Strategy implementation and organizational change: How formal reorganization affects professional networks☆

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ABSTRACT

Strategy implementation is difficult, particularly as it often requires changes in formal organization structures. Prior research has shown that change in the formal structure may affect employee networks. Yet, we know relatively little about how such changes affect different network ties. This paper considers how formal structural change affects senior managers' ability to maintain their intraorganizational networks. The hypotheses are tested on sample of 884 work-related relationships of 96 partners in a global professional services firm. This firm had recently implemented a new strategy, which led to a change in the product-market focus and the resulting formal structure. Our findings reveal that the characteristics of a specific network tie determine whether it is affected by formal structural change. In particular, we find that network ties that are highly embedded in the social structure are more likely to be affected by change in the formal structure. In contrast, ties that are relationally embedded are less likely to be affected by change in the formal structure. We discuss the theoretical and practical implications of these results. In particular, the findings may have consequences for the success of strategy implementation and strategic transformation efforts.

> "All this organizational change we went through in the last several years has been disruptive in terms of relationships, social networks … the formal organization [has become] more and more dispersed, geographically dispersed, the impact on the social environment … internal social environment is quite big." Senior Partner, Milan office of management consulting firm

How do changes in formal organization structures affect professional networks? In today's rapidly changing environment, organizations need to continually adjust and renew their strategy in order to deliver on constantly changing demands (Doz and Kosonen, 2010). To make these adjustments in strategy, an organization may need to change and adapt the day-to-day activities and interactions of its employees (Doz and Kosonen, 2010; Karim and Williams, 2012). One approach that firms take

to alter employee behaviors to fit with a new strategic direction is to change the formal organization structure (Beer and Nohria, 2000; Johnson, 1992; Kostova and Roth, 2002; Malhotra and Hinings, 2015). Indeed, a long line of research in strategy has argued that strategy is an important determinant of structure (Amburgey and Dacin, 1994; Chandler, 1962). As the formal structure is changed, individuals inside the organization are often required to accept new formal work roles. As people are moved across organizational groups and assigned new roles and responsibilities, the informal connections they rely on to get things done, also change (Barley, 1990; Ibarra, 1992; Karim and Williams, 2012; Kleinbaum and Stuart, 2014a; Mohrman et al., 2003; Vogel, 2005).

Recent work on the interaction between formal organizational structure and employee interactions has recognized that structural change affects organizational networks (e.g., Gulati and Puranam, 2009; Kleinbaum and Stuart, 2014a, 2014b; Soda and Zaheer, 2012). Yet, the impact of formal change efforts on networks is often uncertain and is likely to affect different relationships differently. Hence, we still know little about how different work relationships are affected and which type of relationships are more likely to be affected by structural change. In this paper, we seek to further understand the interaction between change in formal structure and professional networks. In particular, we consider how the surrounding social structure affects the ability of employees to maintain their work-related networks when formal structural change is introduced. Structural change may be implemented in order to change or alter interactions among organizational members to achieve different outcomes including strategic transformations (Gulati and Puranam, 2009; Hung, 2002; Karim and Kaul, 2015; Melin, 1985; Padula, 2008). Hence, for the success of strategy implementation, it is important to gain a better understanding of the complex interactions between structural change efforts and intraorganizational networks.

A long line of research on intraorganizational networks has established that organization members need to invest time and energy to maintain their professional networks. Otherwise they may decay and ultimately cease to exist (Burt, 2001; Levin et al., 2011). Moreover, we know that organization members are most likely to interact with others as mandated within the formal organizational boundaries (Barnard, 1938; Karim and Kaul, 2015; Karim and Williams, 2012; Kleinbaum et al., 2013). If the formal structure of interactions is changed, this will therefore have consequences for where organization members choose to invest time and energy in terms of maintaining their relationships. Ultimately formal change may therefore have consequences for strategy implementation. We therefore ask how formal structural change is associated with the ability to maintain professional networks? And, in particular, we develop hypotheses about how different characteristics of the individual network tie affect this association.

We test our hypotheses on a unique dataset of 884 intraorganizational peer networks of 96 senior partners in a large management consulting firm that had gone through a strategic transformation. As a result of the change in strategy, the firm had implemented a major reorganization of the formal structure 18 months prior to our study. The focus of the empirical analysis is therefore how the characteristics of the network ties are associated with the partners' perceived ability to maintain their intraorganizational networks after a change in the formal structure.

Strategy implementation and organizational change in a large consultancy

Much work in strategy has established that strategy implementation is closely interrelated with organizational change (e.g., Grundy and King, 1992; Huntsman, 1994; Johnson, 1992; Melin, 1985; Taylor, 1979). This is because changes in strategy often require the establishment of new reporting roles or related changes in the formal organization structure in order to follow the directives of the new strategy (Johnson, 1992). Going back to the work by Chandler (1962), the direction of the causal interrelationship between strategy and structure has been debated back and forth. Chandler (1962) generally argued that a change in strategy would lead to a change in formal structure and this direction of causality has also been established as predominant empirically (Amburgey and Dacin, 1994). It has also been suggested that the contingency relationship may run the other way, where changes in formal structure lead to changes in strategy (Hammond, 1994) or that both strategy and structure affect each other in a complex interrelationship (Mintzberg, 1990, 1994). In this study, we observe a case firm where a change in strategy (i.e., a new strategic direction) led to a major organizational restructuring. Recent work on networks and change has similarly indicated that when organizations change their formal structures, this will also likely affect the intraorganizational networks (e.g., Battilana and Casciaro, 2012; Kleinbaum and Stuart, 2014a; Vogel, 2005) In this study, we consider the social structural and qualitative features of individual network ties (Moran, 2005; Nahapiet and Ghoshal, 1998) and examine how these features determine the effects of organizational change. First, we study how the structural embeddedness of a network tie affects the ability to maintain that particular relationship. Studies of organizational networks has argued that individual ties need to be considered in the context of the larger network in which they are embedded, as the surrounding social structure may affect individual network ties (e.g., Moran, 2005; Rogan, 2014; Rowley et al., 2000; Uzzi, 1996). Structural embeddedness is therefore defined by the extent to which a particular network tie is embedded in the surrounding social structure. To be sure, the term "structural embeddedness" comes from network theory and refers to embeddedness in the *social* structure and *not* embeddedness in the formal organizational structure. We argue that network ties that are more embedded in the social structure are more likely to be affected by formal structural change, as the surrounding relationships are interrupted by the change. Second, extant work has highlighted the importance of the qualitative nature of the tie — also defined as relational embeddedness — and in particular recognized that feelings of dependence, obligation and trust may arise over time (e.g., Granovetter, 1992; Jones and Lichtenstein, 2008; Nahapiet and Ghoshal, 1998; Moran, 2005; Uzzi and Lancaster, 2003). Relationally embedded ties may therefore have reciprocal obligations, which mean that are less likely to be affected by changes in the formal structure.

