rooms	0.17	0.14	0.15
56	Rooms	0.91	-0.04	-0.02
57	Rooms	1.43	.	.
58	Rooms	1.35	0.57	0.59
59	Rooms	-0.80	-0.45	-0.35
60	Rooms	0.59	.	.
61	Rooms	0.71	0.29	0.40
62	Rooms	0.51	.	.
63	Engineering	-0.05	0.23	0.23
64	Engineering	-0.45	-0.53	-0.41
65	Engineering	-0.22	-0.10	-0.16
66	Engineering	-0.23	-0.13	-0.16
67	Engineering	-0.41	-0.04	-0.07
68	Engineering	-0.09	0.13	0.02
69	Engineering	-0.53	-0.24	-0.20
70	Engineering	-0.49	-0.54	-0.45
71	Engineering	0.97	-0.97	-0.92
72	Engineering	-0.13	0.09	0.07
73	Engineering	-0.27	0.10	0.07
74	Engineering	-0.53	.	.
75	Engineering	0.03	0.01	-0.02
76	Engineering	0.04	0.06	-0.10
77	Engineering	-0.38	-0.11	-0.12
78	Engineering	-0.19	.	.
79	Engineering	0.07	-0.20	-0.14
80	Engineering	-0.92	.	.
81	Engineering	-0.12	-0.20	-0.14
82	Engineering	-0.19	.	.
83	Engineering	0.04	0.37	0.26
84	Engineering	-0.47	-0.63	-0.54
85	Engineering	-0.30	.	.
86	Engineering	-0.03	0.14	0.14
87	Engineering	-0.59	-0.69	-0.79
88	Engineering	-0.38	.	.
89	Engineering	-0.80	-0.43	-0.43
90	Admin.	0.06	0.13	0.12
91	Admin.	0.25	0.15	0.05
92	Admin.	-0.05	-0.07	-0.02
93	Admin.	-0.30	0.08	0.09

Table 5 continued

ID		Time 1 Structural Hole Index	Time 2 Structural Hole Index	Time 3 Structural Hole Index
94	Admin.	-1.00	.	.
95	Admin.	-0.02	-0.11	-0.07
96	Admin.	0.23	0.12	0.12
97	Admin.	0.10	0.21	0.25
98	Admin.	-0.36	-0.02	-0.01
99	Admin.	0.23	.	.
100	Admin.	0.15	0.24	0.24
101	Admin.	0.60	-0.68	-0.70
102	Admin.	0.46	.	.
103	Admin.	0.32	.	.
104	Admin.	0.15	0.18	0.06
105	Admin.	0.03	0.04	0.06
106	Admin.	0.34	.	.
107	Admin.	0.19	-0.03	-0.10
108	Admin.	-1.50	-0.80	-0.78
109	Admin.	-1.08	-0.54	-0.48
110	Personnel	0.31	-0.48	-0.43
111	Personnel	0.52	.	.
112	Personnel	-0.11	0.23	0.26
113	Personnel	0.11	0.58	0.31
114	Personnel	0.16	0.15	0.19
115	Personnel	0.03	.	.
116	Personnel	0.12	-0.04	0.03
117	Personnel	-0.12	0.14	0.13
118	Personnel	-0.81	.	.
119	Personnel	0.65	0.65	0.61
120	Personnel	0.43	0.10	0.13
121	Personnel	-0.37	.	.
122	Personnel	-0.23	-0.11	-0.10
124	Personnel	1.05	0.43	0.43
125	Personnel	0.09	.	.
126	Personnel	1.42	0.66	0.83
127	Personnel	-0.43	-0.11	-0.21
128	Personnel	-0.25	-0.63	-0.03
129	Personnel	-0.07	.	.
130	Personnel	-0.17	0.13	-0.05
131	Personnel	-1.37	-0.71	-0.60

The changes in personnel per group between T1 and T2 in terms of number of employees lost, the number of bridge linkages lost, and the type of personnel lost (e.g., clerical, managerial) are reported in Table 6. A bridge linkage was defined as a connection between two network members who hold membership in different groups and link their two groups together (Richards & Rice, 1985). Each work group sustained some loss through the downsizing, ranging from 4 to 6 employees. The Accounting, Finance, Engineering and Personnel units increased in structural hole experiences while Marketing, Rooms and Administration experienced a decrease in structural holes. Between T2 and T3, Rooms and Personnel experienced small increases in structural holes, Finance, Marketing and Administration experienced small decreases in structural hole scores, while Accounting and Engineering experienced no change in structural hole scores.

Test of the Static Model

The modified hypothesized model of the relationships between structural holes, information deficiency, stress, job affect were tested with the T1, T2, and T3 data. The means and standard deviations of, and the correlations among structural hole index, information deficiency, stress and job affect are reported in Table 7. Path coefficients and their standard error for the static model are reported in Figure 3. As detailed below, initial path analyses revealed that the hypothesized model at all three time periods was overall not a good fit to the data. The model was subsequently revised and tested for each time period.

Table 6
Personnel Changes By Group From Time One to Time Two

Department	Number of Employees at Time One	Number of Employees at Time Two	Bridge Linkages Lost	Mean Change in Structural Hole Index Score (T2 - T1)[a]	Mean Change in Structural Hole Index Score (T3 - T2)[b]	Type of Personnel Lost
Accounting	23	19	9	.09	.00	clerical and staff
Finance	14	9	1	.11	-.02	staff
Marketing	12	8	8	-.03	-.05	clerical and staff
Rooms	12	8	10	-.32	.03	clerical and staff
Engineering	27	21	4	.02	.00	management, clerical, and staff
Administration	20	15	3	-.02	-.01	management, clerical, and staff
Personnel	22	17	1	.03	.02	management, clerical, and staff

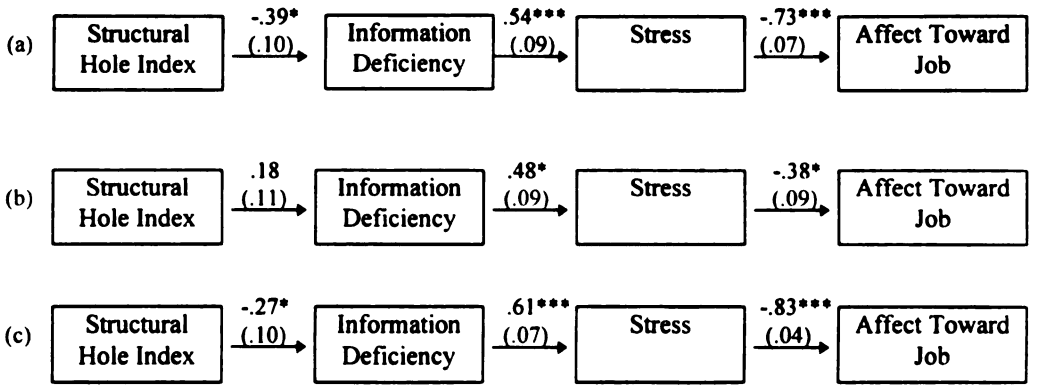
[a] A positive score indicates an increase in structural hole score between time one and time two.
[b] A positive score indicates an increase in structural hole score between time two and time three.

