14 Strategic Management

Competitive Session

A unified social network theory of interorganizational relations

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ABSTRACT

Social network research in interorganizational relations (IOR) has flourished in the recent past. The field, however is fragmented with two distinct viewpoints; micro (individual) and macro (organizational), thus failing to become a standalone theory of IOR. This paper carries out a synthesized review of social network research in the micro and macro domains of IOR. In the review it particularly emphasises on key elements that are implicit in the extant literature: the structural and processual ties (that prevails at macro level), and the workflow and commercial friendship ties (that prevail at micro level).Then it arrives at a new theoretical conceptualization of how the two levels and their corresponding elements can be combined when studying interorganizational collaboration.

Keywords: Networks, Interpersonal behavior, interorganizational relations, collaboration, strategic alliances.

A growing number of alliances over the last two decades reveal that competing through collaboration has become a major strategic intent for organizations. Attention by scholars to describe and improve these relationships has thus resulted in an impressive stock of knowledge on interorganizational relationships (IOR). Studies have looked at IOR from varying perspectives: The transaction cost theory (Jarillo 1988; Williamson 1991), the resource-based view (Gulati & Gargiulo, 1999), the resource dependence theory (Bonacich, 1987; Pfeffer, 1978), and the relational view (Dyer & Singh, 1998). In the light of this development, the social network perspective has gained recognition as a theory that explores IOR. The distinctive characteristic of this perspective is that it deviates from examining organizations in isolation to examining how they access resources and capabilities through relationships (Skjoett-Larsen 1999;

Lazzarini *et al.* 2001; Brass, *et al.* 2004; Carter, Ellram *et al.* 2007; Zaheer, Gözübüyük *et al.* 2010; Gilgor and Autry 2012). However, the perspective is still far from becoming a standalone theory of IOR as it lacks uniformity, with two distinct streams of work: micro and macro existing in the field.

Our purpose is, therefore, to propose a unified social network theory of interorganizational collaboration, by addressing the multilevel challenges and opportunities that exist in this growing field of study. Our study makes three contributions to the extant literature. First, it carries out a synthesized review of social network research in the micro- (individual) and macro- (organizational) domains of IOR. We particularly emphasize the key elements that are implicit in the literature: the structural and processual ties (macro level), and the workflow and commercial friendship ties (at micro level). Second, we assign a passive role to the organization by viewing organizations as 'social actors' capable of making their own decisions. Third, we propose a new theoretical conceptualization of how the two levels and their corresponding elements can be combined when studying interorganizational collaboration.

SOCIAL NETWORK PARADIGM IN INTERORGANIZATIONAL RESEARCH

The social network approach's conceptual roots stem from sociology literature that explores the structure and impact of relational webs or 'networks' of social relationships between and among individuals (e.g. social groups and cliques). The approach has been extended to include organizations that can be interconnected with other organizations through their networks of inter-firm relationships (Brass et al., 2004; Kilduff & Brass, 2010; Zaheer et al., 2010). This perspective presumes that organizations are socially embedded in networks of interpersonal relationships that provide opportunities, for and constraints on, firms' behavior (Zaheer et al., 2010). Thus, for collaborative synergies, individuals who act on behalf of the organizations enter into trustworthy relationships with individuals of other organizations that are developed and strengthened over time (Krackhardt, 1992; Ahrne, 1994). However, a careful review of the work in the field reveals that the two levels of networks (i.e., individual and organizational), are being studied independently (Betts & Stouder, 2004; Borgatti, 2003; Carpenter, Li, &

Jiang, 2012; Galaskiewicz, 2011; Kilduff & Brass, 2010; Oliver & Ebers, 1998; Smith-Doerr & Powell, 2003).

One stream of research studies networks at the individual level, thus taking a micro-approach to IOR, and presumes that IOR are embedded in interpersonal (IP) networks (see table 1). It affirms that relationships among organizations are formed by individuals who act on behalf of their organization. Hence the success of IOR depends on psychological parameters such as trust and affect, and disregards any economic controls that may simultaneously exist at the organizational level. The other stream studies networks at organizational level, thus taking a macro-approach to IOR, and presume that IOR are embedded in interorganizational (IO) networks. It considers organizations as economic actors that possess the ability to make independent decisions in their own best interests (Child, 1997; Kim, Choi, Yan, & Dooley, 2011) and views different exchange conditions such as uncertainty, asset specificity, and frequency (Jones, Hesterly, & Borgatti, 1997), have resulted in creating different forms of IOR (Powell, 1990; Provan, Fish, & Sydow, 2007). The stream disregards any social control that may occur simultaneously at individual level.

