DENSITY IN AFFECTIVE AND INSTRUMENTAL TIES: ANALYZING THE CONTINGENCIES OF TIE CONTENT ON TEAM PERFORMANCE

Supervisor: Filipe Sobral

Rio de Janeiro
2016
JOSMARY KAROLINE DEMKO ALVES

DENSITY IN AFFECTIVE AND INSTRUMENTAL TIES: ANALYZING THE CONTINGENCIES OF TIE CONTENT ON TEAM PERFORMANCE.

Dissertação apresentada ao Curso de Mestrado em Administração da Escola Brasileira de Administração Pública e de Empresas para obtenção do grau de Mestre em Administração.

Data da defesa: 29/08/2016

ASSINATURA DOS MEMBROS DA BANCA EXAMINADORA

Filipe João Bera de Azevedo Sobral
Orientador (a)

Ishani Aggarwal

Denise Medeiros Ribeiro Salles
Alves, Josmary Karoline Demko
Density in affective and instrumental ties: analyzing the contingencies of tie content on team performance / Josmary Karoline Demko Alves. – 2016.
43 f.

Dissertação (mestrado) - Escola Brasileira de Administração Pública e de Empresas, Centro de Formação Acadêmica e Pesquisa.
Orientador: Filipe Sobral.
Inclui bibliografia.


CDD – 658.4036
INDEX

1 INTRODUCTION ........................................................................................................ 6
2 SOCIAL NETWORK THEORY .................................................................................. 8
3 DENSITY AND GROUP PERFORMANCE .................................................................. 10
4 CONTINGENCY FACTORS ...................................................................................... 13
5 METHOD .................................................................................................................. 17
  5.1 Data Collection – Research Setting, Procedure, and Sample ............................ 17
  5.2 Measures ............................................................................................................. 19
6 RESULTS .................................................................................................................. 22
  6.1 Preliminary Analysis............................................................................................. 22
  6.2 Hypothesis testing ............................................................................................... 25
7 DISCUSSION .............................................................................................................. 28
8 CONCLUSION ............................................................................................................ 31
  8.1 Theoretical and Methodological Contributions .................................................. 32
  8.2 Limitations ........................................................................................................... 33
  8.3 Practical Implications ......................................................................................... 34
References .................................................................................................................... 34
APPENDIX ................................................................................................................... 40
  Appendix A – Questionnaire ..................................................................................... 40
TABLES

Table 1 - Decomposition of Variance: Fully Unconditional Model ........................................24
Table 2 - Descriptive Statistics and Correlations .................................................................24
Table 3 - Model 1: Main effects .........................................................................................25
Table 4 - Model 2: Task Interdependence ..........................................................................26
Table 5 - Model 3: Power Distance ....................................................................................27
Abstract

Social structures influence team effectiveness. The purpose of this study is to explore the contingencies effects of this relationship by investigating density in distinct network contents on team performance. We first hypothesized opposite direct effects for instrumental and affective density on team performance; then we further argue that task interdependence and power distance orientation act as moderators. To test our hypotheses we use survey data from 27 Emergency and Care Units and 106 teams. The results support the positive effect of instrumental density and the negative impact of affective density. Moreover, task interdependence was found to attenuate both main relationships. We discuss the implications of these findings for research on network density and team performance.

Keywords: Social network theory, tie content, group density, team performance.
1 INTRODUCTION

Social relationships create important advantages and powerful sources of information and control, aspects highly related to group outcomes (Morrison, 2002; Podolny & Baron, 1997). In this context, our purpose is to extend this literature by exploring how social structure influence team effectiveness in different conditions. To investigate the effects of social relationships we rely on social network theory. The social network approach studies the importance of social structures and social capital by highlighting interpersonal relationships between actors, rather than the actors’ attributes (Wellman & Hampton, 1999).

This study has four main contributions; the first is directly related to the legitimation of social network theory within group studies. According to Borgatti and Foster (2003), a rational strategy for gaining legitimacy is to show that network variables have consequences for important outcome variables that traditional fields already care about. Therefore, examining the direct and indirect ties between group members will contribute to meet demand of several researchers that have attempted to understand the factors contributing to team effectiveness (Kozlowski & Bell, 2003).

Secondly, the studies that investigate the effects between network variables on team level outcomes tend to focus on individual ego networks and neglect the larger context of constraints and content within which such networks are embedded (Fernandez & Gould, 1994). Hence, our purpose is to explore the linkage between network density content and performance adding contextual variables and considering the whole network.

One of the widely used network-level structural feature is network density. Network density captures the degree of connectivity within a network and is measured by the ratio of the number of actual ties in a network divided by the number of all possible ties (Wasserman & Faust, 1994). Although several authors have discussed the effects of network density and its outcomes, the consensus is yet to be reached. While some researchers have found a positive association between network density and team performance (Reagans & Zuckerman, 2001), others argue that the relationship is inverse and U-shaped (Oh et al., 2004; Chidambaram & Tung, 2005). In addition, for large teams and relatively complex tasks a negative association between density and performance was found (Balkundi & Harrison, 2006).
The lack of agreement among the effects of network density leads to our third contribution, which aims to understand the network density for different types of tie content. Hoppe and Reinelt (2010) stated that comparative network studies could significantly strengthen our understanding of how networks evolve, function in different contexts, and how they contribute to achieving desired development outcomes. Furthermore, since Mehra et al (2006) have provided compelling evidence that the content of relationships can influence group’s performance, commitment, and satisfaction, we investigate the density of two different types of ties on group performance: instrumental and affective ties.

According to Zohar and Gazzit (2008), in an instrumental network, density indicates the proportion of actors participating in work-related exchanges, sharing the same information; in an affective network, density indicates the extent to which actors establish direct personal relationships, comparing themselves to each other.

Instrumental and affective ties reflect distinct patterns of interaction that can exercise different kinds of social influence and although they frequently overlap in organizations, they perform distinct functions (Gibbons, 2004). An instrumental network indicates the patterns of advice seeking among individuals in the organization on work-related matters, in which individuals share resources such as information, assistance, and guidance related to their work (Venkataramani et al, 2010). On the other hand, affective networks involve expressions of personal affect, social support, and a sense of identity and personal belongingness (Gibbons, 2004). Thus, individuals depend on friends for counseling and companionship (Krackhardt & Stern, 1988).

The effects of those different types of tie content have been explored by different scholars (Hansen, 1999; Lester, Meglino, & Korsgaard, 2002; Gibbons, 2004; Reagans, Zuckerman, & McEvily, 2004), however, another strength of our mode lies in the fact that we do not aggregate those different kinds of relations. Rather, we adopt a point of view that quite different networks exist simultaneously within the same organization, and that these different networks may have unique causes and consequences in the attributes and behaviors of their members (Rulke & Galaskiewicz, 2000).

Taking into account that network effects are goal-specific and structural advantage may vary depending on the particular situation (Podolny & Baron, 1997; Burt, 2005), we will comply
with the suggestion of Balkundi and Kilduff (2006) that the advantages and disadvantages of network content strategies deserve further research into their effects across a range of situations. To corroborate, Adler and Kwon (2002) advocated that factors that some researchers treat as moderating contingencies will appear as sources in other accounts, thus debate over such issues is inevitable and healthy. Hence, this study includes two moderators that are highly explored in groups’ literature: task interdependence and power distance orientation. The belief is that under these different conditions, network content will lead to distinct effects on team performance.

