Middle Managers' Divergent Strategic Activity: An Investigation of Multiple Measures of Network Centrality

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ABSTRACT   Using a sample of 89 mid-level managers in a US based urban hospital, this study investigates relationships among three measures of network centrality and managers' divergent strategic activity. While prior work has demonstrated a relationship between managers' boundary-spanning responsibilities and strategic activity, inadequate attention has been paid to managers' internal network position. Drawing from established theory, we consider expected network flows associated with three elements of the strategic renewal process. From this, we hypothesize and test relationships among managers' divergent activity and three measures of network centrality. Our findings suggest specific relationships between alternative forms of network centrality and particular elements of the strategic renewal process. Consistent with existing research, the findings also show boundary-spanning managers to be more strategically active than their non-boundary-spanning counterparts.

INTRODUCTION

Strategy researchers have recently called for more concentration on the 'activity based view' that emphasizes micro-organizational processes and practices of key actors within firms (Johnson et al., 2003). One promising stream from which to study these phenomena stems from understanding middle managers' contributions to strategy making (Balogun, 2003; Bower, 1970; Burgelman, 1983; Currie, 1999; Thakur, 1998; Wooldridge and Floyd, 1990). In addition, Floyd and Wooldridge (2000) suggest that strategic renewal often emanates from deeply embedded and socially complex processes within a firm. They argue that the activities of middle managers – as well as their attention to emerging trends and promotion of novel programmes – largely determine how renewal occurs in organizations.

But while the importance of middle managers' strategic activity has been recognized (cf. Burgelman, 1994), explanations for *how* and *why* some managers participate in strategic activities more than others are less clear. To a limited degree, Floyd and

Wooldridge (1997) addressed this issue, finding that managers in boundary-spanning positions reported higher levels of strategic influence than managers in non-boundary-spanning functions. They theorized that managers in boundary-spanning positions mediate between the organization's external and internal constituencies and, and as a result, have more power to exert strategic influence.

In this paper, we focus on internal network conditions that enable managers to engage in divergent strategic activity, i.e. activities that challenge the 'dominant logic' of the firm, help organizations enter new markets, and spark the development of new capabilities (Burgelman, 1983; Floyd and Wooldridge, 2000). Because we assume these activities are embedded in social relationships (Floyd and Lane, 2000; Floyd and Wooldridge, 2000), we adopt a social network approach to examine how these activities are related to three distinct measures of network centrality (Brass, 1984). By linking centrality measures to processes underlying strategic renewal in firms, the paper advances existing theory regarding how middle managers contribute to strategy making. In addition, by explicitly considering assumptions underlying alternative centrality measures, the study responds to an important criticism and limitation of social network research (Borgatti, 2005; Watts, 2003). Our primary objective, therefore, is to unbundle the deeply embedded social behaviours of middle managers (Johnson et al., 2003). Further, we expect to advance the use of social network analysis in the strategy process domain.

In the following section we draw from existing research and theory to develop connections between divergent activity and social network position. Then we explore differences between boundary-spanning managers and their non-boundary-spanning counterparts. The balance of the paper describes the research setting and methodology, presents the results of the study, and discusses implications for research and practice.

THEORETICAL FRAMEWORK AND HYPOTHESES

Floyd and Wooldridge (2000) propose a middle level model of strategic renewal comprised of three interrelated elements or sub-processes: idea generation, initiative development, and strategic reintegration (see Figure 1). They argue that organizations must maintain some capability in each of these domains to effect strategic renewal and that each element brackets a long succession of social interactions within the organization. As Figure 1 shows, it is in the context of these elements that divergent activity occurs.

According to the figure, the process of strategic renewal first depends upon the generation of new ideas. Social network theory suggests that new ideas are generated by
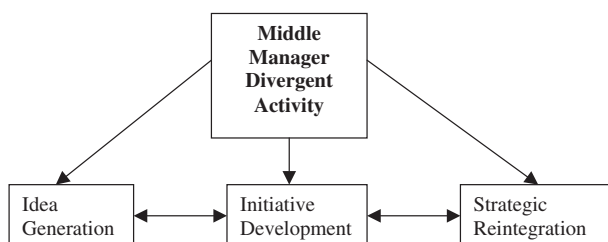

Figure 1. Middle management divergent activity and the elements of strategic renewal

individuals who maintain relationships with a diverse set of organizational actors or groups (Burt, 1992). The basic argument holds that social interactions occur most often within groups of individuals who routinely and repeatedly interact. Members of the same work unit, therefore, often share similar information and form parallel beliefs (Granovetter, 1985). Other individuals, however, maintain numerous and diverse social relationships that extend beyond their own cluster and, by doing so, are more likely to be exposed to novel information, new ideas, and opportunities (Burt, 1992; Freeman, 1979). Thus, theoretically managers who maintain numerous and diverse relationships will gain insights into strategic issues and opportunities not apparent to others in similar positions.