We study these interactions between formal structural change and network ties in a large management consulting firm. The firm provided a broad range of business consulting services, employing more than 55,000 professionals in more than 100 countries and was owned and managed on a day-to-day basis by 1100 semi-autonomous partners. At the time of the study, the firm had undergone a major strategic transformation. Prior to our research effort, the senior leadership, i.e., the Managing Partners, conducted a strategic review and decided to shift the focus of the firm's strategy. Under the new strategy, the firm was to increase the number and depth of consulting engagements for large, global clients and as a consequence reduce the extent to which resources were directed towards serving locally-based, small and mid-sized clients. This change in focus clearly represents a change in the strategic direction for the firm. Some of the challenges the firm had faced in the past included inefficiencies in sharing knowledge and best practices within industries, as well as difficulties serving large, global clients efficiently. One partner, in the London office, expressed concern with this challenge: *"A number of our clients have told us: 'you know, that you have global coverage, but you don't operate globally'."* Another partner said: *"..how in the global environment do you create sufficient critical mass in all industries around the world? … one partner in Finland, serving (five industries). How … can (she) provide the support to those five industries, and how do we not drive them over the edge, with requests coming from … five industry groups?"*

In order to accommodate the change in strategic direction to serve the global clients better, the firm decided to change the formal organizational structure from a focus on reporting lines within country to reporting lines within industry groups (across national offices). Practically, this meant that where a partner might previously have been responsible for, e.g., the Milan office; that same partner would now assume responsibility for, e.g., telecommunications. To implement the new strategy, the Managing Partners therefore instigated a number of changes in the firm's formal reporting relationships and support structures to align the day-to-day focus and interactions of the general partnership with the new strategic direction. These changes affected key organizational routines including those associated with partner assessment and compensation, client development, project staffing and project support. The basis for the determination of a partner's compensation was changed to reflect that partner's contribution to the regional profitability of North America, Europe or Asia and not the contribution to a partner's local office (e.g., Sydney or Milan). The firm's organization structure was partitioned into five global industry groups. The new groups had responsibility for identifying client opportunities and allocating resources to projects. Project staffing became a global function and staffing assignments were elevated to the regional level, not the local office level. On top of this, a global process management group was established to improve firm-wide coordination. The changes caused some short-term upheavals and six months into the change process, one of the Managing Partners was quoted in the press, describing the reorganization as "challenging" and "hard work".

Qualitative interviews with 32 senior partners in the case firm informed our initial understanding of the strategy and provided anecdotal evidence about the effects of the formal structural change on the professional network; including the ability of the partners to maintain their network ties. For example, one partner we interviewed described how the changes in the formal structure affected the professional networks: *"… with this latest round of organization changes … the networks thing, you know, is a bit complicated as a result."* Table 1 provides an overview of the interviews.

Recent work on the networks of managers in professional services firms has emphasized the importance of networks in this context (e.g., Gardner et al., 2012; Gargiulo et al., 2009; Rogan, 2014). This is a setting where employees rely to a large extent on the contacts in their network to access resources and knowledge, which in turn has implications for both individual and firm performance (Gargiulo et al., 2009; Groysberg and Lee, 2009; Lazega, 2001; Mors, 2010; Rogan and Greve, 2015; Rogan and Mors, 2017). As such, this is an appropriate setting for studying the effect of formal organizational change on professional work relationships. As is common in cross-sectional network studies, we are unable to establish direction of causality and instead claim an association between the formal restructuring and the maintenance of informal networks. Getting respondents to fill out complex network surveys is time consuming and challenging. It is therefore difficult to access longitudinal data, which potentially would allow for the establishment of causality. We discuss this further in the methods section and also explore in the discussion how the formation of future network ties might be affected by formal structure.

The change we observed in the case firm is in no way unique, and is in line with many strategic transformations observed in the development of the management consulting industry. In the late 1990s, as client companies became increasingly global, they needed to be served on a global basis. In response, many of the larger international consulting firms changed their strategic focus to respond to these demands (Kreutzer, 2011). As we observe in the case firm, such transformations in strategy are often accompanied by changes in the organization structure. Maister (1993) in his book on the professional service firm noted that while many firms in this industry traditionally were organized according to geography with local office managing partners in charge; many firms *"increasingly face the need to integrate their practices across office boundaries … the professional firm must coordinate its activities across office boundaries not only as to functional speciality, but also its industry experience"* (1993: 346). Accordingly, in the 1980s firms like McKinsey introduced industry specialization (Lorsch and Durante, 2013), and Boston Consulting Group introduced practice areas within industries (Eccles et al., 2014) and in the 1990s Andersen Consulting made similar adjustments (Nanda and Yoshino, 2006). Other service firms, such as for example IT Services, have a similarly history and have moved towards global delivery models (Burgelman and Capur, 2006).

Formal organizational change, structural embeddedness and relationship maintenance

We first consider the concept of structural embeddedness and argue that when a network tie is deeply embedded in the organizations social structure, the tie will be more likely to be affected by any formal change than if it less embedded in the
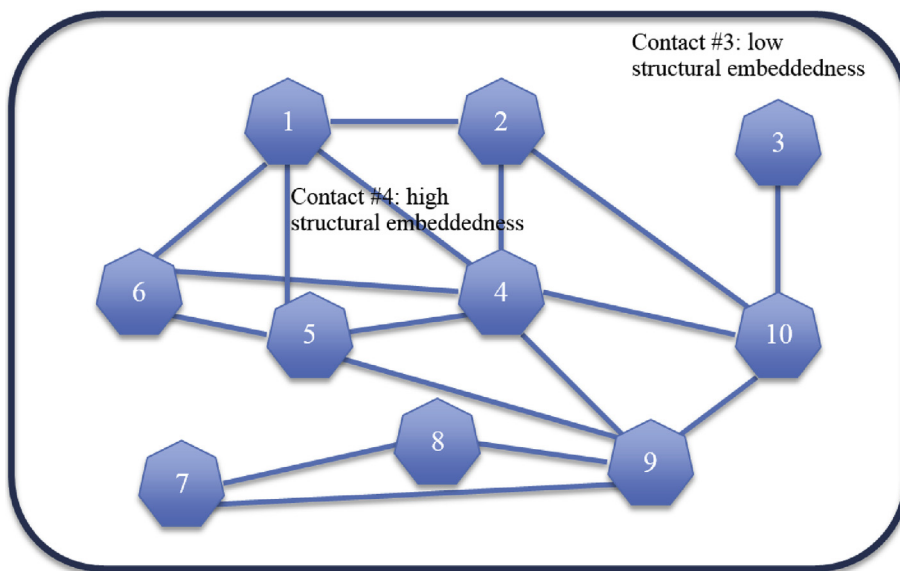
Table 1
Overview of qualitative interviews.

Partner	Office	Industry group	Competency	Tenure with firm	Duration of interview
1	London	Resources	Change	20 years	1 hr 3 min
2	London	Products	Technology	23 years	1 hr 5 min
3	London	Financial services	Strategy		3 h 28 min
4	London	Resources	Strategy	9 years	51 min
5	London	Financial services	Change		1 hr 13 min
6	London	Resources	Technology	28 years	1 hr 23 min
7	London	Communications & high tech	Process	25 years	1 hr 50 min
8	London	Financial services	Process	20 years	1 hr 56 min
9	London	Products	Strategy	24 years	1 hr 58 min
10	Paris	Communications & high tech	Technology	20 years	1 hr 14 min
11	Madrid	Communications & high tech	Technology	12 years	1 hr 38 min
12	Paris	Financial services	Strategy	15 years	2 h 13 min
13	Paris	Products	Process	8 years	1 hr 13 min
14	Paris	Communications & high tech	Process	30 years	1 hr
15	Paris	Resources	Process	22 years	1 hr 20 min
16	Paris	Communications & high tech	Process	23 years	1 hr 15 min
17	Frankfurt	Products	Technology	18 years	1 hr 9 min
18	Frankfurt	Communications & high tech	Technology	20 years	1 hr 11 min
19	Frankfurt	Financial services	Change	17 years	1 hr 39 min
20	Milan	Resources	Technology	12 years	2 h 13 min
21	Milan	Communications & high tech	Technology	15 years	1 hr 19 min
22	Milan	Financial services	Technology	15 years	1 hr 9 min
23	Milan	Products	Process	20 years	1 hr 7 min
24	Milan	Resources			1 hr 6 min
25	Milan	Financial services	Strategy	13 years	1 hr 38 min
26	London	Financial services	Strategy	21 years	N/A[a]
27	London	Communications & high tech	Strategy	20 years	51 min
28	London	Government	Process		1 hr 12 min
29	Paris	Financial services	Process	26 years	1 hr 35 min
30	Madrid	Products	Strategy	22 years	1 hr 20 min
31	Madrid	Financial services	Change	23 years	1 hr 26 min
32	Madrid	Resources	Strategy	15 years	5 h 15 min

