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INFLUENCES OF INTERMEDIATION OF SUPPORT INSTITUTIONS ON INNOVATIVENESS AND ORGANIZATIONAL PERFORMANCE

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Abstract

Purpose: Identify the influence of relationships with support institutions on innovativeness and organizational performance.

Theoretical framework: The innovation intermediaries are organizations that act as a link between those involved in the innovation process and whose purpose is to develop the innovative aspects of organizations. Although studies have pointed out the importance of relationships with support institutions for the development of innovation, the present study investigated the role of these institutions as intermediary actors in the innovation process.

Design/methodology/approach: A systematic literature review was conducted. The Methodi Ordinatio Index was used as a protocol. In order to identify the most central theoretical approaches in the studies, as well to map the interactions between these approaches, the Social Network Analysis - SNA technique was used.

Findings: The relationship with support institutions increases access to non-redundant contacts; these, in its turn, influence innovativeness. The performance of these actors as intermediaries will only influence innovativeness in the circumstances in which the idiosyncrasy of these institutions does not prevent or makes impossible access to non-redundant contacts.

Originality/value: The study contributed with literature from the fields of interorganizational relations, innovation and strategy by identifying the theoretical approaches in which the role of innovation support organizations is inserted, as well as by identifying the influence for access to non-redundant contacts, relevant to the innovation process; in addition, theoretical propositions and a research agenda are presented.

Keywords: Innovativeness. Support Institutions. Organizational Performance. Non-redundant contacts. Intermediation.

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INFLUÊNCIAS DA INTERMEDIAÇÃO DAS INSTITUIÇÕES DE APOIO NA INOVATIVIDADE E NO DESEMPENHO ORGANIZACIONAL

Resumo

Objetivo: Identificar a influência das relações com instituições de apoio na capacidade de inovação e desempenho organizacional.

Método: Foi realizada uma revisão sistemática da literatura. O Methodi Ordinatio Index foi utilizado como protocolo. Para identificar as abordagens teóricas centrais que embasaram os estudos, bem como mapear as interações entre essas abordagens, foi utilizada a técnica de Análise de Redes Sociais - SNA.

Originalidade/Relevância: Os intermediários de inovação são organizações que atuam como elo entre os envolvidos no processo de inovação e que têm por objetivo desenvolver os aspectos inovadores das organizações. Embora estudos tenham apontado a importância do relacionamento com instituições de apoio ao desenvolvimento da inovação, o presente estudo investigou o papel dessas instituições como atores intermediários no processo de inovação.

Resultados: o relacionamento com instituições de apoio aumenta o acesso a contatos não redundantes; estes, por sua vez, influenciam a capacidade de inovação. A atuação desses atores como intermediários só influenciará a inovatividade nas circunstâncias em que a idiossincrasia dessas instituições não impeça ou impossibilite o acesso a contatos não redundantes.

Contribuições teóricas/metodológicas: O estudo contribuiu com a literatura das áreas de relações interorganizacionais, inovação e estratégia ao identificar as abordagens teóricas em que se insere o papel das organizações de apoio à inovação, bem como ao identificar a influência para o acesso a contatos não redundantes, relevantes para o processo de inovação; ademais, são apresentadas proposições teóricas e uma agenda de pesquisa.

Palavras-chave: Innovatividade. Instituições de Apoio. Desempenho Organizacional. Contatos não redundantes. Intermediação.

1 INTRODUCTION

Although studies have pointed out the importance of relationships with support institutions for the development of innovation, few studies have summarized the reason why these institutions, in fact, contribute to the maximization of the capacity to innovate.

The promotion of innovation has been one of the relevant concerns of organizations, which consider it as a variable that can contribute substantially to organizational performance (Ali et al., 2016; Dhanora et al., 2018). Based on this understanding, it is noted that innovative organizations behave differently from others in the face of risks, uncertainties, volatilities and in the different organizational capacities (Ravichandran, 2017; Tajeddini et al., 2017). Thus, the innovative capacity– linked to the intra-organizational capacity – is considered one of the main determinants of performance and organizational survival (Lintukangas et al., 2019; Hult et al., 2004).

It should be noted that the innovation capacity refers to the capacity of one organization to produce innovations, as well as its openness to new ideas as a way to exercise influence to markets (Lintukangaset al., 2019). In this sense, this innovation capacity, its related to the capacities that guide a organization in the search for innovation (Rubera & Kirca, 2012). Lawson and Samson (2001) posit that this capacity is related to the skill to manage different resources and fundamental competences to promote the development of innovation.

In this perspective, research has sought to identify capabilities in organizations that promote innovation (Sheng, 2017; Wang et al., 2018). Studies on governance (Helmers et al., 2017), managerial skills (Aarikka-Stenroos et al., 2017), technological capabilities (Sears, 2017), R&D - Research and Development (Homburg et al., 2017) and political-governmental aspects (Zhang & Guan, 2018; Wang, 2018) aim to understand the specificities linked to the capacity of organizations to innovate and, therefore, to maximize their organizational performance. However, there is a gap regarding the interactions of different actors in the innovation system (Reynolds & Uygun, 2018) and the contributions of links with institutions to organizational processes and results (Ormazabal et al., 2018; Giannopoulou et al., 2018)

It is worth it to emphasize that, in the present study, the term "supporting institutions" is not to be confused with the aspect of institutional sociology or institutional economics, widely studied by Dimaggio and Powell, Meyer and Rowan, North, among others, which specify "institutions" as norms, rules, beliefs and shared values. The term "support institutions" is linked to those organizations that are expressly institutionalized, such as universities, research institutes, government agencies, business associations, etc. Therefore, the terms "support institutions" and "support organizations" are used in the

present study referring to organizations that offer a series of real services that directly or indirectly support organizational activities, such as improving technical conditions, operational support, certification support, information provision, etc. (Brusco, 1993).

