The mediating role of knowledge acquisition between social capital and innovativeness

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Abstract:

In the last decades, there has been a growing interest to study the influence of social capital on entrepreneurial orientation, particularly innovativeness, suggesting the need to study the factors that may drive and determine this relationship. One factor that may help explain this link is external knowledge acquisition. The aim of this paper is to study the mediating role of knowledge acquisition to explain the effect of the structural and relational social capital on innovativeness. The results confirm that knowledge acquisition totally mediates the relationship between trust and innovativeness. However, we only find a significant indirect effect of structural social capital on innovativeness through knowledge acquisition. These results allow us to suggest that in a network of relationships it is more important to develop trust among contacts than encourage network density.

Keywords: social capital, innovativeness, knowledge acquisition, mediating effect.
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1. INTRODUCTION

Research on entrepreneurial orientation (EO from now on) has been the subject of much debate on the conceptualization, dimensionality and effect on firm's performance (Covin and Slevin, 1989; Wiklund and Shepherd, 2005; among others). Initially, Miller (1983), who was the first to identify the entrepreneurial firm, distinguished its three basic dimensions - innovativeness, risk taking and proactiveness-, which were subsequently extended by Lumpkin and Dess (1996), with the introduction of competitive aggressiveness and autonomy. As suggested by Zahra, Jennings and Kuratko (1999), we consider that it is necessary to address and examine new background factors for understanding each specific dimension of the EO.

Specifically, we aim to analyze the factors that determine the innovativeness that is embodied by a strong organizational commitment to "engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services of technological processes" (Lumpkin and Dess, 1996: 142). We consider that innovativeness is particularly relevant in the present context of strong market and technological uncertainty, because of its links with creativity and the incorporation of developments in the firm, which are the basis for their growth and that of the whole economy.

In recent decades there has been a wide-ranging application of Social Capital Theory to the field of Management (Nahapiet and Ghoshal, 1998; Moran, 2005), and, particularly, in research on Entrepreneurship (De Carolis and Saparito, 2006). Social capital (SC from now on) is a difficult concept to measure and value, owing to its multifaceted nature (Moran, 2005). We use the classification of Nahapiet and Ghoshal (1998), which differentiates between structural, relational and cognitive SC. We understand that it is interesting to study in depth the effect of structural and relational SC, on innovativeness. Density and trust of social networks generate controversy about the advantages versus the risks which may cause redundancy of information and opportunistic behavior, particularly in relation to innovativeness (Obstfeld, 2005). This raises the need to study the influence of structural and relational SC separately on firm innovativeness, with a view to understanding the factors that may drive and determine these relationships.

One factor that may help explain the link between SC and innovativeness is external knowledge acquisition. On the one hand, the acquisition and integration of valuable knowledge - tacit and complex- require certain forms of SC (Kogut and Zander, 1992). Therefore, we propose that the effect of structural and relational SC on innovativeness will depend on the extent to which firms are able to take advantage of their membership of dense networks and confidence in their contacts to access new knowledge for the purpose of generating innovativeness.

Thus, the specific aim of this paper is to study the mediating role of knowledge acquisition to explain the effect of the structural and relational SC on innovativeness of firms. Therefore, the main contribution of this study is to demonstrate how the acquisition of knowledge drives the firm's social networks (density and trust) to innovativeness.

The empirical study was developed on the footwear industry. This industry is especially appropriate for research in this field. First, because a certain period of time is required to develop SC fully and, secondly, the concentration of firms in this sector favors its
development. On the other hand, the increasing role of innovation to address the
difficulties faced by firms in this industry in today’s global environment make
innovativeness a key variable to be competitive.

This paper is structured as follows. First, we explain the theory and derived hypotheses.
Then, we describe the methodology used followed by results obtained. Finally, we
present the discussion, conclusions and implications for theory and practice.

