A Social Capital Approach for Open-mindedness and Radical Innovation Relationship

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Despite an extensive number of studies examining market performance as an outcome of social and internal capital, there is still a lack of understanding on how such performance is generated. This study examines the impact of 'open-mindedness' on the challenging of basic beliefs or processes that are explicitly or tacitly represented in internal and external networks. Radical innovation is also posited in this paper as a managerial priority that mediates the relationship between internal social capital and market performance. The research model and hypothesized relationships are empirically tested using the structural equation modeling (SEM) approach, validated by factor analysis of 361 companies in the Brazilian industrial sector. The study found that open-mindedness is associated with internal and external social capital, and external social capital mediates the effects of open-mindedness on internal social capital. We also observed that radical innovation mediates the effects of internal social capital on business performance. Besides that, we found that external social capital doesn't present a direct impact on radical innovation, probably doing it indirectly by internal social capital. Although this result is worthy of further investigation, one conclusion that might be drawn is that since entrepreneurial activity in general, and a turbulent environment in particular, requires customer innovations, many mental models created through internal and external social capital might be counterproductive without the stimulus of an open-mindedness culture. Other conclusion might be that an external knowledge for an enterprise could lead to a market performance, but not to a radical innovation without a necessary internal debate about this knowledge. One of the findings of this study is that open minded firms promote the generation of radical innovations for developing their activities by the internal and indirectly by external social capital. As we have found, these innovations allow companies to increase their performance in the marketplace. Their activities require that these organizations look for new sources for generating ideas. Thus, an open minded organization emphasizes the creation of knowledge through a learning orientation. Our findings regarding the positive effects of open-mindedness, as a dimension of learning orientation, on business performance are supported by previous studies (Baker and Sinkula, 1999, Kropp et al. 2006). That is, firms with open minded posture will achieve higher levels of performance, since they develop better products and are more likely to adapt to the changing marketplace by radical innovation. That influence will be carried by the intensity of internal and external social capital approach. That is to say that when firms are opened to adopt new processes, to review its procedures and exercise the unlearning process, they are more likely to achieve radical innovations in terms of processes and products.

1. Introduction

By social capital we mean the "networks, norms, and trust that enable participants to act together more effectively to pursue shared objectives" (Putnam, 1993). Since social capital is a result of interaction between an organization and its external agents, social capital can be categorized as internal and external (Kim and Cannella, 2008). While external social capital belongs to internal and external agents respectively, the internal social capital contains trust and common visions, which are systematized and internalized by the organization, staying behind after those agents have left. This means that external social capital must be embedded within internal structures in order that it becomes a component of the 'dominant design'. These findings support the views of Ratten and Suseno (2006) that the market-specific knowledge that a firm has about the institutional regulations of their marketplace, their clients and competitors is important, but in order to facilitate firm growth and expansion, this market-specific knowledge needs to be incorporated into the firm's internal depositories of knowledge.

However, there are two problems with previous arguments: on the one hand, the utilization of internal and external capital does not guarantee that appropriate information is used in appropriate circumstances or that information is appropriately updated (De Holan and Philps, 2004). For example, you can believe that a supplier, who has been working with your company for several years, is offering you the lower price in the market, but letter you can find out that there are other suppliers who offer the same quality at a lower price. What this could mean for social capital is that before new networks can be implemented, 'old' networks should be reviewed and challenged. When that happens, a value closely associated with updating internal and social capital is 'open-mindedness'. Open-mindedness is an organizational value that measures receptivity to new and possibly different ideas (Sinkula et al., 1997). While familiar approaches to problems and their solutions may have proven successful in the past, open-minded contexts are more likely to question long-held practices and beliefs (Sinkula et al., 1997) and encourage the sharing of strategic information among decision-makers (Day, 1994). Open-mindedness engenders a willingness to question current thinking and practice, to be receptive to emerging possibilities, to share ideas and to consider differing perspectives.

