How do interaction patterns within a sales force evolve over time? A social network analysis

Abstract

Sales are recognized as a strategic function that creates and delivers value for firms. Improving sales force productivity and overall performance is therefore crucial, and gradually complex challenges emerge. Intra-organizational aspects of the sales force are recognized as an under-researched area. Intra-organizational studies in the sales area draw on social network theory, and on the idea that sales people can use firm's resources (e.g. intra-sales force or inter-departments) to enhance their performance. Knowledge is amongst these resources that sales people can get access to, and social networks then constitute the vehicle for knowledge transfer (KT) between individuals, groups or departments within the firm. The structural and relational characteristics of intra-organizational social networks have been found to condition the effectiveness of KT.

In this paper we address the pattern of evolution of sales social network. We hypothesize that over time salespeople are increasingly selective, decreasing the number of direct voluntary ties to other sales people. The friendship and work related ties between salespeople tend to be reciprocated as time goes by. Homophily plays a role in friendship ties, whilst for work ties heterophily is what matters. Regarding the overall network, we posit that salespeople tend to close their networks and form overlapping reciprocity. Hypotheses were tested with evidence collected in a longitudinal survey format from a company' sales team. Data was analysed with SIENA, a technique that estimates dynamic actor-based models for the evolution of social networks. Results support the majority of our hypotheses, with the exception of the appropriateness of homophily principles to explain how friendship ties evolve over time. We contribute to the growing body of research on intra-organizational studies of sales management.

There are also practical implications, as managers are provided with insights on how to enhance the sharing of *best practices* within their sales force.

1. Introduction

Sales are recognized as a strategic function that creates and delivers value for firms (Geiger and Guenzi, 2009). Improving sales force productivity and overall performance is therefore crucial, and gradually complex challenges emerge as, for example, the environment becomes more uncertain and turbulent (Avlonitis et al., 2010; Ingram, 2004). Intra-organizational aspects of the sales force are recognized as an under-researched area (Geiger and Guenzi, 2009), and a growing body of literature has been recently exploring these issues (e.g. Gonzalez, Claro and Palmatier, 2014). Intra-organizational studies in the sales area draw on social network theory (SNT: Granoveter, 1983; Burt, 1992; Monge and Contractor, 2003), and on the idea that sales people can use firm's resources (e.g. intra-sales force or inter-departments) to enhance their performance (Gonzalez et al. 2014; Üstüner and Godes, 2006; Üstüner and Iacobucci, 2012). Knowledge is amongst these resources that sales people can get access to, and social networks then constitute the vehicle for knowledge transfer (KT) between individuals, groups or departments within the firm (Borgatti and Foster, 2003; Gay and Dousset, 2005). The structural and relational characteristics of intra-organizational social networks have been found to condition the effectiveness of KT (e.g. Reagans and McEvily, 2003; Tang et al., 2008).

Considering the sales intra-organizational network, it is key to understand a particular dynamic status for two reasons. First, social networks are always evolving due to relational changes (Doreian and Stokman, 1997; Snidjers, 1996). Second, sales people have the need to adapt to the ever changing conditions of the environment and the firm (Geiger and Guenzi, 2009; Jones et al., 2005). The question then is: how does the social network of salespeople evolve over time? What are the patterns of evolution? And does every sales person present similar patterns of

interaction over time or do sales people with different performance levels behave in different ways? These are the questions that we address in this paper. Drawing on SNT and sales literature, we put forward and test six hypotheses on the dynamics of sales force in terms of friendship and work related ties. For the friendship network, most of the discussion is based on inter-personal balance theory (Cartwright and Harary, 1956; Davis, 1963), whilst for the work related ties we use resource-dependency theory to develop our hypotheses (Pfeffer and Salancik, 1978).

Our set of hypotheses includes three dimensions of evolution. First, in the salesperson ego network dimension, we posit that salespeople are increasingly selective, decreasing the number of direct voluntary (out) ties to other sales people (Marwell et al., 1988). We also argue that friendship and work related ties between salespeople tend to be reciprocated over time (Aldrich, 1979; Blau, 1964; Larson, 1992). We then claim that in what concerns friendship, salespeople tend to select partners that have similar features to theirs based on homophily mechanisms (McPherson and Smith-Lovin 1987), whilst for work they look for salespeople that can complement their resources based on heterophily mechanisms (Burt, 1983). Second, we hypothesize about the overall network effect. Salespeople tend to close their networks, choosing to interact with salespeople that also have work and friendship relationships with their already existing interaction partners (Holland and Leinhardt, 1972; Gulati and Gargiulo, 1999). Third, we explore the connections across friendship and the work related networks. Drawing on the literature, we postulate an increase of overlapping reciprocity (Galaskiewicz and Marsden, 1978; Skvoretz and Agneessens, 2007) as well as overlap transitivity (Lee and Monge, 2011).