2. THEORY

2.1. Innovativeness

EO reflects the extent to which a firm is able to identify opportunities and develop
innovative actions (Lumpkin and Dess, 1996). Covin and Slevin (1989) offered
important contributions to entrepreneurship literature by means of an aggregated
conceptualization of EO -innovativeness, proactiveness and risk-taking-. Lumpkin and
Dess (1996) suggested that two additional dimensions were salient to EO –competitive
aggressiveness and autonomy-.

However, it has been argued in the literature that future research on EO may benefit
from considering innovativeness, proactiveness, risk-taking, competitive aggressiveness
and autonomy as unique sub-dimensions of the EO construct (Lumpkin and Dess, 1996;
Kreiser and Davis, 2010).

This study focuses on a unique sub-dimension of EO, that is, innovativeness. It is the
predisposition to engage in creativity and experimentation through the introduction of
new product, services or processes. Many authors emphasize the importance of
innovativeness as a strategy in the entrepreneurial process (Schumpeter, 1934; Frese,
1995; Lumpkin and Dess, 1996). Thus, innovativeness is considered to be a prerequisite
for a firm’s survival and success (Rhee and Lee, 2010). Furthermore, focusing on this
dimension is particularly helpful in analyzing the effect of the different dimensions of
SC, because innovativeness is the dimension that best reflects the SC controversy.
Innovativeness emphasizes the active approach of innovation and describes the actual
innovative behavior, such as the daily effort to improve one's work procedures. In this
sense, innovativeness refers to a company's effort to discover new products and/or
service opportunities, and make improvements to existing processes and systems (Hage,
1980). It consists of a willingness to introduce novelty and seek solutions through
experimentation and creative problem solving (Lumpkin and Dess, 1996). Thus,
innovativeness is viewed as essential to maintaining a company's viability because it is a
key source of the new ideas that lead to product introductions, service improvements,
and managerial practices that advance and sustain a thriving company.

2.2. Social capital: structural and relational dimensions.

The SC perspective states that the network of relationships provides value to the agents,
that is, individuals, firms or communities, allowing them to explore and obtain benefits
from the resources placed in these relationships (Lin, 2001). We understand SC as the
sum of current and potential resources embedded in, available through and derived from
the network of relationships possessed by a social unit, following the approach proposed
SC is a difficult concept to measure and value, owing to its multifaceted nature (Widen-Wuff and Ginman, 2004; Moran, 2005). It has to be approached by identifying and assessing a series of dimensions (Koka and Prescott, 2002), so that we do not lose explanatory power resulting from the grouping of the dimensions of SC (Franke, 2005). Nahapiet and Ghoshal (1998) distinguish three dimensions for analyzing the characteristics of SC: structural, relational and cognitive. The structural dimension includes the whole social network interaction, focusing on the properties of the social system and the network or relationships as a whole (Nahapiet and Ghoshal, 1998). Its key aspects are network ties and configuration. Network ties include the specific way in which actors are related in terms of strength, frequency and narrow relationships. Network configuration determines the pattern of connections between its members in terms of density, connectivity and hierarchy. The relational dimension refers to the relationships’ characteristics and attributes derived from a firm’s history and reputation. The key facet is relational trust that can be defined as a set of positive expectations about others or their actions that reduces uncertainty about the behaviour of other agents (Tsai and Ghoshal, 1998). Finally, cognitive dimension refers to the resources that provide common representations and interpretations and systems of understanding between the parties (Cicourel, 1973). The two main aspects of this dimension are the goals and shared culture among network members.