[a] On the request of the interviewee, this interview was not taped. Careful notes were taken by both interviewers and the notes were typed up immediately after the interview.

social structure. To be sure, the term structural embeddedness comes from network theory and refers to the extent a tie is interconnected in the social network (Moran, 2005), i.e., although 'structural' might suggest otherwise, it is not about embeddedness in the formal organization structure and instead relates to embeddedness in the *social* structure of interactions. A relationship is more embedded in an individual's network when the two parties to the relationship share more common third-party work-related contacts (Granovetter, 1985, 1992; Jones and Lichtenstein, 2008; Moran, 2005; Nahapiet and Ghoshal, 1998). In contrast, a less structurally embedded (or more isolated) relationship is surrounded by no or very few common work-related contacts. Fig. 1 illustrates the difference between a contact that has a high level of structural embeddedness (contact #4 in the figure) and a low level of structural embeddedness (contact #3 in the figure). Structural embeddedness is one of the standard conceptual constructs used in the organizational literature on networks, and a long line of research has shown that structural embeddedness has implications for performance (e.g., Jones and Lichtenstein, 2008; Moran, 2005; Rowley et al., 2000), as well as the ability to maintain a tie (Burt, 2001).

Research on formal organizational change has shown that it is disruptive to existing working relationships (Battilana and Casciaro, 2012; Tenkasi and Chesmore, 2003; Vogel, 2005). In particular, as the formal organization structure changes, it will likely lead to the disruption of existing relationships, as well as the formation of new relationships (Battilana and Casciaro, 2012). Ties to contacts that are more embedded in the social structure are therefore more likely to be affected by the change as the relationships around them are disrupted. One of the London-based partners in the firm described the effects of the change on the intraorganizational networks: "… *we're part of one global firm, if I'm going to measure how well you're doing, I'm going to measure it based on the number of networks and relationships and communities that you get yourself connected into in this organization. Because ultimately that's how you're going to be successful … not as an individual entrepreneur …. A lot of those relationships and networks have been torn down, and what's actually more important now, is the relationships that our partners have with people elsewhere in our firm that can bring the right skills to that relationship to help make (the client) more successful.*"

A recent study in this journal showed that collective action in networks allowed employees at Lufthansa and Swisscom to help facilitate organizational change (Vogel, 2005). Work on networks has also shown that a more structurally embedded relationship is subject to social network pressures to conform to local group norms (Granovetter, 1985; Padula, 2008). The greater density of common work-related contacts surrounding a structurally embedded tie allows for better monitoring of the interactions in the relationship. Cohesion in networks has therefore also been shown to facilitate collaboration among individuals (Coleman, 1990; Gargiulo et al., 2009; Lazega, 2001; Vogel, 2005). In addition, the greater density of contacts

Fig. 1. Network contacts with high and low levels of structural embeddedness. This figure illustrates an example of one partner's network of contacts in the firm. The numbered dots are the contacts and the lines show those contacts that are connected to each other (i.e., the partner's indirect ties). Contact #4 has a high level of structural embeddedness, as that contact has ties to six of the other contacts in the network. Contact #3, on the contrary, has a low level of structural embeddedness, as this contact has only one tie to one other contact in the network. As described in the methods section our measure of structural embeddedness is normalized by dividing by the number of contacts in the network (cf. Moran, 2005).

provides greater opportunity for common contacts to sanction the behavior of the parties in that relationship, should that behavior be contrary to local norms (Coleman, 1990; Lazega, 2001; Oh et al., 2004). For example, Lazega (2001) showed in a study of partners in a law firm, that the partners sanctioned other partners who deviated from the underlying social norms of the organization.

The greater density of contacts surrounding a relationship that is more embedded in the social structure, will therefore lead the parties in the relationship to face higher levels of normative pressure to act in line with change in the formal organization structure (Battilana and Casciaro, 2012; Granovetter, 1992; Krackhardt and Stern, 1988; Tenkasi and Chesmore, 2003). Tenkasi and Chesmore (2003: 285) in their study of 40 subunits of a multinational company suggested that a high density of relationships in an intraorganizational network provides conduits for "tugs of conformity" to adopt change. Hence, they found a strong positive relationship between network density and the adoption of formal changes. Similarly, Stevenson et al. (2003) found that more isolated members of a high school faculty — by definition, not heavily embedded in the larger organizational network — were less likely to change their behaviors in response to formal change efforts.

When employees generally follow the direction of senior management to implement the change in formal structure, it will lead to changes in their formal roles and interactions and hence disrupt their network ties. Consequently, we argue that ties that are highly embedded in the social structure will be more likely to be affected by the change in the formal structure, than those ties that are less embedded in the social structure.

In the context of the firm we studied, the consulting partners discussed the effect of the formal structural change on the organizational norms and values in relationships embedded in the social structure. In the words of one partner: *"I think that … with this new organization we have improved the possibility to succeed … because we are better organized to have a team of people delivering … A very, very good team … that follows your directions … they are motivated to do what they do, they understand the common rules, they understand a set of values …"* In sum, we argue that maintenance of network ties with higher embeddedness in the social structure is more likely to be affected by formal change. In formal terms.

Hypothesis 1.   Formal change is more likely to affect the maintenance of network ties with high structural embeddedness than network ties with low structural embeddedness.

Formal organizational change, relational embeddedness and relationship maintenance

In addition to the embeddedness in the social structure, it is likely that the qualitative nature of the tie will affect the ability to maintain it. We therefore also consider the relational embeddedness that arises from repeat interactions (Moran, 2005; Rowley et al., 2000). Relational embeddedness is a characteristic of the relationship and is not a result of the individual employees' personal profile and formal position in the organization. Instead relational embeddedness is an outcome of the participation in the relationship itself, which over time affects the qualitative nature of the tie (Jones and Lichtenstein, 2008; Nahapiet and Ghoshal, 1998; Uzzi and Lancaster, 2003). As individuals interact over time they may develop a deeper social

attachment or a personalized bond, which leads to increased trust, as well as feelings of obligation and dependence in the relationship (Coleman, 1990; Cook, 1987; Jones and Lichtenstein, 2008; Montgomery, 1998; Moran, 2005; Nahapiet and Ghoshal, 1998; Rogan, 2014; Uzzi and Lancaster, 2003).

For example, Moran (2005) in his study of managers in a pharmaceutical firm found that relational embeddedness increased innovation performance and argued that the personal support and obligation inherent in relationally embedded ties is what allows employees to embark on more risky and uncertain innovation projects. Similarly, in a study of bank loan managers in Chicago, Uzzi and Lancaster showed that relationally embedded ties were more likely to encompass feelings of 'social attachments' or create an 'emotion-based bond', which in turn "created cooperative expectations of trust and ongoing reciprocal exchanges" (2003: 392). In theoretical work on the roles of embedded individuals, Montgomery defined relationally embedded individuals as those that were "a "friend" who feels obliged to cooperate" (1998: 105). More recently, Rogan (2014) in a study of mergers in the advertising industry showed that relationally embedded network ties were more stable and more likely to endure after a merger. She argued that past investments in the relationship created obligations and dependence, for example through deep knowledge of clients, that relationally embedded firms wanted to preserve.