The aim of this paper is to contribute to the growing body of research on intra-organizational studies of sales management, investigating how the patterns of interaction

amongst sales people may be expected to evolve over time. To the best of our knowledge, no previous study has investigated this dynamic aspect of sales. The analysis focuses on the structural and relational dynamics of networks. Drawing on the concept of within-firm KT, a field of organizational learning theory, this paper shows the importance of understanding the existing and expected networks of relationships between members of a sales force to increase the effectiveness of knowledge transmission between salespeople, which result in improved sales performance.

2. An intra-organizational network approach to sales

Sales constitute a central area of investment and concern for academics and practitioners. Sales force performance can be expected to have a considerable impact on a firm's short and long term performance (Avlonitis and Panagopoulos, 2010; Evans et al., 2012). One important area of study is intra-organizational aspects of the sales role, i.e., how salespeople manage their internal resources and networks of relationships (Üstüner and Godes, 2006; Wiliams and Plouffe, 2007). This area of research draws on network theory (Burt, 2000; Granoveter, 1983; Scott, 2000), which posits that social actors are connected by ties (Cross et al, 2003, 2005; Iacobucci and Hopkins, 1992;). This relational dimension is a cornerstone for social network analysis, as relationships are perceived as instruments for transferring resources, such as information and knowledge (Wasserman and Faust, 1994; Scott, 2000). The interactions between actors can be of different nature, namely work related or friendship (Bell, 2005).

3. Sales force network dynamics and hypotheses

Result of their social nature, the network of relationships between salespeople within a firm's sales force is expected to evolve over time (Doreian and Stokman, 1997; McPherson e al., 1992). Social networks are not static but instead "*dynamic by nature*" (Snidjers et al., 2010, p.

44). Actors try to improve their position in the network by initiating, changing or discontinuing relationships with other actors (Brass and Burkhardt, 1993). Moreover, as a result of the underlying structural embeddedness of networks, a change in a specific point of the network may have an (indirect) impact over actors or relationships that are elsewhere in the network (Granovetter, 1985; Uzzi, 1996). The dynamics of social networks can be analyzed by the ego-network approach that consists of a focal actor or the ego, and its neighbors or alters (Freeman, 1982; van de Bulte and Wuyts, 2007). Drawing on SNT and the sales literature, we put forward six hypotheses on sales force dynamics presented below.

The evolution of network size: Towards Selectivity

Network theory defines the size of an ego-network as the number of ties formed with other people (i.e. in- and out-degree) (Borgatti et al., 1998; Burt, 1983). We are interested in understanding the dynamics of active connections, i.e., ties with salespeople that the ego salesperson make, and consciously and proactively put effort to keep (Hill and Dunbar, 2003). Bigger ego-networks may reflect redundancy and thus misusage of resources (Ball et al., 2001; Laumann and Marsden, 1982; van de Bulte and Wuyts, 2007). This is intensified when the ego-network's contacts hold the same resources, or if they are strongly interconnected (Burt, 1992). As a consequence, the ego salesperson's network is expected to have a limited degree, i.e. a limited number of other contacts (Jin et al., 2001), and to be effective the salesperson should therefore be selective when choosing their counterparts (Marwell et al., 1988). The more relationships the ego has, the greater the risk of exposure and of losing control over important resources. We put forward:

H_1: Salespeople over time reduce the number of direct voluntary (out) ties to other sales people in the (a) friendship and (b) work related network.

The evolution of reciprocity in single resource networks: Towards mutuality and trust

Reciprocity measures a directed tie from a salesperson to her counterpart that is reciprocated (Katz and Powell, 1955; Tichy et al., 1979; Ouchi, 1980). At this point we are referring solely to single resource networks, i.e., the nature of the reciprocated ties is the same as the original tie. Reciprocity has been found to be crucial for the development of trust and cooperation (Gouldner, 1960). We therefore put forward the following hypothesis:

H$_2$: Salespeople over time increase the number of reciprocal ties with other sales people in the (a) friendship and (b) work related network.

Matching ties: Towards friendship homogeneity and work related heterogeneity

Different principles can guide the salesperson's choice to match characteristics of network counterparts. The compositional quality of network counterparts can be assessed by the level of existing needed characteristics in interacting partners (e.g. expertise). The more connected to useful others, the better is the compositional quality (Borgatti et al., 1998). Thus, salespeople are rationally expected to choose interacting partners having in mind the maximization of such compositional quality.

Social comparison theory (Festinger, 1954), and similarity-attraction theory (Heider, 1958, Byrne, 1971) explain why people prefer to interact with others that are similar to themselves with respect to one or more relevant features. This is also known as homophily theory (Fischer, 1982; McPherson and Smith-Lovin 1987). For example, a salesperson that chooses a counterpart with similar sales performance. However, salespeople do not always choose to interact with similar other: they can 'feel attracted' and interact with salesmen that do not share the same characteristics. In this case the choice of interaction patterns is explained by heterophily mechanisms (Burt, 1983; Granovetter, 1983), that may result in higher information

benefits than those obtained with homophily ties to counterparts (Burt, 1992) as it may result in getting access to more diverse information than that available in homogeneous networks. According to balance theory (Davis, 1963), homophily principles explain how the ego-network evolves over time because individuals tend to look for other and nurture relationships with others that share the same characteristics or have things in common. When it comes to work related ties, resource dependency theory is more suitable than balance theory to explain salespeople's bonding: salespeople are expected to look for resources they do not hold but that they require (Laumann and Marsden, 1982; Pfeffer and Salancik, 1978). We then put forward:

H$_{3a}$: Salespeople over time increase the number of contacts in the friendship related network with other salespeople that present *similar* levels of performance.