Based on these considerations, this study aims to identify the influence of these relations with support institutions on innovativeness and organizational performance.

Although an extensive number of studies has highlighted the importance of inter-organizational relationships for organizational innovation (Radziwon & Bogers, 2018; Xie et al., 2018) and for corporate results (Rungsithong et al., 2017; Alaaraj et al., 2018) and a large number of researches have emphasized the relevance of interactions with universities (Chen & Lin, 2017), scientific parks (Díez-Vial & Montoro-Sánchez, 2015), financial institutions (Beck et al., 2018), suppliers (Chen et al., 2017) and competitors (Pun & Ghamat 2016), few studies, in fact, have emphasized the analysis of what leads these institutions to contribute to the maximization of innovation capacity and to organizational performance.

The realization of this study contributes, first and foremost, to a better understanding of the role of supporting institutions in the innovativeness of organizations; secondly, it helps to advance understanding about aspects that influence access to valuable information by organizations; and, thirdly, it contributes to the expansion of the understanding of variables that measure organizational performance.

The question that this study sought to answer is: what is the influence of relationships with supporting institutions on the innovativeness and performance of organizations? To answer this question, a systematic literature's review was carried out, covering the period from 2010 to 2020. Moreover, there is a discussion of the results, with presentation of propositions and a theoretical model that illustrates the research findings, emphasizing on the relevance of support institutions on expanding access to non-redundant contacts, which significantly influence the innovation capacity of organizations.

Thus, besides the introduction this article is composed by the theoretical background chapters, methods for data collection and analysis, bibliometric results, discussion and, finally, the conclusion of the study.

2 SUPPORT INSTITUTIONS, INNOVATIVENESS AND PERFORMANCE

Studies concerning inter-organizational relationships show that the development of associations between organizations is often a response to environmental uncertainties (Pennings, 1981). In addition, resource scarcity can foster different organizational relationships (Pfeffer & Salancik, 1978; Schermerhorn, 1981). In this way, relations with support institutions can aim at integrated goals, with mutual benefits arising from these relationships (Kshetri & Dholakia, 2009; Oliver, 1990).

The connection with educational and research institutions enables organizations to access important scientific knowledge, which can be applied to the optimization of organizational processes (Rubin et al., 2015). Also, these institutions can act as intermediaries in the sharing of scientific knowledge (Decarolis & Deeds, 1999).

The relationship with associative institutions allows access to relevant statistical information and knowledge of the most cost-effective source of supply (Staber, 1987). Moreover, it facilitates the minimization of uncertainties in relation to political-legal adequacy and access to trends that may influence organizational activities (Oliver, 1990). Based on this relational context, support institutions can mediate relationships among actors in organizational networks (McEvily & Zaheer, 1999), where many organizations form or merge to achieve competitive advantageous positions in the market context (Jarillo, 1988). Through networking activities, organizations develop inter-organizational connections that enable access to critical resources and different marketing channels (Johanson & Mattsson, 1987), and gain legitimacy, optimization of customer service, and attention to high complexity problems (Provan & Kenis 2007).

Most studies of inter-organizational relationships recognize that organizations are emerged in an interconnected environment and that their performance is often linked to their connections with other organizations (Oliver, 1990). Thus, as suggested by Granovetter (1985), Burt (1992) and Portes (1998), different actors can have access to important resources and knowledge throughout direct or indirect contacts or connections, thereby enhancing their condition to reach their goals. In this sense, support institutions can facilitate the exchange of knowledge, mediate inter-organizational relationships (Watkins et al., 2015), provide technical support (Esparcia, 2014), facilitate access to critical resources (Vakharia et al., 2018), and allow obtaining valuable information (Cui et al., 2018). Therefore, companies that establish links in networks with universities, research organizations, government agencies, incubators, among others institutions, are more likely to obtain superior performance (Rehman, 2016; Roundy & Bayer, 2019).

The scope of the markets and the increasingly specific characteristics of assets have led organizations to demand external resources and invest more expressively, based on this need, on inter-organizational relationships (Johanson & Mattsson, 1987), given that technical advances have prevented organizations from completely dominating wide market fronts. This encourages different external relationships in order to enhance learning in the competitive environment (Zahra et al., 2000).

Given the broad market characteristics and resource specificities, it is important for organizations to invest in innovativeness (Rathore et al., 2018; Battor & Battor, 2010) this being the result of data collection and processing (Ahuja, 2000) and the integration of new and different knowledge (Kogut & Zander, 1992).