We consider it important to study in depth the effect of each particular dimension in the strategy orientation of firms. This is because each dimension can have different and, occasionally, even counter effects (Yli-Renko, Autio and Sapienza, 2001). In this paper we focus on the role played by the structural and relational dimensions. This choice is justified for two reasons: First, because these are the dimensions that generate most heated discussion regarding their advantages, and secondly, because the density and trust of social networks have strong implications for the detection and exploitation of new opportunities through entrepreneurial actions. Therefore, these dimensions have strong links with EO in general, and with innovativeness in particular (Ruef, 2002; Kaasa, 2009). The controversy arises from the fact that structural and relational SC make the achievement possible of certain advantages that would be difficult to gain in their absence (Nahapiet and Ghoshal, 1998). However, it is also possible that a particular form of SC that helps in a specific action could harm another. SC supports the paradoxes of the network, because it provides opportunities but also imposes restrictions. This controversy is intensified in the structural SC, because those firms that belong to dense networks with strong linkages benefit from the coordination provided by the social norms of the network, which limit opportunism and facilitate the exchange of valuable information and tacit knowledge. However, these networks often cause problems of redundancy in the information exchanged (Koka and Prescott, 2002) and can also lead to a situation of "blindness" or "myopia", because firms pay little attention to competitors outside the network (Inkpen and Tsang, 2005).

3. HYPOTHESES

3.1. Social capital and innovativeness

Throughout the literature we can find several studies that have analyzed the influence of SC on innovativeness (Tsai and Ghoshal, 1998; Ruef, 2002; De Carolis and Saparito, 2006; among others). It is has been highlighted that innovativeness requires the development of certain resources (Kanter, 1988). Thus, the relationships with other organizations have become an essential factor in the innovation process (Zhong and
Ozdemir, 2010) and new sources of value are generated through resource development, especially through exchange and combination of resources (Moran and Ghoshal, 1996). Thus, to have a greater innovativeness, firms need to reallocate resources, to get new ones and to combine the resources existing in the firm in a new way (Tsai and Ghoshal, 1998). Therefore, we would expect a positive influence of SC on innovativeness. We shall now analyze separately the influence of structural and relational SC on innovativeness.

3.1.1. Structural social capital and innovativeness

The development of cohesive links, characteristic of dense networks, facilitates the exchange of information, cooperation and interaction, so that members of these networks can learn the new technologies, ideas and opportunities they need to innovate quickly (Coleman, 1988; Meagher and Rogers, 2004; Moran, 2005). Kaasa (2009) points out that network density and strong links, in which information flows quickly, are of great importance for innovativeness.

However, the literature also contains a different approach, representing the other side of the structural SC controversy. Thus, a group of studies, such as those of Burt (1992) or Obstfeld (2005) suggest that networks with structural holes are the main source of new and useful information for innovativeness. So firms in sparse networks can enjoy access to less redundant information, which favors the use of new opportunities or the development, combination or recombination of new ideas (Obstfeld, 2005). As indicated by Rowley, Behrens and Krackhardt (2000), in an evolutionary environment firms should have a mixture of the two types of links in order to reap the benefits of both and avoid possible drawbacks, which improve its innovativeness (Tsai and Ghoshal, 1998). These arguments can be formulated in the following hypothesis:

H1a: Structural social capital will be positively associated to innovativeness of the firm.

3.1.2. Relational social capital and innovativeness

Trust can influence innovativeness through many mechanisms. First, the higher the general trust, the lower the monitoring costs of possible malfeasance by partners and the smaller the need for written contracts (Tamaschke, 2003). Furthermore, higher trust enables firms to spend more time and finances on other ends, innovativeness being one of them. Thus, different levels of perceived trust and reliability can result in different levels of exchange and combination of resources between firms, improving their innovativeness (Tsai and Ghoshal, 1998).

Landry, Amara and Lamari (2002) highlight that firms in environments with high confidence are more likely to innovate, as this facilitates the exchange of reliable information or tacit knowledge. Therefore, as established by Doh and Acs (2010), trust encourages agents to cooperate and share resources such as information, skills and knowledge, reducing the need for intervention and promoting innovativeness. From these arguments we can propose the next hypothesis:

H1b: Relational social capital will be positively associated to innovativeness of the firm.
3.2. The mediating role of knowledge acquisition.