In the context of formal change efforts, we argue that relational embeddedness can in effect insulate a relationship from the impacts of change. The obligations and dependence that characterize relationally embedded ties is likely to mean that maintenance of the relationship is of great priority to the involved parties. They will therefore choose to continue to invest in the relationship regardless of any formal change efforts. As one partner in the London office described: *"those relationships that are based on respect and trust are fairly enduring … you never lose one, you always kind of maintain it, you know, regardless of where that individual happens to be …"* Moreover, the ongoing maintenance of the relationship is likely to be more personalized and emotion-based and as a consequence it is unlikely to be reliant on any support or lack of support from the formal organization and structures (Uzzi and Lancaster, 2003). One partner explained: "… *nothing to do with the firm, it's just he and I have worked together and he knows that I will get things done … That's somewhere where it goes beyond the transactional relationships, much more built on trust. And that's important …"* Hence, even if a formal structural change were intended to affect the relationship, relational embeddedness may enable the individuals involved in the relationship to ignore or discount formal change efforts (Battilana and Casciaro, 2013). To the extent that the relationship is built on a history of interactions that lead to obligations, dependence and hence ongoing reciprocal exchanges between two exchange partners, this will also make it more difficult for others to replace the parties to the relationship (Rogan, 2014).

In the firm that we studied, the partners gave examples of relationships imbued with trust and dependence. As also illustrated by the quotes above, we therefore observed that the partners were concerned with maintaining relationally embedded network ties, regardless of whether the ties were aligned with the surrounding formal structure. Another partner said: *"… when one of your counterparts gets whatever problems, you know, he's fired or he moved, or whatever; the best thing to do is to take care of him and continue to maintain a relationship … It means that you keep this relationship whatever happens … The trust is very, very, very important."* In other words, the focal parameter was maintenance of the relationship itself.

Effectively this means that managers will maintain relationally embedded network ties regardless of any change in the formal organizational structure. We therefore argue that maintenance of relationally embedded ties is less likely to be affected by formal organizational change.

Hypothesis 2. Formal change is less likely to affect the maintenance of network ties with high relational embeddedness than network ties with low relational embeddedness.

Methods

Survey procedure

To test our hypotheses, we conducted an egocentric network survey (cf. Burt, 1992) of a cross-section of the general partnership. The survey took place approximately 18 months after the reorganization was first introduced. Although not ideal, this allowed us to explicitly examine the maintenance of the professional work relationships of the sample of partners following the change. Yet to establish a true causal relationship between the change and network ties, we would have had to collect data before and after the formal restructuring. Unfortunately this was not possible: Negotiating access to the firm took almost two years and the final data collection process was time-consuming and costly.

The survey instrument was pre-tested and piloted in the firm with the help of the Managing Partner who sponsored this second stage of our research. Feedback from the pilot test led to a decision to administer the survey in person by one of five trained interviewers, who were then available to answer clarifying questions. The partners were chosen through a clustered sampling procedure to alleviate administration and manpower costs, and were selected at random from ten major offices — San Francisco, Chicago, New York, London, Paris, Frankfurt, Milan, Madrid, Tokyo, and Sydney. Of the 147 partners in the original sample, the researchers scheduled meetings with 133 partners.[1] The final data collection resulted in 102 completed

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[1] Four partners left the firm between the sample selection and the interview period, four had moved to geographical regions outside of the sampled office, and an additional six partners had engagements that kept them away from the office during the one or two-week period of the trained interviewer's visit.

surveys (a 69% response rate).[2] The 102 partners surveyed were not members of the North American based leadership group that had directed the formal change effort and 59 partners were based in offices outside North America.[3] As the working language of the firm was English and all partners highly proficient in the language, the survey was conducted in English.

The survey consisted of three main parts. First, we asked the partners to fill out a number of basic demographic questions about their age, gender, education and tenure with the firm. The partners were on average 44 years old and had worked at the firm for 16 years. In the sample used in this study, 9% of the respondents were women.

In the second part of the survey, we identified each partner's egocentric network of work-related relationships (Marsden, 1990). An egocentric network instrument was used as the vast and diverse set of possible network contacts of each partner made the generation of a complete list of possible contacts impractical.[4] To identify the networks of each partner surveyed, we build on the methodology developed by Burt (e.g., 1992). Initially respondents were asked to identify the individuals, both internal and external, who were most important for them to be successful with their work in the firm. This step generally yielded an unstructured list of around 15—20 names. This list included both the internal and external contacts. Next, the respondent was provided with a set of name generating questions customized to reflect the primary roles and responsibilities of partners in the firm (e.g., "who do you rely on to get things done" and "who are your most important sources of valuable knowledge and expertise"), without feeling bound to stay within the initial list.

On average, each partner identified 18 names, 13 of which were internal to the firm. Because we are concerned with working relationships between firm members, we focus our analysis on peer level (or partner equivalent) work-related relationships between partners *inside* the firm. It is likely that the external network and contacts at lower levels of the hierarchy were affected differently by the change. Focusing on the internal peer-to-peer relationships allows us to reduce the level of heterogeneity in terms of how contacts were affected differentially by the change. To be sure, we did run the analyses using the full sample of internal contacts and including a control variable for position and the results are robust to this approach.[5] As is common practice in work focusing on professional networks and performance (e.g., Moran, 2005; Rodan and Galunic, 2004), we do not distinguish between the different types of networks in our analyses and instead utilize the full sample of network ties.[6] Nevertheless, we felt the role of sponsor might have particular implications for our outcome variable and therefore include a control for whether or not the contact is a sponsor of the partner. Finally, the 102 partners responded to survey questions about the qualities and characteristics of their working relationships, so called name interpreter questions. In total, we analyzed survey responses of 96 partners leading to a total sample of 884 internal peer-to-peer working relationships.[7]

Statistical analyses

We analyzed the data at the level of the dyadic relationship to assess how each working relationship was affected by the formal change. This method is consistent with our theoretical focus and has advantages over combining the relational data into summary measures for each partner in that it avoids potential aggregation bias. Aggregation of network data assumes effects either accumulate or average to yield results at the level of the individual.

Because the outcome variable is binary, as described in more detail below, we run a logistic regression model to test the hypothesized effects of structural and relational embeddedness on the maintenance of each relationship following the organizational change. The research design meant that each of the 96 partners surveyed appeared many times in the sample of working relationships (once for each relationship nominated). This can result in a non-independence problem as certain partner attributes that do not change from relationship to relationship may cause systematic underestimation of the standard

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[2] Many senior partners failed to complete a survey: Business would frequently call them out of the office. Illness and other unforeseen circumstances accounted for the rest of the incomplete surveys. To test if there were any systematic biases between the 147 senior partners initially sampled and the 102 that we collected network data on, we tested for difference in the mean value of the main organizational units of the firm; industry group, functional practice group, and geographic location. Since the standard error of the difference in means (t-value) of the population is not available, it needs to be estimated. The procedure for this depends on whether the difference in variance of the two samples is statistically significant. Levene's test (1960) provides a way to assess this. This test revealed that there were no significant differences with respect to industry group and functional specialization. Partners in two offices (Chicago and Sydney) were more likely to participate, but this can be explained by the fact that the interviewers had more time to set up the interviews and more time was spent in that geographical region. Partners in the San Francisco office were less likely to participate, which can be explained by less time being spent in San Francisco for those interviews. These results hold whether one compares the 102 interviewed partners to the initial sample of 147 or to the 133 that indicated their willingness to take part in the survey.