2 SOCIAL NETWORK THEORY

Some scholars have been noticing that social relations can play an important role in teamwork. Thus, concepts from social network theory have been added to the study of work satisfaction, performance, and power (Yang & Tang, 2004). A network is a set of actors connected by a set of ties. The actors – “nodes” – can be persons, teams, organizations, etc. Ties connect pairs of actors and can be directed or undirected; it can be measured dichotomously (i.e present or absent), as in whether two people are friends or not, or valued, measured on a scale, as in strength of friendship (Borgatti & Foster, 2003).

The boom in network research is part of a general shift, which began in the second half of the 20th century. Specifically, away from individualist, essentialist, and atomistic explanations toward more relational, contextual, and systemic understanding of the phenomenon (Borgatti & Foster, 2003). Social relations are different from individual attributes because, unlike an individual attribute such as a person’s age, a relationship involves more than a single individual. In fact, the individual’s social ties are embedded in larger social networks and may have implications beyond the individual level (Balkundi, Barsness, & Michel, 2009).

There is no single or all-encompassing social network theory (Kilduff & Tsai, 2003). However, some scholars used the direction of causality in their theoretical models to define two broad classes of network studies. First, they focus on recognizing the outcomes and consequences of networks for actors, called social capital research by Carpenter et al (2011). On the other hand, there are those that focus on the use of networks constructs to serve as predictors, called network development research. Borgatti and Halgin (2011) also use the same distinction but they use network theory to nominated the studies about the consequences
of network variables and *theory of networks* for the processes that determine why networks have the structures they do—the antecedents of network properties.

This paper investigates the mechanisms of network structures that yield certain outcomes for individuals and groups, where social capital plays an important role. Social capital reflects the instrumental utility and beneficial consequences of a social network to its participants (Burt, 1982; Lin, 2001; Carpenter et al, 2011), such as power, influence, and enhanced performance.

Ibarra, Kilduff, and Tsai (2005) distinguish between two types of social capital: communal and individual social capital. The former is understood as benefits that accrue to the collectivity as a result of the maintenance of positive relations between different groups, organization units, or hierarchical levels. The later refers to the benefits that accrue from individual network connections. In this teamwork study, the communal social capital will be examined.

While focusing on the social capital research, Borgatti and Foster (2003) developed a framework of two dimensions (network explanatory mechanisms and explanatory goals) and constructed a 2-by-2 table cross-classifying studies of network consequences. The explanatory goals are divided as follows: social capital studies seek to explain variation in success (i.e., performance or reward) as a function of social ties, whereas diffusion and social influence studies seek to explain homogeneity in actor attitudes, beliefs and practices, also as a function of social ties (Borgatti & Foster, 2003).

The explanatory mechanisms are understood as structuralist and connectionist. According to Borgatti and Foster (2003), the first focuses on the structure or configuration of ties; it is a structural, topological approach that highlights the patterns of interconnection. In the other, the focus is on the resources that flow through social ties. In line with the connectionist approach, Marin and Wellman (2011) use four instruments through which the parts can flow the resources: transmission, adaptation, binding, and exclusion. In this research, we attempt to explore the transmission by spotting networks as pipelines through which many things flow: information, social support, norms, workplace identities, knowledge. The resources that will be transmitted depend on the content of the tie which is discussed in the next section.
Further, a pioneer work of Tishy et al (1979), which helped to explore network characteristics as explanatory mechanisms, identified three sets of network properties. Specifically, the transactional content analyzes what is exchanged by the social objects, and four types can be distinguished: exchange of affect (liking, friendship), exchange of influence or power, exchange of information, and exchange of goods or services. The nature of the links refers to the strength and qualitative nature of the relation between two social objects, those can be intensity, reciprocity, clarity of expectations, and multiplexity. Finally, the structural characteristics refer to the overall pattern of relationships between the system's actors. For instance, clustering, network density, and the existence of special nodes in the network are all structural characteristics.

We research two structure constructs, which some scholars have suggested to be essential: cohesion and position (Burt, 2005; Gargiulo & Benassi, 2000). Cohesion is usually measures in the dyadic or group level and the main features are density – connectivity within the group and closeness – nearness of all network members (Carpenter et al, 2011). Position is measured in the individual level; the main features are centrality – the extent to which an actor is the center of a network and constraint – the extent to which an actor’s contact are redundant and lack structural holes (Carpenter et al, 2011).

For this study, we focus on the social capital research, using density as the structural property and the content of affective and instrumental ties to predict group performance.

3 DENSITY AND GROUP PERFORMANCE

Density can be understood as a group-level variable defining social proximity in terms of the number, length, and strength of paths connecting actors in a social network (Balkundi & Harrison, 2006). Density is analogous to the mean number of ties per group member. The more ties each group member enjoys with other group members, the greater the density of the network (Sparrowe et al, 2001).

The positive impact of network density on team performance has been advocated by several scholars. For Balkundi and Harrison (2006), denser teams have higher levels of information sharing which enable the task completion success. Teams in which many members have ties to one another make easier for the provider to transfer knowledge to the acquirer (Reagans &
McEvily, 2003). More specifically, Obstfeld (2005) stated that dense networks present the optimal conditions for the exchange of the complex information, which have a stronger impact on team outcomes.

Colazo (2000) corroborates that denser teams expend less effort in finding and using information given the high level of communication and access to more resources to accomplish their tasks. Teams with high density also tend to have fewer coordination problems, given that they use direct ties to transmit information and direct ties require less effort to convey information, which enhances productivity (Colazo, 2000).

Organizations are transitive knowledge systems in which the bulk of knowledge is in individuals’ heads (Wegner, 1987). To use this knowledge in the solution of problems and the creation of new knowledge, organizational members must know who knows what, and interact with each other in order to use and combine knowledge (Cross, 2000). That is why high level of information sharing, greater access to resources and fewer coordination problems are the main contribution of density to group performance.

In sum, in this study we consider that teams with higher density have characteristics that promote better performance. However, the purpose of this study is not to discuss the effects of teams with high or low density, but to explore the content of dense ties. That is, highly dense teams which share instrumental and affective ties.

Instrumental ties are largely formed in response to actors’ demands for information and knowledge (Balkundi, Barsness, & Michel, 2009). The tie content is the transmission of job-related information. Gibbons (2004) stated that an organization’s internal network of professional relations develops over time as people seek information, advice, and opportunities for problem solving among their colleagues. Social interactions may be fostered at first by proximity (Locke et al, 1981), similarity between tasks, or by formal lines of communication (Carley, 1991).

More specifically, Cross (2000) found that in instrumental ties, members tend to provide solutions, meta-knowledge, problem reformulation, validation, and legitimation. In an instrumental network, density indicates the proportion of actors participating in work-related exchanges.
In instrumental networks, team members are prone to benefit from a stronger sense of accountability and greater agreement on expectations (Sparrowe et al, 2001). This context indicates more discussions about work-related problems, which inflates the continuous improvement and in turn enhances group performance. In addition, instrumental ties encourage norm-supporting interactions, which create a safer environment for exchanges, facilitating the enforcement of cooperative interactions (Morrison, 2002; Gargiulo, 2009). Moreover, the more collaborative interaction, the higher the task mastery and performance. This leads to our first hypothesis:

**Hypothesis 1a: Density of ties in a team's instrumental social network is positively related to team performance.**

On the other hand, affective ties are largely formed on the basis of similarities between employees (Balkundi, Barsness, & Michel, 2009). Afterwards affective ties develop over time through shared experiences, frequent interaction, and growing affection (Gibbons, 2004). They are voluntary, egalitarian, trusting, and enduring (Krackhardt & Kilduff, 1990). In an affective network, density indicates the extent to which actors establish direct personal relationships (Zohar & Gazzit, 2008).