On the other hand, the information given by an external or internal agent (e.g. employees, customers or suppliers) is one thing, and the knowledge used by the company is another. For example, the knowledge created by sales is not formulated or controlled directly by the management, but it is being continuously created through new customers and lost as employees move, groups dissolve and application wanes, thus, the transformation of external social capital into internal social capital is important, but not enough to achieve higher levels of business performance, in this way, only if internal social capital is used can it becomes a powerful tool for success. In other words, organizations that can acquire their partners' firm-specific knowledge and adapt it to their internal operations are those that are more likely to succeed in the marketplace (Ratten and Suseno, 2006). Regarding this, innovation could be understood as the adoption of a new idea or behavior in an organization (Damanpour and Gopalakrishnan, 1998). In fact, Baker and Sinkula (2005) posit that a radical innovation posture stimulated by a generative learning increase new product success rate and so the market performance of a firm.

To address above issues, this study aimed to examine the impact of the 'open-mindedness culture' of organizations on the challenging of basic beliefs or processes that are explicitly or

tacitly represented in internal and external networks. Radical innovation is also posited in this paper as a managerial priority that facilitates the creation of a competitive advantage. In the following section, we introduce the key concepts of social capital (internal and social), open-mindedness and radical innovation.

2. Conceptual framework

An environment's discontinuities are difficult for firms to manage because they demand different product architectures, they change the economics of the industry, destroy existing firm competences, create new value networks in which to compete and require technology investments with highly uncertain outcomes (Christensen and Rosenbloom, 1995). In this context, innovation is increasingly considered to be one of the key drivers of the long-term success of a firm in today's competitive markets (Baker and Sinkula, 2002). The reason is that companies with the capacity to innovate will be able to respond to environmental challenges faster and better than non-innovative companies (Brown and Eisenhard, 1995).

The data, information and knowledge that contribute to innovation processes may be available within the 'internal social capital' or the 'external social capital'. While internal social capital enhances can allow departmental work to be better integrated and can facilitate easier knowledge generation, as pointed out by Nahapiet and Ghoshal "who you know affects what you know" (1998:252). A firm's external networks enable the company to gain resources from its environment to discover new opportunities (Aldrich and Zimmer, 1986). For instance, external social capital can provide information about the customer's expertise, and can inform the partners how to manage and operate the relationship (Suseno and Ratten, 2007). Because of its over-arching nature, social capital is a construct difficult to delimitate, operationalize and measure. In an attempt to overcome such difficulty, we focused the concept of social capital particularly on its approach of internal and external networking (Stam and Elfring, 2008; Atuahene-Gima and Murray, 2007; Tyagi, 2006). Considering this, we argue that the effectiveness of these networks can be determined by whether the personnel who interact perceive the relationship as worthwhile, equitable, productive, and satisfying, only individuals can apply their own experience and contextual understanding to interpret the details and implications of a particular situation in order to determine what is the appropriate action or actions to take.

However, there is a problem with above arguments in that individuals can develop a unique 'knowledge lens' through which they interpret the outside world as a basis for decision making (Sinkula, 2002). In this regard, Sinkula asserts that "marketing managers cling to routines, dominant logics, and mental models that are out of date, which drives organizations to be lulled into complacency because individuals do not like change" (2002:258). As noted above, open-mindedness fosters an interruption of the employees' habitual, comfortable state of being (e.g. identifying problems, initiating projects or introducing novelties). A sudden change in those habits forces individuals to reconsider their old basic attitudes toward external and internal agents (e.g. peers, customers, competitors and suppliers).

However, at this stage updated-knowledge (e.g. new meanings) is individual rather than social, and tacit rather than explicit. This knowledge then need to be embedded through the internal and the external networks in order to become a dominant design, otherwise innovation processes will not take place (Suseno and Ratten, 2007). Therefore, open-

mindedness is proposed to play an important role in the development of both types of social capital. In this sense:

H_1: The extent to which open-mindedness exists is positively associated with internal social capital.