Table 7

Scale Correlations, Means, and Standard Deviations for Time 1, Time 2, and Time 3

	Scale Item	Mean	sd		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	T1 Structural Hole Index	0.02	0.61		-	-0.39	-0.15	0.12	0.88	-0.14	-0.22	0.08	0.89	-0.28	-0.39	0.35
(2)	T1 Information Deficiency	2.02	0.79		-0.34	-	0.54	-0.84	-0.42	-0.06	0.13	0.05	-0.43	0.01	0.22	-0.09
(3)	T1 Stress	2.5	0.7		-0.14	0.47	-	-0.73	-0.04	-0.01	0.12	0.04	-0.04	-0.11	0.00	0.06
(4)	T1 Job Affect	3.75	0.72		0.10	-0.68	-0.62	-	0.21	0.13	-0.15	-0.10	0.19	-0.03	-0.13	0.11
(5)	T2 Structural Hole Index	0.04	0.43		0.83	-0.37	-0.04	0.18	-	0.18	-0.14	-0.16	0.99	-0.23	-0.04	0.38
(6)	T2 Information Deficiency	3.53	1.23		-0.13	-0.05	-0.01	0.11	0.17	-	0.48	-0.94	0.14	0.07	-0.02	0.12
(7)	T2 Stress	3.14	1.27		-0.21	0.11	0.11	-0.13	-0.13	0.45	-	-0.38	-0.14	0.11	0.11	-0.03
(8)	T2 Job Affect	2.5	1.00		0.08	0.04	0.04	-0.09	-0.25	-0.89	-0.36	-	-0.22	-0.15	0.03	-0.11
(9)	T3 Structural Hole Index	0.03	0.41		0.84	-0.38	-0.04	0.16	0.97	0.13	-0.13	-0.21	-	-0.27	-0.41	0.40
(10)	T3 Information Deficiency	1.86	0.99		-0.26	0.01	-0.10	-0.03	-0.22	0.07	0.10	-0.14	-0.25	-	0.61	-0.68
(11)	T3 Stress	1.85	0.92		-0.36	0.19	0.00	-0.11	-0.36	-0.02	0.10	0.03	-0.38	0.57	-	-0.83
(12)	T3 Job Affect	4.15	0.83		0.33	-0.08	0.06	0.10	0.36	0.11	-0.03	-0.11	0.38	-0.65	-0.79	-

Note: correlations above .26 are significant at $p < .01$; and values in the upper triangle are adjusted for attentuation. N=89 due to missing values. The means of structural hole index moved further away from zero.



Note: "*" = $p < .05$, "***" = $p < .001$; the standard errors are in parentheses.

Figure 3. Tests of the Modified Hypothesized Model at (a) Time 1, (b) Time 2, and (c) Time 3

The Hypothesized Model. The modified hypothesized path model tested at T1 identified significant relationships among the variables. However, the test of the model produced a significant chi square score (χ^2 (3) = 7.92, p = .048, SSE = .21) indicating that additional significant relationships among the variables in the model were not identified. It is important to note that the path coefficient from structural hole index to information deficiency was negative, the opposite of the hypothesized relationship.

Tests of the path models at T2 also revealed a large sum of squared errors and a significant chi square score (χ^2 (3) = 30.63, p = .00, SSE = .67), indicating that the model was not a good fit with the data. In this case, the path coefficient between the structural hole index and information deficiency was positive as predicted, but nonsignificant (r = .18, p > .05).

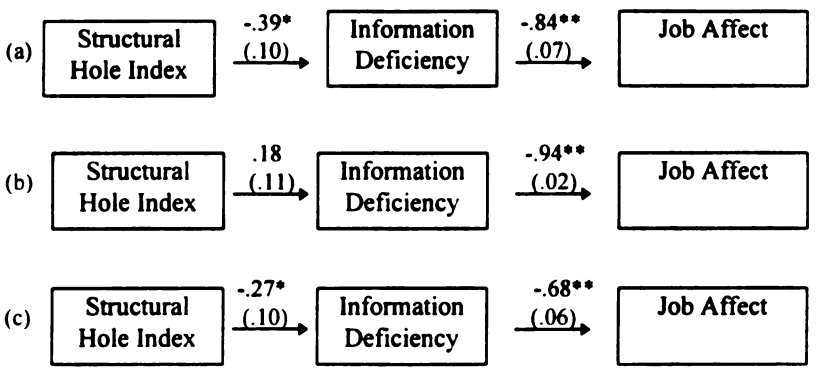
Analyses of the path model at T3 again resulted in a significant chi square score (χ^2 (3) = 8.01, p = .046, SSE = .16) despite significant relationships between the variables. Similar to the path coefficient at T1, the path coefficient from structural hole index to information deficiency was negative and counter to the hypothesized relationship.

An examination of the variables in the model at T1, T2, and T3 suggested that the correlations between employee stress and job affect were weaker than those between information deficiency and job affect. Specifically, stress was consistently correlated with information deficiency (r corrected for attenuation = .54, .48, and .61 at T1, T2, and T3, respectively), but stress was less correlated with job affect (r corrected for attenuation = -.73, -.38, and -.83 at T1, T2, and T3, respectively). In comparison, information

deficiency was more strongly correlated with job affect (r corrected for attenuation = -.84, -.94, and -.68 at T1, T2, and T3, respectively).