Even though the level of emotional attachment or commitment to the relationship is also important because it affects the motivation to provide assistance or support (Morrison, 2002), process losses are more likely to occur in affective ties, because individuals must spend time and effort on maintaining ties (Balkundi & Harrison, 2006). Furthermore, given the familiarity between members, they may start to divert each other from work-related duties and enjoy themselves by discussing non-work related matters (Paulus & Dzindolet, 1993). In addition, during the socialization, they can indulge in activities that might take them away from the task at hand (Balkundi & Harrison, 2006).

In addition to this process, affective ties might constrain individual group members’ contacts with diverse others outside and restrict access to the more diverse resources available beyond the closed group (Oh et al, 2004). Moreover, the rigidity can go so far that no critical evaluation of each other’s ideas takes place anymore and groupthinking emerges (Paulus & Dzindolet, 1993). Since members develop conformity, sharing only acceptable and attitude-
reinforcing information, it constrains access to valued resources which negatively impacts group performance (Sparrowe et al, 2001). Moreover, we hypothesize that:

_Hypothesis 1b: Density of ties in a team's affective social network is negatively related to team performance._

### 4 CONTINGENCY FACTORS

Network effects are goal-specific and structural advantage may vary depending on the particular situation (Podolny & Baron, 1997; Burt, 2005), because of that, in this study we also explore the contingencies of tie content with two variables with high impact on team outcomes: task interdependence and power distance orientation. We chose those moderators given the study of Burke et al. (2006), where they stated that team performance outcomes are highly influenced by two types of behaviors: those dealing with task accomplishment (task-focused) and behaviors which facilitate team interaction and/or development (person-focused).

Regarding task-focused behaviors, we found that task interdependence is an important job attribute with significant motivating potential for interaction (Kozlowski & Bell, 2003). Therefore, we acknowledged task interdependence as a defining characteristic of teams and an important contingency condition. On the other hand, regarding person-focused behaviors, we understand the role of interpersonal distance in organizations is fundamental to our comprehension of workplace dynamics (Javidan et al., 2006). Thus, we study power distance orientation, given its influence on shaping beliefs about what behaviors, styles, skills, and personality traits are required for group interaction.

According to Burke et al. (2006), task interdependence is the degree to which team members must depend upon one another to perform their tasks in route to goal accomplishment. For Van de Ven et al (1976), task interdependence is defined as the workflow interconnectedness of unit personnel in performing their individual jobs and they propose three workflows to represent the degree of task interdependence: (1) Independent workflow, where work and activities are performed by your immediate subordinates independently and do not flow between them. (2) Sequential workflow, where work and activities flow between your
immediate subordinates, but only in one direction. (3) Reciprocal workflow, where work and activities flow between your immediate subordinates in a reciprocal "back and forth" manner.

In levels of high task interdependence, group members seek for material support and expertise, they are more exposed to be influenced by others (Vidyarthi, Anand, & Liden, 2014). Furthermore, task interdependence requires the accuracy of individual and group cognition about who knows what (Balkundi & Harrison, 2006). Given this, we advocate that the condition of high task interdependence will accentuate the positive mechanisms of instrumental ties on team performance, such as the work-related exchanges, cognitive trust, and the belief that the others have the ability and competence to provide help (Ho, 2005; McAllister, 1995).

Jehn et al (1999) also emphasize the demand for coordinated interaction among the group members in context of high task interdependence. Moreover, when task interdependence is high, the group will interact using the roadmap for accessing and utilizing members' expertise of instrumental ties (Bunderson, 2003). The more the members involved interact, the more pieces of non-redundant information are likely to be shared, which increases the result of the group performance, leading to our following hypothesis:

Hypothesis 2a: High task interdependence will further increase the positive relationship between instrumental ties and team performance.

The impact of task interdependence on affective ties and team performance can be hypothesized through the mechanism of social loafing, that is, individuals tend to expend less effort when working collectively than when working individually. Sparrowe et al (2001) argue that affective ties tend to enhance the occurrence of social loafing, given that affect-laden ties create a high level of dependency in which the less motivated members tend to trust and delegate the activities to their friends or colleagues that they share emotional bonds with.

When task interdependence is high, individuals believe that their effort is indistinguishable from the effort put forth by their coworkers, and may feel that it is best to reduce effort given that opportunities for personal accomplishment are not forthcoming (Liden et al, 2004). On the other hand, when task interdependence is low, individuals believe their effort can be isolated from the effort put forth by others, and thus feel that increased recognition for one’s
work makes it worth expending effort (Liden et al, 2004). Taking this into account we can predict that task interdependence will trigger negative effects for affective ties on team outcomes, due to the tendency of members to reduce efforts during the tasks.

In addition, combining task interdependence that requires higher levels of interactions between members and affective ties that emphasize the need for socialization and the indulgence of members in activities that might take them away from the task at hand, the group is inclined to blur out from the work activities, which reduces productivity and impacts the performance negatively. Thus, we hypothesized that:

**Hypothesis 2b: High task interdependence will further increase the negative relationship between affective ties and team performance**

The second variable hypothesized that may influence the relationship between network density and performance is power distance. According to Hofstede et al (1991), power distance is understood as a cultural dimension at societal level, however several scholars have examined power distance orientation at group levels (Gibson & Saxton, 2005; Kirkman & Shapiro, 2001; Schaubroek, Lam, & Cha, 2007). The construct is described as the extent to which people expect and accept that power is distributed unequally among persons and across different levels of the organizational hierarchy (Kirkman & Shapiro, 2001). For this study, we will treat power distance as the group-level variable.

Those with a high power distance orientation tend to behave submissively around managers, avoid disagreements, and believe that bypassing their bosses is an act of insubordination (Hofstede et al, 1991). In low power distance orientations, in contrast, members have little concern for titles, status, and formality; and are comfortable accepting higher levels of responsibility and autonomy (Adler & Kwon, 2002).

The most significant characteristic of instrumental ties is that they are channels of work-related advice and relevant information to task completion (Nebus, 2006). However, in a context of high power distance orientation, contact and communication is inhibited (Kirkman et al, 2009). Therefore, the transmission of solutions, meta-knowledge, problem reformulation, validation, and legitimation are damaged, affecting group outcomes.
The beliefs that leaders deserve respect and deference, are superior, and are elite; the acceptance of one’s decision-making limitations while trusting that leaders provide more reliable decisions (Javidan et al., 2006) of high power distance orientation go against the characteristics of instrumental ties which imply discussing work-related problems (Ibarra, 1993). Furthermore, the association of power distance and instrumental ties can be harmful for team performance, given that power distance obstructs the positive effects of informational exchanges, resulting in our fifth hypothesis:

**Hypothesis 3a:** High power distance will reduce the relationship between instrumental ties and team performance.

We predicted that affective ties impact team performance negatively due to the propensity to divert each other from work-related duties and enjoy themselves by discussing non-work related matters. However, high power distance orientation can create order and control over the team, which will enhance team performance. This effect can occur since hierarchical asymmetry and task-related dependence is balanced by the increased emotional investment of affective ties. When members face high power distance with their superior, affective bonds create incentives for the investment of time and energy in order to help others (Gargiulo, 2009). Also, members tend to tolerate the status difference by showing respect, which facilitates the group coordination in order to achieve task performance (Vidyarthi, Anand, & Liden, 2014).