Through the diversity of knowledge, the scope and speed of organizational learning is intensified, resulting in the introduction of new products in the market and in the optimization of fundamental competencies and processes (Zahra et al., 2000). It should be noted that organizations that use different collective knowledge have a greater possibility of innovation (Laursen & Salter, 2006). Thus, support institutions play an important role in obtaining valuable information (Watkins et al., 2015).

In this context, teaching and research institutions can provide specific and innovative knowledge (Ritala et al., 2015), enabling the integration between available knowledge and new knowledge obtained through the established relationship (Colombo & Delmastro, 2002). In addition, this relationship extends access to broad perspectives and experiences (Stam & Elfring, 2008), as well as the intermediation of different sources of knowledge (Hameed et al., 2019; Colombo & Delmastro, 2002). Thus, connections between organizations and research institutions with substantial advances in basic science are emphasized (Orsenigo et al., 2001), given that the direction of basic research to applied research and its application to organizational processes allows the integration of research with organizational innovations (Lofsten & Lindelof 2005).

It is also worth noting that associative institutions play a central role in the innovation process, since these institutions act as innovation intermediaries, encouraging and potentiating the innovative arrangement (Watkins et al., 2015). The so-called innovation intermediaries are organizations that act as a link between those involved in the innovation process and whose purpose is to develop the innovative aspects of organizations (Howells, 2006). Thus, these institutions work in the dissemination of information to organizations and in representation and political ties, promoting negotiations of conditions and incentives for innovation (Watkins et al., 2015).

In addition, support institutions influence the innovative capacity of organizations throughout the development of technical capabilities (Joo et al., 2017). Thus, it is understood that the experiences and training promoted by these institutions, also promotes qualification of the workforce (Campos, 2006), which is necessary for organizations to obtain the necessary skills for the generation and absorption of organizational innovations (Hameed et al., 2012; Minh et al., 2017).

Therefore, besides supporting institutions directly contribute to the development of innovation capacity, they can favor transference of knowledge, information and resources which influences innovativeness (Chung, 2019; Cui et al., 2018; Roundy & Bayer, 2019; Watkins et al., 2015).

3 MATERIAL AND METHODS

With the purpose of identifying how the relationships between support institutions are done, innovativeness and organizational performance, scientific articles published

between 2010 and 2020 were analyzed. As a source of academic production, the following databases were used: Web of Science, Scopus and ProQuest. Table 1 shows the keywords used to search the databases.

Table 1 Keywords used

Keywords
("support institutions" OR "supporting institutions" OR "supporting organizations" OR "support organizations") AND ("innovative capacity" OR "innovation capacities" OR "innovativeness" OR innovation) AND ("organizational performance")

Source: Elaborated by the authors

In the initial search of these databases, 186 articles were found. As a way to specifically select articles with empirical research, scientific relevance and linked to the objective of the present study, four filters were sequenced, namely:

1st Filter) Elimination of duplicate articles, that were published in annals of events, bibliometric studies and without impact factors (Scientific Journal's Rankings was considered as an impact factor index).

2nd Filter) Scientific Relevance: the Methodi Ordinatio Index (Pagani et al., 2015) was used as a protocol to qualify articles regarding their relevance (based on the journal's impact factor, year of publication and number of citations).

3rd Filter) Reading of abstracts: elimination of articles that do not investigate the following aspects in parallel: i) support institution (such as organizations that offer services that directly or indirectly support organizational activities); ii) organizational performance; and iii) innovation.

4th Filter) Full texts' reading: elimination of articles that do not investigate previously presented aspects (from the full reading).

Figure 1 illustrates articles' process selection, based on databases searches and the specified filters. The list of selected articles is presented in the appendix of this article.

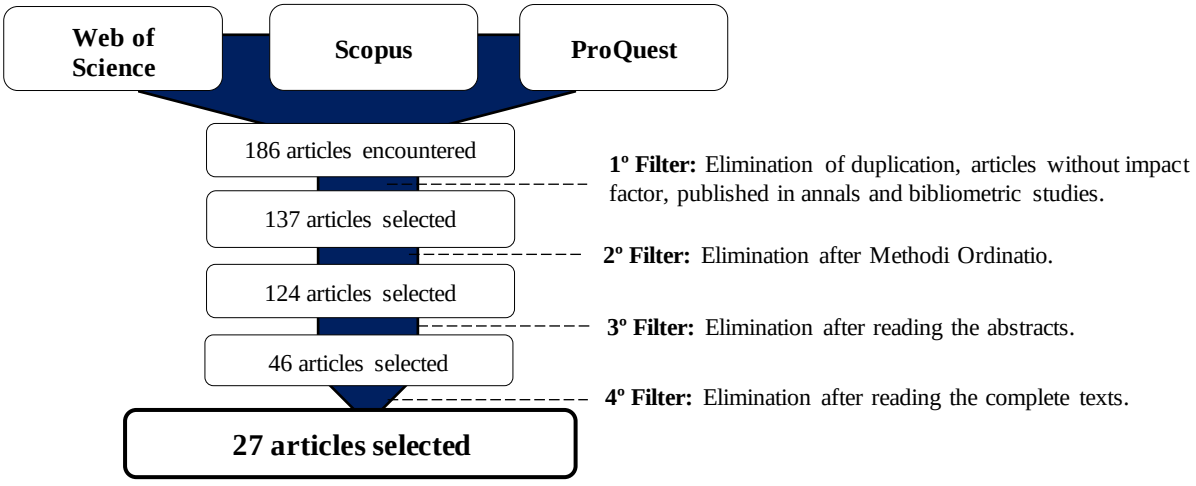

Figure 1 - Article selection filter
Source: Elaborated by the authors

For the bibliometric investigation of the selected studies, the main theoretical approaches that underpinned the research were analyzed, in addition, the different support institutions investigated and, considering that different indicators are used to measure organizational performance, the types of performance metrics that were used in the studies. For these analyzes, descriptive statistics were used.