H$_{3b}$: Salespeople over time increase the number of contacts in the work related network with other salespeople that present *non-similar* levels of performance.

The evolution of transitivity in networks: towards a closed, collective network

Network transitivity refers to a tie between two actors being established as a consequence of one another actor having relationships with those two actors (van de Bulte and Wuyts, 2007). This network effect reflects the importance of acquaintances or common partners as means to obtain a guarantee for trustworthiness and legitimacy (Gulati and Gargiulo, 1999). A salesperson is expected to be more willing to share and engage with a friend's acquaintance than with a total stranger. This closing of triads is found in previous studies (e.g. Holland and Leinhardt, 1972), commonly guiding social networks evolution. This type of structure eases better quality and timeliness communication, also facilitating the application of sanctions (Baker, 1984; Burt, 2000; Coleman, 1988). As a result, trust among network members and social support increases.

H₄: Salespeople over time increase the number of ties with counterparts that have ties with each other (transitivity) in the (a) friendship and (b) work related network.

The evolution of overlapping reciprocity: towards interdependence and trust

Relationships between salespeople are very frequently multiplex (Lee and Monge, 2011; Mitchell, 1969: Skvoretz and Agneessens, 2007) that suggests overlapping ties of different nature exist between the same people. For example, a salesperson discusses personal issues with another salesperson friend, whilst simultaneously give technical advice on a specific product. In this situation, the salesperson is connected in different networks (van de Bulte and Wuyts, 2007). We are interested in a variant of overlapping named *exchange* (Blau, 1964; Skvoretz and Agneessens, 2007), which takes place when resources of different nature flow between individuals in both directions (Galaskiewicz and Marsden, 1978). A salesperson invites a colleague out for coffee to discuss her son's at school and in return the colleague reciprocates, giving a special tip on a certain deal. The salesperson takes the initiative to form a tie and expects to be reciprocated in the other net. This is more than the reciprocated tie in a similar nature to the original ties, as we hypothesized earlier (H₂), as well as from the general definition of overlapping where there are simultaneous flows of different nature in the same direction.

H₅: Salespeople over time increase the number of reciprocal ties that are initiated in one network and become also part of the other network. That is (a) work related to friendship network and (b) friendship to work related network

The evolution of transitivity in multiple networks: towards a collective multi-network

Transitivity in multiple resource networks refers to a salesperson's preference for having relationships with her contacts´ contacts, but where the established ties have different natures (Lee and Monge, 2011). In a previous hypothesis (H₄), we investigate transitivity in single resource networks (e.g. Gulati and Gargiulo, 1999; Holland and Leinhardt, 1972). Here

transitivity is occurring within different resource networks. For example, the ego salesperson has a friendship relationship with salesperson i, and the ego then develops a work related relationship with another salesperson j that is also friend of i. The ego salesperson takes the initiative to form this work related ties with i and j that are friends resulting in transitivity across networks.

> **H$_6$:** Salespeople over time increase, in a different network, the number of ties with counterparts that have ties with each other (i.e. transitivity). That is (a) work related to friendship network and (b) friendship to work related network.

4. Method

We tested our hypotheses with evidence collected in a longitudinal survey format. The respondents, salespeople, are part of a business-to-business firm that distributes a broad mix of industrial products (e.g., equipment, chemical supplies, technical services). Each salesperson has its own territory and accounts with sales target for the annual year sales cycle. Salespeople's compensation includes a fixed salary and a commission based on sales performance. This firm is well suited for testing our hypotheses, because the sales force is responsible for providing integrated solutions that require technical expertise, and they deal with both relationally complex relationships and transactional exchanges.

Data Collection

The 34 salespeople of the firm responded the questionnaire administered in three waives at the beginning of every next sales year. A name-generating questionnaire was employed following prior measures of intrafirm network for friendship (Podolny & Baron, 1997) and work related issues (Krackhardt & Stern, 1988). Our survey instrument consists of two name-generating questions about salesperson's friendship ties with others in the sales force: "*Who do you go to confide work or personal affairs? And/or to invite to participate in a social/leisure*

event?" Respondents received both questions at once time and generated a unique list of names after reading the questions. After responding to the questions about work related ties, respondents received the questions about the sales work related contacts to other in the sales force: *"Who do you go to obtain information related to your job? And/or to gain an advice or help to your job? Whom would you trust to confide your concerns about work-related issues?"* No salespeople name roster was provided to assure the reliability of such names mentioned. Based on the name generating questions we retrieved a directed, binary adjacency matrix for each measurement wave, where 1 indicated a present friendship relation, and 0 indicated an absent of friendship relation and the work related questions. The firm also provided the data we used to assess the sales performance of each salesperson. The constructs of the study are described in table 1.