In addition, high power distance can rupture the rigidity imposed by affective ties, given that in this condition members are motivated to behave in ways that benefit their leaders and their organization as a whole (Kirkman et al., 2009). Moreover, members are more prone to change their behaviors due to the bounded solidarity and stronger reciprocity norms (Oh et al., 2004). To sum up, bearing in mind that power distance can weaken the negative effects of affective ties on team performance, we state that:

**Hypothesis 3b:** High power distance will mitigate the negative effect of affective ties on team performance.

Finally, Gibbons (2004) stated that affective and instrumental networks emerge through different kinds of interactions, represent dissimilar relations, and serve diverse purposes, yet
these networks overlap in an organization because many of the same people participate in both. Subsequently, the interesting contribution of this paper consists of the identification of specific contingencies that trigger different effects and examine the specific mechanisms through which contradictory effects operate. Therefore, hypotheses englobing task interdependence and power distance orientation were developed and they are better presented in the Figure 1:

![Figure 1 – Hypotheses](image)

### 5 METHOD

#### 5.1 Data Collection – Research Setting, Procedure, and Sample

The research setting were 27 Emergency and Care Units (Unidades de Pronto Atendimento - UPA). Emergency Care Units are 24/7 service that handles much of the urgent cases and emergencies, such as hypertension and high fever, fractures, cuts, heart attacks, and strokes. This service helps to reduce the queues at the hospital emergency departments. UPAs have evolved and now offer simplified medical structure with X-ray, electrocardiography, pediatrics, laboratory tests, and observation beds. When a patient comes to the unit, nurses perform first aid, and then pass the patient to doctors who take over and specify the diagnosis. Subsequently, it is determined whether to refer the patient to a hospital or keep them under observation for 24 hours.

To verify if the research setting was suitable for our research question we conducted interviews with three UPAs coordinators. The aim was to understand mainly the configuration of teams and the dynamic between leaders and followers. We chose to undertake the study with all the professionals of the nursing team, considering each shift as one team. All teams were of roughly comparable gender and age diversity, and each team was headed by a formal
team leader. Team members worked together, offering health support for the community in cooperation with the state.

We aimed to use all 29 UPAs of the State, however, one of them was passing through a management change and the other one was used in the pilot study. During May of 2015 we conducted the research with nurses from one UPA. The purpose was to verify the understanding of questions and filling time. Considering the results we only made minor adjustments.

Data were collected for this study from June to October of 2015 in the employees’ daily working hours. We printed the questionnaires and to each UPA we delivered one package containing the questionnaires separated by shift. We gathered more than 40 UPA’s coordinators in a meeting to present the study, explain the data collection procedure, and deliver packages with questionnaires and instructions. Afterwards, each coordinator was in charge of applying the research with their shifts and then after a period of time we collected the completed questionnaires. Each respondent had to complete the survey individually and then seal their answers in an envelope and return it directly to the shifts’ folder.

The survey took 10–15 min to complete, and included a cover letter describing the purpose of the study and ensuring group members of their anonymity. In addition to the letter, the survey had two and three sections for leaders and followers, respectively. For leaders, the sections were the network data and demographic items. For followers, in the first section, participants were asked to report on task interdependence and perceived power distance. The second section included the network data. The final section contained demographic items. The questionnaires are available in Appendix A.

In total we received 2,015 responses from 154 teams. We decided to drop the teams considering the following criteria: (1) shifts that do not have a formally designated leader; (2) teams with less than 3 respondents per shift; (3) the leader did not answer the questionnaire; (4) response rate of the network data was less than 50% of the shift members. After disregarding those shifts, we remain with 106 valid teams and 1,396 answers.
5.2 Measures

To test our predictions, we gathered data from multiple different sources. We collected network data, team task interdependence, and power distance using the survey instrument described in the previous section. For team performance, we distributed surveys to the patients of the UPAs to collect the user’s satisfaction with the service provided by the nursing team. We also obtained demographic data from the human resources department. The use of multiple individual responses and multiple data sources in constructing the network variables means that response bias does not affect the test of the network hypotheses.

The questionnaire items and scales were translated into Portuguese and subjected to careful validity checks using back-translations by a Brazilian fluent English speaker independent of the research team.

Network Data. Network analysis relies heavily on sociometric data. According to Tishy et al (1979), sociometry is a method for ascerting the relationship between units. The degree (often merely the presence or absence of a relation) to which each unit is related to all other units is mapped. When the relationships between all units are mapped, a graph or sociogram displays the network of relationships.

Due to the fact that measures at the network level are affected by network boundaries (e.g., network size), it is extremely important to choose an appropriate boundary specification strategy. We used one of the Laumann’s et al. (1992) strategies for boundary specification in network studies, the realist strategy, where the investigator adopts the presumed vantage point of the actors themselves in defining the boundaries of social entities. In addition, Laumann et al (1992) detailed four definitional foci for delimiting actors within a network. We used the relationship based one, in which the boundary is identified by socially recognized and defined relationships.

To operationalize the chosen network boundary strategy, we used the interaction method of data collection as defined by Tishy et al (1979). In this approach, individuals are asked to report their interactions or influence attempts over the period studied and for particular content areas. With these data, interaction nets relations can then be determined. Furthermore, we used a network questionnaire containing two name-generating items that asked
participants to identify key contacts from their workplace. We use the approach where a sample of individuals is asked to name their contacts for each question. To aid the respondents, we provided a list of nurses working in the same shift to enhance recall and improve accuracy and reliability (Perry-Smith, 2006).

In network studies, measurement error is a prominent source of endogeneity. Measurement error arises from the discrepancy between the true score or value of a concept and the observed value of that concept (Wooldridge, 2002). Holland and Leinhardt (1977) noted that network studies in which respondents are required to nominate a fixed number of others may inevitably introduce measurement error. Therefore, in the name generating questions we allow for the respondents to mention the quantity of names that they want. Respondents also could list the same individual in response to the different name-generating items.

The specific items presented to participants were:

- **Instrumental ties** – Name the people with whom you discuss what is going on in the organization and whom you approach if you have a work-related problem;
- **Affective ties** – Name the people whom you view as allies and with whom you discuss non work-related problems.

Answers to these two questions provided the raw data used to derive tie content indicator. Even though multi-item scales are preferable, such scales are difficult to administer in social networks research due to time- and fatigue-related concerns. Marsden’s (1990) conclusion emphasizes that network indexes are largely reliable when measures are taken to facilitate individuals' capacity to recall and report their network links accurately, thus multi-item scale requires time and cognitive effort that can result in lower response rates and more error in our data (Zagenczyk et al, 2010). Moreover, when using single-item measures, Sackett and Larson (1990) suggest that researchers should provide unambiguous, focused information in the question, thus we opted for single-item scales.

Questions were also constructed to elicit thinking about typical patterns of interactions. It has been shown that although people's recall of interactions within a highly circumscribed period of time, such as one day, are largely inaccurate, people are remarkably accurate in reporting their typical patterns of relations (Ibarra, 1993).
For the network data, we created two asymmetric binary matrixes for each ward, which resulted in 308 matrices (one for instrumental ties and other for affective ties). Each cell \( X_{ij} \) corresponded to i’s relation to j as reported by i. If i reported j as a friend then the cell \( X_{ij} \) was coded as 1, otherwise the cell was coded as 0. We did not symmetrize relations: the distinction between being the source and the object of a relation was preserved (Burt, 1982). Many relationships, particularly those to which advice and influence are central, are not inherently symmetrical; even intimate relationships such as friendship may be asymmetrical since conceptions of closeness vary across individuals (Krackhardt & Kilduff, 1990; Marsden, 1990).

