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MANAGEMENT PRACTICES OF SMALL-FIRM NETWORKS AND THE PERFORMANCE OF MEMBER FIRMS

Douglas WEGNER[1], Felipe de Mattos ZARPELON[2], Jorge Renato VERSCHOORE[3], Alsones BALESTRIN[4]

Business School, Unisinos University, Address: Av. Unisinos, 950, 93.022-000, São Leopoldo/RS – Brazil
E-mails: [1]dwegner@unisinos.br (corresponding author); [2]fmzarp@gmail.com;
[3]jorgevf@unisinos.br; [4]abalestrin@unisinos.br

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Abstract. Even considering a small-firm network as a new organizational form, few studies analyze how network management practices may influence the performance of member firms. To help overcome this gap, we conducted a survey with 242 firms associated with 49 small-firm networks in Brazil. The results show that collective planning, evaluation, communication, innovation, services offered by the network, leadership, and also the entrepreneurs' orientation to business development have a positive influence on firms' performance. The study contributes to the organizational literature and practice as it identifies a set of management practices that influence the performance of firms in small-firm networks.

Keywords: small-firm networks, network management, firm performance, management practices, cooperation, BSC.

JEL Classification: M10.

Introduction

Firms of all sizes and market segments have benefited from collaboration to broaden their competitiveness, to speed up the innovation process and to obtain better performance. From an academic perspective, interorganizational relationships have been studied under a wide range of objectives. The motivations for cooperating and the context in which they are embedded (e.g., Child and Faulkner 1998, Ebers 1999, Jarillo 1993, Oliver 1990), the relationships' forms and characteristics (e.g., Grandori and Soda 1995, Todeva 2006), outcomes reached through cooperation (e.g., Dyer and Singh 1998, Podolny and Page 1998, Provan and Milward 1995) and management practices that networks may adopt to reach better collective outcomes (e.g., Järvensivu and Möller 2009) are examples that clarify the complexity in the interorganizational relationships discipline.

Even in the face of this intense academic interest, there remain important gaps in the literature regarding cooperation management (Möller et al. 2005, Hibbert et al. 2008) and its effects on firm performance (Cepiku et al. 2014). The analysis of the ways in which small-firm networks are managed is important to understand its functioning (Mueller 2012) and to promote its development and performance (Willem and Gemmel 2013). This gap is also highlighted by Raab and Kenis (2009), who suggest that there still is a lack of studies considering networks and their attributes as independent variables and the performance of the member firms as a dependent variable.

The discussion about network-management practices has received the attention of studies regarding interorganizational relationships (Hibbert et al. 2008, Hatmaker and Rethemeyer 2008), as a further analysis of network structure and governance (Provan and Kenis 2008). The aim here is to differentiate management in networks from management implemented in individual firms (Järvensivu and Möller 2009, Sydow 2006) by highlighting elements of collectivity, interdependence, confluent interests and the need for common strategies.

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Therefore, this paper aims to analyze the influence of management practices adopted by small-firm networks on the performance of member firms. Specifically, we analyze the influence of a set of management practices such as collective planning, the evaluation of collaborative actions, communication, the fitting of services, collaborative innovation practices and leadership in the network. Small-firm networks (Jarillo 1993, Perrow 1993) are the empirical object of this study. These networks are formally established, managed and goal oriented (Kilduff and Tsai 2003). They gather "two or three legally autonomous organizations that work consistently to reach not only individual goals, but also collective ones" (Provan and Kenis 2008: 231). Relationships among network members are primarily symmetric, and these members have the operational autonomy and strategic freedom to leave the network any time they consider convenient.