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INSERT TABLE 1 ABOUT HERE
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Data Analysis

Friendship and work related networks served as co-dependent variables in the analysis and were assessed at three time points with a time lag of one year. Our hypotheses uncover two distinct levels of analysis, be the within salespeople (Hypotheses 1-4) and across networks (Hypotheses 5 and 6). The complexity of our research questions requires such an approach specifically designed for longitudinal social networks analysis. We use an actor-based approach that models the co-evolution of several social networks and behavioral dynamics (i.e. sales performance).

Network researchers have used the Simulation Investigation for Empirical Network Analysis (SIENA), to carry out the statistical estimation of models for repeated measures of social networks (Snijders et al., 2010). SIENA has been applied to analysis of friendship and

gossip in the workplace (Ellwardt et al., 2012) and ties formed after job mobility in investment banking (Checkley & Steglich, 2007). There has recently been a growing popularity that drives continuous development by social network researchers (Snijders et al., 2013). All data were processed with the software RSiena in R (Ripley et al., 2013), which estimates dynamic actor-based models for the evolution of social networks.

5. Results

We modeled the main variables (Salesperson Ego Network, Overall Network Effects and Effects Across Networks) and the control variables, which are basically the tendencies of period 1 and 2 (the change from time 1 to time 2 and from time 2 to time 3 respectively). Changes in the network are expressed with rate parameters and estimation was carried out by the method of moments (Ripley et al. 2013). The first observation is used as a starting point for estimating the network evolution process. Model estimation amounts to the identification of those behavior rules that fit best the observed trajectory of networks. To gain excellent model quality, as recommended by Ripley et al. (2013) all analyses were carried out with 8000 iterations and only used for interpretation when the convergence statistics were between −0.1 and 0.1 for all specified parameters. Table 2 presents the results of the model estimation. The algorithm of the simulation procedure has converged because estimated t-ratios of every parameter are smaller than 0.1 (absolute value), which suggest that the coefficients and significance level can be interpreted.

INSERT TABLE 2 ABOUT HERE

The direct ties a sales person, initiated and maintained with other salespeople, significantly reduced over time. The results show that the pattern exists for the friendship (θ = -2.21, p<.01) and work related networks (θ = -1.81, p<.01). Salespeople have been discontinuing

established relationships with others in their networks that support our hypotheses (H_{1a-b}). Reciprocity shows to increase over time in the friendship network ($\theta = 1.27$, p<.05), suggesting that friends are reciprocating the initiated ties continuously as hypothesized (H_{2a}). This reciprocity effect is not found in the work related network. We did not find significant effects of homophily in friendship ties (H_{3a}), which may suggest that salespeople are forming ties with non-similar performance level's counterparts. We controlled for the non-similar performance ties and found that salespeople are actually forming ties with high performers ($\theta = 1.16$, p<.05). We also found a significant coefficient for the tendency of forming ties with high performers in the work related ($\theta = -0.96$, p<.10) networks. A sales person increases the number of salespeople that have ties with each other providing more transitivity to the structure of the friendship ($\theta = 1.30$, p<.05) and work related networks ($\theta = 1.43$, p<.01). This provides support to our hypotheses (H_{4a-b}). We also found support to one of our overlapping ties hypothesis (H_{5b}). The tie initiated by a sales person in the friendship network is reciprocated by a work related tie from that friend ($\theta = 1.08$, p<.10). Overlapping transitivity is found no significant effect in both networks.

7. DISCUSSION

The study of intra-organizational network dynamics of sales force is central in this paper. Over time a salesperson is able to make use of the firm's internal resources and gain cooperation to meet customers' demands by managing her relationships with sales colleagues (Üstüner and Godes, 2006; Wiliams and Plouffe, 2007). The KT is key to salespeople network activity because it becomes a driver and an expected outcome of relationships (Alder and Kwon, 2002). Salespeople through relationships and networks are able to access and exchange resources such as knowledge reflecting the human and social nature of knowledge management processes

(Brown and Daguid, 1991). Drawing from our study findings, we discuss three relevant implications for sales management and network literature.

First, our analysis of the actor-based model shows a particular dynamic pattern of relationships within a firm's sales forces. We found that salespeople have a tendency over time to form selective, trustworthy and intimate, non-similar and closed networks. We observed that salespeople tend to be selective in their relationships, choosing to keep solely ties that may bring something valuable (Jin et al., 2001; Marwell et al., 1988). We also found that salespeople prefer to interact with others that perform better than they do, benefiting from their experience and expertise. This lower redundancy results in higher effectiveness of the network and a wiser usage of available resources through the contact with new and diverse sources of information (Burt, 2005; Cross and Parker, 2004; Reagans and McEvily, 2003). Given that overall salespeople's sales increased, we can argue that this selectivity strategy is effective, providing the opportunity to strengthen the existing ties and develop trust, and thus enhance relational embeddedness (Burt, 1992; Granovetter, 1983). Salespeople that interact frequently are more effective than others who do not (Üstüner and Iacobucci, 2012). The structural dimension of the network (e.g. size of the network) is thus expected to have an impact over its relational features such as strength of relationships (Inkpen and Tsang, 2005; van Wijk et al., 2008) that is key for assuring the effectiveness of KT (Dhanaraj et al., 2004). The literature points to the strong ties as being the best conductors for KT to take place (Fritsch and Kauffeld-Monz, 2010; van de Bulte and Wuyts, 2007; van Wijk et al., 2008). However, weak ties have been found to be more suitable for knowledge search. This is nevertheless dependent on the level of complexity of the knowledge (Hansen, 1999). The optimal strength of ties to facilitate KT is thus contingent upon the nature of

the knowledge. Therefore, John appears to be forming a selective number of ties to more effectively share knowledge.