**Team Density.** To assess team density for each tie content, we calculated the density degree of each matrix using UCINET 6 (Borgatti et al. 2002). Density is perhaps the most common way to index network structure as a whole; it reflects the level of interrelatedness, or reticulation, among all possible social ties (Scott, 2000). It is measured by the ratio of the number of ties present to the maximum number of ties theoretically possible for a given team size. We separately computed the overall density of the asymmetric instrumental and affective networks between all members of that group. Density can vary from a minimum of 0 to a maximum of 1, where 1 represents a highly dense team.

**Task Interdependence.** Van de Ven, Delbecq, and Koenig's (1976) workflow of task interdependence scale was used. In this study, we provided diagrams describing three dynamics of how tasks are done within a work unit. Respondents indicated which one of the diagrams is more similar to the real workflow they are embedded. After that, it was used the 3 items of Likert-style questions on task interdependence from Van Der Vegt, Emans, and Van de Vliert (2001). Examples: I have to obtain information and advice from my colleagues in order to complete my work and I rarely have to check or work with others – reverse coded. The scale range from from 1 “strongly disagree” to 5 “strongly agree”. Since the diagram question has a scale of 3 points and the likert-questions has a scale of 5 points we need to adjust the score. Thus, during the tabulation we code the first diagram as point 1, the second as a point 3 and the third diagram as point 5.

**Power Distance.** To measure how followers perceive power distance related to leaders, an eleven-item individual-level measure taken from Brockner et al (2001) was used. Likert-type scales range from 1 which represents “strongly disagree” and 5 represents “strongly agree”.
Sample of items are: Even if an employee may feel he deserves a salary increase, it would be disrespectful to ask his supervisor for it and Communications with superiors should always be done using formally established procedures.

**Team Performance.** We measured team performance objectively by assessing the satisfaction of the patients and users of the UPAs service thought a questionnaire created specifically for this study. We hired independent researchers to go to all UPAs and apply the survey. They collected data in person with the patients and users in each shift of 8 hours, every day of the week, during 40 days. In total, we collected 3.124 questionnaires, having on average 21 answers per shift. We calculate a general measure of satisfaction with the following single-item: “How do you consider the UPA’s service: Excellent, Very Good, Good, Average, and Poor”. It is important to mention that we used simple and direct questions considering the low level in average education of UPA’s users and their time availability.

**Controls.** Previous research suggests that group size influences group dynamics and performance (Oh et al, 2004). For example, larger teams tend to be less dense. We controlled for these possibilities by controlling for the number of members in each group. We used team size as a control variable given that the range for members in one team varies from 5 to 19 people. By controlling for the size of the networks, we were able to address the possibility that it was simply the extensiveness of the networks that determined group effectiveness, thus allowing us to isolate the effects of the density mechanisms.

**6 RESULTS**

6.1 Preliminary Analysis

The sample of 1,396 responses has on average 12 professionals per team (SD = 0.324), including the designated formal leader. The demographic profile of the participants is as follows: 80 per cent were female and the average age was 36 years old (with a range of 18 to 73); 42% were married, 45% single and 8% divorced, the other 5% were separated or widowers.

Taking into account that power distance and task interdependence were collected at the individual level, but the representation is on group level, we have to demonstrate within-team
agreement to justify using the team average as an indicator of a team-level variable (James, Demaree, & Wolf, 1993). Furthermore, we calculated the Intraclass Correlation, in which the ICC(1) describes the amount of variance in a variable that can be attributed to belonging to the higher-level unit (e.g., team or division) (Woehr et al, 2015). In addition, ICC(2) provides an estimate of the reliability of the higher-level unit’s group means within a sample (Woehr et al, 2015).

We calculated the ICC for Power Distance and Task Interdependence. For the former, we had a significant ICC (1), F = 0.08, p<.05, and an ICC (2) of 1.03. The same was found for task interdependence, where the ICC (1), F = 0.05, p<.05, and an ICC (2) of .56. Although we had relatively small values, it can be the result of a high number of members per group, hence we consider only the ICC(2) to justify aggregation for this study given that ICC(2) adjusts ICC(1) for group size; therefore, values of ICC(2) are higher when there are more lower-level observations per higher-level unit (e.g., more team members per group) (Woehr et al, 2015). In addition, the SD indicates sufficiently low within-group variation, coupled with the analysis of variance results indicating sufficiently high between-group variation, which warranted the use of aggregation method (Zohar & Tenne-Gazit, 2008).

To test our hypotheses we ran a hierarchical linear model using STATA 13. The HLM is a complex form of ordinary least squares (OLS) regression that is used to analyze variance in the outcome variables when the predictor variables are at varying hierarchical levels. Given that our sample is composed by teams from different Emergency and Care Units, we considered UPA as a control variable from Level 1 and the other variables as Level 2.

Before start analyzing the results, we examined the Variance Inflation factors (VIF) to test multicollinearity and the VIFs ranged from 1.09 to 3.17, thus we concluded that the data set is clean from any multicollinearity issues. Also, HLM is optimal in terms of linear unbiased estimators when the errors are homoscedastic, serially uncorrelated, and normally distributed: all the premises were fulfilled. Besides that, to correct for the multicollinearity that arises when testing moderated relationships among continuous variables (Mehra, Kilduff, & Brass, 2001), we centered the density variables before generating interaction terms. Centering consists of subtracting the sample mean from each independent variable. The adjusted variables each have a mean of zero, but their sample distribution remains unchanged.
We also estimated a fully unconditional model (i.e., a model without predictor variables at any level) in order to decompose the variance of performance. As shown in Table 1, the Confidence Interval did not contain 0, which means that UPA and team level affect significantly (p<.05) the team performance. To assess how much of the variability is due to each level, we calculated the Intraclass Correlation Coefficient (ICC). We found that 63% of team performance can be explained by UPA, on the other hand, teams itself can explain 37% of its performance.

**Table 1 - Decomposition of Variance: Fully Unconditional Model**

<table>
<thead>
<tr>
<th>Fixed Effect</th>
<th>Coefficient</th>
<th>SE</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>3.334*</td>
<td>.114</td>
<td>30.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Random Effect</th>
<th>Estimate</th>
<th>SE</th>
<th>[95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 (UPA)</td>
<td>0.236</td>
<td>0.087</td>
<td>0.114</td>
</tr>
<tr>
<td>Level 2 (Team)</td>
<td>0.139</td>
<td>0.028</td>
<td>0.092</td>
</tr>
</tbody>
</table>

*p<.05

The correlation matrix and descriptive statistics in Table 2 show that typical work group in this study has twelve members; relatively low density in the affective and instrumental ties, and low power distance; moderately high task interdependence and satisfaction. Densities in affective and instrumental ties are correlated (r=0.81).

**Table 2 - Descriptive Statistics and Correlations**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Density (Affective)</td>
<td>0.16</td>
<td>0.009</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Density (Instrumental)</td>
<td>0.20</td>
<td>0.010</td>
<td>0.81*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Power Distance</td>
<td>2.29</td>
<td>0.039</td>
<td>-0.12</td>
<td>-0.18*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Task Interdependence</td>
<td>3.67</td>
<td>0.027</td>
<td>-0.02</td>
<td>0.06</td>
<td>-0.16</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Satisfaction</td>
<td>3.36</td>
<td>0.069</td>
<td>0.02</td>
<td>0.15</td>
<td>0.05</td>
<td>-0.18</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>6 Team Size</td>
<td>12</td>
<td>0.324</td>
<td>0.13</td>
<td>0.31</td>
<td>-0.26*</td>
<td>-0.14</td>
<td>0.03</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*p<0.05

We calculated density scores in UCINET 6 for each shift, in its instrumental and affective ties. For affective ties, the lowest density score was 0.03 and the highest was 0.60. On the other hand, density in instrumental ties ranged from 0.27 to 0.70. To illustrate the differences in density between groups, Figure 2 shows the density of two teams with the same number of members and the same response rate.
6.2 Hypothesis testing

We tested the hypotheses with three models, one for main effect and two for each moderator. We ran models 2 and 3 in two steps: in step 1 we included only the direct effects, while in step 2 we added the interaction terms. All models were controlled by team size, given that even though the mean of member for group was 12, the range varied from 5 to 19.