Table 1

The exploration of tie content is likely to be critical to the emergence of multiplex networks (Ferriani et al. 2013), so we take a dyadic perspective (two nodes and a link) to the study and focus on 'the content of tie or link, rather than merely the structure formed by those ties or the attributes of the nodes. In the following sub-section, we explore what flows through the tie (content) of the IO network in an interorganizational relationship and how it contributes to the effectiveness of the relationship. This is followed by an exploration of the IP network of a dyad and how it contributes to forming stronger IOR.

Organizational Networks in Interorganizational Relationships - Macro-approach

The macro-approach has focused on gaining synergetic benefits through alternative organizational configurations (Van Alstyne, 1997). Some, for instance, have referred to IO networks as a variety of forms of cooperation, such as joint ventures, strategic alliances, collaborations, and consortia (Brass, 2004). Others (e.g., Osborn & Hagedoorn, 1997; Zaheer & Venkatraman, 1995) have looked at them as unique forms of governance. Another stream of research has adopted a 'network metaphor' to the study of IO networks by defining them as a form of economic organization separate from markets and hierarchies (Baker, 1992; Powell, 1990; Smith-Doerr & Powell, 2003). Despite the many interpretations to IO networks, Provan et al. (2007) affirmed that all these terms represent a common view that relationships lead to a 'tie' of connectedness, collective action and reciprocity. Thus, it is quite possible for a researcher to investigate 'network ties' and not be concerned with a network form of organization or governance when studying IO networks (Betts & Stouder, 2004). Hence, our discussion on IO networks would be limited to dyads or long-term collaborative relationships between two organizations, in which the two actors retain control over their own resources, but jointly decide on their use through negotiations (Brass, 2004). Below, we explain how a dyad's IO network is formed.

In social network terms, IO networks typically represent a dyadic relationship, with two nodes and a link (Bernardes 2010; Choi & Wu, 2009). Each node can be conceptualized as an actor (or organization), engaged in the process of value creation (Choi & Kim, 2008). Unlike a firm's internal resources, most significant resources lie outside firm boundaries. Therefore, the actors consciously create a link and form a dyad and engage in an exchange relationship to utilize these network resources (Gulati & Gargiulo, 1999). IO networks would therefore be the first, and the foremost dyadic connection, that reflects the contractual structuring of the relationship: 'Contracts are often considered to represent the structural dimension in relationships [….] and the parties engage in exchange based on market incentives, reputation, and experience. Economic incentives thus provide an important condition to form

relationships' (Ness & Haugland, 2005, p. 1227). According to Gulati, (Gulati & Singh, 1998, p. 785) in addition to formalizing transactions, the link designates roles for the partners and includes the following hierarchical components: a command structure, authority systems, incentive systems, standard operating procedures, dispute resolution procedures, and non-market pricing systems. The IO network, therefore, contains the prescribed governance structure (including vertical and horizontal linkages) and processes of the dyad (Zaheer & Venkatraman, 1995).

Governance structure is established through the organization of relations among members through formalized roles. Once the overall objectives of the partnership are delineated, they will be partitioned into manageable, specialized jobs. The dyad's governance structure will reflect how the parties allocated these jobs, in order to achieve coordination among the partners. Thus, in network terms, it can be viewed as the 'structural tie' that connects the two organizational actors: the 'conception of structure as networks stresses the configuration of relations among organizational members and subunits' (Shrader, Lincoln, & Hoffman, 1989, p. 44). Governance processes in contrast, are recognized as the standard operating procedures, guidelines or routines set forth to perform the structured tasks of the relationship (Nelson, 1982; Pentland & Feldman, 2005). The 'standard operating systems are coupled to the organization structures that define rules and demarcate activities'(Lampel, Honig, & Drori, 2014, p. 469). Processes can therefore be viewed as the 'codified behaviour' of the relationship (Pentland & Feldman, 2005), that shifts the focus from what a structure is, to how it is accomplished (Feldman, 2000). Hence, in network terms, the governance processes of a dyad act as the 'processual tie' that connects the two organizational actors via routinized behavior (Zollo, 2002). Zaheer and Venkatraman's (1995) work on relational governance has shown that both the structural and processual ties are embedded in IO networks, yet, an explanation as to how the two influence each other was not apparent. Drawing mainly on the organizational learning and routine literature, we argue that in an IO network, the structural and processual ties exist in symbiosis, and a change in one would directly affect the other.