Performance analysis suggests, in some cases, a multidimensional approach. Provan and Milward (2001), for example, propose the evaluation of public-sector networks on three levels: community, network and participant organization. However, as we analyze here small-firm networks that seek the development of their businesses through profitability (Mazzarol et al. 2013), we understand it would not make sense to conduct an analysis from the community point of view. Furthermore, evaluations on the network level, with an increase in membership (Provan and Milward 2001), would be incapable of defining whether the organization in networks is in fact worthwhile to individual firms. Then, we understand that the analysis on the firm level, with a multidimensional approach, as proposed by the Balanced Scorecard (BSC), is the fittest to evaluate the outcomes for network-member firms. Kaplan and Norton (1996) refer to BSC as a broad way to evaluate firm performance as it considers tangible and intangible outcomes (Kaplan 2008). BSC brings a strategic and multidimensional approach in opposition to the purely financial paradigm of accounting reports (Modell 2004). Thereby, we chose to utilize the four dimensions recommended by Kaplan and Norton (1996), combined with measures highlighted in alliance and network studies (Mohr and Spekman 1994, Mjoen and Tallmann 1997), to evaluate the performance of firms associated with networks.

The paper is organized as follows. After this introduction, section two presents concepts of network-management practices. The research methodology is presented in section three. Section four describes the results, and section five presents the implications and final remarks.

1. Management practices of small-firm networks

The management of a small-firm network aims at governing the common interests, in addition to guaranteeing continuity to the interorganizational arrangement. This aim is possible only when the business owners realize that network participation is positive and necessary for obtaining gains they would not be able to reach by operating individually. In networks, management includes a series of processes and practices executed by a group of individuals, with a focus on defining the direction to be followed and the allocation of resources to reach these goals (Hibbert et al. 2008). However, they do not always understand the formation of a network, through the collaboration of business owners, as a new organization with its own characteristics and management needs.

The main difference between management in an individual firm and that in a small-firm network lies on the need of the latter to constantly negotiate among a group of autonomous actors (Järvensivu and Möller 2009). The management of a small-firm network implies significant changes in managerial functions and practices, compared to those implied by hierarchic organizations (Sydow 2006). It is essential to consider the existence of collectiveness, interdependence, confluent—although not necessarily consensual—interests, and the need for strategies the members are willing to implement. Therefore, the identification and incorporation of the fittest composition of members is important to reach network goals (Saz-Carranza and Ospina 2011).

Cooperation studies approach network management with different terminologies: Grandori and Soda (1995) use the term management mechanisms, Sydow and Winderler (1998) and Sydow (2006) refer to management functions and practices, and Ritter and Gemünden (2004) mention functions of network management. Despite the use of different terminologies, it is consensual the importance of management practices in an interorganizational arrangement to increase results. That is, network management must include functions to ease the access of member firms to benefits provided by cooperation. This revision of highline studies comprises the basis for the identification of a set of management practices that enables the empirical research conducted in this study.

In a study conducted with small-firm networks in Brazil, Verschoore (2006) identified and analyzed five attributes of management considered relevant. The first attribute was called social mechanisms, which have a relevant role in the organization of networks because they partially substitute the hierarchic mechanisms of control and contribute to enhancing relationships among actors. The second attribute was called contractual aspects, and the third was called motivation and commitment. The fourth one was integration and flexibility, that is, the capacity of integrating activities into the group of enterprises with no lack of flexibility. Lastly, the fifth attribute highlighted was strategic organization, which is related to the ability of planning

networks and the aptitude of tracing and reaching common goals effectively. Network management is responsible for defining together the direction of efforts to be taken and the allocation of resources required (Hibbert et al. 2008).

Sydow and Winderler (1998) suggest that management in networks must be based on central function, i.e., the allocation of tasks, resources and responsibilities, the regulation of work in networks and the evaluation of results. The last one has emphasized importance because it supplies information to maintaining and giving feedback to network management. This enables adjustments whenever necessary. Although the evaluation of results might be challenging, it is reinforced that results in interorganizational networks are characterized by reaching goals that would be unreachable through hierarchic or market structures (Provan and Kenis 2008).

Grandori and Soda (1995) proposed communication as another network-management practice. Mechanisms of communication, decision making and negotiation are those with the lowest costs in which networks are grounded and seen in every network on a lower or higher scale. Communication helps decentralize resources flow inside the network. This, according to Provan and Huang (2012), might bring effective results to the collective organization. Communication is essential to make transparent every developed activity and to reinforce the emotional connections among members.