[3] After conducting the network survey, we identified four cases of overlap between the interview sample and the network survey respondents. To avoid biases in testing hypotheses from the same sample that we theorized from, we excluded these four cases from the qualitative analysis (Suddaby, 2006).

[4] The firm itself had 55,000 individuals that a respondent might identify as an important contact, and the inclusion of external parties for partners in different office and in different countries makes such a list essentially boundless.

[5] 15% of the sample or 195 relationships were not peer-to-peer (or below the partner level). Including a control for position showed that maintenance of peer-to-peer relationships was more likely to be affected following the formal change.

[6] Splitting the analyses according to the different name generator questions revealed only slight nuances in the size and significance (not direction) of the effects.

[7] As a result of missing data, the responses of six partners were excluded entirely from the analyses. There was some overlap in the variables that had missing responses. Dyads were dropped from the analyses due to missing data for the following variables: the measure capturing the dependent variable; the industry in which the contact worked, relational embeddedness, and the closeness of the relationship.

Table 2
Dyad-level descriptive statistics (N = 884).

	Mean	SD	Min	Max	1	2	3	4	5	6	7
1. Tie affected by the change	0.45	0.50	0	1	–						
2. Local	0.82	0.38	0	1	−0.19[*]						
3. Same industry	0.81	0.39	0	1	−0.12[*]	−0.00					
4. Sponsor	0.30	0.46	0	1	0.11[*]	−0.06	0.06				
5. Recent tie	0.25	0.44	0	1	−0.03	−0.16[*]	0.02	−0.06			
6. Closeness	3.81	0.97	1	5	−0.06	0.10[*]	0.04	−0.01	−0.32[*]		
7. Structural embeddedness	3.36	2.62	1	13	0.13[*]	0.07	0.15[*]	0.10[**]	−0.18[*]	0.29[*]	
8. Relational embeddedness	2.69	1.15	1	5	−0.14[*]	0.17[*]	0.04	−0.02	−0.18[*]	0.27[*]	0.03

[*]$p < 0.05$

errors. To control for non-independence in the data, we run a multilevel model. This is a commonly used procedure when analyzing dyadic ties contained in individual networks (Snijders et al., 1995).[8]

Dependent variable

We analyzed the maintenance of each relationship based on self-reported responses as to the effect of formal change on each working relationship. Appendix A gives more information on how the dependent variable was created, but in short, we analyzed whether each relationship was affected following the organizational change. The variable was based on the following question: "How have the changes in the organization affected your ability to build and maintain your relationship with each person listed?"

The dependent variable and independent variables all come from the same survey, which potentially could lead to concerns about common methods variance. Each partner assessed specific items for each of the respective contacts separately. This should reduce the likelihood of self-report bias. To be sure, we conducted a Harman single factor test to determine if common methods variance affected the results (Andersson and Bateman, 1997; Greene and Organ, 1973). The single factor test indicates that the proportion of variance is 22.17%. This is well within the 50% limit for common methods bias.

Independent variables

Structural embeddedness was measured as the number of strong connections that existed between a particular contact and other members of the focal partner's network (cf. Wasserman and Faust, 1994). Respondents were asked how closely members of their network were connected to each other ranging from 'distant' to 'especially close' with 'neither distant nor especially close' on the middle of the scale. To measure the structural embeddedness of each working relationship, we counted the number of contacts identified in the partner's network as "especially close" to the other parties in the network, i.e., indirect ties in the network. Hence, and consistent with our arguments, a working relationship was more structurally embedded when that relationship was surrounded by connections to many third party contacts.[9] As the number of indirect ties in a network increase with the number of direct ties in the network (Moran, 2005), we normalize this measure by dividing by the total number of direct ties in the relevant network.

To assess the level of *relational embeddedness* we used a measure of the employee's irreplaceability in that particular relationship. Specifically, we asked partners to indicate on a Likert scale from one to five for each internal contact in the network: "Suppose another partner were assigned to continue your work in the firm, who had a profile and skill set similar to yours, but did not know the people in your network. How easy would it be for your replacement to attain a similar level of cooperation with each person listed?" (1 = very easy, 5 = very difficult). Appendix A provides more detail on the measure of relational embeddedness.

Control variables

To make the network ties comparable and rule out alternative explanations, we controlled for other factors that might affect the ability to maintain a particular tie. These include controls that indicated whether the network ties were in line with the formal structural change and hence less likely to be affected (*Local* and *Same industry*). We also include controls for the strength of the tie (*Closeness*) and whether the tie was relatively recent. More recent ties would be expected to be more

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[8] The model was run in Stata14 using the xtmelogit command. Alternative approaches would have been to run an ordinary logistic regression and reporting robust standard errors adjusted for the clustering of observations by each partner (Rogers, 1993; White, 1980) or a multinomial logit. The results of these approaches are consistent with the main results reported here.

[9] The models were also run with a weighted measure of indirect ties. These models revealed the same pattern of results. However, embeddedness usually focuses on strong ties. Moreover, it is unclear if the answer 'distant' here means that two people are not particularly close or if they do not know each other. We therefore decided to focus solely on the strong ties.

Table 3
Mixed-effects, multi-level logistic regression of effect on maintenance of relationships after a change in the formal organization structure.

DV	Likelihood that the maintenance of a network tie is affected following the formal change		
	(1)	(2)	(3)
Constant	2.429*** (0.664)	2.768*** (0.663)	2.801*** (0.680)
Local	−1.979*** (0.329)	−2.037*** (0.331)	−2.029*** (0.334)
Same industry	0.750* (0.305)	−0.855** (0.311)	−0.834** (0.315)
Sponsor	0.627** (0.213)	0.589** (0.214)	0.596** (0.215)
Recent tie	0.377 (0.271)	−0.347 (0.272)	−0.415 (0.275)
Closeness	−0.184 (0.122)	−0.238† (0.126)	−0.141 (0.131)
H1: Structural embeddedness		1.559† (0.927)	1.550† (0.933)
H2: Relational embeddedness			−0.262** (0.105)
Wald X^2	52.02***	54.24***	58.24***
Degrees of freedom	5	6	7
Dyads	884	884	884
Log-likelihood	−441.4	−440.0	−436.9

† $p < 0.10$, * $p < 0.05$, ** $p < .01$, *** $p < .001$, Standard errors in parentheses.

likely to be in line with the new organization structure and hence less likely to be affected by the formal change. We code a tie as a *recent tie* if it has existed for two years or less. Appendix A provides further information about these control variables.

The extent to which an individual's contact controls organizational resources, for example, acting as a sponsor for projects and activities, is also likely to affect the leverage (or lack thereof) an individual has over that contact. Hence, whether a contact acts as a sponsor may have implications for whether or not formal organizational change affects that relationship. We therefore include a control for whether a contact is a *sponsor* of each partner. This variable comes from the name generator question: "On whom do you rely to sponsor and support your projects and activities?"

Table 2 provides dyad-level descriptive statistics of the variables used in our analyses.