Symbiotic structures and processes

Though formed at the inception, and display considerable continuity over time, organizational routine and learning scholars (e.g., Feldman, 2000; Pentland & Feldman, 2005) observe structures and processes as generative and dynamic systems. For instance, Doz (1996) claimed that learning will lead to organizational members continually assessing how effective the routines and processes are for the partnership, while Gulati (1998) affirmed 'more complex and overlapping division of labor […..] will entail continuing mutual adjustments' to the governance structure (Gulati & Singh, 1998, p. 785). They also identified that the two are interlinked, so a change to one carries a clear knock-on effect on the other; Changes to processes alter the meaning of jobs and, as a result, 'the structure of the organization is transformed' (Feldman, 2000, p. 626). Similarly, any changes to task performance will call for a new process or a change in the existing ones (Baum & Singh, 1994; Miner, 1991). However, these knock-on effects often go un-unnoticed. As a result, there is a high possibility that the changes may affect collaborations adversely or may not bring the desired synergies in the long run. For example, Feldman (2000) affirmed that the routines' potential for change has not been sufficiently recognized, and as a result such changes have failed to produce the expected outcomes. Organizational members should therefore master the process of changing routines (Musa & Ismail, 2011). Similar Doz (1996) mentioned that learning should lead to continuous improvements in the task definition as the organizational members assess how best the partners' routines suit the task.

We propose that the governance structure and processes carry an active as opposed to a passive role in daily collaborative efforts, and can therefore be viewed as the two relational elements entwined in forming a dyad's IO network. So, to establish a stronger IO network in a dyadic relationship, the two should constantly be in symbiosis (see Figure 1). However, this symbiosis does not occur naturally. Decision makers should consciously strive to maintain it. When a change is made to the structure /

(processes), processes/ (structure) should be changed accordingly, or the gap would invariably cause negative consequences to the relationship. In other words, the emergent changes in structure/(processes) left to themselves without the aid of conscious redesigning of processes/(structure) would naturally form in ways that are suboptimal, even dysfunctional, for the relationship.

Figure 1

Interpersonal networks in interorganizational relationships – micro-approach

Unlike the macro-approach where scholars are interested in understanding how and why organizations create external links, micro-approach has investigated the nature of interpersonal links within the collaboration. Using social network analysis methods (a tool used to study the interconnectedness of individuals) they have strived to unveil the nature of these individual ties in collaboration. In the light of this development, workflow and friendship ties have gained significant attention in the IOR network literature (e.g., Turnbull, 1979; Hallen, 1992; Mehra, 2001; Gilgor & Autry 2012). Turnbull (1979), and later Hallen (1992), claimed that a dyad's IP network consists of both workflow and friendship ties. Ferriani et al., (2013) consider that while workflow tie reflects the economic nature of IP network, friendship tie reflects the social nature of it.

Indeed, the workflow ties operate on an economic exchange logic, as they arise in the course of performing assigned work roles and are directly associated with the prescribed objectives of the task (Ferriani *et al.* 2013). Our discussion on the IO networks, has shown how the structural and processual ties lead to formalizing boundary spanning roles by creating vertical and horizontal linkages. Friendship ties in contrast, operate on social exchange logic as they arise from interpersonal attraction and emotions that primarily influence the personal rather than the task-related sphere of social action (Gouldner, 1954; Blau, 1955; Lincoln & McBride, 1985; Gibbons, 2004). Compared to workflow ties that flow from formal

position-to-position, friendship ties thus flows from person-to-person on a tacit and voluntary basis and continue to provide value even after the individual has shifted positions (Podolny & Baron, 1997; (Gonzalez et al., 2014)).

We argue that in a collaboration context, instead of affect based friendships, it is a special nature of friendship that coevolves with and complements workflow ties. Price and Arnould (1999, p. 51) defined this unique nature as 'commercial friendships', claiming that it emerges as a result of the boundary spanners pursuing their workflow ties. Commercial friendships are 'circumscribed and bound by their context' and thus anchored in instrumental goals. So, like in normal friendships, these commercial friendships do not allow any discretion in the choice of friends. Indeed, it then becomes true that similar to forming workflow ties, governance structure and processes play a key role in forming commercial friendship ties across organizations. This effect of formal organizational positions in forming commercial friendships was first identified by Lincoln and Miller (1979) who claimed that official roles are not only capable of shaping workflow relations of individuals, but also their friendship relations by locating them in physical space and at particular points in the workflow. Below, we use a role theory perspective to explain how the boundary spanning workflow and commercial friendship ties could conceivably coevolve in the pursuit of collaborative efforts.