Table 3 presents the results of the regression analyses that test the hypothesized relationships between network density and group performance. In support of hypotheses 1a and 1b, density of ties in a team's instrumental social network is positively related to team performance, while density of ties in a team's affective social network is negatively related to team performance. Taken together, network density variables explained 8% of the variance in team performance.

Table 3 - Model 1: Main effects

<table>
<thead>
<tr>
<th>Model 1</th>
<th>DV: Performance</th>
<th>Step 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Effects (Level 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Density – Instrumental</td>
<td>3.222*</td>
<td>(1.179)</td>
</tr>
<tr>
<td>Density – Affective</td>
<td>-2.741*</td>
<td>(1.309)</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team size (Level 2)</td>
<td>-0.029</td>
<td>(0.308)</td>
</tr>
<tr>
<td>UPA (Level 1)</td>
<td>0.241*</td>
<td>(0.088)</td>
</tr>
</tbody>
</table>

*p<0.05
In model 2, we hypothesized that high task interdependence will further increase the positive relationship between instrumental ties and team performance, while it will increase the negative relationship of affective ties and team performance. According to Table 4, in Step 2 where we included the interaction effect, we obtain significant results for both relationships. For instrumental density, as predicted, task interdependence enhances the relationship in 11.875 (p<0.05). On the other hand, for affective ties, task interdependence further negatively impacts its effect on team performance (b= -15.952, p<0.05). Therefore, we found support for hypotheses 2a and 2b.

Table 4 - Model 2: Task Interdependence

<table>
<thead>
<tr>
<th></th>
<th>DV: Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
</tr>
<tr>
<td>Direct Effects (Level 2)</td>
<td></td>
</tr>
<tr>
<td>Density – Instrumental</td>
<td>3.212*</td>
</tr>
<tr>
<td></td>
<td>(1.283)</td>
</tr>
<tr>
<td>Density – Affective</td>
<td>-2.897*</td>
</tr>
<tr>
<td></td>
<td>(1.154)</td>
</tr>
<tr>
<td>Task Interdependence</td>
<td>-0.369</td>
</tr>
<tr>
<td></td>
<td>(0.213)</td>
</tr>
<tr>
<td>Interaction Effects (Level 2)</td>
<td></td>
</tr>
<tr>
<td>Instrumental Density x Task Interdependence</td>
<td>11.875*</td>
</tr>
<tr>
<td></td>
<td>(5.426)</td>
</tr>
<tr>
<td>Affective Density x Task Interdependence</td>
<td>-15.952*</td>
</tr>
<tr>
<td></td>
<td>(7.065)</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td>Team size (Level 2)</td>
<td>-0.034</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
</tr>
<tr>
<td>UPA (Level 1)</td>
<td>0.235*</td>
</tr>
<tr>
<td></td>
<td>(0.085)</td>
</tr>
</tbody>
</table>

*p<0.05

To further probe the moderation effect found in hypothesis 3a and 3b, we conducted simple slopes analysis. Figure 3 shows the change in the regression depending on the level of task interdependence in the relationship between instrumental and affective density and team performance. Firstly, at high level of task interdependence, instrumental density had a significant and positive effect on team performance (b= 4.38, p<0.05). On the other hand, in low level of task interdependence, instrumental density presented a negative effect on team performance; however, this was not significant. Secondly, affective density showed a significant and negative impact on team performance for high task interdependence (b= -8.46, p<0.05). As happened with instrumental ties, in low level of task interdependence, the effect
of affective density is the opposite of high level of task interdependence; not significant, though.

Finally, in Model 3 we tested the hypotheses that high power distance will diminish the relationship between instrumental ties and team performance, while it will dampen negative impact of affective ties on team outcomes. The results showed significant direct impacts of ties on performance, but none of the interactions were significant (Instrumental: b = 1.207, p > 0.05; Affective: b = -1.795, p > 0.05). Thus, we did not found support for hypotheses 3a and 3b.

Table 5 - Model 3: Power Distance

<table>
<thead>
<tr>
<th></th>
<th>DV: Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
</tr>
<tr>
<td><strong>Direct Effects (Level 2)</strong></td>
<td></td>
</tr>
<tr>
<td>Density – Instrumental</td>
<td>3.253*</td>
</tr>
<tr>
<td></td>
<td>(1.180)</td>
</tr>
<tr>
<td>Density – Affective</td>
<td>-2.708*</td>
</tr>
<tr>
<td></td>
<td>(1.310)</td>
</tr>
<tr>
<td>Power Distance</td>
<td>0.079</td>
</tr>
<tr>
<td></td>
<td>(0.152)</td>
</tr>
<tr>
<td><strong>Interaction Effects (Level 2)</strong></td>
<td></td>
</tr>
<tr>
<td>Density Instrumental x Power Distance</td>
<td>1.207</td>
</tr>
<tr>
<td></td>
<td>(3.162)</td>
</tr>
<tr>
<td>Density Affective x Power Distance</td>
<td>-1.795</td>
</tr>
<tr>
<td></td>
<td>(3.971)</td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
</tr>
<tr>
<td>Team Size (Level 2)</td>
<td>-0.027</td>
</tr>
<tr>
<td></td>
<td>(0.024)</td>
</tr>
<tr>
<td>UPA (Level 1)</td>
<td>0.237*</td>
</tr>
<tr>
<td></td>
<td>(0.087)</td>
</tr>
</tbody>
</table>

*p<0.05
7 DISCUSSION

Social structures influence team effectiveness. The purpose of this study is to explore the contingencies effects of this relationship by investigating density in distinct network contents on team performance. We collected data from 106 teams (1,396 responses), where we tested for a direct effect of density on performance and two theory-driven moderators that may govern the strength (or direction) of network effects on team outcomes, task interdependence and power distance.

To understand how network ties affect team outcomes in the connectionist approach of Borgatti and Foster (2003), we use one of the instruments advocated by Marin and Wellman (2011) through which groups can flow the resources. We use the transmission by spotting networks as pipelines through which many things flow: information, social support, norms, workplace identities, knowledge.

Our first finding confirms that instrumental density has a positive effect on performance, which can be explained by the transmission of job-related information and norm-supporting interactions that create safer environment for exchanges and promote cooperation enhancing the team performance. The contrary effect was found for affective ties, and it also is related to the transmission instrument. That is, in affective ties members transmit only acceptable and attitude-reinforcing information which leads to rigidity and conformity harming team performance.

Moreover, different network structures create different patterns of flow under different circumstances (Marin & Wellman, 2011); hence the contribution of this study goes further when we include two contextual variables. The first condition was task interdependence, which we predicted to enhance the relationship between instrumental ties and performance.

We supported this hypothesis given that task interdependence fosters the demand for coordinated interaction, which is one of the strong points of instrumental ties that allow for a positive effect on team performance. In addition, the more the members interact to perform the task, it impacts on more pieces of non-redundant information being shared through instrumental ties, strengthening the reaction of team performance.
We found that high task interdependence improves the relationship between instrumental ties and team performance; in the meanwhile, the overall coefficient was negative, though not significant, it can indicate an interesting result. We support that the condition of task interdependence encourages a favorable environment for the exchanges that happen in instrumental ties.