The second element of strategic renewal denotes the transformation of ideas into initiatives that have the potential to importantly affect organizational capability. Initiatives that originate from middle management layers have been identified in research on innovation (Kanter, 1988), new venture development (Burgelman, 1983, 1994), and business planning (Currie and Procter, 2001). Middle managers may use upward-oriented strategic activities, i.e. championing new ideas, to directly influence top management (Currie, 1999). Other forms of strategic activity are downward in nature and might entail, for instance, facilitating the development of trial projects or experimental programmes (Currie and Procter, 2001). Prior research, suggests that network centrality increases managers' control over how information is communicated and to whom (Brass, 1984; Pfeffer and Salancik, 1978). This control helps managers gain cooperation and support from others for divergent strategic initiatives (Dutton et al., 2001; Kanter, 1988).

During the third element of strategic renewal, initiatives extend beyond trial projects and experiments to become part of the organization's capability base. Knowledge that was only narrowly shared must now be widely disseminated *and accepted* throughout the organization (Floyd and Wooldridge, 2000). The scope of this knowledge transfer problem extends across functions and subunits. While some knowledge may be codified and easily shared, transmitting and integrating tacit knowledge is not (Nonaka, 1994, 1998). From a social network perspective, transferring tacit knowledge may be more sophisticated than simply connecting individuals and may require managers to influence others to influence others (Borgatti, 2005).

Overall, the framework presented above suggests associations between managers' network position and their ability to effect strategic renewal. Social interactions within and between management layers are a critical component in the process of developing ideas into new capabilities as well as integrating those capabilities into the strategic direction of the firm (Nonaka, 1994; Gourlay, 2006). Research suggests that occupying structurally advantageous positions, i.e. centrality within social networks, is critical in developing resource advantages (Cook and Emerson, 1978), early promotions (Burt, 1992), and workplace performance (Mehra et al., 2001). Centrally located middle managers are more likely to possess the ability to exert influence and engage in higher levels of divergent strategic activity. The question here, however, is what form(s) of centrality are most conducive to which elements of strategic renewal?

While numerous centrality measures have been developed (Katz, 1953; Stephenson and Zelen, 1989), by far the most well known and widely used measures are based on Freeman's (1979) concepts of closeness, betweenness, and degree. A fourth measure, eigenvector centrality (Bonacich, 1972) is also popular and is mathematically similar to

several other network measures (Friedkin, 1991; Hubbell, 1965). Borgatti (2005) reviews these measures, examining the assumptions each makes about network flows, and suggests the types of networks for which each measure is most appropriate. Here we draw from Borgatti (2005) to develop hypothesized relationships among three specific network measures and divergent strategic activity.

Idea Generation

Earlier we argued that the generation of new strategic ideas was stimulated by managers' exposure to novel information and beliefs about strategy. Further we cited social network theory suggesting the maintenance of numerous and diverse relationships as a likely source of this type of information. Operationally, these theoretical relationships are consistent with Freeman's closeness measure of centrality. This measure is produced by summing the graph-theoretic distances from (in this case) a manager to all other managers in the network (Wasserman and Galaskiewicz, 1994). That is, the measure examines the number of links between an individual and each other individual in the network, and then sums these. Assuming that what flows in a network originates from all other nodes with equal probability and flows along the network's shortest paths, actors with low closeness scores tend to receive information sooner. Borgatti (2005) notes that in the case of information flows, low closeness scores are often associated with well-positioned actors who can obtain novel and valuable information early. Said differently, managers with high closeness centrality, on average, maintain relatively direct relationships that connect them with numerous others in the organization. Their links to other organizational members are more direct or shorter than managers with less closeness centrality. Assuming novel information – the basis for new strategic ideas – travels via shortest paths, these managers are likely to be the first to learn about new ideas and novel information. Thus:

> *Hypothesis 1*: A manager's overall level of divergent strategic activity will be positively associated with his/her level of closeness centrality.

Initiative Development

While closeness centrality seems important for managers' exposure to new information, degree centrality seems important for the type of influence behaviour associated with initiative development. This measure simply counts the number of paths that emanate from an organizational actor (Wasserman and Galaskiewicz, 1994), and thus, is a measure of 'immediate influence' in one time period (Borgatti, 2005). Distinct from other centrality measures that assess influence through chains of relationships and parallel replication (Bonacich, 1972; Friedkin, 1991), degree centrality assesses 'immediate' or direct influence (Borgatti, 2005). Degree centrality represents a more direct, one-on-one, connection that is especially critical to divergent strategic activity (Currie and Procter, 2001; Floyd and Wooldridge, 1997). When facilitating development efforts within the organization, for example, managers are likely to garner favours from others using past favours, personal relationships, or reputations as social currency (Kanter, 1988). Simi-

larly, divergent initiatives benefit when those championing them develop a top management ally (Dutton et al., 2001). This type of direct relationship can provide critical information concerning top management team dynamics and knowledge of informal rules not widely disseminated within the organization that are often critical to an initiative's success (Floyd and Wooldridge, 2000). Thus:

Hypothesis 2: A manager's overall level of divergent strategic activity will be positively associated with his/her level of degree centrality.