In order to identify the most central theoretical approaches in the studies, as well to map the interactions between these approaches, the Social Network Analysis - SNA technique (with support from UCINET and NetDraw software) was used, which makes it possible to analyze elements of centrality, structures of the network, intermediation between actors, in addition to the possible representation and visualization of existing relationships (Dai et al., 2020). In the present study, *nDegree* and *nBetweenness* were used; the first indicates how central the different theoretical approaches are in the analyzed context, taking into account the direct connections with the other approaches; and the second expresses the intermediation exercised by the theoretical approach in relation to the others. Thus, from the analysis, it was possible to identify the evolution of the studies, as well as to verify on which theoretical and operational perspectives they are investigated.

4 RESULTS

4.1 Theoretical Approaches

The figure below shows the network formed with the theories and theoretical approaches that underpinned the research.

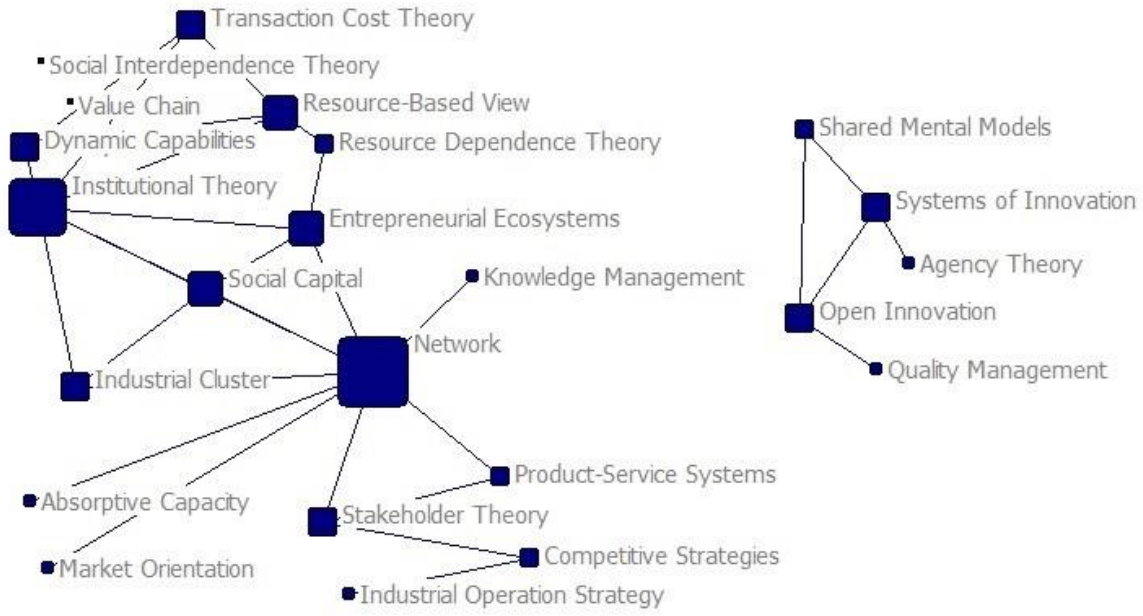

Figure 2 - Theoretical Approaches: Formed Network
Source: Elaborated by the authors

It is observed that there is an expressiveness of theoretical lenses on which the studies are based on. Note that the network formed is fragmented into two independent subnets.

The first subnet (larger subnet) consists of theoretical approaches linked to the fields of strategy and sociology (Resource-Based View, Resource Dependence Theory, Stakeholder Theory, Dynamic Capabilities, Transaction Cost Theory, Entrepreneurial Ecosystems, Network, Institutional Theory, Social Capital). Therefore, it is worth emphasizing the existing connections between these two dimensions of scientific knowledge (Strategy and Sociology), demonstrating the complementarity of these theoretical fields for investigating the role of supporting institutions in innovativeness and organizational performance.

Besides, the smaller subnet is centered on theoretical approaches from the economic side of the field of innovation management (Systems of Innovation, Open Innovation). Therefore, the emphasis of these investigations is on the existing influences in the innovation processes based on the participation of different actors from the public and/or private sectors whose activities can influence the production and diffusion of knowledge and resources useful for the development of innovation (Freeman, 1987; Hameed, 2018; Kafetzopoulos, 2019).

As a way of objectively identifying the main theoretical approaches, the centrality measures (*nDegree* and *nBetweeness*) are presented in the table below, showing the approaches that presented the most expressive results.