In recent decades the literature has shown a growing interest in knowledge as a key element in behavior and a source of value creation for companies (Spender and Grant, 1996; Weber and Weber, 2007; among others). Generally, firms do not have all the knowledge they require, so they must have ties outside the organization to acquire knowledge (Anand, Glick and Manz, 2002). Knowledge acquisition is understood as the process used by an organization to obtain knowledge. This process takes place through the organization’s external and internal relationships that provide knowledge varying in nature, and includes both formal and informal daily activities, among others.

Recently, several researchers have paid special attention to external sources of knowledge. External knowledge acquisition becomes crucial for the innovativeness, since its development requires external knowledge flows (Lane and Lubatkin, 1998).

3.2.1. Social capital and knowledge acquisition

Most companies cannot generate internally all the knowledge they need to deal with the complexity and dynamism of the environment. Companies seek external sources of knowledge through their relationships with suppliers, customers, competitors, institutions, etc. and interorganizational relationships thus create opportunities for acquisition and exploitation of external knowledge (Dyer and Singh, 1998; Lane and Lubatkin, 1998). We believe that the first advantage derived directly from SC is knowledge acquisition, because it facilitates access to extensive information sources and improves the quality and relevance of such knowledge (Adler and Kwon, 2002). We understand that the characteristics of the relationships affect both the quantity and type of transmission and acquisition of knowledge.

3.2.1.1. Structural social capital and knowledge acquisition

Dense networks are the ideal framework for the development of learning through interaction and exchange of tacit knowledge between agents (Hansen, 1999). Thus, firms located in dense networks, in a good position in the network and with a large number of connections, will have access to greater diversity of knowledge, increasing the likelihood of having access to valuable and / or relevant knowledge (Reagan and McEvily, 2003). Thus, the cohesion created by dense networks not only increases the extent and speed of information transmitted between the parties, but also provides certainty about how it will be used (Moran, 2005).

A highly interconnected network is effective for the dissemination of tacit knowledge. Therefore, the characteristics of these networks are ideal for exploiting existing opportunities and sharing information and knowledge in cooperative exchanges (Rowley et al., 2000). Thus, when a group of individuals are closely linked, they share a heuristic that facilitates and simplifies the collective work and understanding of ideas and thoughts expressed by others (Hansen, 1999). Thus, network density is expressed as a critical element to support and maintain the flows of knowledge (Yli-Renko et al., 2001). Accordingly the following hypothesis is formulated:

H2a: Structural social capital will be positively associated to knowledge acquisition of the firm.
3.2.1.2. Relational social capital and knowledge acquisition

Through trust individuals show greater access to knowledge sharing (Nahapiet and Ghoshal, 1998). This confidence plays a key role in the willingness of network actors to share knowledge (Inkpen and Tsang, 2005). When two organizations begin to trust each other, it increases their willingness to share resources, without worrying that the other part will take advantage of them (Tsai and Ghoshal, 1998). Therefore, a high level of relational SC facilitates the exchange of confidential information and valuable knowledge, and decreases the risk of opportunistic actions.

Thus, Koka and Prescott (2002) observed that high levels of trust among stakeholders will lead to greater access to information between those agents. Furthermore, Weber and Weber (2007) found a positive relationship between trust and knowledge transfer. Then, we believe that companies with confidence in their social networks will be able to acquire and integrate more valuable knowledge.

These arguments can be formulated in the following hypothesis:

\[ H2b: \text{Relational social capital will be positively associated to knowledge acquisition of the firm.} \]

3.2.2. Knowledge acquisition and innovativeness

Knowledge acquisition enhances the smooth development and establishment of a new organizational structure and effective administrative system, which will lead to innovativeness. In this sense, when firms are effective in their acquisition knowledge from external sources, they are likely to increase their innovativeness.