Results

The results of our analyses are reported in Table 3. Model 1 is the baseline model that includes only the control variables. The control variable *Local* is negative and significant (p = 0.000). This indicates that partners perceived the maintenance of a relationship to be less likely to be affected when the contact was in the same country (versus a different country). The negative coefficient is consistent with the intention of the firm's leadership to use the imposed change to promote and support global relationships. The formal structural change encouraged partners to build global relationships and was therefore more likely to facilitate the maintenance of these ties. Analysis of the proportion of global ties in each partners' networks developed earlier versus more recently suggests that indeed global ties had become easier to develop. While only 13% of ties formed before the change were global, 26% of ties formed in the two years just prior to our study were global. We explored this result further with a multilevel regression estimating the characteristics of recently formed ties, that is, ties that were formed within the most recent two years. This analysis revealed that recent ties were significantly (p = 0.000) more likely to be non-local. Yet, at the same time, local ties that were developed more recently were less likely to be affected by the change (p = 0.001). This suggests that while the partners are indeed tending towards developing ties across geography in line with the formal organizational change, maintenance of ties in the local environment is still viewed as easier following the structural change. This is consistent with Allen's (1977) work, which shows that proximate ties are more easily maintained.

The control for whether the contact works in the same industry is also negative and significant (p = 0.014) indicating that ties within the same industry (in line with the change) are less likely to be affected. The control for whether or not a contact is a *Sponsor* of the partner is positive and significant (p = 0.003). This indicates that relationships to those who are sponsors in the partners' networks are more likely to be affected by the change. Sponsors are likely contacts that interact with the partners regardless of the formal organizational change.

The control for the variable *recent tie* is not significant in model 1, which means that maintenance of ties formed closer to (just before) the change are not more or less likely to be affected by the change.[10] Finally, the strength of the tie had no effect on the maintenance of the ties following the organizational change.

Next, we move to the hypothesized effects. In models 2 and 3 we enter the variable testing Hypotheses 1 and 2. The measure of *structural embeddedness* is positive and significant (p = 0.093) showing support for Hypothesis 1. This indicates that following the change; maintenance of more structurally embedded ties is more likely to be perceived as affected than ties with lower structural embeddedness. Model 3 includes the test for *relational embeddedness*. The term is negative and

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[10] To be sure, we ran the analyses excluding the recent ties and the results are consistent with those reported here. However, as we also want to understand the effects on maintenance of the more recent ties, we include them in the final analyses.
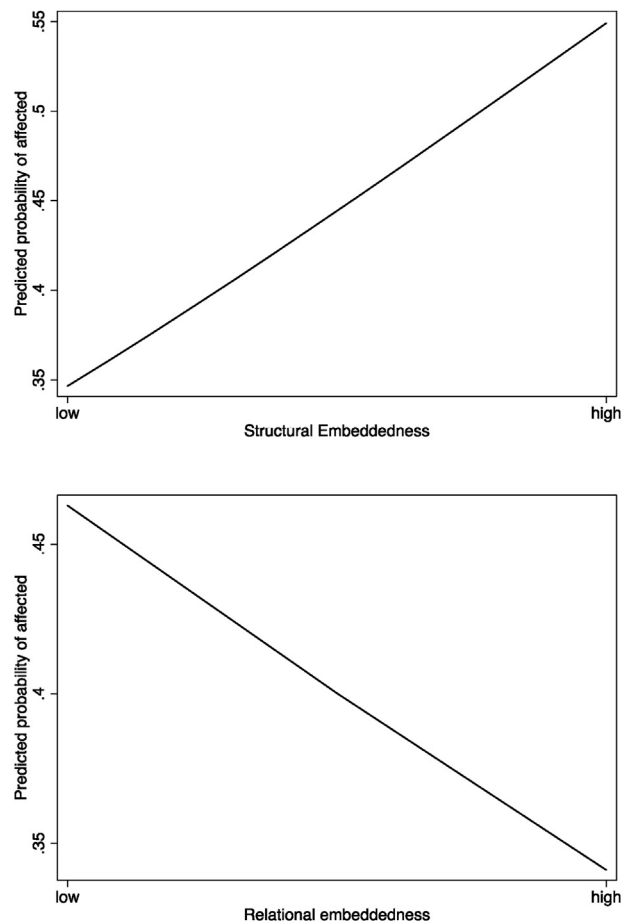
Fig. 2. Marginal effects showing the predicted probability that the maintenance of structurally and relationally embedded relationships are affected following the formal change. The graphs are based on the marginal effects from model 3 in Table 3. Structural and relational embeddedness are varied from the minimum to the maximum of the variable. All other variables are set at the mean.

significant (p = 0.013). This indicates that maintenance of those network ties that have high relational embeddedness are less likely to be affected following the change than ties with low relational embeddedness.

To better illustrate the results, we graph the marginal effects of model 3 (Table 3) in Fig. 2. The top graph shows that at low levels of structural embeddedness the maintenance of ties is less likely to be affected by the formal change. As the level of structural embeddedness increases; the ability to maintain a particular tie is more likely to be affected. In contrast, the bottom picture shows that as the level of relational embeddedness increases; the maintenance of network ties is less likely to be affected by the formal structural change.

We will now go on to discuss the theoretical and practical implications of our results in more detail.

Discussion and conclusion

Translating a firm's intended strategy into the behaviors and interactions that occur between a firm's employees is critical for the success of purposive organizational change and strategy implementation (Hung, 2002; McEwen et al., 1988). Yet, we have only a limited understanding of the processes and structures that enable organizational change inside the firm (Burke, 2002; Melin, 1985; Vogel, 2005). In this paper, we contribute to this understanding by considering whether the social structure and quality of networks in the firm, affect the ability of employees to maintain their work-related relationships after a formal structural change.

### Theoretical contributions

With this study, we inform work that investigates the interaction between networks, formal organizational change and strategy implementation (e.g., Battilana and Casciaro, 2012, 2013; Gargiulo and Benassi, 2000; Hung, 2002; Kleinbaum and Stuart, 2014a; McEwen et al., 1988; Mohrman et al., 2003; Soda and Zaheer, 2012; Valley and Thompson, 1998; Vogel, 2005).

Extant research considers a range of change outcomes including the adoption of change (Battilana and Casciaro, 2012; McEwen et al., 1988; Valley and Thompson, 1998), the extent to which an individual adapts their network in line with change objectives (Gargiulo and Benassi, 2000; Soda and Zaheer, 2012) and how networks affect the success of strategy implementation (Hung, 2002; Vogel, 2005). We further extend this body of work by showing that the maintenance of network ties highly embedded in the social structure is affected by organizational change, while relationally embedded ties remain unaffected. This has implications for future studies of intraorganizational networks, organizational change and strategy implementation. Our study shows that we have to consider both the structural and qualitative characteristics of networks. Alternatively, we may miss important nuances in how different ties are affected by structural change.

Our study raises a question as to whether strategic transformations like the one we observed also affect future interactions in the firm. In extended analyses, we therefore explored the more recent ties formed in the organization. The results revealed that not only were partners more likely to form newer ties that were in line with the organizational change, i.e., non-local ties (p = 0.001). The partners also indicated that more recent ties within industry — again in line with the change — were more likely to have been affected by the structural change (p = 0.102), suggesting that the structural change may have led them to form these new ties. These findings support a growing body of work showing that formal structures affect network ties (e.g., Gulati and Puranam, 2009; Kleinbaum et al., 2013; McEvily et al., 2014; Soda and Zaheer, 2012). In our study, we are limited by our data and cannot study the evolution of the networks. Yet this exploratory analysis indicates that formal structures affect not only the maintenance of existing ties, but also the formation of new ties. Future studies taking a longitudinal approach would be able to disentangle both how the maintenance of existing ties and the formation of new ties are affected by change in formal organizational structures. In particular, as we consider changes in strategic directions in firms, the formation of new ties are an indicator of the extent to which such changes have generated permanent changes in intraorganizational interactions (Cross et al., 2007; Kleinbaum and Stuart, 2014a). Hence this may be one way to observe whether management have been successful in implementing formal structural change and hence in achieving strategic transformations (Doz and Kosonen, 2010; Hung, 2002; Mohrman et al., 2003).