Networks also maintain a role of creating practices to enhance collaborative innovation. In a study conducted by Balestrin, Vargas and Fayard (2008), the authors identified that networks are a space for the interchange of experiences and the creation of knowledge, leveraged by the function of exchange described by Ritter and Gemünden (2004). The development of specific actions to stimulate and to support interaction might ease learning and innovation, whether they are held in physical meetings (Theurl and Schweinsberg 2004) or through virtual means. In the network analyzed, Balestrin, Vargas and Fayard (2008) identified practices the management developed to encourage processes of exchange, e.g., visits among the companies within the network, itinerant meetings held within companies, assemblies, social meetings, collective visits to fairs, courses, collective strategic planning and virtual spaces.

So far, the discussion around network management has focused on practices that facilitate in-network activity. That is, these practices are implemented by network managers to better conduct the interorganizational arrangement and, indirectly, to contribute to reaching the goals proposed by network members, according to Grandori and Soda (1995). Nonetheless, in parallel, the network needs to be capable of understanding the necessity of each member and to offer services for individual and collective development. This capacity is understood as a network managerial function described as synthesizing, proposed by Järvensivu and Möller (2009). This means that network management has duplicity of influence over the firms: on one hand, it needs to employ management practices regarding the organization and efficiency of activities (planning, learning incentives, communication, an evaluation); on the other hand, it offers services used by member firms to enhance their competitiveness, e.g., marketing campaigns, trainings, human resource development, and negotiation. It is also a role of the network management to evaluate whether its actions are addressing the interests of the members and are acknowledged as a contributing factor to competitiveness.

Network management has to address the paradox of maintaining both control and flexibility. On the one hand a centralized management helps maintaining collective goals; on the other hand, managers and leaders of networks have to provide foundations so that participants might interact with the flexibility and resilience necessary to reach collective gains (Provan and Huang 2012). In this way, the informal power based on interpersonal relationships must be as important as the formal power. Leaders, as orchestrators and facilitators, are necessary for network development (Keast et al. 2004, Klijn 2008). Network orchestration is frequently associated with the development of a space that enables interaction and collective gains. Silvia and McGuire (2010) identified distinguishing marks of effective leadership in networks: treating all members as equal, freely sharing information, creating trust, encouraging support and keeping the network in good standing.

Then, according to the literature reviewed, it is possible to identify a set of practices considered relevant to management in organizational networks: collective planning (Hibbert et al. 2008), evaluation of collaborative actions (Sydow and Winderler 1998); communication (Grandori and Soda 1995), collaborative innovation (Balestrin et al. 2008), identification of network services (Järvensivu and Möller 2009); and leadership (Keast et al. 2004, Silvia and McGuire 2010). Table 1 synthesizes the literature about network-management practices.

Network-management practices observed in the literature and synthesized in Table 1 constitute the basis of the empirical study. The methodological procedures are presented in the following section.

2. Method

To reach the proposed goals, this research conducted a quantitative study through a survey. The data-collection instrument was constructed with the objective of understanding the influence of network-management practices on the performance of member firms. The upcoming sections detail the operation of variables, the sample and the techniques of data collection and analysis.

Table 1. Network management practices

Category	Concepts	Authors (year)
Collective planning	Related to the attribute of strategic organization, planning refers to the capacity to delineate common goals through collective processes.	Grandori and Soda (1995), Verschoore (2006), Hibbert et al. (2008)
Evaluation of collaborative actions	Supplying information about collective actions that support and give feedback to network management, enabling adjustments whenever necessary.	Sydow and Winderler (1998), Provan and Kenis (2008)
Communication	Mechanisms that make all developed activities transparent enhance the commitment of members and promote the decentralization of resource flow.	Grandori and Soda (1995), Provan and Huang (2012)
Collaborative innovation	The network builds a space for the interchange of experiences and for the creation of knowledge, leveraged by the complementarity of tangible and intangible resources.	Ritter and Gemünden (2004), Balestrin et al. (2008)
Identification of services	Network capacity to understand the need of each member and to provide services that stimulate its competitiveness.	Järvensivu and Möller (2009)
Leadership	Existence of leadership capable of developing a collective space that enables interaction among members and democratic decision making processes.	Silvia and McGuire (2010), Keast et al. (2004), Klijn (2008)

2.1. Measures

The variable performance was based on the perspectives of performance suggested by Kaplan and Norton (1996) in the Balanced Scorecard (BSC). Although objective measures may always be desirable, Dess and Robinson (1984) sustain that subjective measures are correlated to absolute measures. In the specific case of small firms, a small amount of indicators is usually available, and most of the time, entrepreneurs are not open to conceding access to quantitative information.