Second, based on a firm that outperformed industry growth, the estimated model provides a better understanding of the overall pattern of sales network evolution. Individual sales performance is expected to considerably impact firm's short and long term performance (Avlonitis and Panagopoulos, 2010; Evans et al., 2012). Complementing the actor-based model we also analyzed alternative explanations for the performance of individual salespeople by conducting two post-hoc analyses, looking specifically into the evolution patterns of groups of salespeople (namely top performers and low performers), as well as individual network management strategies. The first post hoc analysis looked at the evolution patterns of top performers networks, resulted in a second relevant implication for sales network management. This is a static analysis given that it always accounted for the top performers in each period, no matter whether the included salespeople were already top performing in the previous periods. In our sample, top performers showed a tendency to behave as suggested by the actor oriented model presented above, looking like John in Figure 4. Thus, networks of high performers follow exactly the path taken by the firm and the sales force as a whole. The main difference with low performers is the intensity of changes in pattern as top performers tend to intensify the selectivity, intimacy, ties to high performers and closed networks. Therefore, the top performer strategy for each sales cycle appears to remain consistent over time.

Finally, the evolution of networks and potential association with increasing performance was also addressed in this paper. The results of the post-hoc of an evolutionary analysis, which considered the salespeople that gained performance over the three year period, lead to a third important implication for management with the identification of particular patterns of dynamics

in the formation, maintenance and discontinuing of network ties by individual salespeople. Following previous studies that suggested an impact of networks on the performance over time (Williams and Plouffe, 2007; Üstüner and Godes, 2006), we identified a particular strategy to manage networks. In contrast with the benchmark of John's network strategy (Figure 4), salespeople with increasing sales invested in the work related direct ties and not being reciprocated in the friend ties. Additionally, these increasingly top performing sales individuals reduced ties with friends that are connected to each other. This is an indication that the benefits on performance came from the formal team work and team selling as opposed to the emotionally consuming friendship ties (Ingram, 2004).

We identified opportunities of future research based on limitations of our study. First, we measure sales force performance in terms of objective value of dollar sales, an indicator associated with the sales task of closing the deal (Üstüner and Godes, 2006). Future research may consider other outcome-based performance measures such as the number of identified prospects, degree of opportunity identification and level of solution creation by each salesperson (Üstüner and Iacabucci, 2012; Üstüner and Godes, 2006), or even more behavioral related indicators (Anderson and Oliver, 1987; Plouffe et al., 2010). Future studies can also adopt a broader view of sales performance and include other pointers besides value of dollar sales, also because previous work shows that depending on the stage of the sales process, different network configurations may be more effective (Üstüner and Godes, 2006). Additionally, this paper focuses solely on the intra-organizational and intra-sales network of analysis level (see for example Steward et al., 2010). Although to understand how salespeople use this internal network of resources in the pursuit of better performance is key, other critical actors within the firm (other individuals, department, or divisions) have been also found to play a crucial role in the

effectiveness of the sales force (Dewsnap and Jobber, 2002; Homburg e al., 2008). Future studies could integrate both perspectives, also looking outside the company and including in salespeople's networks relationships with external actors such as clients, and suppliers (Cron et al., 2005; Evans et al., 2012; Tuli et al., 2007; Weitz and Bradford, 1999).
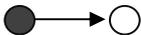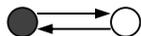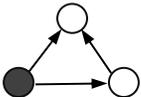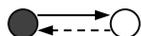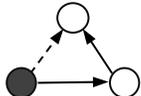
Reference List

Alder, P.& S.-W. Kwon (2002). Social capital: prospects for a new concept. *Academy of Management Review*. 27, 17-40.

Aldrich, H. (1979). *Organizations and environments*. Stanford University Press..

Anderson, E. & R.L. Oliver (1987). Perspectives on behavior-based versus outcome-based salesforce control systems. *Journal of Marketing*, 51(4), 76-88.

Avlonitis, G. & N. Panagopoulos (2010). Selling and sales management: An introduction to the special section and recommendations on advancing the sales research agenda. *Industrial Marketing Management*, 39(??), 1045-1048.

Baker, W. E. (1984). The social structure of a national securities market. *American journal of sociology*, 775-811.

Ball, S., Eckel, C., Grossman, P. & W. Zame (2001). Status is markets. Quarterly Journal of economics, 116(1), 161-188.

Bell, G. (2005). Clusters, networks, and firm innovativeness. *Strategic Management Journal*. 26, 287-295.