H_2: The extent to which open-mindedness exists is positively associated with external social capital.

Another possible problem would be the fact that the information given by external agents is one thing, and the knowledge created and used by the organizational members is another. For example, if it were not for internal social capital, learning would have a relatively short half-life because or 'employees' turnover and the passage of time (Levitt and March, 1988). Regarding this, prior research has shown that the effect of social capital on knowledge creation can vary substantially with environmental conditions (e.g. Ratten and Suseno, 2006; Suseno and Ratten, 2007). For instance, under turbulent conditions, internal social capital might produce more desirable results for innovation. Thus, internal social capital enhances the ability of members within a firm to know who to contact for relevant knowledge (Lesser, 2000). This means that internal social capital facilitates the development of innovations through the updated knowledge acquired from internal and external networks. Consequently, we propose that:

H_3: The impact of external social capital on radical innovation is mediated through internal social capital.

The effective utilization of the existing assets and resources, including extant knowledge, further allows for appropriate responses to be made to changes in, for example, competitors´ pricing structures (Jaworski and Kohli, 1993), or to changes in customer expectations. For the purposes of this paper, we further define 'market performance' as the knowledge created by customers in the relationship with an organization. On the one hand, customers create knowledge based on their direct experiences and observations, which are stored in their memories as feelings of gratitude, reciprocity, respect, and friendship (Adler and Kwon 2002: 23).

Thus, potentially 'external social capital' facilitates the development of self-enforcing norms and trust within a collective allowing the group to more easily attain communal goals, which in turn will improve business performances (Burt, 1992). On the other hand, radical innovation is relevant for the improvement of customer relations, depending on whether organizations exploit knowledge correctly or incorrectly, they have the potential to strengthen or weaken customer relationships and hence enhance or dilute market performance (e.g. through coordination of the knowledge which has been derived from interacting with customers, reducing transaction costs and increasing cooperative efficiency). These issues are explored through the testing of the following hypotheses:

H_4: The extent to which radical innovation exists is positively associated with market performance.

H_5: The extent to which external social capital exists is positively associated with market performance.

3. Method

The population included Brazilian organizations with more than one hundred employees located all around of this country. Similar to other studies on these topics (Jaworski and Kohli, 1993; Sinkula et al., 1997), this study was designed to cover a wide range of industries. The structured questionnaire was sent to CEOs of 3,000 companies by mail. 361 questionnaires were obtained, yielding a response rate of 46.5 percent. The sample included a large range of economic sectors in Brazil (by SIC code: Agriculture, Forestry, Fishing - 2,77%; Mining - 1,94%; Construction - 3,05%; Manufacturing - 60,94%; Transportation, Communication, Electric, Gas, and Sanitary Services - 9,14%; Wholesale Trade - 4,71%; Retail Trade - 3,32%; Finance, Insurance, Real Estate - 2,77%; Services - 11,36%).

In order to test the hypotheses Open-mindedness, external and internal social capital radical, radical innovation and market performance were all measured as constructs (Table 1). To assess the unidimensionality of each construct, a confirmatory factor analysis of the five constructs employing 18 items was conducted (Anderson and Gerbing, 1988) using LISREL 8.54. The measurement model provides a reasonable fit to the data (χ^2= 250.16, *df*= 125, p< 0.001; GFI= 0.93; RMSEA= 0.049; CFI= 0.97; NNFI= 0.96). The traditionally reported fit indices were within the acceptable range. Reliability of the measures was calculated with Bagozzi and Yi's (1998) composite reliability index and with Fornell and Lacker's (1981) average variance extracted index. For all the measures, both indices were higher than the evaluation criteria of 0.6 for the composite reliability and 0.5 for the average variance extracted (Bagozzi and Yi, 1998).