Symbiotic workflow and commercial friendship ties

Role theory presumes 'expectations' as major determinants of role behavior (Biddle, 1986). Individuals are considered to naturally pursue their role expectations or to resist others with whom they disagree (Westaby, 2005). As discussed earlier, formal roles manifest two types of role behavior in individuals: the 'business' roles guided by 'utility maximization considerations,' and the associated 'friendship' roles guided by the principle of cooperation (Heide & Wathne, 2006). While the expectations of the former encourage an instrumental orientation, those of the latter encourage an exclusively intrinsic orientation in the relationship (Price & Arnould, 1999; Grayson, 2007). Ferriani et al. (2013, p. 25) recently identified

that 'the trade-off between selfish instrumental interests and an exchange partner's interests can fade as multiplexity kicks in. Their argument is in line with role theory (Sarbin & Allen, 1968; Biddle, 1979), that presumes in an event where the two coexist and, a conflict might arise, the individuals are at the discretion of enacting one type of behavior, but not the other (Heide & Wathne, 2006). As Ring and Van de Ven (1994) point out: 'In dealing with uncertainties brought upon by their roles, prudence may require that the parties employ "life jackets" recognized by their organizations (e.g., formalized contracts, exogenous safeguards) in lieu of exclusive reliance on trust (p. 96).

We propose that both the workflow and commercial friendship ties together form a dyad's IP network. We further affirm that in order to establish a stronger IP network, these two should be in symbiosis (see Figure 2). This symbiosis does not occur naturally, and the boundary spanning individuals of the relationship should make a conscious effort to maintain it. Maintaining a symbiosis in workflow and friendship ties is a skillful action of the boundary spanners, which we identify as the 'symbiotic capability'. Symbiotic capability may only arise out of the effective tradeoffs the boundary spanners make between work and friendships when pursuing collaborative efforts. It is a skill that has to be nurtured by the boundary spanning individuals in IOR.

Figure 2

Symbiotic existence of interpersonal and interorganizational networks in an interorganizational relationship

Introducing the concept, 'duality of social structure' to organizational network research, Breiger (1974) affirmed that while two people are connected through organizational linkages, the two organizations are simultaneously connected through people. In other words, when two boundary spanning individuals interact, they not only create an interpersonal link, but also represent and execute organizational demands of which they are members (Galaskiewicz & Burt, 1991; Zaheer & Soda, 2009). Hence, a dyadic

relationship within which the actors are embedded, essentially generates two types of networks: an IO network that reflects interorganizational collaboration, and an IP network that mirrors the individual relationships residing in the IO network (Ma, Yao, & Xi, 2009). In the light of this, researchers (e.g Borgatti & Li, 2009; Carpenter et al., 2012; Inkpen & Currall, 2004; Ma et al., 2009) have recently emphasised the significance of simultaneously studying IP and IO networks in IOR. For instance, Smith-Doerr and Powell (2003, p. 14) noted when the examining lens is directed onto the 'relationships among organizations, attention is directed much more at formal ties that connect organizations[…]with two categories often neglected - formal internal networks and informal external networks'. Yet, scholars have repeatedly failed to address this explicitly. Even the most recent work that has attempted to explore network meltiplexity has unfortunately employed a micro behavioral perspective (e.g. Ferriani et al., 2013), thus failing to address the macro dynamics of the phenomenon. As a result, we know surprisingly little about how networks are affected both from below (by individual characteristics) and from above (by organizational characteristics) (Brass, 2004; Phelps, Heidl, & Wadhwa (2012). A synthesis is thus sought between conceptions of social and economic behavior by utilizing multilevel lenses (Hitt, Beamish, Jackson, & Mathieu, 2007) for a more sophisticated understanding of IOR.

By being in line with utilizing a multilevel lens to the study of IOR, our work first argues that two types of networks exist in IOR; the IO and IP. By drawing on literary evidence, we affirm that the two are not interchangeable and cannot singularly explain IOR. Next, we move on to discussing how the two types of networks affect each other in collaboration. By introducing the term 'symbiotic existence' to network literature, we demonstrate the fact that the four elements: structural and processual ties (that form the IO network), and workflow and friendship ties (that form the IP network), of a dyad need to be in symbiosis for effective collaboration. The decision makers should consciously strive to maintain a 'symbiotic existence' of the four elements.