In keeping with the findings of Research Question 2 that indicated considerable differences in structural hole experiences among departments, the hypothesized path model was tested at T2 by separating the sample into two groups: (a) units which experienced increases in structural holes (Accounting, Finance, Engineering, and Personnel); and (b) units which experienced decreases in structural holes (Marketing, Rooms, and Administration). A similar procedure was followed for separating groups at T3. At T3, employee responses in Rooms and Personnel were aggregated to form the structural hole increase group, and Finance, Marketing, and Administration scores were combined to form the decrease group. As mean structural hole scores did not change in the Accounting and Engineering units, subjects' responses from these units were not tested in a path model at T3. Results of the path analyses for units with increased and decreased structural hole experiences at T2 and T3 revealed the model to be a poor fit to the data as significant chi-squares resulted from each test of the model.

Tests of the Revised Static Models. Based on the analyses of the relationships between information deficiency, stress, and job affect, a revised model with a direct link between information deficiency and job affect was tested at each time period (see Figure 4). With the stress variable removed, analyses indicated the model was a good fit to the data at T1, T2, and T3. A test of the path model at T1 produced a nonsignificant chi square score (χ^2 (1) = 1.88, p = .17, SSE = .04). While the path coefficient between the structural hole index and information deficiency was negative (r = -.39, p < .05) and



Note: "*" = $p<.05$, "**" = $p<.01$; the standard errors are in parentheses.

Figure 4. Tests of the Modified Static Model at (a) Time 1, (b) Time 2, and (c) Time 3.

the hypothesized relationship countered the relationship between information deficiency and job affect ($r = -.84$, $p < .001$) was keeping with theory (Miller, Johnson & Grau, 1994) and supported the reasoning that the experience of information deficiency reduces affect toward one's job.

Results of the tests of the revised static model at T2 revealed a nonsignificant chi square (χ^2 (1) = .40, p = .53, SSE = .008). While the path coefficient from the structural hole index to information deficiency was nonsignificant ($r = .18$, $p > .05$), information deficiency was significantly predictive of job affect ($r = -.94$, $p < .0001$). This negative relationship suggested that those experiencing information deficiency were less content with their employment.

A path analysis of the revised model at T3 resulted in a nonsignificant chi square score (χ^2 (1) = 2.19, p = .14, SSE =.05). As in the model at T1, the relationship between structural hole index and information deficiency was negative ($r = -.27$, $p < .05$), and the path coefficient between information deficiency and job affect was negative as well ($r = -.68$, $p < .05$). It should be noted that the relationships between the variables at T3 were weaker than those reported at T1.

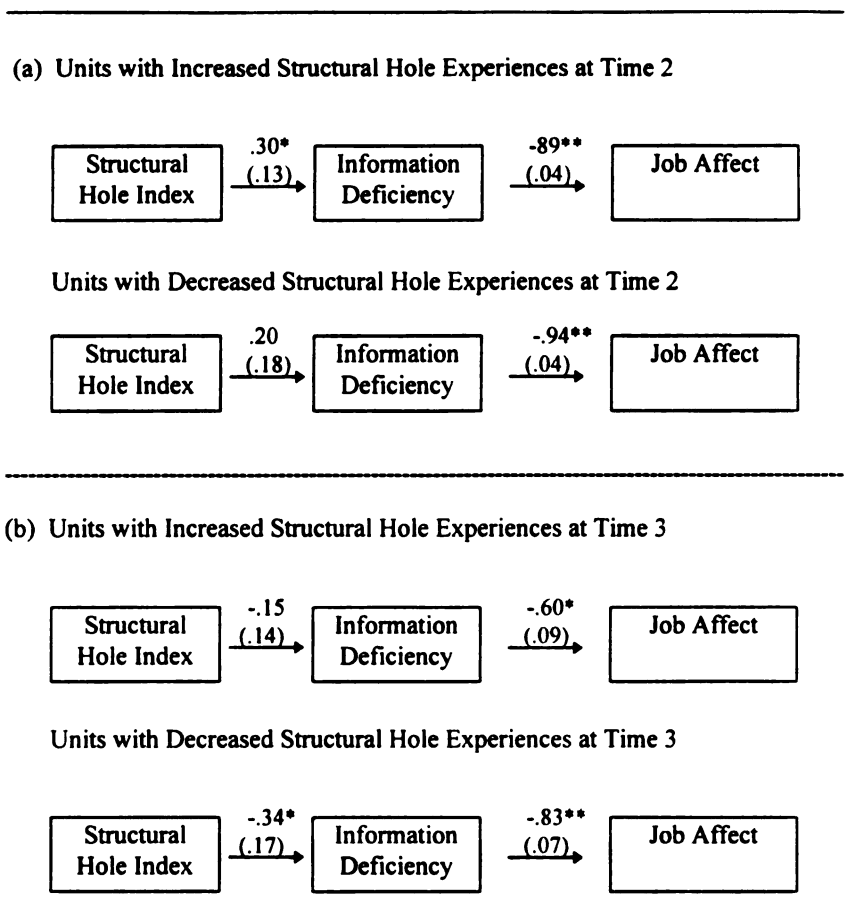
In an attempt to further explain the data, post hoc regression analyses were conducted to determine if organizational characteristics (i.e., age, tenure, level of education, sex) produced any discernible linear patterns among the variables. Regression analyses did reveal any alternative explanations beyond the findings reported above. Additionally, scatter plots were computed in order to detect nonlinear trends among stress and the other variables in each time period. As with the regression analyses, the scatter

plots indicated that the relationships of stress with the other variables failed to exhibit a consistent pattern over time.

In keeping with the exploratory nature of earlier analyses revealing considerable variability in structural hole experiences among units, separate post-hoc path analyses were conducted for units which (a) structural hole experiences increased and (b) structural hole experiences decreased (see Figure 5). Units which showed increases in aggregate group structural hole index scores were separated from those units showing a decrease. From T1 to T2 increases in structural holes were experienced in the Accounting, Finance, Engineering, and Personnel units (N = 66) while Marketing, Rooms, and Administration experienced decreases in structural holes (N = 31).

Path analyses of the revised model at T2 for the units reporting increased structural hole activity revealed a nonsignificant chi square (χ^2 (1) = .32, p = .57, SSE = .01), suggesting the model is consistent with the data for this subgroup. The path coefficients from the structural hole index to information deficiency and from information deficiency to job affect were both significant at $p < .05$ level ($r = .30$, and $r = -.89$).