We consider that innovativeness requires external knowledge flows that favor its development (Dyer and Singh, 1998; Lane and Lubatkin, 1998). Therefore, depending on the degree to which a company has access to external sources of knowledge, it will be able to make better use of their resources to generate innovation (Kogut and Zander, 1992). Furthermore, innovation and innovativeness may be associated with the company's ability to obtain and share knowledge (Kogut and Zander, 1992). In this sense, Cohen and Levinthal (1990) suggest that knowledge acquisition allows the accumulation of knowledge, and this improves the ability of firms to recognize and assimilate new ideas as well as the ability to turn these ideas into future innovations.

In general, we believe that those companies that are able to acquire more external knowledge will display more innovativeness. From this argument, we can propose the following hypothesis:

\[ H3: \text{Knowledge acquisition will be positively associated to innovativeness of the firm.} \]

3.2.3. The mediating effect of knowledge acquisition

The literature establishes a general relationship between SC and innovativeness (De Carolis et al., 2009). However, the potential problems of redundancy in information and opportunism in the use of shared information by the members of the networks may particularly affect the development of innovativeness. Therefore, we examine independently of each other the role of knowledge acquisition in the relationship between the structural and relational SC and the innovativeness of the firm.
As argued previously, network density is a context that favours superior innovativeness of the firms (Kaasa, 2009). This is because the agents of dense social networks can acquire new technologies, ideas and opportunities to innovate quickly and sustainably (Meagher and Rogers, 2004). However, structural SC controversy also involves the problem of redundant information derived from strong ties to develop innovativeness (Obstfeld, 2005). Therefore, belonging to a dense network is not a sufficient condition to lead the firm toward innovativeness. We consider that only those firms which are able to take advantage of redundant ties in their networks to acquire and integrate relevant tacit knowledge will tend to innovativeness. Thus, we consider knowledge acquisition has a mediating role in the structural SC and innovativeness relationship. We can propose then our next hypothesis:

\textit{H4a: Knowledge acquisition will mediate in the association between structural social capital and innovativeness of the firm.}

With regard to relational SC, we have considered its potential for generating innovativeness (Chou, 2006). The ability to generate innovativeness from trust is justified by the reduction of monitoring costs, less need for written contracts or better understanding of the demands of innovations, among other reasons (Landry et al., 2002, Tamaschke, 2003). However, relational SC is not a sufficient condition for the firm to generate innovativeness. We consider that firms differ in their ability to access valuable knowledge sharing from relationships of trust with its contacts. Therefore, only firms that take advantage of the confidence with their contacts to exchange relevant information, access tacit knowledge and avoid opportunistic actions, will tend to innovativeness. Therefore, we propose that the relationship between relational SC and innovativeness will be mediated by knowledge acquisition of the firm. Accordingly the following hypothesis is formulated:

\textit{H4b: Knowledge acquisition will mediate in the association between relational social capital and innovativeness of the firm.}

![Figure 1. Theoretical model: hypotheses](image-url)
Figure 1 presents the direct and mediating effects and the proposed model. We also include size, age and the use of Information and Communications Technologies (ICT) as control variables.

4. METHODOLOGY

4.1. Sample

The empirical study is focused on the Spanish footwear industry. This industry is characterized by the predominance of small and medium firms and by the concentration of these firms in regional agglomerations that are located around certain areas with a strong tradition of shoemaking.

We used two databases to establish the population of firms, SABI² and Camerdata³. Firms with less than five employees present characteristics substantially different from the considerations raised in the theoretical argumentation. For this reason, we added the condition not to include this group of firms (Spanos and Lioukas, 2001). We obtained a database of 1403 records after we eliminated duplicated cases. Once the questionnaire⁴ was sent to all these firms, we obtained a sample of 224⁵ firms, representing a response rate of 16.97%, for a confidence level of 95% and a sampling error of 5.96%. Finally, we tested non-response bias and observed no differences between respondent and non-respondents on structural characteristics (Armstrong and Overton, 1977).