In IOR, there exist two types of relationships: The IO and IP networks

Literature presents IP networks as informal governance mechanisms that emerge through social processes (Dyer & Singh, 1998; Zaheer, McEvily, & Perrone, 1998; Zaheer & Venkatraman, 1995), and IO networks as a frame of interfirm exchanges (Gulati, 1995a; Llewellyn, 1931) - in other words they represent the formal coordination and control of the relationship (Grandori & Soda, 1995; Gulati & Singh, 1998; Langfred, 2004). It is thus clear that the content of the two types of networks differ significantly from each other. Psychological factors such as trust and intimacy are more pertinent for the individual-level relationships than for organizational-level relationships (Rowley et al., 2000). This distinguishing characteristic of the two networks also becomes apparent when studying the nature of the underlying relationships. For example, in IP networks, once two actors are connected, they cannot later be 'unconnected' (Fei, Hamilton, & Wang, 1992), although the nature, strength, or content of their relationship may vary (Earley, 1997; Luo, 2000). On the other hand, in IO networks, they are deemed to possess finite time spans, with a contractual obligation to dissolve on the lapse of the agreed time, the accomplishment of cooperative goals, or the inability to follow agreed processes in performing. A similar distinction between IP and IO networks appears in Adler and Kwon's (2002) treatment of social capital. They claimed that while market relations facilitate the transfer of network resources between two organizations, social relations only channel favors and gifts and therefore cannot fully describe the economic benefits that organizations derive from their IO networks. As we have already discussed the nature of content that flows through the two types of networks under the micro and macro perspectives, we now move on to discussing the impact of IO networks on IP networks and the vice versa in collaboration.

The effect of a dyad's IO network on its IP network in collaboration

The effect of a dyad's IO network on the IP network was initially discussed more explicitly by (Macaulay, 1963). Macaulay's findings were reaffirmed by Ring & Van de Ven (1994, p. 103) who claimed 'role formation enables individuals to serve as agents for their organizations and to carry out the

specialized tasks that are a sine qua non for all transactions'. Accordingly, drawing on our previous argument on the macro perspective, we further argue that formal documentation and standardization are initially required to establish the dyad's IO network. This allows the relationship to be legally recognized beyond the time span of the individuals who are involved in negotiating its functionality. We affirm that from the inception of the collaboration, the IO network is enforced on the boundary spanning individuals thus forming a somewhat 'regulated' base for the dyad's IP network to emerge. A major change in the dyad's IO network is therefore more likely to disrupt or sever its IP networks (Podolny & Baron, 1997). Yet, only a limited work to date has attempted to explain how IO networks affect IP networks. By exploring the cross level effects of governance structure and processes (that forms the IO network) on the workflow and commercial friendship ties (that forms the IP network) we attempt to develop a more complete explanation to how a dyad's IO network affects its IP network in collaboration.

The effect of structure and processes on individual workflow ties is not new to organizational theory. For instance, many (Blau & Scott, 1962; Brass, 1984) identified that task performance (the structure) can be activated to establish individual communication flows across organizations (workflow ties), while Wathne and Heide (2000) have identified how processes can be changed to redirect individuals' workflow ties. Similarly, the fact that the two macro elements have a profound effect on the individuals' friendship ties is also apparent in extant literature. For example, Podolny and Baron (1997, p. 690) claimed that in IOR, 'many important informal ties in organizations are a result of ego's and alter's positions within the organizational division of labor and are therefore only minimally controllable by the actors involved'. Gulati's (2009) work on the 'complementary fit' of formal and informal organization, showed how workflow processes were redirected in such a manner by placing organizational boundaries between engineers who worked on different technologies, as well as between engineers and marketing personnel, to discourage continuing personal relationships those workers had earlier.

Indeed, under the macro perspective, we have shown that while the governance structure reflects the prescribed tasks of the relationship, governance processes reflect the ways and means of performing them and therefore the two are entwined components of a dyad's IO network (see "*X"* arrow in Figure 3). The prescribed objectives of the boundary spanning tasks or in other words the workflow ties are therefore an apparent manifestation of both the governance structure and processes of the relationship. A change in either the structure and /or process would therefore directly affect the direction of individual workflow ties (see arrows "*A"* and "*B"* in Figure 3). Similar to the boundary spanning workflow ties, we have also shown how these prescribed tasks lead to forming commercial friendships in the workplaces; Official roles are capable of shaping individual friendships by locating them in physical space and at particular points in the workflow (Lincoln & Miller, 1979) (see "*A1"* and *"B1"* in Figure 3). Thus, we affirm that both a dyad's governance structure and processes have an influence on the workflow and friendship ties of the boundary spanners and a change in one will carry a knock –on effect on workflow and /or friendship ties.