Strategic Reintegration

As a divergent idea develops into an initiative and then ultimately becomes part of the firm's strategy, information about the initiative spreads to 'increasing numbers of individuals of disparate functional backgrounds and at different hierarchical levels, and the emergent network begins to expand across the organization' (Floyd and Wooldridge, 2000, p. 122). To advance this process, we argue that strategically active managers often influence others through others. The form of centrality enabling this more indirect form of influence is best assessed by Bonacich's (1972) eigenvector measure of centrality (Borgatti, 2005). Conceptually, this measure assesses a manager's links to other highly central nodes (Wasserman and Galaskiewicz, 1994). The measure assumes that even if a manager connects to just one other actor who subsequently connects to many others (and so forth), then the first manager has the potential to be highly influential in the communication and promotion of new strategic capabilities (Bonacich, 1972). Hence:

Hypothesis 3: A manager's overall level of divergent strategic activity will be positively associated with his/her level of eigenvector centrality.

Hypotheses 1–3 suggest relationships between managers' network position within the organization and divergent strategic activity. A previous study (Floyd and Wooldridge, 1997) found that managers who held boundary-spanning positions exerted more strategic influence than their counterparts in non-boundary-spanning roles. The theoretical basis for this finding was boundary-spanning managers' external network position, i.e. their unique position straddling the divide between the organization and its external environment (Jemison, 1984). Theoretically, boundary-spanning managers have increased opportunities to influence strategy because of their increased exposure to 'the latest market and technical developments' (Floyd and Wooldridge, 1997, p. 481). Stated differently, boundary-spanners play a mediating role between environmental uncertainty and internal organizational arrangements (Thompson, 1967), and thus, have the potential to generate organizational influence by affecting asymmetrical resource dependencies (Pfeffer and Salancik, 1978). The previous study then, suggests that boundary-spanners have an advantage over their non-boundary-spanning counterparts (Burt, 1992) that stems from their external network position. That is, boundary-spanners have higher levels of access to, and control over critical, externally generated, information (Brass, 1984; Floyd and Wooldridge, 1997). For consistency, and to allow our findings to be reconciled with the earlier study, here we also hypothesize that:

Hypothesis 4: Managers with boundary-spanning responsibilities have higher levels of divergent strategic activity than non-boundary-spanning managers.

Together the first four hypotheses raise two interesting questions. Do boundary-spanning managers who benefit from being well positioned externally also tend to be best positioned within the organization? If so, do the relationships suggested in Hypotheses 1–3 hold for non-boundary-spanning managers or is internal network position only relevant when complimented by an advantageous external network position?

Floyd and Lane (2000) noted that divergent strategic activity in firms is a social learning process that takes place between management layers. An individual's chances of successfully championing funding for a new piece of capital equipment, for example, is likely to be increased when the individual has linkages to powerful others in top management (Phillips et al., 2004; Thompson, 1967). Similarly, a manager attempting to facilitate an organizational learning effort, e.g. cross functional experiments or information sharing, is likely to benefit from numerous connections throughout the organization (Cohen and Levinthal, 1990; Floyd and Wooldridge, 2000). Thus, since boundary-spanning managers on average display higher levels of divergent activity than non-boundary-spanning managers, we expect these managers to be centrally located within the organization's internal social network.

Hypothesis 5: Managers with boundary-spanning responsibilities have higher levels of closeness, degree, and eigenvector centrality within the organization than non-boundary-spanning managers.

However, while boundary-spanning managers may, on the whole, engage in more divergent activity and be more centrally located within the organization, we assert that non-boundary-spanning managers may also be internally positioned to influence strategy (Thakur, 1998). Like boundary-spanning managers, non-boundary-spanners can engage in divergent activities by providing new information, directing top management attention, and by linking actions to ideas in organizational settings (Dutton and Ashford, 1993). By maintaining knowledge of the firm's resource allocation or strategy making processes, non-boundary-spanning managers are also able to participate in divergent strategic activity (Thakur, 1998). Thus:

Hypothesis 6: For non-boundary-spanning managers, there is a positive association between divergent strategic activity and (a) closeness, (b) degree, and (c) eigenvector centrality.

METHODOLOGY

Research Setting

The research was conducted in a medium-sized urban hospital located in the northeastern United States. Referred to here as Catholic Hospital, it is supported by a Catholic mission and employs over 2000 people. In 1999, Catholic Hospital had 386 licensed

medical/surgical beds with a total salary budget of over $70 million. In addition to its primary location, the hospital operates a second facility that offers extensive rehabilitation services. To remain competitive, Catholic has consistently offered comprehensive services and state of the art facilities. In 1998, for instance, Catholic built a new surgical pavilion and completely renovated its inpatient-nursing units. At the same time, the hospital continued to support its community-based mission by losing over $6 million on free care, uncollected accounts, and uncollectible Medicaid reimbursements. Still, however, Catholic was one of a diminishing handful of hospitals in the region to experience an operating gain for the fiscal year.