However, we believe that since those ties tend to be cognition based, nonreciprocal, and relatively short lived (Umphress et al. 2003; Nebus, 2006), team members could want to limit risk by reducing dependence on potentially unreliable people (DeDreu & Weingart, 2003). This reaction could even involve individuals performing an entire team task, pointing to a danger for team performance (Langfred, 2007). Therefore, we suggest that task interdependent is beneficial for instrumental ties but it can create a negative impact on performance.

In hypothesis 2b, the results supported the prediction that high task interdependence enforces the negative relationship between affective ties and team performance. Our main argument is that task interdependence amplifies the occurrence of social loafing. High level of dependency of affective ties is a fruitful condition which increases the tendency of members to expend less effort when working collectively than when working individually (Sparrowe et al, 2001), thus by delegating the activities to their friends, members reduce their efforts during the tasks harming the performance directly. In addition, we also argue that the increased need for interaction created by task interdependence also increases the possibilities of engaging in activities that might take the member away from the task at hand, because of the familiarity and the high level of socialization between members.

As predicted, task interdependence reduced the impact of affective ties on team performance, however, even though not significant, a positive main relationship points to an intriguing argument to be studied. That is, task interdependence reduced in 19.63 the main effect of tie content, however, the impact was 49.31 positive. A suitable argument to explain this event comes from Reagans and McEvily (2003), when they state that in affective ties members fear that their uncooperative behavior will spread to other network members quickly and limit their ability to interact with them in the future. Therefore, we believe that despite of the willingness to reduce the effort on tasks because of social loafing (which was used as a proposed mechanism to explain the moderator’s negative coefficient), members’ reputation
within the group matters more, so the loss in productivity is not enough to reverse the impact of affective ties on team performance.

The second condition was power distance orientation, that is, the extent to which people expect and accept that power is distributed unequally among persons and across different levels of the organizational hierarchy (Kirkman & Shapiro, 2001). In this case, we did not confirm the predictions that high power distance weakens the impact on performance for instrumental ties and strengthens for affective ties. For affective ties, we believe that power distance can behave in two distinct ways; fist, we understood that in high power distance conditions, trust will ensure that members tolerate the status difference by showing respect, which facilitates the group coordination in order to achieve performance (Vidyarthi et al, 2014).

Conversely, as stated by Kirkman and Shapiro (2001), regarding affective ties relying on tight personal relationships, it can activate the social identity and the “us versus them” mentality, thus high power distance can damage the relationship between affective ties and performance. Therefore, both are valid arguments that deserve more analysis thought the examination of social identity mechanism in future research. Through a deeper investigation, it can be possible to find the real effect of this variable.

Secondly, we predicted that for instrumental ties, power distance would weaken their impact on team performance. We argue that high power distance orientation would inhibit the contact and communication between the members and leaders, a necessary condition for the positive effect of instrumental ties on team performance. However, our results did not find a statistically significant coefficient.

To justify this occurrence, we believe that specifically contrary to the argument we proposed above, Oh et al (2004) defend that since in instrumental ties employees share information and knowledge related to the completion of their work, high power distance is viewed more positively given that they believe that other members have the ability and competence to provide help. Further, in high power distance, for instrumental ties, leaders can be perceived as members with greater knowledge that needs to be shared, which creates cognitive trust. Regarding the cognitive trust that employees develop, it has positive effect on team performance (McAllister, 1995).
As for instrumental ties, we encourage more research regarding the perception of the leader’s knowledge by group members. This is in order to assess whether it can help to reduce the downsides of high power distance for instrumental ties. In other words, if the members from an instrumental network perceive their leader as the knowledge keeper, this should substitute the need for communication, since they will trust their leaders and the work-related information they provide.

Moreover, we believe that group configuration may have affected the results. In UPAs, the assigned leader is a nurse from the team and they have a high turnover in the position of team leader. A high rotation does not provide time for members to recognize authority of the leader. Thus, the hypothesis should be tested after checking for members recognitions towards the team leader.

Regarding our second mechanism, power distance, as we did not confirm any of our hypotheses, we suggest further research to explore other mechanisms that can help to illustrate and interpret the effect of power distance in these two types of ties, such as social identity for affective networks and perception of leader’s knowledge for instrumental networks. In addition, we could test for members’ recognition of team leader in general.

8 CONCLUSION

Although empirically they might be correlated, affective network is distinct from the instrumental network (Borgatti, 2002). We corroborate to this premise by exploring the mechanisms that change the impact of tie content on team performance. In the direct impact, we found a positive relation of instrumental ties on team performance and a negative impact of affective ties. However, those relationships change when we included task interdependence. In a context of high task interdependence, it improved the effect of instrumental ties on performance and further hindered the relationship between affective ties and team performance.
8.1 Theoretical and Methodological Contributions

The results of this study offer several contributions. Theoretically, we complied with some researchers demand for more comparative studies between the effects of density on team performance (Hansen, 1999; Lester, Meglino, & Korsgaard, 2002; Gibbons, 2004; Reagans, Zuckerman, & McEvily, 2004). Even though our study was carried out in a specific context of public health and with specific configurations of the groups, we believe that our findings and arguments can contribute to understand the impacts of different tie contents.

In addition, we explored our variables taking into account the larger context of constraints and content within which networks are embedded. We confirm the argument that network effects are goal-specific and structural advantage may vary depending on the particular situation (Podolny & Baron, 1997; Burt, 2005; Balkundi & Kilduff, 2006; Adler & Kwon, 2002), considering that our main effects change significantly after the inclusion of contextual variables.

Methodologically, this research demonstrated the utility of social network methodology for studying social interaction and team performance. Structured social relationships are more powerful sources of explanation than are the personal attributes of the members of a social system (Morrison, 2002). Group interactions measured as social networks provide a fuller description of interactions for each social unit.

We also had a methodological strength when using different sources for our research, minimizing common source biases. Nurses answered questions about the network, task interdependence, and power distance while patients evaluated team performance.

Moreover, the interaction method of data collection that we used and advocated by Tishy et al (1979) has the advantages of easy access, simplicity of design, high reliability and can deal with multiple networks. However, this approach presented some weaknesses as well: need for definition of boundaries, need for high return rate, costly management and administration, high commitment from the respondents’ part, as well as high level of trust.
8.2 Limitations

Although our study has notable strengths, we acknowledge certain limitations. First, data were collected at a single point in time, as is the case in most network studies (Umphress et al., 2003), and thus raising questions about the direction of causality. Thus, carefully designed longitudinal studies are needed to unravel these complex structural dynamics and confirm our findings.

Second, our sample consists of teams that work for the same organization. Although these teams are semiautonomous between UPAs, they are constrained by the same policies and rituals. It is arguable that focusing on one company can effectively control for the effects of company-level influences, such as environmental uncertainty (Zhang & Peterson, 2011). Further, a focus on one organization allowed for a meaningful and consistent performance metric. Still, the generalizability of the study’s findings would be improved if our sample included teams from different organizations. Moreover, the teams execute the same tasks with the same pattern, which increases the difficulty of generalizability. Future research could include work teams with different functions from different organizations.

In addition, given that the research setting is in a service industry, we faced limitations in measuring team performance objectively. To diminish this bias, we collected performance data from the team group and the service users; nonetheless, future research could also collect objective measures, such as in Mehra et al. (2009), which would strengthen the reliability of the dependent variable.

Another concern involves missing data. Extensive efforts were undertaken to promote as high a response rate as possible, given that network analysis cannot be performed with low response rate within a team. Nevertheless, we used a relatively low threshold of 50% response rate per team to include the team in our sample.