However, we also keep to the fact that the corresponding changes in workflow and friendship ties may not always be desirable. Although structural and processual ties are often refined with the expectation of meeting the dyad's economic objectives via boundary spanning individuals, the change may affect negatively, if not monitored. For example, Musa and Ismail (2011) recently discussed how the process constraints hindered creative problem solving in Microsoft, while Ring and colleagues identified how 'IOR are placed in jeopardy by an excessive reliance on formal, legal procedures and an exclusion of informal, interpersonal norms for negotiating, committing to, or executing a cooperative IOR' (Ring & Van de Ven, 1994; Ring, 1994, p. 110). As a result, though structural mechanisms hold the ability of redirecting workflow and friendship ties of the boundary spanners in such a manner to achieve the dyads economic objectives, designing such mechanisms requires the decision makers' careful and systematic attention to the concrete processes by which personal relationships emerge between transacting parties:

'In this way, personal relationships can serve to shape and modify the evolving structure of a cooperative IOR' (Ring & Van de Ven, 1994, p. 93).

Figure 3

The effect of a dyad's IP network on its IO network in collaboration

The effect of IP network on the IO network in collaboration was first implied by Granovetter (1985) and much later by Uzzi (1997) who argued that the economic actions are embedded in ongoing social ties. Their work subsequently initiated a large body of literature (e.g., Ingram & Roberts, 2000; Larson, 1992; McDonald & Westphal, 2003; Saxenian, 1990) dedicated to exploring the effect of IP networks on IO networks in IOR. For instance, Zaheer, McEvily, and Perrone (1998) claimed that while ties between organizations may originate because of interorganizational trust, the success of interorganizational cooperation essentially depends on interpersonal trust. Accordingly, a major change in the dyad's IP network is more likely to disrupt or sever its IO network. 'Levels of flexibility and efficiency that may have existed in management of the cooperative IOR are likely to be lost [….] when roles are changed, new "agents" occupy the existing roles […] or the vicious cycle dwindling personal trust has gone beyond a threshold level' (Ring & Van de Ven, 1994, p. 104). Yet, only a limited work to date has attempted to explain how IP networks affect IO networks collaboration. We attempt to explore the cross level effects of workflow and commercial friendship ties (that form the IP network) on the structural and prccessual ties (that form the IO network), in order to develop a more complete explanation to how a dyad's IP network affects its IO network in collaboration.

We have argued under the micro perspective, that the workflow and commercial friendship ties are two entwined components of a dyad's IP network (see arrow "*Y"* in Figure 3). Hence a change in either one would directly affect the structural and/or processual tie of a dyad. The effect of a change in workflow ties on prescribed tasks (or structure) (see arrow "*C*" in Figure 3) is clearly evident in Burkhardt and

Brass's (1990) work. They showed how in an event of a technology change, the individuals became uncomfortable with uncertainty and suddenly increased interaction with a number of different parties (a change in workflow ties), resulting in a subsequent change in organization's functionality. In our discussion on the macro perspective we have discussed how learning leads to continuous improvements in the task definition as the organizational members assess how best the partners' routines suit the task (Doz 1996). Similarly, many (e.g., Gulati, 1995a; Hutt, Stafford, Walker, & Reingen, 2000; Ingram & Roberts, 2000) have observed how increased friendship ties consequently form a dyad's functionality or the structural relations (see arrow "*D*" in Figure 3) by easing communication, providing a shared interpretation of goals and performing norms across organizations.

The fact that a change in the two micro elements (workflow and friendship ties) carries a profound effect on the IO network's processual tie (see arrow "*C1"* and "*D1" in* Figure 3) is evident in extant literature. For example, organizational routine scholars observe processes (or in other words routines) as ongoing "effortful accomplishments" (workflow ties) of people (Pentland & Rueter, 1994, p. 488) institutionalized at a subsequent stage. 'Routines are performed by people who think and feel and care […]. Their reactions are situated in institutional, organizational and personal contexts' (Feldman, 2000, p. 614). Musa & Ismail (2011) have shown how 'personal bonds of friendship' or the informal group like a community of practice, provide support to the formal management systems and even transcends to formulating new processes. In our discussion on processual changes under the macro perspective we clearly highlighted how learning leads to organizational members to constantly assess their existing processes and make changes for continuous improvement. Thus, we affirm that both a dyad's workflow and commercial friendship ties of the boundary spanners carry an influence on the structural and processual ties, and a change in one will carry a knock –on effect on the structural and/or processual ties of the relationship.