Competitive Environment

Mid-level strategic activity is probably best studied in large organizations competing in dynamic, complex, and competitive business environments (Floyd and Wooldridge, 2000). In these firms, competitive demands across diverse products and markets create both the need and opportunity for substantive contributions. While previous research has suggested that the hospital industry meets these conditions (Zuckerman et al., 1990), we interviewed members of the top management team to confirm Catholic's competitive position. During the interviews, the industry's complex, dynamic, and competitive nature became quite clear. A key goal expressed by top managers, for example, was to become the most comprehensive community hospital in the region. Overall, this goal serves to increase the complexity faced by the hospital since it requires it to manage a wide range of heterogeneous patients, technologies and medical specialties (Dess and Beard, 1987).

Similarly, hospital executives' comments about the industry and aspects of their recent strategy reflect a high level of industry dynamism. In recent years, new forms of competition, rapidly advancing technologies, and ever changing regulations have combined to make healthcare among the more dynamic industries in the economy. In response, to stabilize revenues and costs, hospitals such as Catholic have been increasingly entering into mergers and other forms of partnerships. The explosion of multi-hospital systems and fully integrated medical centres (i.e. insurance firms combined with medical professionals) has clearly been intended to buffer organizations from the industry's inherent uncertainty. Catholic, like other hospitals, has attempted to create stability by entering into long-term contracts with insurance providers, physician groups, and labour unions.

Finally, the interviews highlighted the intense competition inherent in the hospital industry. In addition to its traditional competition with other hospitals, Catholic faces an array of new forms of competition including urgent care centres, stand alone surgical facilities, etc. Providers of holistic and alternative healthcare services also compete in specific arenas. Reflecting this intense competition, operating margins for Catholic and throughout the hospital industry are 'extremely thin'. In addition, Catholic, like many hospitals, has a non-profit mission. In the words of the Chief Operating Officer, 'an important part of the mission is to provide as much care as possible to the economically fragile segment of the community'. In sum, the complex, dynamic, and competitive nature of Catholic Hospital's business environment make it an extremely appropriate site

to study mid-level strategic activity. To survive, the organization must continually renew its product-market and capability mix.

Mid-Level Professionals at Catholic Hospital

After verifying its appropriateness for the study, we met with the President and CEO of Catholic to identify the population of middle level professionals working within the Hospital. We began by defining these individuals as non-top management professionals 'entrusted by the firm with significant responsibilities who have access to top management and who possess significant operating know-how' (Floyd and Wooldridge, 2000, p. 158). Our discussion and a review of the hospital's organizational chart revealed that most of these middle managers were part of what the CEO called the 'Leadership Team'. The CEO was quick to point out, however, that there were other actors, not part of this team, who fulfilled our definition. To identify these individuals we asked members of the Leadership Team to identify any non-team members whom they felt met the requirements of the definition. Individuals identified by two or more members of the Leadership Team were included in the study. This procedure identified ten additional employees, producing a total of 90 potential respondents for the study (members of the top management team were excluded from the sample). In the end, all but one potential participant completed the quantitative survey giving us a final sample of 89 mid-level professionals.

Research Procedures

To develop a context specific survey that presented strategic issues in a recognizable format, including language commonly used in the hospital, we conducted semistructured interviews with the CEO and six other top managers. This allowed us to gain an understanding of the organization's strategic context: its competitive environment, priorities, and resource profile. This approach minimized an anticipated problem that respondents' understanding of strategy is context specific and may not transfer to survey items utilizing generic strategy terms (Denzin and Lincoln, 1998).

Measures

Divergent strategic activity. To measure divergent strategic activity we asked each respondent to rate two or three of their peers on 20 Likert-type items developed by Floyd and Wooldridge (1992, 1996, 1997) to assess how frequently middle managers perform various strategic activities (1 = never, 5 = frequently). Thus, each manager was rated by at least two of their co-workers familiar with their day-to-day job activities. In contrast with self-reported ratings used in previous studies, this peer evaluation technique reduced the possible effect of common method bias and enhanced the overall reliability of the data. For each manager, the responses of the two raters were correlated to assess inter-rater reliability. Correlations in all cases were sufficient (>0.70) for meeting commonly established guidelines (Hair et al., 1984). Responses from the raters were then averaged and following procedures set forth by Floyd and Wooldridge (1992), each

element of middle management strategic activity was calculated. Since this study was concerned with divergent activity, scores for upward-oriented divergent influence (championing alternatives) and downward-oriented divergent influence (facilitating adaptability) were summed to create a composite score. Individual alpha coefficients for championing (0.90), and facilitating (0.84) were at acceptable levels (see Table I).