Table 2 - Theoretical Approaches: Centrality Measures

Main Theoretical Approaches	nDegree	nBetweeness
Network	0.435	0.283
Institutional Theory	0.348	0.132
Entrepreneurial Ecosystems	0.217	0.041
Resource-Based View	0.217	0.011
Social Capital	0.217	0.002
Systems of Innovation	0.174	0.012
Open Innovation	0.174	0.012
Stakeholder Theory	0.174	0.103
Dynamic Capabilities	0.174	0.000
Transaction Cost Theory	0.174	0.000
Industrial Cluster	0.174	0.000

Source: Elaborated by the authors

The relevance of the Network approach to the analyzed context stands out, being this considered the main theoretical lens on which the analyzed studies were based on.

Therefore, this approach (Network), which emphasizes relational arrangements, interactions and configurations of existing ties, seeks to explain the performance of organizations based on multilateral behavior, as well as the position of actors in the

network, in direct and indirect ties, in the engagement to achieve relationships that provide access to resources, and in the set of integrating actors that can influence the existing connections (Burt, 1992; Granovetter, 1985; Gulati, 1998; Lavie, 2006; Rivera et al., 2010; Uzzi, 1997).

Thus, it is understood that organizations can maximize their capacity for innovation, as well as improve their performance through networks, making use of the possibility of accessing the knowledge and resources held by the interrelated actors directly or indirectly (Belso-Martínez et al., 2017; Rehman, 2016). In this sense, the support institutions play an important role, acting in the intermediation between the actors of the network, connecting parts that would not relate without their performance as a broker (Hameed et al., 2018).

Furthermore, it is worth noting the wide diversification of Institutional Theory, Stakeholder Theory and Entrepreneurial Ecosystems in focal studies. As the *nBetweeness* measure expresses the intermediation exercised by theoretical approaches, it appears that these approaches that presented the greatest results *nBetweeness* are related in a widely diversified way with other theoretical approaches.

It is inferred, therefore, that studies focus on the network approach and are investigated in a diversified way from Institutional Theory, Stakeholder Theory and Entrepreneurial Ecosystems.

4.2 Supporting Institutions

From the bibliometric analysis, it was possible to identify the support institutions studied in the focal context, and it is possible to observe that there is a broad set of institutions that were the object of analysis.

It is important to highlight the expressiveness of studies (44%) that observed the role of universities in the analyzed context, highlighting the important role of this type of support institution in the transfer of knowledge and technology, in access to resources, in capital development in stimulating innovation, and in increasing the likelihood of related organizations to maximize their performance (Hameed et al., 2019; Rehman 2016).

In addition, the range of investigations by public organizations (such as government agencies, ministries, state secretaries, etc.) is highlighted, analyzed in 41% of the studies; in addition to these, they include incubators and business development centers (investigated in 22% of research), accelerators (in 15%), research institutes, science parks, financial and consulting organizations (11%), certification organizations (7%), associations and venture capital groups (4%).

It is noteworthy that these support institutions influence the capacity for innovation, both acting in the intermediation between interested parties, in the provision of services,

and in supporting the development of the competitiveness of organizations (Chung, 2019; Cooper et al., 2012; Roundy, 2017; Yu et al., 2019).

In the next topic, from the Networks approach, the role of support institutions as intermediaries in interorganizational relations and the influence of these institutions on the capacity for innovation will be discussed. In addition, proposals will be presented, as well as a theoretical model that illustrates and summarizes the research findings.

5 DISCUSSION

Due to the dynamicity of organizational environments, several studies emphasize organizations' capabilities and resources as ways of dealing with environmental uncertainties (Teece et al, 2016; Meinhardt et al., 2018). In view of this, there is the understanding that organizations must be innovative in a highly volatile environment.

It is observed that the dizzying change in the market allows organizations to position themselves based on innovativeness (Hooley et al., 1998). This, in turn, makes it possible to transform the intangibility of opportunities into tangible performances (Wang et al., 2018). In this way, it can be said that innovativeness is a necessary aspect of the organization that seeks to maximize its performance and maintain advantages in the market context (Sulistyo & Siyamtinah, 2016).

Based on this logic, the level of dependence of organizational resources, as well as their criticality, can affect organizational performance (Rehme et al, 2016; Ulrich & Barney, 1984). Therefore, it is important that the organizations maximize their innovative capacity, so they can extend their alternatives of access and usage of their organizational resources, and, this way, reduce their dependence level from specific resources. (Li & Atuahene-Gima, 2001; Jean et al., 2017). In addition to it, the possibility to introduce new products and entering new markets minimize the conditions imposed by the effect of the cyclic fluctuations and the seasonal current demand of the products offered by the organization. Thus, product innovation becomes an important driver to face environmental uncertainties, due to the fact that the different kind of products hold the risks (Penrose, 1959).

It should be noted that innovativeness is an important organizational capacity, since it widens the list of goods and services, influencing the maximization of sales and competitiveness (Battor & Battor, 2010). Besides, it also allows the optimization of current organizational procedures, allowing the reduction of costs and the supply of products or services with better quality (Dhanora et al., 2018). Furthermore, it favors the inclusion of new organizational mechanisms, improving internal and external relations (Ali et al., 2016). In this sense, it is important to highlight the importance of the development of appropriate innovative capacities (Rajapathirana & Hui, 2017; Wang et al., 2018).