Path analyses for the revised model applied to participants in units with decreased structural hole experiences at T2 indicated that the model was consistent with data (χ^2 (1) = .14, p = .71, SSE = .008). The path coefficient from the structural hole index to information deficiency was nonsignificant ($r = .20$, $p > .05$), while the path coefficient from information deficiency to job affect was significant ($r = -.94$, at $p < .05$).



Note: "*" = $p<.05$, "**" = $p<.001$; the standard errors are in parentheses.

Figure 5. Tests of the Revised Static Model For Units With Increased and Decreased Structural Hole Experiences at (a) Time 2, and (b) Time 3.

A path analysis of the revised model at T3 applied to participants in units with increased structural hole experiences (e.g., Rooms, Personnel, N = 25) indicated that the model was consistent with data (χ^2 (1) = .28, p = .60, SSE = .01). As with the T1 model for this subgroup, the path coefficient from the structural hole index to information deficiency was nonsignificant (r = -.15, p > .05), while the path coefficient from information deficiency to job affect was significant (r = -.59, at p < .05).

Path analyses for the T3 revised model applied to participants in units with decreased structural hole experiences (e.g., Finance, Marketing, Administration, N = 32) revealed a nonsignificant chi square (χ^2 (1) = 1.21, p = .27, SSE = .07). The path coefficients from the structural hole index to information deficiency and from information deficiency to job affect were both significant at p < .05 (r = -.34 and r = -.83). The Accounting and Engineering units experienced no change in overall unit structural hole scores at T3 and were excluded from the analysis.

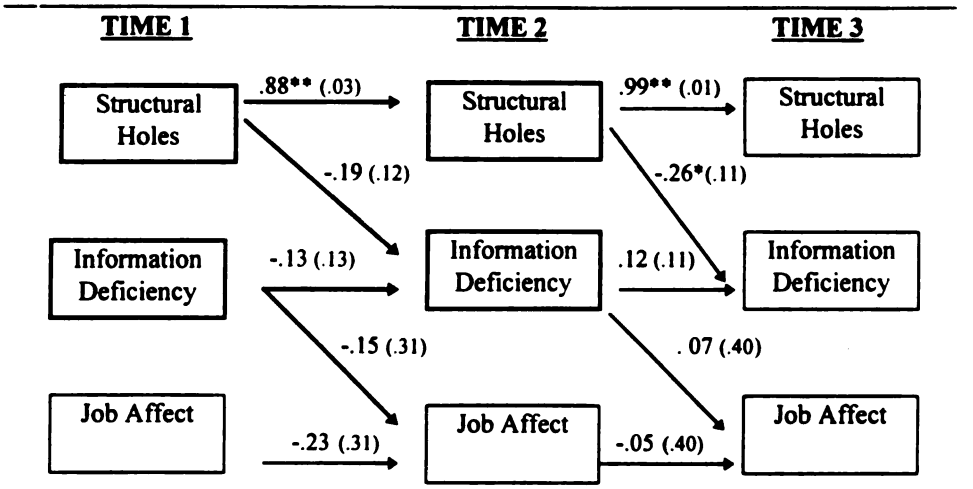
In sum, an examination of the full revised model and subgroup analyses of the revised model was consistent with the data at T1, T2, and T3. At both T1 and T3, the relationship between the structural hole index and information deficiency was negative. However, subgroup analyses revealed that significant negative relationships were present only in units experiencing a decrease in structural holes experiences. At T2, the relationship between structural holes and information deficiency was positive, but only significant for the units which had an increase in structural hole experiences. Although significance is noted among the structural hole index and information deficiency in many of the path models above, these results should be interpreted with caution. The large

confidence intervals around the coefficients suggest that a larger sample is needed to insure that each subgroup's score is statistically different from the others.

Tests of the Longitudinal Model

In keeping with the results of tests of the modified static models above, employees' levels of stress was removed from the cross-lagged model. Results of the path analysis of this modified longitudinal model (see Figure 6) revealed that the model did not produce a good fit to the data as a chi square test was significant (χ^2 (23) = 94.15, p = .00, SSE = 2.22). Subsequent tests of alternative models were unable to produce an acceptable fit of a cross-lagged model to the data. Additional post-hoc tests of cross-lagged model were performed by separating the participants into their subgroups based on increases and decreases of structural hole experiences. In a test of the longitudinal model presented as Figure 7, the specified model fit neither the increase nor decrease subgroups at T2 and T3 (χ^2 (23) = 43.91, p = .005, SSE = 1.71; χ^2 (23) = 41.96, p = .009, SSE = 3.14, respectively).

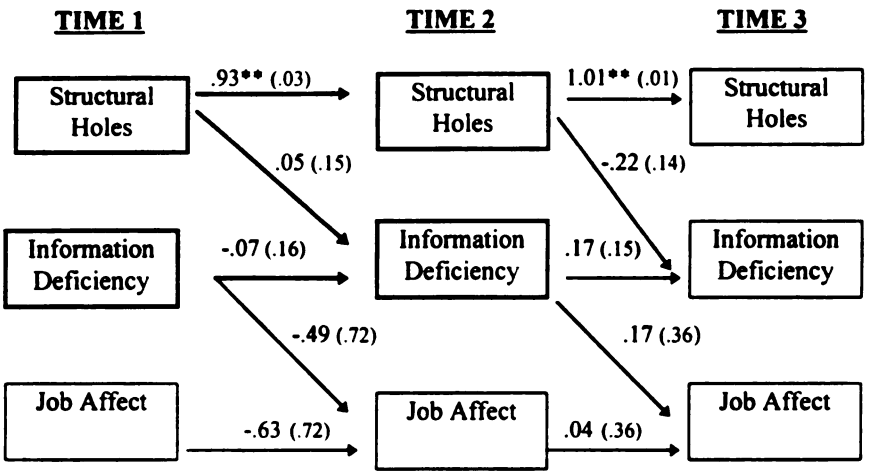
Analysis of the relationships among the variables indicated four reasons for the model's inability to fit the data. First, outside of the links between structural holes there were few significant paths between the variables at T1, T2, and T3. For instance, the structural hole index at T1 was significantly related (r =.88, p < .001) to the structural hole index at T2, and the T2 index was significantly related (r =.99, p < .001) to the T3 index. Only the cross-lagged path coefficient between the structural hole index at T2 and information deficiency at T3 was significant (r = -.26, p < .05). Thus, while hypothesized significant relationships were evidenced among the structural holes, only structural hole