Network centrality. Since mid-level strategic influence tends to occur through emergent or informal channels (Floyd and Wooldridge, 2000), we examined managers' network centrality within the organization's informal communication network. This approach allowed us to assess each actor's position 'in the actual patterns of interaction that define a social network rather than from their positions in the formally defined vertical and horizontal division of labor' (Ibarra, 1993, p. 476). 'Centrality' typifies the actors' involvement in a given network and it has been used to explain a person's access to information and control over resources (Knoke and Kuklinski, 1982; Wasserman and Galaskiewicz, 1994). These centrally located actors are potentially powerful as other actors are dependent on them and they are not dependent on others.

To measure network centrality respondents were asked to review an alphabetical roster of fellow employees and place checks next to the names of those individuals to whom they frequently (i.e. many times daily) communicate. Respondents were asked about communication via electronic mail, telephone, or other modes of communication. Consistent with research on social networks, these data were then arranged in an $N \times N$ binary matrix (Borgatti et al., 1999; Mehra et al., 2001). Each cell Xij in this matrix corresponds to i's relation to j as reported by i. For example, if manager B reports manager C as one with whom he communicates, then that cell was recorded as a 1, otherwise it was coded as a 0 (Wasserman and Galaskiewicz, 1994). The data were analysed using the UCINET V computer program (Borgatti et al., 1999). The program automatically computes all measures of network centrality including closeness, degree, and eigenvector centrality.

Boundary-spanning. Although the boundary-spanning activity is not limited to a particular set of organizational subunits, it can be argued that structure is the 'first and foremost' determinant of boundary-spanning domain (Tushman and Scanlan, 1981). Thus, an individual's formal position within a sub-unit is a principle factor governing the extent of their boundary-spanning activity (Brass, 1984). Sub-unit domain also defines a constraint on how much influence results from boundary-spanning (Floyd and Wooldridge, 1997). Thus, our measure of boundary-spanning was based on functional descriptions of sub-units and formal organizational roles. As part of the qualitative component of the data collection process, we asked upper management about various roles of the Leadership Team. To classify respondents as having positions with boundary-spanning or non-boundary-spanning responsibilities, we closely followed procedures utilized by Floyd and Wooldridge (1997). First, consistent with Thompson (1967), the following functions were classified as boundary-spanning: direct patient care, marketing, human resource management, purchasing. Non-boundary-spanning positions included MIS, accounting, finance, and utilization review. In addition to functional descriptions, we discussed other roles with upper managers for externally oriented individuals within non-boundary-

spanning units. Thus, while finance was coded as a non-boundary-spanning unit, the financial planner in charge of forecasting was coded as a boundary-spanner. In total, 34 mid-level managers were classified as boundary-spanners and 55 were coded non-boundary-spanners.

Control variables. Organizational tenure, age, and hierarchical level were selected as control variables. Differences in these variables could affect the pattern of participation in social networks or may be associated with an individual's strategic understanding (Mehra et al., 2001). Tenure was coded as the number of years an individual had been employed by Catholic (mean tenure = 7.22 years). We identified two hierarchical levels within the sample of mid-level managers. Catholic's top management team identified two separate groups within the Leadership Team: (a) Operations Group (N = 43); and (b) the remainder of the Leadership Team (N = 46). These were coded with a 0 and a 1.

RESULTS

Table I presents the means, standard deviations, alpha coefficients, and correlations between all the variables in the study. Three demographic variables – age, job tenure, and organizational level – are included as controls that could potentially affect a manager's influence on strategy (Schilit, 1987). Consistent with prior research (Floyd and Wooldridge, 1997), there are significant interrelationships between the influence measures. In addition, the table shows significant correlations between the influence measures and the measures of perceptual deviance and network centrality.

Hypotheses 1–3 predicted associations between divergent activity and network centrality. Ordinary least squares regression analysis was used to examine these relationships. As Table II shows, all three hypotheses are strongly supported. For championing, facilitating and for the summed score for divergent activity, the relationship to centrality was significant at the $p < 0.01$ level for all three measures.

Table III presents ANOVA results that were used to test Hypothesis 4 (measures of divergent strategic activity would be higher for boundary-spanning than for non-boundary-spanning managers). Since factors other than boundary-spanning could affect a manager's level of divergent behaviour, the three control variables were included in the analysis as covariates. As the table shows, Hypothesis 4 was strongly supported. Measures for divergent activity were higher for boundary-spanning managers than non-boundary-spanners.

Table IV reports ANOVA results that were used to test Hypothesis 5, predicting that reported levels of network centrality would be higher for managers who have boundary-spanning responsibilities. Again, the three control variables were included in the analysis as covariates. As Table IV shows, the results supported Hypothesis 5 at the $p < 0.05$ level.

Finally, Hypothesis 6 predicted that relationships between divergent activity and network centrality would hold for non-boundary-spanning managers as well. Again, ordinary least squares regression analysis was used to examine these relationships. As Table V shows, Hypothesis 6 was supported for each centrality measure at the $p < 0.05$ level.