Therefore, the data-collection instrument was built on subjective measures regarding the four perspectives of BSC: finance (e.g., "During the last three years, we have had surplus resources to invest in what was planned"), clients (e.g., "During the last three years, my company has strongly increased the number of clients"), learning and innovation (e.g., "During the last three years, my company has introduced innovations in products, services or work practices") and process (e.g., "During the last three years, we have improved the internal organization in the company"), combined with measures highlighted in studies about alliances and small-firm networks (Mohr and Spekman 1994, Mjoen and Tallmann 1997). The option for a broad set of dimensions derives from the multidimensionality of organizational performance, from the difficulty of measuring outcomes of companies in networks and from the need for going beyond exclusive finance measures. A total of eight items were used to operationalize the variable (Cronbach's alpha of .882), constituting and aggregated variable with the four perspectives of BSC.

To verify the reliability of subjective performance measures, respondents were asked about the percentage of variation in companies' revenues in the three years prior to the research. However, as expected, some entrepreneurs were not able to provide this precise information or preferred not to respond. There was a total of 215 answers. We decided not to use this information as a dependent variable. A correlation analysis between the variation of revenues and the aggregated variable of performance in the BSC showed a positive correlation ($r = .299$; $p < .001$, $N = 215$), confirming the relationship between the objective and subjective performance measures. Regarding the capacity to measure multidimensional performance aspects, we opted to utilize the aggregated variable in the BSC as the dependent variable in the study.

Concerning the construct of network-management practices, the variables utilized were based on the six categories identified in the literature: collective planning, the evaluation of collaborative actions, communication, collaborative innovation, the identification of services and leadership. A total of 16 items were used to operationalize these variables, as seen in Table 2. All questions were operationalized through a six-point scale, ranging from "totally disagree" to "totally agree".

The items in Table 2 form the independent variables used in the study. In addition to these, we used control variables to construct the testable model.

We opted also to include questions to characterize the company, the network of which it is part and the conditions of the competitive environment, within four control variables. The first one concerns the duration of association with the network. Time is an important condition to expand relationships built by the company and to enhance ties that might lead to better access to information. Then, time might positively influence the company's performance. The second variable is related to a characteristic of the network itself. It measures the number of members.

The next two control variables are related to internal and external influences that might affect entrepreneurial performance. The third control variable is about market competitiveness. Consistent with Hofer and Sandberg (1987), the level of competitiveness is negatively related to financial

Table 2. Operationalization of the variables in the construct network-management practices.

Category	Number of questions	Examples of questions
Collective planning	3	"In our network, there is a previous planning of action that will be developed."
Evaluation of collaborative actions	3	"The network always evaluates the outcomes from the actions developed to the members."
Communication	2	"The network headquarters communicates with the members in an easy and efficient way."
Collaborative innovation	3	"Inside the network, there are specific opportunities in which we can discuss how to generate innovations."
Identification of services	2	"The network provides services that satisfy the need of my company."
Leadership	3	"The network leaders are able to motivate the associates."

performance. These authors propose three items to measure market competitiveness that in addition to a fourth item suggested by Scheer (2008), compose the variable utilized in this study (Cronbach's alpha of .750). The last control variable is related to entrepreneurs' orientation to business development, where there exists a clear inclination towards risk taking in favor of change and innovation to obtain competitive advantages and towards a proactive way of acting in the market (Covin and Slevin 1988). Companies managed by entrepreneurs with this profile are suggested to have superior financial performance (Lumpkin and Dess 1996). Four items were used to measure this variable (Cronbach's alpha of .850). The inclusion of this variable aims at verifying whether, beyond the characteristics of the network and the competitive environment, entrepreneurs' individual profile might influence firm performance.