Our findings hold implications for a contingency model of the relationship between group network structure and performance. Of course since we did not manipulate the task type in this study, we can only speculate about this link. However, we could provide the identification of specific contingencies that trigger different effects and examination of specific mechanisms through which these contradictory effects operate. Moreover, we were able to forge new understanding of the interplay between the psychology of individuals (not
just attributes) and the complexity of the networks through which actors exchange information, affect, and other resources (Hoppe & Reinelt, 2010).

8.3 Practical Implications

Beyond those theoretical implications, this study also brings practical contributions. Our results suggest that organizations should recognize that two distinct types of social networks appear to have relevance for team performance. More than that, the impact of structures for these two types of networks varies.

Given that instrumental ties have positive features; managers can create occasions to promote the exchange of work-related topics. On the other hand, if the focus is encouraging high levels of informal socializing, it can be counterproductive for group effectiveness, once it will create highly closed affective teams. Moreover, to deal with the negative impact of affective ties on team performance, managers should produce activities that break the group's rigidity acceptance for different information and reduce the conformity among members.

In addition, organizations can promote task interdependence in order to create opportunities for information exchange in instrumental ties, but be attentive with affective ties to not create territory to discuss non work-related matters. For organizations with high power distance orientation, managers should encourage discussion among members of instrumental ties to take advantage of their willingness to share. On the contrary, for affective ties, managers within high power distance context should employ strong control and coordination regarding member’s tendency to comply with status difference and exhibition of respect.

To sum up, the results of this study allow the theory to extend at a high level the investigation of the mechanisms involved in instrumental and affective ties. Empirically, managers and organizations should recognize the distinct tie contents to be able to handle them correctly, given that both ties can bring beneficial impacts for performance.

References


Vidyarthi, P. R., Anand, S., & Liden, R. C. (2014). Do emotionally perceptive leaders motivate higher employee performance? The moderating role of task interdepe


Prezado (a) participante,

Você está participando de uma pesquisa da Fundação Getúlio Vargas sobre comportamento no trabalho. Para isso, você deverá responder as questões a seguir considerando suas atividades no trabalho e as relações com os membros de sua equipe e com o seu líder de plantão.

Não existe resposta certa ou errada e suas respostas serão tratadas de forma **anônima** e **confidencial**, isto é, em nenhum momento será divulgado o seu nome em qualquer fase do estudo. Os dados coletados serão utilizados apenas NESTA pesquisa e serão analisados de maneira agregada.

Sua participação é **voluntária**, isto é, a qualquer momento você pode recusar-se a responder qualquer pergunta ou desistir de participar e retirar o seu consentimento. Sua recusa não trará nenhum prejuízo em sua relação com os pesquisadores, com a FGV, ou com qualquer outra instituição relacionada a esta pesquisa.

Não se espera riscos nem custos de qualquer natureza relacionados à sua participação. Os procedimentos dessa pesquisa estão de acordo com as normas éticas e científicas estabelecidas pela FGV.

O preenchimento leva em torno de 10 a 15 minutos e a pesquisa está dividida em três páginas.

Ao responder esse questionário você declara que concorda com os termos acima citados.

Desde já agradecemos a sua participação.

Josmary Alves, Juliana Mansur e Liliane Furtado.

Escola Brasileira de Administração Pública e de Empresas – EBAPE/FGV

E-mail: Josmary - josmarykaroline@yahoo.com.br, Juliana - juliana.kopp@fgv.br, Liliane - liliane.furtado@fgv.br.
QUESTIONÁRIO PARA LÍDERES DAS EQUIPES

Para responder as duas questões a seguir, caso necessário, use a lista em anexo com os nomes e sobrenomes das pessoas do seu plantão para ajudá-lo.

Mencione no mínimo 5 nomes.

A - Indique as principais pessoas (da sua equipe ou não) com as quais você discute o que está acontecendo na organização e que você aborda quando tem um problema relacionado ao trabalho.

B - Indique as pessoas que você vê como aliado/parceiro e que você discute assuntos não relacionados ao ambiente de trabalho.

Exemplo: Maria Silva (Plantão 3)

<table>
<thead>
<tr>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

Exemplo: José Souza (Plantão 5)

<table>
<thead>
<tr>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

Dados demográficos

Idade (em anos): __________ anos

Qual seu gênero: [ ] Feminino [ ] Masculino

Estado Civil: [ ] Solteiro(a) [ ] Casado(a) [ ] Separado(a) [ ] Divorciado(a) [ ] Viúvo(a)

Nome: ____________________________________________

Reforçamos que esse questionário será tratado de forma confidencial e analisado de maneira agregada.

Muito obrigado pela sua participação!
Survey: Members form

**QUESTIONÁRIO PARA MEMBROS DAS EQUIPES**

Para responder esse questionário, pense no seu dia a dia, nas suas atividades no trabalho e as relações com os membros de sua equipe e no seu líder de plantão.

**Utilizando a escala abaixo (1 a 5), assinale o quanto você concorda com cada uma das afirmativas:**

1 = Discordo Totalmente; 2 = Discordo; 3 = Nem discordo nem concordo; 4 = Concordo; 5 = Concordo Totalmente

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. O líder do plantão evita contatos sociais com a equipe fora do ambiente de trabalho.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Eu tenho que trabalhar em parceria com meus colegas para fazer meu trabalho bem feito.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Eu preciso obter informação e recomendação dos meus colegas a fim de completar meu trabalho.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Em situações de emergência, o líder do plantão não costuma delegar tarefas importantes para os demais membros da equipe.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Os membros da equipe frequentemente concordam com as decisões do líder do plantão</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. **Observe os fluxos de atividades a seguir:**

<table>
<thead>
<tr>
<th></th>
<th>Trabalho entra na unidade</th>
<th>Trabalho entra</th>
<th>Trabalho entra</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trabalho sai da unidade</td>
<td>Trabalho sai</td>
<td>Trabalho sai</td>
</tr>
</tbody>
</table>

(1) **Fluxo de Trabalho Independente:** as atividades são realizadas de forma independente.

(2) **Fluxo de Trabalho Sequencial:** as atividades fluem em uma direção entre os membros da equipe.

(3) **Fluxo de Trabalho Recíproco:** as atividades fluem entre os membros da equipe de um modo recíproco.

Assinale a opção que mais se aproxima à rotina de atividades da sua equipe:

- [ ] Fluxo Independente
- [ ] Fluxo Sequencial
- [ ] Fluxo Recíproco
Para responder as duas questões a seguir, caso necessário, use a lista em anexo com os nomes e sobrenomes das pessoas do seu plantão para ajudá-lo.

Mencione no mínimo 5 nomes.

A - Indique as principais pessoas (da sua equipe ou não) com as quais você discute o que está acontecendo na organização e que você aborda quando tem um problema relacionado ao trabalho.

Exemplo: Maria Silva (Plantão 3)

1
2
3
4
5
6
7
8
9
10

B - Indique as pessoas que você vê como aliado/parceiro e que você discute assuntos não relacionados ao ambiente de trabalho.

Exemplo: José Souza (Plantão 5)

1
2
3
4
5
6
7
8
9
10

Dados demográficos

Idade (em anos): ___ anos

Qual seu gênero:  [ ] Feminino  [ ] Masculino

Estado Civil:  [ ] Solteiro(a)  [ ] Casado(a)  [ ] Separado(a)  [ ] Divorciado(a)  [ ] Viúvo(a)

Nome: ____________________________________________

Reforçamos que esse questionário será tratado de forma confidencial e analisado de maneira agregada.

Muito obrigado pela sua participação!