Furthermore, all items loaded on their hypothesized factors (see Table 1), and the estimates were positive and significant (the lowest t-value is 8.62), which provides evidence of convergent validity (Bagozzi and Yi, 1998). Discriminant validity was tested using three different procedures recommended by Anderson and Gerbing (1988) and Fornell and Larcker (1981). First, discriminant validity was indicated since the confidence interval (±2 S.E.) around the correlation estimate between any two latent indicators never included 1.0 (Anderson and Gerbing, 1988). Secondly, discriminant validity was tested by comparing the square root of the AVEs for a particular construct to its correlations with the other constructs (Fornell and Larcker, 1981).

Finally, we compared the chi-square statistic between the constrained model where the correlation of a pair of factors was fixed to unity and the unconstrained model with the freely estimated correlation (Anderson and Gerbing, 1988). The results of these three tests provided strong evidence of discriminant validity among the constructs.

TABLE 1: Constructs measurements summary: Confirmatory factor analysis and scales reliability

Item description	Standardized loading	T-value	Reliability (SCR[a], AVE[b])
Open Mindedness (α=0.86) **(Baker and Sinkula, 1999)**			SCR=0.86
1. We are not afraid to reflect critically on the shared assumptions we have about the way we do business.	0.75	16.08	AVE=0.61
2. Our business unit places a high value on open-mindedness.	0.77	16.48	
3. Managers encourage employees to "think outside of the box".	0.83	18.28	
4. Original ideas are highly valued in this organization.	0.76	16.13	
(scale: 1= strongly disagree; 7= strongly agree)			
External Social Capital (α=0.91) **(Perin, Sampaio, Baker, and Simões, 2009)**			SCR=0.91
1. Our employees are encouraged to network with experts outside of the company to find new ways to solve problems and exploit opportunities.	0.87	20.31	AVE=0.73
2. Our employees' decision-making process includes integrating knowledge and expertise from outside of our company.	0.84	19.30	
3. Our employees are encouraged to exchange ideas with external sources whose point of view may be different than ours.	0.83	19.05	
4. Our employees work with knowledgeable people wherever they can find them to "make sense" of information	0.86	20.09	
(scale: 1= strongly disagree; 7= strongly agree)			
Internal Social Capital (α=0.90) **(Perin, Sampaio, Baker, and Simões, 2009)**			SCR=0.90
1. Our employees are expected to collaborate with each other to find new ways to solve problems and exploit opportunities.	0.74	15.83	AVE=0.69
2. Our employees' decision-making process includes integrating knowledge from various parts of our company.	0.85	19.52	
3. Our employees are encouraged to improve ideas by sharing them with employees that have a variety of perspectives.	0.87	20.24	
4. Our employees work together to "make sense" of information	0.85	19.48	
(scale: 1= strongly disagree; 7= strongly agree)			
Radical Innovation (α=0.82) **(Perin, Sampaio, Baker, and Simões, 2009)**			SCR=0.83
1. Innovations that make your current product/service line obsolete	0.46	8.62	AVE=0.56
2. Innovations that fundamentally change your prevailing products/services	0.68	14.01	
3. Innovations that go beyond merely improving current products/services	0.87	19.31	
4. Innovations that represent a totally new way of satisfying customer needs	0.87	19.32	
(scale: 1= strongly disagree; 7= strongly agree)			
Market Performance (α=0.72) **(Baker and Sinkula, 1999)**			SCR=0.71
1. Sales growth relative to the competition	0.63	10.37	AVE=0.56
2. Number of new customers	0.88	12.92	
(scale: 1= Much lower; 7= Much higher)			