Prior to the query application, we conducted a step to validate the data-collection instrument with eight experts in small-firm networks. This step aimed at collecting information that would complement the literature review to build and to verify the data-collection instrument. The eight participants were selected by convenience, according to its potential to contribute to the research: four organizational consultants that supported the development of small-firm networks, two network managers and two researchers focused on interorganizational cooperation.

After the modification proposed by the experts, a trial version of the query was applied to six entrepreneurs associated with small-firm networks. The entrepreneurs answered the query in researcher's presence, noting questions that were not clear, questions that did not represent the reality of the small-firm network and questions that did not make the respondent comfortable. Following this review, it was necessary to conduct a second round of tests with six other entrepreneurs. These respondents answered the query individually, not in the presence of the researcher. Once again, the respondents highlighted the incoherence found in the query. After the elimination of all inconsistences, we elaborated the final version of the query. This final step focused on modifications regarding texts that would ease comprehension for respondents.

2.2. Sample and data analysis

The sample established for the study comprised networks formed by small and medium-sized firms, generally managed autonomously and independently, opting for the association as an operational model (Mazzarol et al. 2013). The population of horizontal networks in Brazil ranges from 800 to 1,000 in several segments of activity (Sebrae 2012). The main challenge consists of accessing the information about these small-firm networks, particularly member firms. The support institutions do not provide access to their database, and most networks do not have a website with contact information. Nonetheless, initially, we formed a database with approximately 2,200 firms associated with 75 small-firm networks in Brazil, gathered from an internet search.

The data were collected through on-line and print queries with company owners or people in charge of the company's participation in network activities. Three sets of emails were sent with invitations to participate in the research, followed by calls to the companies reinforcing the importance of responding to the query. Companies located in cities with easy access to the researchers received a print query, without the identification of the respondent. A total of 269 companies from 49 different networks answered the query, of which 71 answered via the print version. From this total, we excluded companies with less than one year of participation in the network and incomplete queries, resulting in a final sample of 242 firms associated with 49 networks. Companies with less participation time in the network might have had difficulty evaluating network-management practices. Moreover, it was possible that the participation in the network had still not had an effect on the development of these companies, justifying the exclusion in the sample.

After the data collection, we proceeded to the analysis in three steps. The first step consisted of a descriptive data

analysis to characterize the sample. In the second step, we conducted a factor analysis. Because we did not find any study operationalizing and validating network-management practices, we considered it relevant to undertake an exploratory factor analysis of the items composing the variables. Next, we conducted a regression analysis to meet the objective of the study.

3. Results

The sample of 242 companies was heterogeneous in terms of their market segments. Although the sample was primarily composed of commerce companies (97.1%), these companies were split among 15 segments, the most prominent ones being supermarkets (21.1%), drugstores (20.7%) and construction materials (20.7%). In these segments, the scales were particularly important for competitiveness, which is one of the main gains obtained in a collective initiative (Waarden 1992).

Measures of the duration of the company's existence and its participation in the network were also important to characterize the respondents. The duration of existence in the study was 17.4 years, with a variation between 2 and 73 years. These data indicate that cooperation is an option not only for young companies but also for companies established in the market for decades. The mean duration of participation in a network was 4.8 years, with a variation between 1 to 16 years. Regarding the network size, the sample had wide variation, including small networks involving only 8 firms to networks with 350 members. Complementary data on the sample are better observed in Table 3.

The next step consisted of a factor analysis to verify the consistency of the items that referred to the construct of network-management practices. As a procedure for the factor analysis, we opted for the development of scores by the regression method. This method creates factors with low within correlation and enables their later use in other tests of multivariate statistics (Dancey and Reidy 2007). The method is the fittest when the researcher intends to conduce a linear regression analysis. In this factor analysis, we used the fitting measure of Kaiser-Meyer-Olkin (KMO), which presented a satisfactory result (KMO = 0.9, $p < .001$), demonstrating the factor analysis was adequate. Notwithstanding, the Cronbach's alpha measure of all factors was high enough to indicate reliability among items. Table 4 presents the results of the factor charge of each item and the factor to which it corresponds.