Hence, organizations can develop changes in their processes and in the usage of their resources and, this way, the innovations of products, processes, organizational and marketing, can represent the set of changes of the firm's activities (OECD, 2005). In this vein, innovativeness makes it possible for organizations to provide for market needs (Adler & Shenbar, 1990), to optimize processes (Rajapathirana & Hui, 2017), and to strengthen organizational resource management (Lawson & Samson, 2001), thus generating higher growth rates (Geroski et al. 1993) and influencing organizational performance (Hult et al., 2004; Ali et al., 2016).

Some studies point to the existence of a positive relationship between the development of innovativeness and the organizational performance (Sulistyo & Siyamtinah, 2016; Rehman, 2016; Ali et al., 2016). Thus, relational bonds can contribute significantly to the expansion of the capacity for innovation, thereby influencing organizational performance.

Thus, the interorganizational relations can integrate network structures (McEvily & Zaheer, 1999), which are important for the management of organizations and the formation of innovations (Provan & Kenis, 2007). These organizational networks, which represent long-term relationships between two or more organizations (Thorelli, 1986), are a valuable source of knowledge, generated from organizational interactions (Johanson & Mattsson, 1987). It should be noted, therefore, that organizations do not relate only in a dyad way, but there are also innumerable indirect links with third parties (Jones et al., 1997), and there is a positive association between the collaborative relationships formed among them and the development of innovation (Shan et al., 1994).

Studies have demonstrated the importance of integrating networks of inter-organizational relationships to foster innovation (Díez-Vial & Montoro-Sánchez, 2015; Ahuja, 2000), given that the external sources of new knowledge and ideas often can have more express value than the ones obtained from internal sources (Sakkab, 2002). Hence, a broad number of external knowledge sources makes possible that the organizations obtain ideas and resources to increase the conditions of the diversified exploration innovative opportunities (Laursen & Salter, 2006).

In this sense, the interrelationships and position of the organization in the network consist of aspects that affect the innovative development (Shu et al., 2018; Aarikka-Stenroos et al., 2017). However, increasing the number of connections, disregarding the diversity of the actors involved, can create inefficient arrangements, which generate information and resources with high redundancy, minimal diversity, and expressive costs (Baum et al., 2000). Thus, Laursen and Salter (2006) noticed that the breadth of players's set – that is, the number of external knowledge sources that the firms use to execute their innovative activities – influence significantly the innovation performance.

Hence, studies show that non-redundant contacts[4] and the expressiveness of structural holes[5] (Burt, 1992; Ahuja, 2000) may influence the innovative development of organizations; bearing in mind that the highly redundant contacts are important for the information absorption (Gilsing et al., 2008), the expressively redundant arrangements can hinder the reach of information essential for adequate organizational adaptation, consequently limiting the number of connections with those organizations attuned to emerging innovations (Uzzi, 1997). Therefore, it is important for organizations to maintain new contacts to access new and diverse information (Levin & Cross, 2004), since network density may limit the possibility of innovative development (Gilsing et al., 2008), once the accessed information is reiterated and do not give access to new broad ideas and knowledge to foster innovation.

Thus, an organization integrated with a diffused network can benefit from relations through non-redundant information (Burt, 1992), which are considered important to the development of innovation (Bergé, et al., 2017; Gilsing et al., 2008).

It is important to note that networks that have expressive structural holes provide access to a variety of information sources (Hargadon & Sutton, 1997; Ahuja, 2000), since they connect non-redundant contacts (Burt, 1992; Gao et al., 2015), promoting the generation of new ideas and increasing innovative potential (Ahuja, 2000). However, in this context, the bonding of non-directly related parties is essential, what can be fostered by the performance of intermediaries, who are actors that promote the connection between parties that are not directly related (Howells, 2006). Therefore, the intermediary can act in brokerage between two or more actors (Küçüksayraç et al, 2015; McEvily & Zaheer, 1999), promoting, this way, the transfer of knowledge and resources necessary for the development of innovation (Kanda et al., 2019).

In this sense, studies have identified the role of intermediaries performed by different institutions, which include associative organizations (Küçüksayraç et al., 2015; Watkins et al., 2015), regional institutions (McEvily & Zaheer, 1999), universities (Molina-Morales & Martínez-Cháfer, 2014), research organizations (Giannopoulou et al., 2019), incubation centers (Shih & Aaboen, 2017; Su & Wu, 2015).

Thus, support institutions play an important role in structural holes, which can act as intermediation between different actors (Howells, 2006), which makes it possible to reach external sources of new knowledge (Molina-Morales & Martínez-Fernández, 2004), as well as expanding access to resources (Doloreux & Melançon, 2009) and support for

[4] Contacts are considered as non-redundant assuming the access to diverse players; on the contrary, redundant contacts consider the same players in the net and, this so, the same information (Pitt et al., 2006).

[5] Structural holes are empty spaces among players in the net with absence of direct relationship. These holes exist when two players are not connected directly, but through a third player to make the connection (Balestrin & Verschoore, 2016).

technology transfer between organizations (Howells, 2006). Thus, these institutions promote links between actors that would not be related due to the lack of direct connections between them.