Blau, P. M. (1964). *Exchange and power in social life*. New Jersey: Transaction Publishers.

Borgatti, S. & P. Foster (2003). The network paradigm in organizational research: a review and typology. *Journal of Management*, 29, 91-1013.

Borgatti, S., Jones, C. and M. Everett (1998). Network measures of social capital. Connections, 21(2), 27-36.

Brass, D. & Burkhardt, M. (1993). Potential power and power use: An investigation of structure and behavior. *Academy of Management Journal*, 36, 440–470.

Brown, J., & P. Duguid (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization Science*, 2(1), 40–57.

Burt, R. (1983). *Corporate Profits and Cooptation*. New York: Academic Press.

Burt, R. (1992). *Structural holes: The social structure of competition*. Cambridge: Harvard University Press.

Burt, R. (2000). The network structure of social capital. Research in Organizational Behaviour, 22, 345-423.

Burt, R. S. (2005). *Brokerage and Closure: An Introduction to Social Capital: An Introduction to Social Capital*. Oxford: Oxford University Press.

Byrne, D (1971), *The Attraction Paradigm*. New York: Academic Press.

Cartwright, D., & F. Harary (1956). Structural balance: a generalization of Heider's theory. *Psychological review*, *63*(5), 277.

Checkley, M. & C. Steglich (2007), Partners in power: job mobility and dynamic deal-making, *European Management Review*, 4, 161–171.

Coleman, J. (1988). Social capital in the creation of human capital. American Journal of Sociology, 94, S95-S120.

Cron, W. L., Marshall, G. W., Singh, J., Spiro, R. L., & H. Sujan (2005). Salesperson selection, training, and development: Trends, implications, and research opportunities. *Journal of Personal Selling and Sales Management*, *25*(2), 124-136.

Cross, R., Liedtka, J. & L. Weiss (2005). A practical guide to social networks. *Harvard Business Review*. 83, 124-132.

Cross, R., Parker, A. & L. Sasson (2003). *Networks in the knowledge economy*. Oxford: oxford University Press.

Cross, R., & A. Parker (2004). *The hidden power of social networks: Understanding how work really gets done in organizations*. Harvard Business Press.

Davis, J.A. (1963). *Structural balance*, *mechanical* solidarity, and interpersonal relations. *American Journal of Sociology*. 68, 444-462

Dewsnap, B. & D. Jobber (2002). A social psychological model of relations between marketing and sales. *European Journal of Marketing*. 36(7/8), 874-894.

Doreian, P. & F. Stokman (1997). Evolution of social networks. Amsterdam: Gordon and Breach Publishers.

Dhanaraj, C., Lyles, M., Steensma, H. & L. Tihanui (2004). Managing tacit and explicit knowledge transfer in IJVs: the role of relational embeddedness and the impact on performance. *Journal of International Business Studies*, 35, 428-442.

Ellwardt, Lea, Christian Steglich & Rafael Wittek (2012), The co-evolution of gossip and friendship in workplace social networks, *Social Networks*, 34, 623– 633

Evans, K., McFarland, R., Dietz, B. & F. Jaramillo (2012). Advancing Sales performance research: a focus on five underresearched topic areas. *Journal of Personal Selling and Sales Management*, 32(1), 89-105.

Festinger, L. (1954). A theory of social comparison processes. *Human relations*, *7*(2), 117-140.

Fischer, C. (1982). Th*e dwell among friends*. Chicago: University of Chicago Press.

Freeman, L. C. (1978/1979). Centrality in social networks: Conceptual clarification. Social Networks, 1, 215-239.

Freeman, L. C. (1982). Centered graphs and the construction of ego networks. Mathematical Social Sciences, 3, 291-304.

Fritsch, M., & Kauffeld-Monz, M. (2010). The impact of network structure on knowledge transfer: an application of social network analysis in the context of regional innovation networks. *The Annals of Regional Science*, *44*(1), 21-38.

Galaskiewicz, J., & Marsden, P. V. (1978). Interorganizational resource networks: Formal patterns of overlap. *Social Science Research*, *7*(2), 89-107.

Gay, B., & Dousset, B. (2005). Innovation and network structural dynamics: Study of the alliance network of a major sector of the biotechnology industry. *Research policy*, *34*(10), 1457-1475.

Geiger, S. & P. Guenzi (2009). The sales function in the twenty-first century: Where are we and where do we go from here?. *European Journal of Marketing*, 43(7/8), 873-889.

Gonzalez, G. R., Claro, D. P., & Palmatier, R. W. (2014). Synergistic Effects of Relationship Managers' Social Networks on Sales Performance. *Journal of Marketing*, *78*(1), 76-94.

Gouldner, A. (1960). The norm of reciprocity: A preliminary statement. American Sociological Review, 25(2), 161-178.

Gulati, R., & M. Gargiulo (1999). Where do interorganizational networks come from? *American Journal of Sociology*, 104(5), 1439–1493.

Granovetter, M. S. 1983. The strength of weak ties: A network theory revisited. In P. V. Marsden & N. Lin (Eds.), *Social structure and network analysis* (pp.105-130). Beverly Hills, CA: Sage.