However, we also keep to the fact that the corresponding changes in structure and processes may not always be desirable if not identified and carefully absorbed. For example, in collaborative efforts it is often seen that boundary spanners' mindful actions help to develop new understandings of how best the task should be performed (Feldman, 2000). 'The informal network provides unconventional and novel ways of doing things' (Gonzalez, Claro, & Palmatier, 2014, p. 76). Yet, these emerging IP networks 'if left to themselves without the aid of conscious design, will evolve naturally in ways that are suboptimal, even dysfunctional' (Krackhardt & Stern, 1988, p. 123). Partners to the collaboration should therefore make conscious decisions to timely recognize and capitalize on these emergent processes for effective performances (Nadler & Tushman, 1997). While we have shown the positive effects of the emerging IP networks on the IO network and the importance of decision makers to recognize them and make the corresponding changes in the IO network, we also stress the fact that if not carefully monitored, the very IP networks may also carry negative effect on the IO network. For instance, in their seminal work on social embeddedness, Uzzi (1997) affirms that the embeddedness logic works only up to a point, and beyond that it creates negative results. The influence of micro elements on macro can be overwhelming. The very friendship relations formed to facilitate commercial transactions may result in creating 'feelings of obligation' for the other, superseding the economic imperatives and this may therefore stifle effective economic action. 'Overembedded networks can sometimes release intense negative emotions of spite and revenge that trap firms in self-defeating cycles of behavior' (Uzzi, 1997, p. 59). The need to make a conscious effort to control negative effects of the emerging IP network was also evident in Hutt et al.'s (2000) work where they showed how formal processes begin to rule when trust in the interorganizational relationship erodes.

Accordingly, by introducing the term symbiotic existence to interorganizational social network theory, we propose a framework (see Figure 4) that presents a new theoretic conceptualization of how the two levels and their corresponding elements can be combined when studying interorganizational collaboration. We affirm that the development of an interorganizational relationship occurs through a combination of both

interpersonal and interorganizational interactions (see Figure 4), and the four elements of structural and processual ties (that create the IO network) and friendship and workflow ties (that create the IP network), are interdependent rather than independent. By being aware of the interdependency of the four elements, the dyad may be able to scan the corresponding effects and duly rectify any negative outcomes to yield greater benefits from its interpersonal network and interorganizational networks.

Figure 4

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

Arriving at a unified social network theory of IOR utilizing a multilevel lens was subject to great scrutiny in the recent past (Carpenter, Li, & Jiang, 2012; Gulati, Lavie, & Madhavan, 2011; Kilduff & Brass, 2010; Phelps, Heidl, & Wadhwa, 2012; Zaheer, Gözübüyük, & Milanov, 2010). Our framework focuses on the micro and macro dynamics of IOR. By simultaneously considering the organizational and individual level effects on interorganizational collaboration, the framework offers unique insights to organizational network theory. For instance, by acknowledging the prevalence of structural and processual mechanisms, our model accounts for their direct effect on individual action in collaboration. Moreover, instead of simply integrating prior work on individual workflow and friendship ties, we have sought to uncover a unique form of a friendship that enables the boundary spanners to effectively create value from their workflow networks. Our model discriminates between conceptually separable elements of IO networks (structural ties and processual ties) and IP networks (workflow ties and commercial friendship ties) and proposes a new conceptualization - 'a symbiotic existence' in the four elements for synergetic performance. Our focus on a symbiosis of the four elements allows us to depart from the dominant distinction between macro and micro domains of networks. Both domains have failed to consider the cross-level effect of networks that may shape interorganizational performance. Thus, for example, while economic controls have been overly used as a proxy for social controls and the vice

versa in prior research, our framework opens the way for understanding the distinction between the two types.

One major implication of our research is that the decision makers should pay attention to the changes in micro and macro elements and their repercussions to mindfully uphold a symbiosis in the four elements for collaborative synergies. We suggest this to be the 'symbiotic capability' of the decision makers. Future research is needed to clearly articulate what this 'symbiotic capability' construct means, as it involves a rational process of recognizing when the four ties becomes ineffective, cognitively engaging in reconstructing new structure processes, and workflow ties, and the capacity to implement these changes in the collaboration. Though it is not intended in this study to shed in detail how the symbiosis works, by bringing the four elements together our study provides an effective platform for empirical investigation into this very important area.