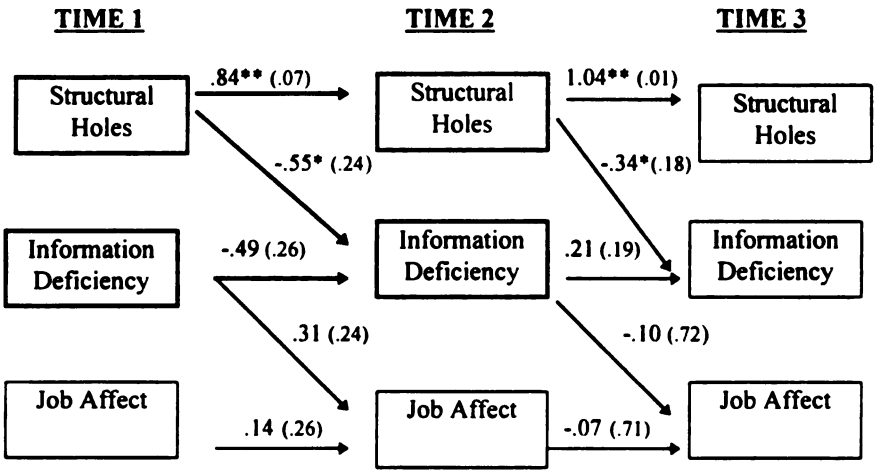
Note: "*" = p<.05, "**" = p< .001; the standard errors are in parentheses.

Figure 6. Test of the Modified Longitudinal Model

(a) Units with Increased Structural Hole Experiences



(b) Units with Decreased Structural Hole Experiences



Note: "*" = p<.05, "**" = p< .001; the standard errors are in parentheses.

Figure 7. Test of the Modified Longitudinal Model For Units With (a) Increased and (b) Decreased Structural Hole experiences.

experiences at T2 predicted information deficiency at T3. Second, the cross-lagged model was unable to provide a good fit to the data because the least squares approach used in PATH (Hamilton & Hunter, 1995) was unable to secure a fit with multiple R's approximating 1.00 among the structural hole indexes and attitude variables with little or no correlation.

Third, due to the strong static relationships observed in each time period between information deficiency and job affect, large amounts of error were produced from the static paths which were not specified in the cross-lagged model. Fourth, the lack of autocorrelation among the variables indicates that participants significantly changed their responses to the scale items between data collections. An examination of the means for variables under consideration revealed considerable shifts in employees' perceptions and attitudes (see Table 6). For example, survivor's perceptions of information deficiency at T1 ($M = 2.02$) increased at T2 ($M = 3.53$, $t(92) = -9.87$, $p = .0001$), but decreased at T3 ($M = 1.86$, $t(95) = 10.75$, $p = .0001$). Similar changes were present in employees' report of stress ($M = 2.50$ at T1 to $M = 3.14$ at T2, $t(85) = -3.87$, $p = .0001$; $M = 1.85$ at T3, $t(92) = 7.76$, $p = .0001$) and job affect ($M = 3.75$ at T1 to $M = 2.50$ at T2, $t(88) = 9.68$, $p = .0001$; $M = 4.15$ at T3, $t(91) = -11.32$, $p = .0001$). The lack of discernible pattern among cross-lagged variables and shifts among mean scores may indicate that *gamma* change occurred in these data as a result of the organizational downsizing (Golembiewski, Billingsley & Yeager, 1976; Randolph, 1982; Thompson & Hunt, 1996). With *gamma* change, subjects perceive scale items differently over time through a cognitive redefinition of the construct (Thompson & Hunt, 1996).

Chapter 4

Discussion

Overview of the Study

Organizational downsizing is a common practice in business today (Rosenthal, 1996; Uchitelle, 1996), and most downsizing efforts are initiated to restore declining businesses (Cascio, 1993). Despite downsizing's overwhelming use in today's workplace, few downsizing efforts yield the projected outcomes of increased productivity and profitability (Cameron & Whetten, 1994). One reason for this failure to attain projected productivity and profitability may be related to the lack of attention to layoff survivors' communication patterns and relationships. Examining how networks change in a downsized organization may provide valuable insight into employee responses to the upheaval and new environment.

Differences in organizational members' attitudes toward organizational change depends in part on how the change impacts their work routine. Among the changes, employees gain or lose unique network contacts during an organizational downsizing. The loss of unique information and resources creates structural holes and highlights the degree of disruption to survivors' communication networks. While structural holes are theorized to remain constant in organizational networks (Burt, 1992a, 1992b), organizational change alters the location and impact of structural holes that are embedded in members' communication networks. Downsizing survivors who experience increases in structural holes are hypothesized to perceive that they are receiving less information. Newly formed gaps in their communication network restrict the flow of information and

resources. Subsequently, increases in information deficiency should lead to increases in their level of stress which will negatively impact their affect towards their job. Additionally, it is hypothesized that in a cross-lagged effect each variable will predict itself and its static consequent in the subsequent time period. In other words, structural hole experiences will predict both structural holes and information deficiency at a later time period. Information deficiency will lead to information deficiency and stress at a later time and so forth.

In examining the impact of structural holes on employees, this research investigation examines these hypothesized responses of layoff survivors of an organizational downsizing over three points in time. Specifically, this examination explores: (a) the presence of structural holes in an international hotel company's corporate headquarters; (b) how structural hole experiences changed following a downsizing; and (c) the impact of structural hole experiences on layoff survivors' perceptions and attitudes of their work environment prior to and following an organizational downsizing. This longitudinal study of employees at corporate headquarters also considers a number of issues which have hampered downsizing research. For instance, according to Kozlowski et al. (1993) downsizing research rarely examines organizational change and employee attitudes over time, relies too heavily on simulations and lab studies, and does not consider how communication patterns change in an organization. In addition, this study examines group- and organizational-level influences on downsizing survivors' attitudes, and thus considers the impact of macro variables on survivors' responses (Rousseau, 1985; Staw & Sutton, 1993). Finally, this

investigation extends research on structural holes. Prior structural hole research examines non-fluctuating network conditions (e.g., Burt, 1992a) and has yet to consider how structural holes vary under conditions of change.