The 16 original items of network-management practices are comprised of four factors that together correspond to 67.7% of the data variation. The first factor is responsible for 44.4% of the data variation, and it is formed by three items of collective planning and three items of evaluation of collaborative actions. The first factor is called collective planning and evaluation. The composition is coherent considering that both practices are complementary. The second factor corresponds to 8.6% of data variation, and it is formed by three items of leadership. The third factor corresponds to 7.9% of the data variation, and it comprises two items of communication and two items of identification of services.

Table 3. Sample description

	Company		Network
	Duration of participation in the network (years)	Duration of firm existence (years)	No. of member firms
Mean	4.8	17.4	70.8
Standard deviation	2.9	11.9	104.7
Minimum	1	2	8
Maximum	16	73	350

Table 4. Factor analysis of the variables – network-management practices

	Factor 1	Factor 2	Factor 3	Factor 4
Collective planning – Q1	.576			
Collective planning – Q2	.610			
Collective planning – Q3	.608			
Evaluation of collaborative actions – Q1	.773			
Evaluation of collaborative actions – Q2	.676			
Evaluation of collaborative actions – Q3	.755			
Leadership – Q1		.781		
Leadership – Q2		.851		
Leadership – Q3		.815		
Communication – Q1			.799	
Communication – Q2			.696	
Identification of services – Q1			.719	
Identification of services – Q2			.663	
Collaborative innovation – Q1				.849
Collaborative innovation – Q2				.748
Collaborative innovation – Q3				.527
Cronbach Alpha	.843	.895	.827	.725
KMO		0.900		
Bartlett's Test	$\chi 2$	1883.04		
	Df	120		
	sig.	<0.001		

These items are also complementary practices, considering that effective communication tools help management in the understanding of what services are needed by members. Thus, the third factor is called communication and services. Lastly, the fourth factor corresponds to 6.7% of the data variation and embraces three items from collaborative innovation practices.

Following the factor analysis, we structured two linear regression models with the dependent variable of firm performance – the mean of BSC perspectives – and with the factors that emerged from network-management practices as independent variables. We also added the control variables to the models. The collinearity of the model was measured with the variance inflation factor (VIF), which showed an index lower than 10. This finding confirms the absence of multicollinearity among the variables (Meyers et al. 2006).

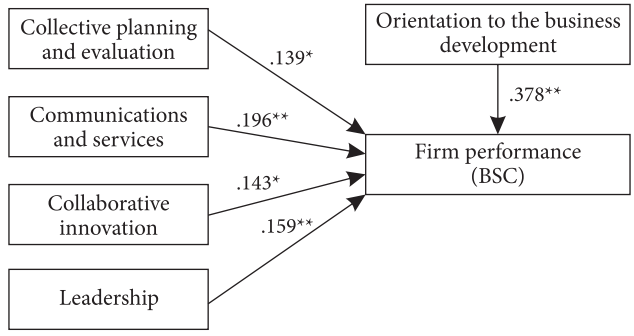
The first regression model tested the influence of the control variables on the firm's performance (Table 5). The model was statistically significant ($F = 19,2$; $p < .001$) and explained 25.4% of firm performance. The results indicated that the number of member firms, the duration of participation in the network and the competitiveness of the market do not influence firm performance. Nevertheless, the orientation to the business development showed a significant influence on firm performance ($t = 8.12$; $p < .001$).

In the subsequent analysis, the independent variables were included in the second model of regression (Table 5). The model was equally significant ($F = 14.48$; $p < .001$) and had a higher power of explanation ($R^2 = .359$). The results demonstrated a significant effect of network-management practices on firm performance. In fact, all dimensions of practice (collective planning and evaluation; communication and services; leadership; and innovation) positively influenced firm performance.