4.2. Variables⁶

*Structural SC –density-:* The network configuration determines the pattern of unions between members of the network. In this study we approach this variable by measuring the density of the network. In order to adjust these measures to multi-item scales, it was necessary to adapt the way of operationalizing the variable density used in other studies. Thus, our study used a three-item scale adapted from Molina and Ares (2007) who adapt the way of operationalizing the variable density used in other studies (e.g., Tsai and Ghoshal, 1998; Rowley et al., 2000).

*Relational SC –trust-:* In the process of selecting the most appropriate scale to measure this variable, we analysed different studies (e.g., Tsai and Ghoshal, 1998; Kale et al., 2000; Yli-Renko et al., 2001). Finally, we decided to use the scale of Kale et al. (2000) which includes a total of five items.

*Knowledge acquisition:* After revising several studies (Tsai and Ghoshal, 1998; Kale et al., 2000; Yli-Renko et al., 2001), we consider that the scale proposed by Kale et al. (2000), which includes three items, is most suitable for application to our study.

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² SABI compiles information on more than 95% of Spanish firms with total yearly revenues over 360,000-420,000.
³ This database compiles a directory of all Spanish firms form the network of local Chambers of Commerce.
⁴ The information was gathered between October (2007) and January (2008).
⁵ After eliminating incomplete questionnaires or those that did not meet the proposed criteria, e.g., being answered by the manager of the firm.
⁶ All scales were measured with a Likert scale of 1 to 7, where 1 indicated the value strongly disagreement and 7 strongly agreement.
Innovativeness: After revised several studies (Covin and Slevin, 1989; Hughes and Morgan, 2007) we have selected the scale proposed by Covin and Slevin (1989), as the most suitable for our study.

Control variables: We included in this study three control variables: age, size and use of TICs. The effect of firm size on innovativeness has been amply demonstrated in the literature (e.g., Su, Tsang and Peng, 2009). Firm size was measured by the number of employees. Similarly, age is a typical control variable in the study of innovativeness (e.g., Salavou and Lioukas, 2003). In addition, we introduce the variable "use of Information and Communications Technologies" (ICTs) as a control variable, since several studies show that it fosters innovation and even innovation performance (Tatikonda and Stock 2003). In order to measure this variable we have included a single item that measures the frequency with which the firm uses ICTs.

4.3. Analysis

We decided to use Structural Equations Analysis, since this methodology is perfectly suited to our study. Thus, we used PLS\(^7\) to test the proposed hypotheses. As indicated by Cassel, Hackl and Westlund (1999), PLS is quite robust against multicollinearity, the incorrect specification of the structural model, because of the omission of regressors and skewed distributions in the variables. Furthermore, some studies (Falk and Miller, 1992; Hulland, 1999) indicate as advantages to this technique that it places minimum requirements on simple and measurement scales, is more suitable for small samples and does not require assumption about multivariate normality. Finally, this technique is especially suitable for testing mediating hypotheses (James, Mulaik and Brett, 2006).

5. RESULTS

5.1. Measurement model test

In order to have a good measurement model, we evaluate the item reliability, construct reliability, convergent validity and discriminant validity. The value of the loadings ($\lambda$), allows us to evaluate item reliability. Following Carmines and Zeller (1979), our model has a good degree of item reliability because all loading values surpass the recommended threshold of 0.7. The composite statistic of reliability ($\rho_c$) is used for test construct reliability. All the constructs used in the model exceeded the recommended threshold of 0.8 as we can see in Table 1. Convergent validity is assessed by the average variance extracted (AVE). In this case all constructs exceeded the recommended threshold of 0.5.

<table>
<thead>
<tr>
<th>Table 1. Construct reliability and AVE</th>
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<tr>
<td>Construct</td>
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<tr>
<td>Structural social capital</td>
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<td>Relational social capital</td>
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<td>Knowledge acquisition</td>
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<td>Innovativeness</td>
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\(^7\) We use PLS-Graph software to analyze data.
Again, following Fornell and Larcker (1981), in order to control discriminant validity we compared the square root of the AVE (the diagonal in Table 2) with the correlations between constructs (the off-diagonal elements in Table 2). We can observe that the square root of AVE for both constructs is greater than the correlation between constructs, suggesting that each construct relates more strongly to its own measures than others.