Granovetter, M. 1985. Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91(3), 481–510.

Hansen, M. T. (1999). The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative science quarterly*, *44*(1), 82-111.

Heider, F. (1958), *The Psychology on Interpersonal Relations*. New York: Wiley.

Hill, R. & R. Dunbar (2003). Social networks size in Humans. Human Nature, 14, 53-72.

Holland, P. & S. Leinhardt (1972). Some evidence on the transitivity of positive interpersonal sentiment. *American Journal of Sociology*, 77(6), 1205-1209.

Homburg, C., Jensen, O. & H. Krohmer (2008). Configurations of marketing and sales: A taxonomy. *Journal of Marketing*. 72, 133-154.

Iacobucci, D. & N. Hopkins, (1992). Modeling dyadic interactions and networks in marketing. Journal of Marketing Research, 29, 5-17.

Ingram, T. (2004). Future themes in sales and sales management: complexity, collaboration, and accountability. Journal of Marketing Theory and Practice, 12(4), 18-28.

Inkpen, A. C., & Tsang, E. W. (2005). Social capital, networks, and knowledge transfer. *Academy of management review*, *30*(1), 146-165.

Jin, E., Girvan, M. & M. Newman (2001). The structure of growing social networks Physical Review Letters E, 64(046132)

Jones, E., Brown, S.P., Zoltners, A.A. & B.A. Weitz (2005). The changing environment of selling and sales management. *Journal of Personal Selling & Sales Management,* vol. 25(2), 105–111.

Katz, L., & Powell, J. H. (1955). Measurement of the tendency toward reciprocation of choice. *Sociometry*, *18*(4), 403-409.

Krackhardt, D. & R. N. Stern (1988), Informal Network and Organizational Crises: An Experimental Simulation, *Social Psychology Quarterly*, 51 (2), 123-140.

Larson, A. (1992). Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative science quarterly*, 76-104.

Laumann, E. O., & Marsden, P. V. (1982). Microstructural analysis in interorganizational systems. *Social Networks*, 4(4), 329-348.

Lee, S., & P. Monge (2011). The coevolution of multiplex communication networks in organizational communities. *Journal of Communication*, *61*(4), 758-779.

Marwell, G., Oliver, P. E., & R. Prahl (1988). Social networks and collective action: A theory of the critical mass. III. *American Journal of Sociology*, 502-534

McPherson, M. & L. Smith-Lovin (1987). Homophily in Voluntary Organizations: Status Distance and the Composition of Face-to-Face Groups, *American Sociological Review*, 52 (3), 370-09.

McPherson, J., Popielarz, P. & S. Drobnic (1992). Social networks and organizational dynamics. *American Sociological Review*, 57, 153-170.

Monge, P. & N. Contractor (2003). *Theories of Communication Networks*. Oxford: Oxford University Press.

Ouchi, W. G. (1980). Markets, bureaucracies, and clans. *Administrative science quarterly*, 129-141.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organization: A resource dependence perspective*. NewYork: Harper and Row.

Plouffe, C., Sridharan, S. & D. Barclay (2010). Exploratory navigation and salesperson performance: Investigating selected antecedents and boundary conditions in high-technology and financial services contexts. *Industrial Marketing Management*. 3(4), 538-550.

Podolny, Joel M. & James N. Baron (1997), Relationships and Resources: Social Networks and Mobility in the Workplace, *American Sociological Review*, 62, 673-693.

Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative science quarterly*, *48*(2), 240-267.

Ripley, R. M., Snijders, T.A.B., Boda, Z. Voros, A. & P. Preciado (2013), *Manual for RSiena*. University of Oxford: Department of Statistics.

Scott, R. (2000). *Social Network Analysis: A handbook*. Second edition. London: Sage.

Skvoretz, J., & Agneessens, F. (2007). Reciprocity, multiplexity, and exchange: Measures. *Quality & quantity*, *41*(3), 341-357.

Snijders, T. (1996). Stochastic actor-oriented dynamic network analysis. *Journal of Mathematical Sociology*, 21, 149–172.

networks, with an application to employment preference, friendship, and advice. *Social Networks*, 35. 265– 276.

Snijders, T.A.B., van de Bunt, G.G. & C.E.G. Steglich (2010), Introduction to stochastic actor-based models for network dynamics, *Social Networks*, 32, 44–60.

Steward, M., Walker, B., Hutt, M. & A. Kumar (2010). The coordination strategies of high performing salespeople: Internal working relationships that drive success. *Journal of the Academy of Marketing Science*, 38, 550-566.

Tang, F., Mu, J., & MacLachlan, D. L. (2008). Implication of network size and structure on organizations' knowledge transfer. *Expert Systems with Applications*, *34*(2), 1109-1114.

Tichy, N. M., Tushman, M. L., & Fombrun, C. (1979). Social network analysis for organizations. *Academy of management review*, 4(4), 507-519.

Tuli, K. R., Kohli, A. K., & S. G. Bharadwaj (2007). Rethinking customer solutions: from product bundles to relational processes. *Journal of Marketing*, 1-17.