Table I. Correlation matrix (N = 89)

Variable	Mean	St. dev.	1	2	3	4	5	6	7	8	9
1. Boundary-spanning	0.38	0.49	—								
2. Champion	17.33	3.53	0.435*	0.90§							
3. Facilitate	16.40	3.48	0.324*	0.859*	0.84§						
4. Tenure	7.22	6.69	-0.104	-0.034	0.049	—					
5. Age	47.97	8.22	0.296*	0.13	-0.049	0.532	—				
6. Hierarchical level	0.764	0.43	-0.380*	-0.102	-0.057	-0.052	0.112	—			
7. Network closeness	59.90	8.16	0.254**	0.397*	0.347*	0.165	0.116	-0.206	—		
8. Network degree	34.65	18.10	0.252**	0.386*	0.321*	0.182	0.159	-0.228**	0.983*	—	
9. Eigenvector centrality	13.36	6.84	0.277*	0.390*	0.325*	0.211**	0.204	-0.261**	0.970**	0.989*	—

Notes: * p < 0.05, ** p < 0.01.
§ Alpha coefficients are shown on the diagonal.

Table II. Regression of divergent strategic influence on network centrality measures (N = 89)

	Championing	Facilitating	Divergent strategic influence
Closeness centrality	0.398	0.346	0.385
	(3.741)**	(3.195)**	(3.600)**
Covariates			
Age	0.018	−0.115	−0.050
	(0.149)	(−0.925)	(−0.406)
Tenure	−0.102	0.045	−0.029
	(−0.824)	(0.360)	(−0.237)
Level	−0.021	−0.016	−0.019
	(−0.200)	(−0.145)	(−0.179)
R squared	0.158	0.128	0.148
Adj. R^2	0.117	0.085	0.106
F	3.806**	2.969*	3.518**
Degree centrality	0.388	0.324	0.369
	(3.590)**	(2.941)**	(3.386)**
Covariates			
Age	0.002	−0.129	−0.066
	(0.013)	(−1.030)	(−0.532)
Tenure	−0.099	0.050	−0.025
	(−0.795)	(0.398)	(−0.201)
Level	−0.016	−0.014	−0.016
	(−0.151)	(−0.132)	(−0.147)
R squared	0.148	0.113	0.134
Adj. R^2	0.106	0.069	0.091
F	3.527**	2.572*	3.140*
Eigenvector centrality	0.401	0.338	0.383
	(3.645)**	(3.006)**	(3.449)**
Covariates			
Age	−0.011	−0.140	−0.078
	(−0.091)	(−1.117)	(−0.631)
Tenure	−0.109	0.041	−0.035
	(−0.877)	(0.325)	(−0.282)
Level	0.000	0.000	0.000
	(0.004)	(0.001)	(0.002)
R squared	0.152	0.117	0.138
Adj. R^2	0.110	0.073	0.096
F	30.628**	20.670*	3.249*

Notes: * $p < 0.05$, ** $p < 0.01$.
Results for standardized betas with T-score in parentheses.

DISCUSSION

Research has increasingly shown that middle managers play a pivotal role in developing new ideas, reshaping firm capabilities, and affecting strategic renewal (Burgelman, 1994; Currie, 1999; Currie and Procter, 2001). In a previous study, Floyd and Wooldridge (1997) theorized that due to their external network position, boundary-spanning

Table III. Univariate analysis of variance for divergent strategic influence

Divergent strategic influence activity	Boundary-spanning (N = 34)	Non-boundary-spanning (N = 55)	F	Covariates (F)		
				Age	Tenure	Level
Championing	19.14	16.13	19.93**	2.76	1.42	0.302
(Std. dev.)	(2.63)	(3.50)				
Facilitating	17.70	15.45	14.81**	5.89*	4.34*	0.263
(Std. dev.)	(2.89)	(3.56)				
Divergent activities	36.84	31.58	18.69**	4.54*	2.92	0.305
(Std. dev.)	(5.23)	(6.83)				

Notes: * p < 0.05, ** p < 0.01.

Table IV. Univariate analysis of variance for network centrality measures

	Boundary-spanning (N = 34)	Non-boundary-spanning (N = 55)	Mean square	F
Closeness centrality	62.44	58.28	286.353	4.608*
(Std. dev.)	(6.82)	(8.71)		
Covariates				
Age			57.697	0.929
Tenure			303.897	4.891*
Hierarchical level			92.042	1.481
Degree centrality	40.21	31.08	1091.458	3.62
(Std. dev.)	(18.89)	(15.91)		
Covariates				
Age			91.97	0.305
Tenure			1360.58	4.513*
Hierarchical level			657.96	2.183
Eigenvector centrality	15.65	13.31	165.928	4.049*
(Std. dev.)	(6.06)	(6.89)		
Covariates				
Age			5.156	0.126
Tenure			225.532	5.504*
Hierarchical level			132.11	3.224