3.1. Theoretical and managerial implications

The results of this study have implications for the management of interorganizational networks. In a broad way, a positive influence of network-management practices on firm performance confirms the understanding that small-firm networks are a new organizational form and therefore must be managed differently from traditional management (Podolny and Page 1998). Figure 1 demonstrates this relationship and highlights the need for understanding each of the dimensions of management practice and the role of orientation in business development.

The practices of collective planning and evaluation indicate the network capacity of tracing common goals, controlling results and acing them. Because planning is one



Note: ** = $p < 0.01$; * = $p < 0.05$

Fig. 1. Framework proposed with β values for each relationship

Table 5. Network management and firm performance

Variables	Model 1			Model 2		
	B	t	VIF	B	t	VIF
(constant)					5.057	
Collective Planning and Evaluation				.139*	2.414	1.07
Communication and Services				.196**	3.392	1.07
Collaborative Innovation				.143*	2.523	1.04
Leadership				.159**	2.648	1.16
Competitiveness of the market	–.036	–.615	1.05	–.066	–1.154	1.07
Orientation to business development	.485**	8.128	1.08	,378**	5.936	1.31
No. of member firms	–.15*	–2.468	1.11	–.114	–1.857	1.22
Duration of participation	–.044	–.726	1.12	–.081	–1.35	1.17
Model						
F		19.20			14.48	
R^2		.254			.359	
Sig		.001			.001	

Note: ** = $p < 0.01$; * = $p < 0.05$

of the main attributes of network management (Hibbert et al. 2008) and evaluation is a way to give feedback and to adjust network practices (Sydow and Winderler 1998), it is remarkable the fact these two practices act positively on the performance of member firms. Network managers must be concerned with constantly involving members in the definition of goals and collective objectives that might be controlled and adjusted whenever necessary.

Because of the horizontal characteristic of the studied networks, the transparence of activities elicits the promotion of confidence and commitment among members (McGuire 2002). Effective communication helps improve the understanding of members' needs and enables the appropriateness of services. Adequate services may be a motive for participation in the network. For this reason, it is comprehensible that practices of internal communication and adequacy of services exert a positive influence over firm performance. Failures in communication may reduce the capacity of managers to understand the real needs of each member or even limit the information flow about services offered by the network, interfering with the effective use of services by the member firms.

Ritter and Gemünden (2004) suggest that one of the primary functions of collaborative arrangements, as networks, is the possibility of exchange among members. Through this function, it is possible that knowledge flows inside the network. With the proper mechanisms, this knowledge may be shared and lead to innovative solutions (Balestrin et al. 2008). Thus, it is important to understand what innovation practices adopted at the network level are more likely to support positive performance at the firm level.

The creation of spaces that enable interaction and stimulate exchange is a role of the network leader (Keast et al. 2004). This research indicates that the existence of leadership inside networks positively influences firm performance. Therefore, the leader is an important element in the understanding of the network. An important part of network management is the development of new leaders who might be capable of maintaining the cohesion and motivation to execute collective actions.

All four dimensions of management practices show a positive influence on individual firm performance. Therefore, network managers must be aware of the development of management based on these four perspectives.

Furthermore, based on the indication of the relevance of network-management practices, the regression analysis showed unexpected results. Previous research has indicated the size of the network as a relevant factor for the achievement of scale (Waarden 1992). However, the results of this study did not show the influence of this variable on firm performance. By contrast, the analysis revealed the orientation to business development with a strong influence over firm performance, even when analyzed in the management-practices model. This result is appealing, particularly when no parallel study was found considering this as a variable in small-firm network analysis.

The orientation to business development is linked to an individual behavior of entrepreneurs and is usually related to the tendency for risk taking as a way to enable business to thrive (Covin and Slevin 1988). This behavior does not follow one of the main competitive gains engendered in the network: the mitigation of risks to its members (Ebers 1999). Hence, these entrepreneurs seek participation in the network for diverse reasons, and the mitigation of risks would not be an attractive advantage. Further on, this profile of entrepreneurs premises individuals with proactive behavior towards the market (Covin and Slevin 1988). This behavior would hamper the adherence to collective strategies and shared goals. Therefore, the result shows contradictory characteristics to traditional literature.