One might speculate as to whether the effect of structural or relational embeddedness is more pervasive. That is, if structurally embedded ties are also relationally embedded, will those ties then be more or less likely to be affected by the change? In order to decipher these effects, we ran a regression model with an interaction term between structural and relational embeddedness. This term was negative and significant (p = 0.025) and the main effects remained the same. In order to better illustrate the interaction, we graphed the marginal effects in Fig. 3. The figure reveals that at *low* levels of relational embeddedness; the higher the structural embeddedness, the more likely it is that a tie is affected by the formal change. However, at *high* levels of relational embeddedness: the predicted probability that a tie is affected by the change is much lower (for all levels of structural embeddedness). This is interesting, as it shows that the effect of relational embeddedness is more pervasive than that of structural embeddedness.

Perhaps this reveals that relational embeddedness serves to counteract the normative influences in structurally embedded ties, such that those ties remain unaffected by the change. Indeed, recent work has shown that trust and obligations in relationships create more dynamic exchanges, where the involved parties can act to counterbalance forces to comply with extant norms (e.g., Ody-Brasier and Vermeulen, 2014; Rogan and Greve, 2015; Vogel, 2005). In the scenario of implementing organizational change, this could not only decrease the likelihood that a formal change will have an impact on the ability to maintain a particular relationship, but could also mean that individual employees may work actively to resist the formal change effort (Vogel, 2005). Ultimately this could lead to the failure of formal change efforts (Caldwell et al., 2008). Given that
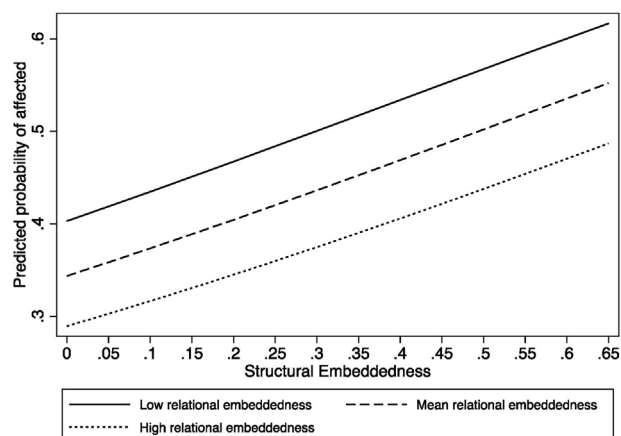
Fig. 3. Marginal effects showing the predicted probability that the maintenance of structurally embedded relationships is affected at different levels of relational embeddedness. Structural embeddedness is varied from the minimum to the maximum of the variable. Relational embeddedness is set at the mean, one standard deviation below the mean (low relational embeddedness) and one standard deviation above the mean (high relational embeddedness). All control variables are set at the mean.

formal structural change likely is related to major strategic transformations, by extension, this may have implications for the effectiveness of strategy implementation (Caldwell et al., 2008; Hensmans et al., 2013; Huntsman, 1994; Johnson, 1992; Malhotra and Hinings, 2015; Melin, 1985).

Managerial implications

Our findings also have important managerial implications. The fact that the maintenance of individual network ties is affected differently in the face of organizational change certainly has implications for how senior managers might design and implement strategic change. For managers who seek to translate new strategies into action, our findings suggest that understanding of a firm's social structure may assist in successfully implementing organizational change (cf. Cross et al., 2007). The social structure in which a firm's working relationships are embedded provides connections to other organization members who may move around when the firm takes on new strategic directions. One partner described how the new formal structure disrupted his networks: *"you create different networks for different purposes … the more I think about (the formal structure) the more I realise (it) gets in the way."* Yet some relationships may have a history of interaction, which means that they are maintained regardless of changes in organizational priorities (Rogan, 2014). Our results suggest that ultimately employees or managers involved in such relationships may resist formal structural change. Therefore, while embeddedness in the social structure can lead to disruption of networks when faced with formal change, high levels of relational embeddedness must also be taken into account. These insights can fundamentally alter the way management in organizations think not only about implementing change in organizations, but also how they manage intraorganizational networks and encourage the development or maintenance of certain types of network ties. The fact that formal structures potentially affect the formation of new ties, also suggests that managers can consider formal structures as levers to manipulate tie formation. In fact, the partners we interviewed were quite explicit about how they thought about their networks as assets that could be changed and moved around: *"… if you want to move the network, create the network, move it forward faster, then you do need to put some sort of focused time and energy and effort into actually making it happen."* They also talked about having a choice in deciding how to develop their networks and they were aware that it required a conscious investment of their time and energy: *"… how do you develop individual networks? … I suppose that I would argue that a … lot of it's about investing …. it is a bit about give and take. You have to put in as well as take out."*

As indicated above our work also contributes to the understanding of strategic transformation efforts. Several studies on the success of strategic transformation have shown that a key success factor is the ability to get employees on board (Hensmans et al., 2013; Hung, 2002; McEwen et al., 1988; Melin, 1985). If indeed, as our study indicates, the ability to affect employees and their networks depends on the larger social structures in which they are embedded, then senior executives seeking to implement strategic transformation need to consider these network structures.

Limitations

This work is not without limitations. Analyzing the impact of change within one firm allows us to control for firm specific factors, but raises questions as to the generalizability of our results. Partners in a professional services firm are likely to have greater control over their actions than employees and subunits in other, more hierarchical structures. Greater individual autonomy suggests that relational embeddedness is more salient than in a more bureaucratic structure where there is a greater level of corporate control. On the other hand, Zald and Berger (1976) argue that in a professional organization, firm members will have more opportunities to voice their grievances than in more hierarchical organizations. This would tend to suggest that while in a professional partnership there is more open debate as to what the firm's intended strategy should be, there is likely to be lower levels of rejection of change in strategic direction at the strategy implementation stage than in a hierarchical organization where there is less opportunity for debate before implementation occurs.

Although we include controls for whether the relationship was global and within industry as supported by the change, our analyses and approach generally assumes that all of the partners (across geographies) were exposed to the same level and form of change. Empirically, we try to avoid this bias of homogeneity of change by focusing on peer-to-peer relationships inside the firm.[11] Yet this also means that we cannot entirely disentangle the complexities in how corporate governance interacts with the networks to hinder or facilitate the change. Moreover, the firm in our study underwent a major strategic transformation effort. Organizations undergoing smaller change programs might be affected differently. Further research is needed to better understand how the governance structure of an organization affects organization change processes and strategy implementation.

A second issue pertains to the cross section of data that we examine. As it is difficult to obtain longitudinal data on networks, a common problem is the endogeneity of the variables observed (Moran, 2005; Gargiulo and Benassi, 2000). Looking at a cross section of the ties means that we cannot make claims as to the direction of causality, and can only look at how the characteristics of the ties are associated with the individual partner's perception as to how the ties are affected following the change. Nevertheless, given that the ties existed prior to our study (and in most cases also prior to the change), it

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[11] Because of the differences in views towards the change in the US and the rest of the world, we also ran the analyses including a control for whether or not the partners were based in the US. This control was not significant, nor did it change the results. Consequently, it was dropped from the final analyses.

is not unreasonable to assume that the partners are responding as to how the individual tie is affected *after* the change had taken place.