Notes: R squared (closeness) = 0.131, adjusted R squared = 0.088; R squared (degree) = 0.139, adjusted R squared = 0.096; R squared (eigenvector) = 0.178, adjusted R squared = 0.137.
* p < 0.05, ** p < 0.01.

managers engage in higher levels of strategic activity than non-boundary- spanning managers. They argued that boundary-spanners play a key, mediating role between environmental uncertainty and internal organizational arrangements (Pappas and Flaherty, 2005; Thompson, 1967). By bringing new information into the organization,

Table V. Regression of divergent strategic influence on network centrality measures for non-boundary-spanners (N = 55)

	Divergent strategic influence	R squared	Adj. R^2	F
Closeness centrality	0.363 (2.649)**	0.184	0.116	2.701*
Covariates				
Age	−0.268 (−1.650)			
Tenure	0.086 (0.523)			
Level	−0.007 (−0.051)			
Degree centrality	0.335 (2.484)*	0.173	0.104	2.516*
Covariates				
Age	−0.292 (−1.791)^			
Tenure	0.096 (0.584)			
Level	−0.008 (−0.055)			
Eigenvector centrality	361 (2.599)**	0.180	0.112	2.633*
Covariates				
Age	−0.292 (−1.794)^			
Tenure	0.077 (0.465)			
Level	−0.007 (−0.054)			

Notes: Results for standardized betas with T-score in parentheses.

boundary-spanners create resource dependencies that are the source of organizational power (Astley and Sachdeva, 1984; Pfeffer and Salancik, 1978).

To complement previous studies, this paper examined associations between managers' internal social network position and divergent strategic activity. Divergent activity, while less commonly studied than integrative behaviours, is critical to organizations' strategic renewal capabilities, i.e. activities that challenge the 'dominant logic' of the firm, help organizations enter new markets, and spark the development of new capabilities (Burgelman, 1983; Floyd and Lane, 2000; Floyd and Wooldridge, 2000). Grounded in the assumption that renewal emerges from socially complex processes embedded in relationships (Floyd and Lane, 2000; Granovetter, 1985), the paper develops connections between the types of network flows suggested by three elements of the strategic renewal process (Floyd and Wooldridge, 2000) and divergent strategic activity.

Overall, the results support our theorizing showing measures of internal network position, consistent with the types of network flows suggested by strategic renewal, to be

significantly associated with divergent strategic activity (Hypotheses 1–3). Specifically, the results suggest that closeness centrality positions managers to obtain novel information (Borgatti, 2005), and indicate that this type of centrality is relevant in contexts where managers are tasked with developing new strategic ideas (Floyd and Wooldridge, 2000). Similarly, the results support the notion that degree centrality facilitates the type of immediate or 'one-on-one' influence that seems necessary for developing new ideas into strategic initiatives. Finally, the significance of the eigenvector measure suggests the importance of this form of centrality for achieving the type of indirect influence required for strategic reintegration.

From a theoretical perspective, the findings advance the field's thinking concerning relationships among various forms of network centrality and divergent activity within the strategic renewal process. To build on this, future research should conduct 'finer grained' analyses focused narrowly on specific elements of the strategic renewal process (Johnson et al., 2003). Studies might, for example, examine how various patterns of relationships, both within and external to organizations, influence the generation of novel ideas. Similarly, other studies might focus on how the quality and strength of established relationships, including affect-based factors (e.g. friendship or trust networks), influence the development of strategic initiatives. Finally, studies focusing on strategic reintegration might examine the relevance of broadcast or parallel duplication mechanisms (Borgatti, 2005) that are consistent with the type of influence represented by the eigenvector measure.

Beyond examining internal network position, to reconcile our study with previous research we confirmed that among the managers in this study, boundary-spanners displayed higher levels of divergent activity than non-boundary-spanning managers (Hypothesis 4). In addition, the results showed boundary-spanners to be more centrality located internally than non-boundary-spanning managers (Hypothesis 5), raising the question of whether there is sufficient variation in the internal network positions of non-boundary-spanning managers to predict levels of divergent strategic activity. Addressing this, the results show internal network position to be associated with divergent activity for the sub-sample of non-boundary-spanning managers (Hypothesis 6). That is, internal network position is a vital element that seems associated with strategic activity regardless of a manager's external network position.

Managerial Implications

Our study has practical implications as well as theoretical. First, to ensure managers are in position to understand emerging organizational events that might be the source of new ideas, managers must cultivate numerous contacts throughout their organization. That is, consistent with existing theory our findings suggest that managers should maintain relationships and even cultivate loose and non-reciprocated ties (Granovetter, 1985). These linkages – both vertical and horizontal – channel information to internal and external actors outside of their prevailing communication network (Granovetter, 1985). In essence, we found that social structure serves as a conduit for divergent thinking. While it is common for top management teams to utilize a variety of mechanisms to foster better implementation of plans (i.e. multidisciplinary teams, training programmes),

they should also promote social connectivity that fosters divergent activity. This would include, of course, fostering ties internally as well as externally.