Üstüner, T. & D. Iacobucci (2012). Does intraorganizational network embeddeddness improve salespeople's effectiveness? A task contingency perspective. *Journal of Personal Selling and Sales Management*, 32(2), 187-205.

Üstüner, T. & D. Godes (2006). Better sales networks. *Harvard Business Review*, July-August, 1-11.

Uzzi, B. 1996. The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *American Sociological Review*, 61: 674–698.

van de Bulte, C. & S. Wuyts (2007). *Social networks and marketing*. Relevant knowledge series. Advancing the Science of World Class Marketing. Cambridge, Massachusetts: Marketing Science Institute.

van Wijk, R., Jansen, J., & M. Lyles (2008). Inter- and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies*, 45(4), 830-853.

Wasserman, S. & K. Faust (1994). *Social network analysis: Methods and applications*. Cambridge: Cambridge University Press.

Weitz, B. A., & K. D. Bradford (1999). Personal selling and sales management: a relationship marketing perspective. *Journal of the Academy of Marketing Science*, *27*(2), 241-254.

Williams, B. & C. Plouffe (2007). Accessing the evolution of sales knowledge: A 20-year content analysis. *Industrial Marketing Management*, 36(??), 408-419.

Table 1: Description of Constructs

Variable	Network design	Definition
Salesperson Ego Network		
Direct out ties		Sales person´s tendency to create direct ties in a network (e.g. working related & social related).
Reciprocity		Preference for mutual ties between sales person and her contact in a network.
Homophily		Tendency to create ties with salespeople that perform similarly
Overall Network Effect		
Transitivity		Sales person´s preference for creating ties with her contacts´ contacts in a network.
Effects Across Networks		
Overlapping reciprocity		Creating ties in network A (e.g. social) by a sales person that is reciprocated by her contact in network B (e.g. work related).
Overlapping Transitivity		Creating ties with sales person´s contacts´ contacts in another network.
Performance nature of Contacts		
Sales Lower		Tendency to create ties with lower performers salespeople.

Note: Ego salesperson is filled circles and her contacts are white circles. Dashed lines represent ties in a different network. Adapted from Ripley et al. (2013).

Table 2: Results of Dynamic Actor-Oriented Model (RSiena Models)

Variable	Hypothesis	Predicted effect	Estimated parameter	Estimated t-ratios
Salesperson Ego Network				
Direct (out) ties$_{friendship}$	H$_{1a}$	(-)	**- 2.21 (7.36)*****	0.049
Direct (out) ties$_{work\ related}$	H$_{1b}$	(-)	**- 1.81 (6.73)*****	0.028
Reciprocity$_{friendship}$	H$_{2a}$	(+)	**1.27 (2.13)****	0.041
Reciprocity$_{work\ related}$	H$_{2b}$	(+)	- 0.69 (1.18)	0.014
Homophily Friendship Ties	H$_{3a}$	(+)	0.06 (0.08)	0.065
Work Related Ties to non-similar Performers	H$_{3b}$	(+/-)	**.96 (1.18)***	0.007
Overall Network Effect				
Transitivity$_{friendship}$	H$_{4a}$	(+)	**1.30 (2.78)****	0.042
Transitivity$_{work\ related}$	H$_{4b}$	(+)	**1.43 (3.61)*****	0.026
Effects Across Networks				
Reciprocity Overlapping $_{friendship\ \leftarrow\ work\ related}$	H$_{5a}$	(+)	0.73 (1.04)	0.050
Reciprocity Overlapping $_{work\ related\ \leftarrow\ friendship}$	H$_{5b}$	(+)	**1.08 (1.87)***	0.079
Transitivity Overlapping $_{friendship\ \leftarrow\ work\ related}$	H$_{6a}$	(+)	- 0.36 (0.75)	0.095
Transitivity Overlapping $_{work\ related\ \leftarrow\ friendship}$	H$_{6b}$	(+)	- 0.32 (0.86)	0.009
Control Variables				
Tendency to Change in Friendship Ties (Period 1)		(+)	**3.55 (3.78)*****	0.029
Tendency to Change of Friendship Ties (Period 2)		(+)	**2.75 (3.94)*****	0.097
Tendency to Change of Work Related Ties (Period 1)		(+)	**2.73 (3.44)*****	0.007
Tendency to Change of Work Related Ties (Period 2)		(+)	**2.56 (2.83)*****	0.036
Tendency to Change Sales (Period 1) (,000)		(+)	**0.53 (7.65)*****	0.017
Tendency to Change Sales (Period 2) (,000)		(+)	**0.51 (11.48)*****	0.065
Friendship Ties to non-similar Performers		(ns)	**1.16 (2.01)****	0.066
Homophily Work Related Ties		(ns)	0.21 (0.31)	0.029

Notes: Estimated parameters are reported with |t-value| in parentheses. Good convergence is indicated when |t-ratio| for deviations from target is below 0.1. *p < .10, **p < .05. ***p < .01. Two-tailed signficance tests were used (df=23). (ns): predicted not significant coeficient.