In order to test the proposed relationships, communication network data and attitudinal survey measurements (information deficiency, stress, job satisfaction, and organizational commitment) were collected from a company's headquarters during the process of undergoing an organizational downsizing. Pre-downsizing measurements were taken sixty days prior to the downsizing (T1), and post-downsizing measures were taken at 60 days (T2) and 150 days (T3) following the downsizing. Communication network data were converted, standardized, and tested to form a measure of structural holes. The configuration and impact of structural holes on layoff survivors were examined in each time period in concert with specific tests of causal relationships within and between each time period.

Findings and Implications

Five notable findings emerge from this investigation. First, the computation of the structural hole index reveals considerable variability in network members' structural hole experiences. For instance, at the initial measurement prior to the downsizing, employees structural hole index scores range from - 1.50 to 1.52. Ranges for their scores at two and five months following the downsizing evidence similar dispersion with high structural hole scores at 1.15 and 1.08, respectively, and low scores at -1.12 and - 1.11, respectively. Unit level analyses also reveal variability among departments' structural hole index scores. At T1, employees in Marketing, Rooms, and Personnel units

experience more structural holes on average than employees in the Accounting, Finance, Engineering, and Administration units. Further, individual structural hole experiences are predictive of their future structural hole encounters (r_{T1T2} = .83 , r_{T2T3} = .97, and r_{T1T3} = .84).

Overall these data suggest that structural hole experiences vary among employees and each employee's experience tends to remain constant. Employees with high structural hole scores continue to have more structural hole experiences following downsizing and remain in disadvantaged network positions. Employees with low structural hole scores continue to experience fewer structural holes, are well-connected, and are in comparatively advantageous positions. However, where employees *are* in the network is critical. Evidence suggests that employee network position *and* unit assignment determine their experience of structural holes. Some units experience more structural holes than others. Apparently, each work unit sustains varying levels of intra- and inter-group interaction. For example, the Administration unit is interactive by design as its function requires input and interaction from the other functional units. The Accounting unit is more self-contained and requires less inter-group communication. Prior research tends to omit the work unit context in the report of the structural hole. Burt (1992) and Ibarra (1995) examine managers' proximity to structural holes without using department affiliation to assess systemic influence. In this case, aggregating structural hole index scores by departments provides insights into the variety of network experiences within units and throughout the organization.

Second, in spite of the tendency of structural hole experiences to remain constant, the distribution of structural holes among individuals and work groups changed with the downsizing at the corporate headquarters. While the overall mean structural hole index scores showed little variation (as the standardization of scores produces an overall mean of zero), at the unit level significant shifts in structural hole experiences were noted. The Finance unit experienced the greatest post-downsizing increase in structural holes at T2. In contrast, the Marketing department exhibited decreases in their structural hole experiences from T1 to T2 and continued to experience decreases into T3, suggesting that the unit became more insular over time. Accounting and Rooms units also experienced decreases in structural holes at two months following the downsizing. In short, the unit level comparisons suggest that individual and work unit were differentially affected by the downsizing.

Current descriptions depict downsizing as having uniformly negative repercussions on survivors (Cameron, in press-a; Gutknecht & Keys, 1993; Kleinfield, 1996; Whetten, et al., 1995). Yet, unit level analyses indicate that employees in some units benefit from a downsizing. Those network members experiencing a loss in structural holes gain unique contacts and prominence in a network. Layoff survivors reporting increases in structural holes either lost unique contacts or became less prominent in their network. The increase in structural holes suggests that their post-downsizing position in the organization has become redundant to (or just the same as) others in the network, or they have become more disconnected in the organization through the loss of unique contacts in the network. Yet, a number of questions remain about the effects of downsizing on

structural hole configurations. While this study indicates that some employees benefited from the downsizing, it remains unclear if employees in this organization experienced more or less structural holes than members of different, downsized organizations. For those who benefited from the downsizing, it is unclear to what extent they chose to close structural holes or the network closed the hole for them. In addition, due to standardizing index scores, this investigation is unable to determine if the total number of structural holes in this organization increased or decreased at each point of measurement. Clearly, future investigations of structural holes should address these concerns.

Third, path analyses revealed that the relationship between structural hole experiences and perceptions of information deficiency reversed across time. Employees' structural hole index scores were negatively related to information deficiency at T1 and T3, the opposite of the predicted relationship. However, at T2 structural hole experiences were positively related to information deficiency. Other findings from the path analyses at T1, T2, and T3 indicated that: (a) information deficiency was a more consistent predictor of affect toward the organization than stress, as an inspection of the stress-affect and information deficiency-affect relationships revealed considerable variability in the post-downsizing environment at T2; (b) the static model produced a better fit to the data when stress was removed from the model; and (c) at each stage of measurement, information deficiency was negatively related to job affect.

At T1 and T3, structural holes do not lead to information deficiency. It is possible that employees embedded in established or "stable" networks (characterized by incremental change) become accustomed to the benefits and limitations of each of their

available network contacts. In this case information deficiency is mediated by the supervisor's communication behaviors (Miller, et al., 1994). At T1, the pre-downsizing network had not experienced any major shifts during the fiscal year leading up to the downsizing. Thus, the only period characterized by "network instability" is the period directly following the downsizing at T2. With the dismissal of 25 percent of employees, the network changed its configuration and may have created uncertainty among survivors. At T2, the experience of structural holes following a downsizing leads to higher information deficiency and lowers affect toward the job.

Fourth, path analyses of the static model at the unit level revealed stronger relationships between structural holes and information deficiency in comparison to the aggregated complete sample. For example, at T2 path analyses of the units experiencing an overall increase in structural holes demonstrated a significant positive relationship between the structural hole index and information deficiency ($r = .30$, $p < .05$) while the test of the model with the full sample indicated that this relationship was nonsignificant ($r = .18$, $p > .05$). At T3, units reporting a decrease in structural hole experiences demonstrated a stronger negative relationship with information deficiency ($r = -.41$, $p < .05$) compared to the full sample ($r = -.27$, $p < .05$).

Naturally, stronger relationships emerge when separating subjects into high or low structural hole units. However, these sub-analyses suggest that managers should address the information concerns of employees in high structural hole units who, after a downsizing, may be more apt to lose job satisfaction and subsequently voluntarily turnover (Davy et al., 1991; Tett & Meyer, 1993). At the very least, employees in high

structural hole units are more likely to resist the organizational change following a downsizing. Other applications include examining unit structural hole scores as a means of explaining why some units are more upset than others and managing change processes during periods of strategic reorientation (Tushman & Romanelli, 1985; Dewitt, 1993).