Given this consideration, the intermediation in the structural holes allows the diffusion of the information among the actors of the network and the access to non-redundant information (Carnovale et al., 2016). Thus, middlemen fill a gap in the network, connecting actors with common interests, sharing information, and enabling linkages between non-interrelated actors directly (Aldrich & Zimmer, 1986).

It is clear that support institutions act as intermediaries of inter-organizational relationships (Watkins et al., 2015; Hameed et al, 2018; Roundy & Bayer, 2019; Cooper et al., 2012), facilitating the mediation between indirect contacts and the expansion of the set of non-redundant contacts (Cui et al., 2018; Gilsing et al., 2008) which are important towards reaching a diversity of valuable information and contributing to the innovative potential of organizations (Gilsing et al., 2008; Levin & Cross, 2004).

In this sense, the following propositions are presented:

Proposition 1: The relationship with support institutions increases access to non-redundant contacts.

Proposition 2: Non-redundant contacts influence innovativeness.

It should be emphasized that, from the sociological aspect of networks, specifically in the perspectives of Granovetter (1985) and Burt (1992), a highly closed network does not significantly encourage innovation. In this sense, it is observed that the intermediate actors (a role that can be played by the support institutions, as pointed out by Hameed et al. 2018 and Watkins et al. 2015) can play an important role in the development of innovation, making it possible to achieve ties between actors that are not directly related (Cooper et al., 2012; Küçüksayraç et al., 2015).

However, it is important to specify the role of these intermediaries as gatekeepers between the network nodes, which may provide relevant links in the structural holes, enabling the transfer of knowledge and resources necessary for innovation (Hung, 2017; Lin et al., 2010), but also, due to its advantageous position in the network, to have the power to define, in different contexts, which actors will be linked or not, and what external knowledge and resources will be transferred, which may, consequently, originate a highly closed network and therefore, with minimal possibility of contributing to the development of innovation.

This aspect is based on the fact that actors in intermediate positions can enjoy benefits resulting from the possibility of linking disconnected parties (Burt, 1992; Lavie,

2006), which may give rise to certain opportunistic behavior, in order to exercise control over other actors, or even promote relationships that benefit them.

Therefore, the performance of support institutions as intermediaries will only influence innovativeness in the event that the idiosyncrasy of these institutions does not prevent or prevent (deliberately or not) access to non-redundant contacts. Therefore, it is inferred, in addition, that the influence of relationships with support institutions on innovativeness is dependent on the redundancy of contacts provided by these institutions.

The third hypothesis of the study is presented.

Proposition 3: Support institutions' influence on innovativeness is moderated by non-redundant contacts.

The set of propositions and their relations are represented in Figure 3.

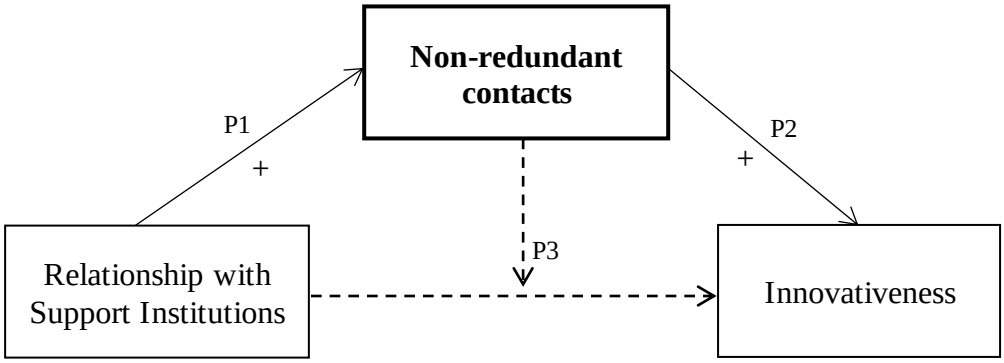

Figure 3 - Theoretical model based on the propositions
Source: Elaborated by the authors

In the context of the proposals presented, it is observed that there is an apparent counter-proposal between them. However, it is inferred that relations with support institutions influence the organization's innovativeness itself, and only itself, these institutions provide access to non-redundant contacts. Therefore, a guiding question arises for conducting an empirical test, namely: do non-redundant contacts have a mediating or moderating effect on the relationship between support institutions and innovativeness?

It is important to highlight the mediation performed by the non-redundant contacts in the effect of the relation with support institutions to foster innovativeness. In this sense, it is observed that one of the main roles that the support institutions can perform is to allow to the organizations the access to players those players that would not be accessed without the activities of these institutions. Thus, the development of innovation, that is linked to the access of diversified information and resources, is highly related to the contact with different and diversified players. In this vein, it could be inferred that the role of the supporting institutions is significantly relevant for the innovation activities, favoring the widening of the sources of information and resources through the mediation performed

between the players that are not directly related; in line with the research by Laursen and Salter (2006) who identified that a central aspect of the innovation process is linked to how organizations seek new ideas. Thus, support institutions can enhance the ability of organizations to access new and diverse ideas in order to maximize their capacity for innovation.

6. CONCLUSIONS

In order to analyze the influence of organizational variables on organizational innovativeness and performance, the following assertions were proposed: the relationship with support institutions increases access to non-redundant contacts; these, in turn, influence innovativeness. Furthermore, the performance of these actors as intermediaries will only influence innovativeness in the circumstances in which the idiosyncrasy of these institutions does not prevent or prevent (deliberately or not) access to non-redundant contacts.