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Appendix

Figure 1. Symbiotic structural and processual ties in an inter-organizational network

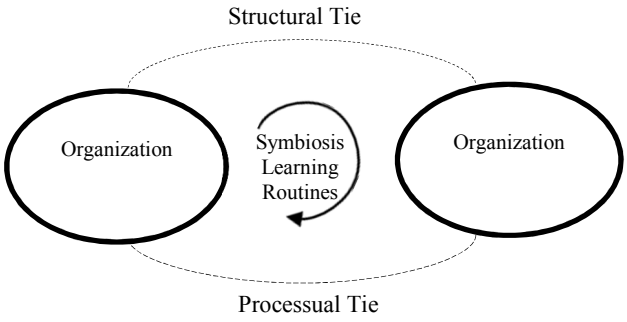


Figure. 2: Symbiotic commercial friendship and workflow ties in an interpersonal network

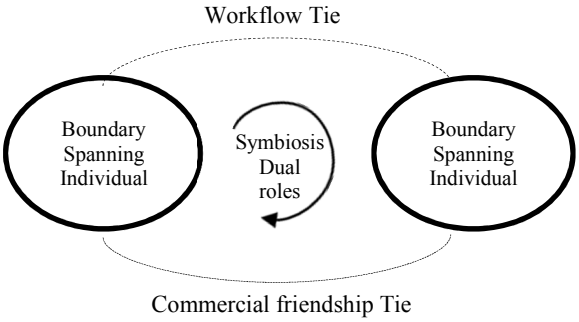


Figure. 3: Symbiotic existence of micro and macro elements in collaboration

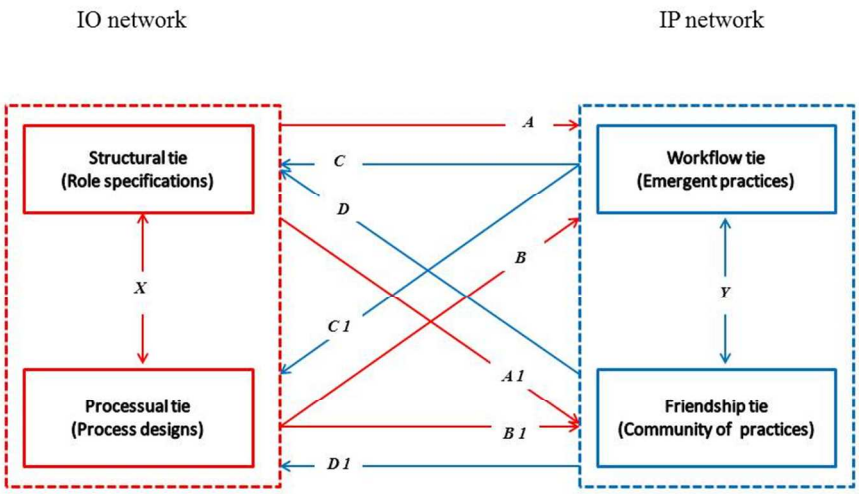


Figure 4. Symbiotic interpersonal and inter-organizational networks

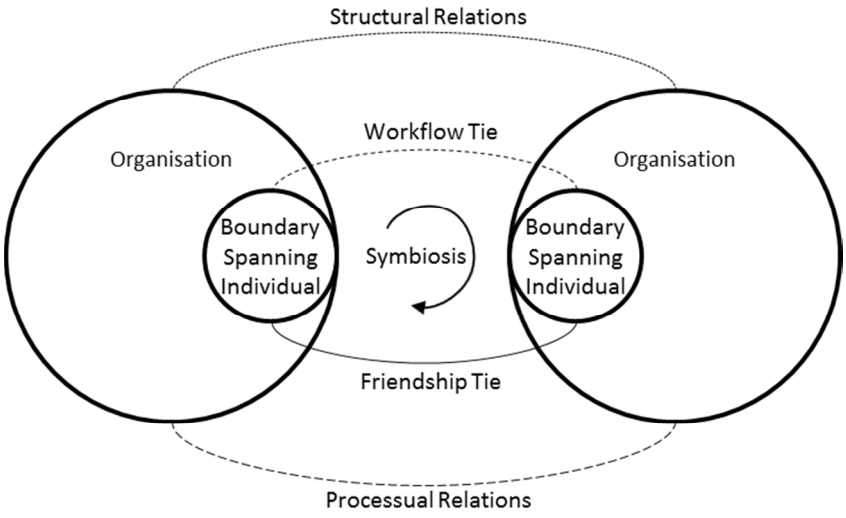


Table 1: The micro and macro approaches to IOR

Attribute	*Micro-approach*	*Macro-approach*
Lens	Behavioural	Strategic
Unit of Analysis	Personal networks	Organizational networks
Alliances	Embedded in personal networks	Embedded in impersonal networks
Modelling approach	Mapping personal ties	Governance structures
Collaboration	Micro-dynamics	Macro-dynamic
Duration	Continuous	Discrete