Fifth, as noted earlier, experiences of structural holes were predictive of structural hole experiences in subsequent time periods, Yet, tests of other path relationships indicated that only structural holes at T2 were significantly predictive of information deficiency at T3. While respondents' descriptions of their network were consistent over time and structural hole experiences at T2 decreased information deficiency at T3, employees' report of information deficiency and job affect were not significantly related over time. At odds from findings of the static models were the lack of relationships in: (a) information deficiency between T1 and T2 and between T2 and T3; (b) job affect across time; and (c) information deficiency with job affect between T1 and T2 as well as T2 and T3.

These patterns suggest that layoff survivors experience profound shifts in their perceptions and attitudes over time. These shifts may be a result of the loss or gain of relationships with coworkers, supervisors, or their jobs themselves. When considering the lack of discernible linear patterns in the longitudinal analyses, several researchers point out the connection between second order change and gamma change (Bartunek, 1993, Levy & Merry, 1986; Thompson & Hunt, 1996). Gamma change occurs when subjects shift their perceptions of the construct and the meaning assigned to it (Randolph, 1982). Uncertainty about work relationships and their career future may lead layoff

survivors to gamma shifts in their perceptions and attitudes, may impact the manner in which the questionnaire items are cognitively defined, and create a difference in their reported responses from one time period to the next. In effect participants respond differentially as the survey items develop a different meaning across time. Based on an approach to identifying gamma change through the examination of the factor structures over time, in a preliminary sense, these data, exhibit similar characteristics to gamma change identified by Bedeian, Armenakis, and Randolph (1988). The factor loadings for the individual items within each scale displayed noticeable shifts across each time period, indicating that the responses to the items changed over time (Bedeian, et al., 1988).

It is interesting to note that gamma change was only evident among the psychological measurements. Stable longitudinal relationships emerged from analyses of the structural network variables measured by the structural hole index. While the index was based on respondents' identification of their work-related contacts, these measures provided comparatively objective responses. In contrast, psychological-based measures were subject to gamma change despite evidence of stable factor structures across each time period.

There are a variety of ways structural holes could have been measured, such as counting gains or losses of individual links. The statistical method which resulted in a structural hole index provided a standardized and valid approach to measuring structural holes. While in some cases the use of the structural hole index revealed few overall changes in employees' structural hole circumstance, the shifts are very important. Namely, increases in structural holes lead to higher levels of stress and information

deficiency and lower levels of job affect. Conversely, decreases in structural holes result in higher levels of job affect and decreases in information deficiency and stress. Consequently, while the structural hole index provides a conservative measure of employee network gains and losses, the index shows the impact of downsizing on employees and has the potential to reveal network gains and losses in other organizational settings.

In sum, this research investigation contributes to the field of organizational communication and research on downsizing through its longitudinal approach to examining communication network structure and its impact on layoff survivors. Specifically, this investigation extends Burt's (1992a) concept of structural holes in networks by coupling validated autonomy and prominence indicators, and it focuses on the longitudinal impact of structural holes on surviving worker's experiences of information deficiency, stress, and affect toward their job. Furthermore, this investigation bridges the gap between micro- and macro-level processes by considering the individual's reaction to changes in network structure. While the investigation of network structure and worker attitudes is not new, few investigations, examine structural and perceptual variables under conditions of organizational change. By investigating the communication relationships of workers in terms of structural holes, future studies may be able to gain an increased understanding of layoff survivors' reactions to an organizational downsizing.

Limitations

In any organization, both formal and informal network relationships drive the behavior of network participants (Monge & Eisenberg, 1987; Johnson, 1993). In this study, respondents were asked to report only their formal work relationships. Yet, as formal relationships are embedded in the organizational hierarchy they may under-represent participants' true network interaction. Workers may exchange useful work-related communication with others who are not a part of their formal organizational contacts through "the grapevine" or informal social conversations with members of other departments (Hellweg, 1987; Johnson, 1993; Stohl & Redding, 1987). The data in this study may also under represent employees network connections as they may be reluctant to include informal contacts due to fears that their superiors may deem their informal contacts inappropriate during this major organizational change. The importance of formal and informal relationships should be made clear in future investigations so that communication relationships specifically leading to the formation of structural holes and subsequent changes in perceptions and attitudes can be identified.

The findings and interpretation of this study may also be limited by the use of a corporate headquarters as a sample in comparison to examining the network of a large national organization. For instance, the extreme density of this network sample may be an outcome of investigating the corporate headquarters. Even though individual units within the headquarters varied in function and duties, it is possible that the corporate office is uncharacteristically integrated (compared to the rest of the organization) and may not accurately represent an entire organizational workforce's reaction to downsizing.

Furthermore, a hospitality-based organization may respond differently to downsizing in comparison to a manufacturing-based organization. While employees in hospitality organizations may be expected to communicate with employees at the same level and upper levels in their unit *and* of other units in order to accommodate the customer, manufacturing organizations may have formalized and regulated channels for vertical and horizontal communication. Thus, while hotel employees may have numerous, regular contacts throughout the organization (especially at the headquarters) and may rebound quickly to the loss of a few contacts, the loss of a few contacts may be very problematic in organizations where formal, task interactions within and across units are limited.

Related issues of concern to any network analysis are office configuration and worker immediacy. Previous research in office design associates privacy in a work environment with improved work-related satisfaction (Oldham, 1988). However, most work environments involve considerable interaction with coworkers. In this investigation, the physical proximity and office configuration of the research participants in their work environment are not examined. As employees lose contact with a portion of their coworkers through downsizing, those who sharing a common work space may be affected more intensely than those coworkers who were physically distant (Hatch, 1987). It is possible that workers become accustomed to other members in their immediate work environment, and a level of comfort and security may form. Future research should examine the impact that physical proximity has on layoff survivors' reactions to an organizational downsizing and the formation and experience of structural holes.