This result indicates new insights into the management of small-firm networks and into the importance of the partner-selection process in this type of collaborative arrangement. Questions about prior relationships and reputation (Gulati 1995), identity compatibility (Chung et al. 2000), centrality through the lens of social relationships (Guler and Guillen 2010) and a similarity in the governance level (Gulati et al. 2012) have been treated as relevant factors in the choice of partners to form a network. In time, a complementarity of resources and a diversity of ideas for fast and efficient collective solutions (Saz-Carranza and Ospina 2011) are similarly developed in the literature about the selection of partners. However, the orientation to business development as a determinant factor to the selection of a partner seems still to be incipient.

Because this variable shows a positive influence on firm performance, with significance even higher than that of network-management practices, it must not be undervalued by managers and network members. On the one hand, networks should include in their selection-criteria indicators that allow for the identification of orientation to the business development in their potential partners. On the other hand, the network management could develop actions to stimulate this behavior in network members.

Conclusions

This research analyzed the influence of network-management practices on firm performance through a survey of 242 companies, answered by business owners and individuals responsible for participation in network activities. The basis of this study lies on the understanding that a network is a new organizational form that demands proper management practices that differ from those employed in individual companies. The main characteristic of network-management practices is the concern for the development of interaction and the achievement of collective goals. Four groups of practices were identified in the analysis (collective

planning and evaluation; communication and services; collaborative innovation; and leadership), and the results showed the positive influence of all these practices on firm performance.

The study has implications for both the empirical and theoretical fields. In the theoretical field, it helps comprehend how management practices interfere with results obtained by firms associated with networks. The identification of a set of four groups of practices, through a factor analysis, suggests variables for future studies concerned with analyzing the management of small-firm networks. Moreover, the research is developed over a gap highlighted by Raab and Kenis (2009), with respect to the shortage of studies in which the aspects of small-firm networks are considered independent variables affecting the performance attributes of their members. The results allow for the conclusion that the manipulation of certain variables at the network level – notably, the management practices identified – is relevant for the achievement of better outcomes by individual firms. That is to say, the constitution of the network is not enough to generate results; it is imperative to organize and enhance management practices.

From the managerial perspective, these results indicate a diversity of practices that must be developed to positively influence the performance of member firms. This result is important because it sheds light on the complexity of network management. As a supplementary result, this research identified a relationship that is still underexplored studies on interorganizational relationships: the consistent effect of the orientation toward business development on firm performance. Future studies could deepen the understanding of this relationship, particularly taking into consideration the profile of proactivity and risk taking of this entrepreneur and how it effects the network operation. Additionally, the positive effect on performance indicates the development of mechanisms that might identify and stimulate this profile.

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Douglas WEGNER. Professor and researcher at the Business and Management School of Unisinos University. Currently, he is the leader of the track Cooperative Strategies at Enanpad Conference (Brazilian Association of Graduate Programs in Business Administration) and member of GeRedes/CNPq (Brazilian Group for Inter-Organizational Network Studies). His research interest is related to network governance, network orchestration, and inter-organizational relations.

Felipe de Mattos ZARPELON is a PhD candidate under a cotutelle of thesis in Business Administration at Unisinos University, Brazil, and in Sciences of Information and Communication at University of Poitiers, France.

Jorge Renato VERSCHOORE. Professor and researcher at the Business and Management School of Unisinos University. Currently, he is the leader of GeRedes/CNPq (Brazilian Group for Inter-Organizational Network Studies). Regarding intellectual production, he has written books and articles on the Social Science field, concerning management, cooperation, and networks. His main interest nowadays is related to network governance, cooperative strategy, inter-organizational relations, and social network analysis.

Alsones BALESTRIN. Professor and researcher in the Graduate Program of Management at the Business and Management School, Unisinos University, Brazil. Ph.D. in Management by the Federal University of Rio Grande do Sul, Brazil, and Ph.D. in Information and Communication Science by Poitiers University, France. His research interest nowadays includes inter-organizational networks, knowledge creation and collaborative innovation.