<table>
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<tr>
<th>Table 2. Discriminant validity</th>
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<tr>
<td>Construct</td>
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<td>Innovativeness</td>
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5.2. Structural model test

As we can observe in Table 3, structural SC has a positive but not significant effect on innovativeness ($\beta=0.025$; not significant) however, relational SC has a positive and significant effect ($\beta=0.227$; $p<0.01$). So we cannot accept hypothesis 1a whereas hypothesis 1b is verified.

<table>
<thead>
<tr>
<th>Table 3. Social capital’s effects on innovativeness</th>
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<tr>
<td>N=224 *p&lt;0.10; **p&lt;0.05; ***p&lt;0.01; ****p&lt;0.001</td>
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<tr>
<td>Construct</td>
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<td>Use of ICT</td>
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The results obtained (Table 4) show that both structural and relational SC have a positive and significant effect on knowledge acquisition ($\beta=0.244$; $p<0.001$ and $\beta=0.375$; $p<0.001$). Thus, these variables explain almost 30% of the variance. Therefore, we can accept hypotheses 2a and 2b.

<table>
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<th>Table 4. Social capital’s effects on knowledge acquisition</th>
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<tr>
<td>N=224 *p&lt;0.10; **p&lt;0.05; ***p&lt;0.01; ****p&lt;0.001</td>
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<td>Construct</td>
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Hypothesis 3 proposes the positive effect of acquisition knowledge on the firm's innovativeness. In this sense, given the results obtained we can accept this hypothesis ($\beta=0.402; p<0.001$).

Finally, hypotheses 4a and 4b propose a mediating effect of knowledge acquisition in the relationship between both structural and relational SC and innovativeness. To confirm these hypotheses we must check the four conditions established by Baron and Kenny (1986). In the case of relational SC, when we introduced in the model the variables –dependent, mediator and independent-, the results show that the effect of relational SC on innovativeness was eliminated (from $\beta=0.227; p<0.01$ to $\beta=0.086;$ not significant). We can conclude, therefore, that we have a perfect (Preacher and Hayes, 2004) or complete (James and Brett, 1984) mediation. Thus, knowledge acquisition totally mediates the relationship between relational SC and innovativeness and we can accept hypothesis 4b.

In the case of structural SC, we found that only the third condition was satisfied. Hence, a mediation effect of knowledge acquisition in the relationship between structural SC on innovativeness cannot be affirmed.

However, there is an indirect effect of structural SC on innovativeness through knowledge acquisition8. Therefore, if we limit our observation to the significance of the coefficients (following the four conditions established by Baron and Kenny, 1986), we can wrongly conclude that there is an indirect effect. For this reason, Holmbeck (1997) recommends analyzing the full size of the coefficients as well. Hayes (2009) establishes that the best option to test the indirect effects is through bootstrapping, since this non-parametric approach is better suited to controlling type I9 error. In order to confirm the validity of the indirect effects obtained in the model, and following the recommendations of Praches and Hayes (2004) and Hayes (2009), we used a macro for SPSS which shows the confidence intervals. The results obtained allow us to confirm the validity of the effects.

As is shown in figure 2, our model explains 22.8% of the total variance of the firms' innovativeness. This value surpasses the threshold established by Falk and Miller (1992), so we can confirm that the model has a high consistency. In addition, the goodness of fit index (GoF) developed by Tenenhaus, Vinzi, Chatelin and Lauro (2005) is 0.446. This value surpasses the recommended threshold of 0.31. Therefore, we can establish that our model has a good fit.

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8 See Preacher and Hayes (2004); Hayes (2009) for analyzing the distinction between indirect effects and mediation.