Network analysis relies on binary socio-metric choice data. Binary network data does not describe the "quality" of the linkages or relationships reported by network participants. Members may lose unique sources of information or contacts in the network, but may not consider them important or valuable. Prominence measures included in the index adjust for this limitation due to their focus on relationship strength, as opposed to uniqueness (Burt, 1991). However, the structural hole index primarily identifies uniqueness of relationships and does not ascertain the quality of the information exchanged through the unique network connections. Future research should consider collecting additional information concerning the quality and importance of the reported linkages from network members to determine which severed linkages are deemed the most valuable by the participants (Burt, 1992a, 1992b; Ibarra, 1995).

Due to the extreme density of the network sample, only direct, non-mediated, linkages of the participants were examined in the network analyses. Each participant had what can be considered to be an extremely high number of indirect linkages as evidenced by the small number of step linkages separating network members (M = 4). The plethora of indirect linkages rendered the communication network data uninterpretable until the indirect linkages were removed. As a consequence of examining the participants direct linkages only, Burt's (1991) prominence measures of choice status, power, and percent power reflected could not be accurately calculated and were subsequently excluded from the index.

The analysis of the network was further limited by the exclusion of several measures of structural autonomy (Burt, 1991, 1992a). The number of contacts were

excluded because of their lack of differentiation between redundant and non-redundant contacts. The measure of proportional density was also excluded from the index because the binary network data collected here restricted the range of the responses and produced the same results as for network density. Finally, the measure of oligopoly could not be calculated without additional survey data not available from the participants at the times of collection and was excluded from the index. While the confirmatory factor analyses of the structural hole indicators were based on the remaining network indicators of non-redundant ties, constraint, network density, contact efficiency, hierarchy, extensive relations, and exclusive relations, the inclusion of other indicators such as oligopoly, proportional density, and the number contacts could provide a more precise measure of structural hole experiences.

Finally, in regard to study design, a number of scholars (Johnson, 1985; Van de Ven & Poole, 1995; Williams & Podsakoff, 1989) advocate collecting longitudinal data at intervals appropriate to the issues under study. It is possible that different relationships between structural holes, information deficiency, stress, and job affect may have existed at times not observed in this investigation. For example, the sampling frame selected in this study measured employees' relationships and reactions in terms of two and five months post-downsizing. Yet, at two weeks following the downsizing it is possible that confusion and uncertainty reigns in the immediate wake of the reconfiguration and evokes an outcry from survivors. While it is possible that a two week sampling frame may have produced results similar to those in the present study, smaller sampling intervals prior to and following the downsizing might capture the extremity of network

members' reactions of information deficiency, stress, and job affect. Thus, the rationale for the sampling frame should be more clearly specified in future research (Williams & Podsakoff, 1989). Although each field investigation has its unique needs and limits (Monge, 1995), the sampling rationale should be carefully addressed in the research design and grounded in theory.

Future Research

This longitudinal study examines the relationship among structural holes, information deficiency, stress, and job affect. While tests of these relationships represent an initial, exploratory investigation, a number of factors may be influencing the variables under study. For instance, perceptions of support from coworkers, supervisors and the organization as a whole may shape employee reactions under pressured conditions (Ray & Miller, 1991; Salancik & Pfeffer, 1978). In times of uncertainty, workers may rely on support from their coworkers and supervisors to regain a sense of control over their work domain and aid in their adjustment to their changing work environment (Davy, et al., 1991). Future research should determine the role of coworker and supervisory support in the post-downsizing adjustment process. Relatedly, social information from coworkers contributes to the formation of their attitudes about their work environment (Salancik & Pfeffer, 1978). The messages received from coworkers during and after the downsizing may create positive or negative attitudes (Höpfl & Linstead, 1993). Thus future research should discuss *what* coworkers discuss and *how* they characterize events during this transformation.

While the data collected in this study described the diversity of contacts among employees' in their network, it does not address the frequency of communication among contacts. Network members losing frequent contacts (or strong ties) may have experienced a greater disruption in information flow as frequent contacts can be situated in their immediate work group (Granovetter, 1982; Krackhardt, 1992). Under conditions of change and uncertainty, employees rely on strong ties for support and comfort (Krackhardt, 1992). Yet, the loss of less frequent contacts (or weak ties) may also be limiting. Less frequent contacts often provide information and resources not available in their immediate work groups (Granovetter, 1973, 1982). It is also unclear how the loss of perceived high quality contacts shapes network members' perceptions and attitudes following downsizing. Future research should consider the impact which contact frequency and perceived linkage quality has on layoff survivors' adjustment in a post-downsized network.

In this investigation, the measurement of stress, job satisfaction, and organizational commitment did not remain constant over time. Not only did their mean scores vary over time, but these constructs did not demonstrate predictive validity over time. For instance information deficiency at T1 did not significantly correlate with information deficiency at T2. These findings are particularly notable given that they occurred two months (T2) following the downsizing rather than two days or two weeks after the organizational event when emotions may have been particularly raw. Since confirmatory factor analysis indicated that the item measures of these constructs to be internally consistent and distinct from other constructs in the same time period, future

research should examine the impact of potentially catastrophic events on employees. Explorations of these constructs are particularly important given some of these constructs' rich history as having reliable and valid measures (Brooke, Russel, & Price, 1988; Locke & Latham, 1990; Williams & Hazer, 1986) and given the potential for similar upheavals in other organizations (Rosenthal, 1996; Uchitelle, 1996). Thus, these variables should be further studied over time in conjunction with organizational change to determine if the reported results are sample-specific or represent a predictable pattern which should be associated with layoff survivors and organizational downsizing.

To further clarify the relationships among the variables examined in this investigation several suggestions are presented. First, the observed static and longitudinal relationships between information deficiency and stress suggest that a larger underlying construct may be present in the form of second order unidimensional construct (Hunter & Gerbing, 1982). As measured, both stress and information deficiency tap into similar responses of a respondent's sense of organizational control and uncertainty. Both stress and information deficiency showed stable relationships with one another over time, suggesting that some conceptual overlap exists. Based on both of the variables' important role in the causal models proposed (and practical importance in dealing with organizational change), it would be valuable to determine if a more general construct of organizational uncertainty could better explain layoff survivors' reactions to the experience of structural holes following downsizing. Second, through further simplification of the variables measured, a different causal model may better explain the data. For example, rather than positing structural holes as the exogenous variable in the

causal chain, organizational uncertainty could be the proximate cause of changes to survivors' structural hole experiences and job affect in turn. Future investigations of downsizing and communication relationships should consider alternative causal models which accurately reflect the participants' organizational experiences and reactions to change.

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