It can be argued that the relationship with support institutions maximizes the organizations' innovativeness by facilitating the acquisition of specific and diversified information and knowledge, as well as access to comprehensive organizational experiences.

In addition, the relationship with support institutions enhances the access to non-redundant contacts, due to the intermediation of these institutions in the different inter-organizational relationships. These contacts influence innovativeness because of access to new and diversified information and reach to unique and valuable information with the opportunity to get hold of new organizational perspectives.

Finally, it is argued that innovativeness boosts organizational performance due to the possibility of improving products and services and the development of new products, according to market needs, positively impacting commercial results. Also, the innovativeness allows for the optimization of the organizational processes; consequently, minimizing costs. In addition, it facilitates the improvement of the organizational management and its resources.

In the light of what has been presented, this literature review identified the influence of support institutions on the innovativeness and performance of organizations and presented theoretical propositions that can be empirically tested in future studies on inter-organizational relations, innovation and strategy; thus providing valuable contribution to both to the academic and professional contexts.

It is suggested that the theoretical model presented in the present study should be tested empirically, the mediating and moderating effects exerted by non-redundant contacts on the influence of the relationship with supporting institutions on innovativeness. Furthermore, it is suggested to be tested in the context of the organizations involved in

cooperativism, given that creation of innovative products and processes is an essential aspect of cooperatives (Gallego-Bono & Chaves-Avila, 2016). Thus, it is understood that innovativeness can impact results in this organizational context (Ali e al., 2016; Camisón & Villar-López, 2012). And as a consequence of the results of cooperativism, a greater local development is expected, both in the economic and social aspects (Guirado et al., 2017; Stattman & Mol, 2014).

Finally, the importance of investigating the different actions of the support institutions in promoting the dissemination of non-redundant information is herein emphasized. Thus, it is suggested that new studies analyze the relationship of partnerships with technical training institutions with organizational performance, investigate the influence of relations with supporting institutions on cost of supply, and the influence of intermediation of the associative institutions on political actions and the relation of this intermediation with the performance of the linked organizations.

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APPENDIX - List of Bibliometric Analysis Articles

Title	Journal
Dynamics of Brokerage Positions in Clusters: Evidence from the Spanish Foodstuffs Industry	Sustainability
Enhancing transparency and learning sustainability on the perceptions of improving naval ships' support performance	International Journal of System Assurance Engineering and Management
Hybrid organizations and the logics of entrepreneurial ecosystems	International Entrepreneurship and Management Journal
Impediments to sustaining South Korea's economic development: Pathologies of cooperation in intra-team dynamics of technology commercialization	Sustainability
Network alliances and firms' performance: a panel data analysis of Pakistani SMEs	Eurasian Business Review
The Impact of International Standards Certification on the Performance of Firms in Less Developed Countries	World Development
The role of innovation metrics in innovation systems	International Journal of Innovation Management
Towards a new model of success and performance in SMEs	International Journal of Entrepreneurial Behavior and Research
Who is left out: exploring social boundaries in entrepreneurial ecosystems	Journal of Technology Transfer
Strategy Improvement of Competitiveness SMEs of Ship Component based on Value Chain Performance	Calitatea
Understanding Digital Transformation Initiatives: Case Studies Analysis	Business Systems Research

Unbalanced Institutions in Market Transition: How Do They Matter for Firm Strategic Choices and Performance in Emerging Economies?	Management International Review
More is less? The curvilinear effects of political ties on corporate innovation performance	Technological and Economic Development of Economy
How guanxi networking matters in the relation between market orientation and innovation in Asian emerging economies – the case of Markor	Journal of Business and Industrial Marketing
The relationship between EFQM enablers and business performance: IMS	Journal of Manufacturing Technology Management
To bridge or buffer? A resource dependence theory of nascent entrepreneurial ecosystems	Journal of Entrepreneurship in Emerging Economies
Knowledge centricity and organizational performance: an empirical study of the performing arts	Journal of Knowledge Management
Sustainable Economic Growth and the Adaptability of a National System of Innovation: A Socio-Cognitive Explanation for South Korea's Mired Technology Transfer and Commercialization Process	Sustainability
A new model to optimize the knowledge exchange in industrial cluster: A case study of Semnan plaster production industrial cluster	Scientia Iranica
Antecedents and Outcomes of Supplier Innovativeness in International Customer-Supplier Relationships: The Role of Knowledge Distance	Management International Review
Finding the Missing Link between Corporate Social Responsibility and Firm Competitiveness through Social Capital: A Business Ecosystem Perspective	Sustainability
An exploration of contemporary organizational artifacts and routines in a sustainable excellence context	Journal of Knowledge Management
The effects of institutional legitimacy, social capital, and government relationship on clustered firms' performance in emerging economies	Journal of Organizational Change Management
Effects of decision rationality on ERP adoption extensiveness and organizational performance	Journal of Enterprise Information Management
Motivations and obstacles to networking in a university business incubator	Journal of Technology Transfer
Structure of service level agreements (SLA) in IT outsourcing: The construct and its measurement	Information Systems Frontiers