Finally, our data are limited by the fact that the data were collected shortly after the implementation of the change. This means that the ties captured are likely to be biased towards those ties that were facilitated by the change, or in other words, the ties that survived the change. Regardless, on average the ties in our study had lasted for 6.4 years and extant research shows that while network ties decay over time, they don't cease to exist instantly (Burt, 2001) and individuals may continue to interact some time after a formal change (Kleinbaum and Stuart, 2014a). In fact, some ties may even stay dormant for reactivation at a later stage (Levin et al., 2011). In addition, while it is likely that the partners did not mention the ties they considered impossible to maintain after change, they still list ties that had become more difficult to maintain. This leads us to believe that some of those ties indeed still exist, despite the fact that the change had made them more difficult to maintain. Future studies could further disentangle the effects of organizational change on intraorganizational networks by examining the nature of ties both before and after the implementation of a formal organizational change. Nevertheless, this study goes beyond prior work by providing a more nuanced picture of the interaction between intraorganizational networks and formal structures in the context of change and strategy implementation. As such it has important implications not only for theory in this area, but also for managers' understanding of networks and how formal organizational change processes affect them.

Appendix A. Further details on the measures used in the empirical analyses.

This appendix provides some further details on the measures used in the empirical analyses in this paper. Further descriptions of the firm and data collection process can also be found in Mors' (2010) study of innovation and networks and Rogan and Mors' (2017) study of networks and exploration.

Coding of the dependent variable

In order to measure how each working relationship was affected by the formal change, we used the following question: "How have the changes in the organization affected your ability to build and maintain your relationship with each person listed?" The responses were given on a Likert scale from one to five where '1' represents 'greatly reduced' and '5' represents 'greatly improved' the ability to maintain a particular relationship. The partners were instructed that the numbers in middle (2, 3, 4) "describe the relationships that fall between the two extremes." It was clarified that the middle of the scale, '3', were those relationships where the ability to maintain them was neither greatly reduced, nor greatly improved. Or in other words, those were the relationships where the partners felt that the formal changes did not affect their ability to maintain a particular relationship. The change was widely discussed within the partnership group and directly affected relations inside the firm and we therefore feel confident that respondent evaluations stem from consideration prior to our study.

Because of the ordering of the scale we recoded the variable: We created a variable that indicated those relationships where maintenance of the relationship was "affected" following the change (as opposed to unaffected). This variable was created by coding a response of '1', '2', '4' or '5' as a 0 (the maintenance of a relationship was affected following the change) and a response of '3' as 0 (the maintenance of a relationship was unaffected following the change).

The reason that we recode the scale is that we want to test whether each relationship is affected or not by the change and not how it was affected. In separate analyses, we did test different variations of recoding of the dependent variable. The results are consistent with the results provided in Table 3.

Finally, in reality we look at existing relationships, i.e., we asked the partners to consider contacts that were important to them in their work and therefore already were a part of their network. Therefore, the partners responded based on their existing relationships and hence we can only examine the effects on the *maintenance* of existing relationships and not the formation of new relationships. This is why our theory and results are concerned with the maintenance of relationships (and not building relationships). It should also be noted that our measure of relationship maintenance is perceptual. Thus, although we theorize and report results about how the relationships were actually affected, the measure really captures how the partners *perceived* their relationships to be affected. To be sure, this is a nuance in our empirical approach and should of course be considered. Yet, for parsimony in the theory development we did not include the words "perception" or "perceived". It should be noted that it is common practice in network studies to use perceptual survey measures (e.g., Ibarra and Andrews, 1993; Moran, 2005).

A note on relational embeddedness

In prior studies of relational embeddedness, it has been measured in a variety of ways, but consistently across studies the measures account for the quality or depth of the relationship (Jones and Lichtenstein, 2008). For example, Uzzi used interview data and defined those ties that were referred to as "close or special relationships" (1997: 41) as relationally embedded. Similarly, Uzzi and Lancaster measured relational embeddedness as distinct from arms-length ties as "… relationships in which they had a social closeness to, and familiarity with, the client." (2003: 387). Montgomery (1998) in theoretical work defined relational embeddedness as "a "friend" who feels obliged to cooperate" (1998: 105). The partners we interviewed in the firm also frequently expressed feelings of obligation and dependence in their relationships and the depth of relationships was often considered in terms of the irreplaceability of an individual in a relationship or in other words how easily

substitutable an individual was in a particular relationship. We therefore use the *irreplaceability* of a partner in a particular relationship as the best proxy for the obligations and dependence entailed in that relationship.

Consistent with our approach, research investigating intraorganizational dependence used similar survey measures of irreplaceability to proxy for power differences in relationships (e.g., Astley and Zajac, 1990; Hinings et al., 1974; Ibarra and Andrews, 1993; Saunders, 1990). Using perceptual measures is considered appropriate for exploring intraorganizational dependence relationships and dependence is often considered a subjective determination (Astley and Zajac, 1990). In addition, it is common practice in network studies to use single-item measures (e.g., Moran, 2005; Sparrowe et al., 2001). This is because network surveys are time-consuming to answer, as each name interpreter question needs to be answered for each contact in the network. Therefore, there is always a tradeoff between including fewer multiple item measures or several single-item measures.

Detailed information about the control variables

Because the reorganization was designed to encourage and support global relationships and relationships within industry groups, we coded each relationship as to whether it was prima facie supported by the change objectives. Maintenance of relationships of a type consistent with the change objectives would be expected to be less likely to be affected by the change. *Local* was coded 1 when both the parties in the working relationship were based in the same country and 0 when they were based in different countries. *Same industry* was coded 1 when both parties worked primarily in the same industry and 0 when both worked in different industries. Sociological arguments about homophily would also likely predict that maintenance of ties within industry and within country might be easier and hence less likely to be affected following the change (McPherson et al., 2001).

We also controlled for the strength of each working relationship. A strong relationship between two parties may create bilateral obligations and approval seeking exchange processes that may affect how parties in a relationship respond to and hence are affected by formal change. Using Burt's (1992) approach, we measured relationship strength by the reported *closeness* of the relationship. Closeness was assessed through the focal partner's response to the question: "How close are you with each person?" (1 = distant, 5 = especially close). The partner was instructed in writing and by the interviewer who was present that an especially close tie was "one of your closest business contacts or a close personal friend". A distant tie was "one of your least close business contacts".

Because the data were collected 18 months after the formal organizational change had been implemented it is likely that some of the ties in the data were relatively recent and therefore created just before or shortly after the change had taken place. Naturally maintenance of those ties would be less likely to be affected following the change. We thus include a control for *recent tie*. This binary variable depends on whether the tie existed a long time prior to the formal change or not, where 1 means it is a recent tie and 0 means it is an older tie. We code this based on the answer to the simple question: "How long have you known each person?" On average the partners had known their contacts for six years indicating that the majority of the ties existed a long time prior to the formal organizational change. In fact, the majority of ties in the sample of 884 ties have existed for more than two years, where only 224 ties are recent ties.

This is reassuring because one could also be concerned that many ties had been severed due to the organizational change already prior to our study. If this were the case we would expect that the partners would have few ties that were affected by the change. In our sample, the partners indicated for 55% of the ties that there were unaffected by the change whereas 45% were affected by the change. Hence, while we cannot rule out this possibility entirely, it does provide reassurance that there is variance on the dependent variable and a large proportion of the ties are indeed affected by the change.

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