9 Although PLS uses resampling methods, there is evidence that Type I error rates are inflated by resampling methods (Mackinnon, Lockwood and Williams, 2004).
6. DISCUSSION AND CONCLUSIONS

In this paper we analyze how SC –structural and relational dimensions- affects innovativeness by the acquisition of knowledge obtained though these networks. The results obtained show a positive and significant relationship between relational SC and innovativeness of firms. However, we observe a positive but not significant influence of structural SC on innovativeness. Furthermore, we find a strong positive relationship between SC –both dimensions- and knowledge acquisition.

We must point out that in this relationship, the effect of trust on innovativeness is greater than the effect of density. Thus, compared with density, trust explains twice the variance of knowledge acquisition. The results also confirm a positive effect of knowledge acquisition on innovativeness. Finally, when we introduce in a unique model all the variables –SC, knowledge acquisition and innovativeness-, we observe that knowledge mediates the relationship between trust and innovativeness. Moreover, we can establish that knowledge acquisition totally mediates this relationship. Although we do not detect a mediator effect in the case of density, we find a significant indirect effect of structural SC on innovativeness through knowledge acquisition.

These results allow us, therefore, to conclude that in a network of relationships it is more important to develop trust among contacts than encourage network density. Furthermore, trust contributes to a greater extent than density to the acquisition of external knowledge, because trust reduces both opportunistic behavior and monitoring costs, making firms more willing to share relevant and valuable information.

We consider that one of the main contributions of the study is that it allows a better understanding of the differences in the relationships between different dimensions of SC and key variables for the competitiveness of the firm. We have proved that density and trust of social networks have a different relevance in explaining knowledge acquisition and innovativeness. Furthermore this study allows a greater understanding of the SC
controversy, because SC provides opportunities but also imposes restrictions. We detect that this controversy is intensified in the structural dimension; because of the problems of redundancy in the information exchanged, “blindness” and “myopia” counteract the advantages derived from the potential access to information and the limitation of opportunistic behavior among members of the dense network.

We consider that one of the main theoretical and practical implications of this study is that knowledge acquisition is a fundamental driver of social relationships to promote innovativeness. In sum, we believe that the SC perspective (Putnam, 1995) and the knowledge view (Nonaka, 1994) provide a solid base from which to explain innovativeness.

One of the limitations of this study is the cross-sectional and non-longitudinal approach of the study. In any case, the cross-sectional approach of the study suffices for the aims, having already been put to good use in other studies on SC or innovativeness (Wu, Chang and Chen, 2008). Furthermore, the limitations of any of the studies that use a single method include common method bias. We control the potential common method bias conducting a Harman’s ex-post-one factor test (Podsakoff, MacKenzie, Lee and Podsakoff, 2003), which results show that common method bias is not a problem. The perceptions of CEOs with regard to the main aspects of this study would not necessarily be objective, which might lead to possible limitations in the results obtained. Finally, we consider that the role that structural and relational SC plays in a firm's innovativeness in a mature sector may be different from the role that they play in other dynamic industries.

The conclusions of this study lead to several managerial implications. Managers must build trust and rely on their contacts. If they belong to dense networks, they should also take advantage of their proximity to their contacts to access valuable and tacit knowledge that leads them to more innovation. Managers should direct their effort towards building trust and strongly-bonded relationships that effectively allow them to acquire relevant knowledge. Therefore, we encourage managers to maintain relationships with customers, suppliers and competitors to promote this type of cooperative relationship that facilitates the transmission of knowledge and hence innovativeness.

The conclusions of this paper lead to a series of proposals for future studies. In light of the limitation delineated above, we plan to develop new studies on other dynamic industries in order to compare their most significant effects. We also consider analyzing the influence of the cognitive dimension of SC, which has been the least studied, on innovativeness and knowledge acquisition. Finally, it is important to study whether the relationships arising in the model would be different for other dimensions of entrepreneurial orientation.

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