Second, top managers have become increasingly aware of the importance of including middle managers in the strategy process (Burgelman, 1994). Often firms spend significant resources educating managers about strategic concepts in general, and the long-term direction of their firms in particular. The findings in this study suggest that while this may be beneficial, such efforts may not be sufficient for garnering the types of strategic behaviours firms desire from middle managers. While it is vital that managers are knowledgeable about their firm's strategy, this study suggests that divergent thinking develops through a firm's social structure and is critical to its long-term success.

This view is clearly supported by Nonaka (1994, 1998) who stated that the knowledge must become embodied in action and practice through training in strategy. Secondly, however, managers must engage in an exceedingly complex process of learning-by-doing, socialization, and communication (Cohen and Levinthal, 1990). Thus, in addition to developing managers' understanding of strategic concepts, the findings suggest that firms should consider investing in programmes that foster social linkages and the flow of information across unconnected work units both within and outside the organization. A firm that fosters these linkages can better ensure a rich flow of ideas supporting the capability accumulation process and increase 'deviant thinking'. In short, managers at all levels can benefit from a better understanding of the dynamics of socialization that foster change.

Limitations

Like all studies the one presented here suffers from several important limitations that must be kept in mind when interpreting its results. The study within Catholic Hospital is, in essence, a case study of a single, successful organization. Thus, our findings are not readily generalizable across all firms. Instead, the paper does confirm relationships found in previous studies and provides an initial exploration of the conditions that underlie the strategic renewal process. While much has been written about strategic renewal (Floyd and Wooldridge, 2000), little has been empirically tested.

Secondly, while we made specific efforts to guard against common method variance, the potential for response bias must be recognized. We adopted a social network perspective to learn about deeply embedded contextual processes (Dutton et al., 2001). Because this approach requires respondents to rate interpersonal relationships among known peers, the responses could be positively biased. Peer raters, for example, are likely more aware of, and give credit to, the strategic activities of managers they are close to. To help guard against this problem, we used multiple raters and assessed reliability across raters. In addition, we collected data individually in personalized sessions. This helped maintain privacy and allowed us time to answer pointed questions from the respondents. By using this data collection process, we improved the confidence of the respondent in the confidentiality of the study as well as minimizing any potential for error in filling out the questionnaire. Still, the potential for response bias must be recognized.

Thirdly, the study uses cross-sectional data to explain an emerging process of capability accumulation in a hospital setting. Longitudinal data would provide more insight

into this process and offer more opportunities to build and directly test theory. Future studies within this research domain would be wise to incorporate a more pluralistic view (Currie, 1999; Rouleau, 2005); however, within the confines of an empirical study of this nature, unbundling deeply embedded social complexities is ambitious. Finally, due to the small size of the management group at Catholic Hospital, this study was methodologically limited in the breadth of independent measures that could be used. Again, future studies would have the opportunity to examine other relationships that might further explain the strategic influence behaviours of middle managers.

CONCLUSION

The research presented here was motivated by growing evidence that how middle managers influence strategy matters. Moving beyond previous research in this important area, we explored the conditions under which managers engage in divergent strategic activity. According to Floyd and Wooldridge (2000), these types of activities are vital to firms in terms of developing ideas and reshaping capabilities. The study demonstrates that managers' network position both within and outside the organization importantly influences their level of divergent strategic activity. Moving beyond conceptualizations arguing that managers are vital in shaping strategy from the middle (Floyd and Wooldridge, 1992), we argued that managers' social connections foster divergent activity and help renew the firm. In addition, the study found that boundary-spanning managers were more centrally located than their non-boundary-spanning counterparts. Taken together, these results are consistent with the notion that new strategies emerge through a social learning process where new knowledge is created, ideas generated, and capabilities developed as managers and other organizational actors engage in complex social interactions (Floyd and Wooldridge, 2000; Nonaka, 1998).

While the primary objective of this paper was to unbundle deeply embedded social behaviours of middle managers (Johnson et al., 2003), we also expected to advance the use of social network analysis in the strategy process domain (Floyd and Wooldridge, 2000). In addition, we examine the assumptions implicit in utilizing alternative centrality measures as they relate to divergent influence activity (Borgatti, 2005). By appreciating theoretical differences in alternative centrality measures, we address an important criticism and limitation of social network research (Borgatti, 2005; Watts, 2003).

Finally, we found that non-boundary-spanning managers, while engaging in divergent activities less frequently, still utilized social connections and to foster divergent activity. This finding suggests that formal position in the organization, as evidenced by boundary-spanning or non-boundary-spanning roles (Floyd and Wooldridge, 1997), is only part of the equation. Instead, in order for middle managers to effectively engage in the strategy-making conversation, they must use their social position and cultivate a host of relationships that channel divergent strategic information.

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