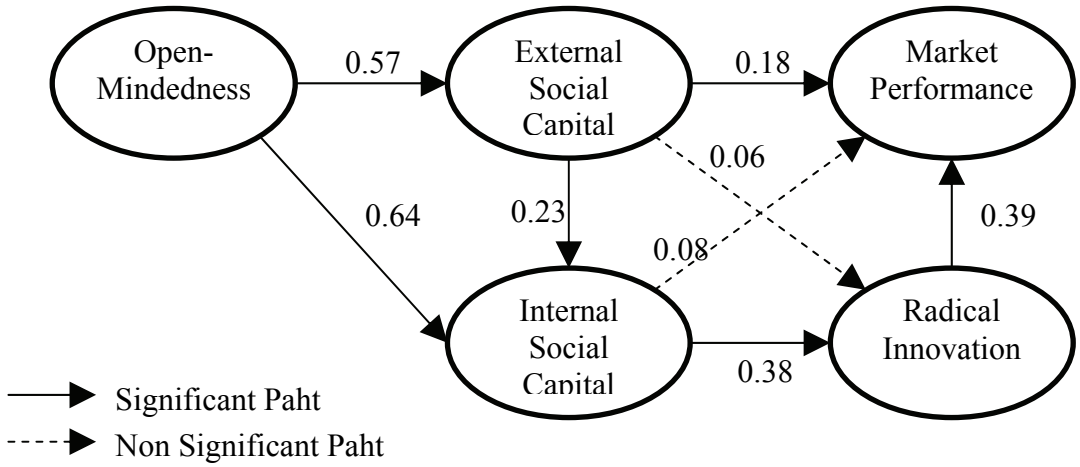
[a] Scale composite reliability ($\rho_c=(\sum\lambda_i)^2$ var $(\xi)/[(\sum\lambda_i)^2$ var $(\xi) + \sum\theta_{ii}]$; (Bagozzi and Yi, 1998)).

[b] Average variance extracted ($\rho_c=(\sum\lambda_i^2$ var $(\xi))/[\sum\lambda_i^2$ var $(\xi) + \sum\theta_{ii}]$; (Fornell and Larcker, 1981).

4. Results

The proposed structural model is presented in Figure 1. This model summarizes the five hypotheses. Conventional maximum likelihood estimation techniques were used to test the model (Jöreskog and Sörbom, 1996). The fit of the model is satisfactory (χ^2= 254.51, *df*= 127, p< 0.001; GFI= 0.93; RMSEA= 0.050; CFI= 0.97; TLI= 0.96), thereby suggesting that the nomological network of relationships fits our data, another indicator of support for the validity of these scales (Churchill, 1979). Figure 1 illustrates our conceptual framework of the role of open-mindedness in facilitating external and internal social capital, which in turn facilitates the radical innovation and promotes a more effective market performance.

Figure 1. Measure model



The results obtained are shown in Table 2. H_1 (Open-mindedness → External social capital) is confirmed since γ_{11} is positive and significant (γ_{11}= 0.57, p< 0.001), supporting the extended idea that Open-mindedness is a key driver to the creation of the relationships between firms with external stakeholders, partners, or its competitors.

Our findings also provide support for H_2 (open-mindedness → external social capital; γ_{21}= 0.64, p< 0.001), what it suggest the creation of a combination of networks together with shared norms, values and understandings that facilitates co-operation within or among groups. Thus, the impact of open-mindedness on internal social capital is potentially mitigated by the extent to which an external social capital exists.

As predicted, external social capital have a clear influence on internal social capital (β_{21}= 0.23, p< 0.001). However, our findings do not provide support for the direct relationship among external social capital and radical innovation (β_{31}= 0.06, non significant). In contrast, we have obtained evidence about the internal social capital has a positive effect on radical innovation (β_{32}= 0.38, p<0.001). Taking into account these results, H_3 was confirmed, what it suggest that internal social capital plays a meditational role in the links external social capital

and radical innovation. Furthermore, it implies, that external social capital requires of the interiorizing of external knowledge before being used to create radical innovations. Also, results show an indirect effect on radical innovation of both, open-mindedness (κ_{11}= 0.32, p< 0.001) and external social capital (κ_{31}= 0.09, p< 0.01) through internal social capital.

In the case of market performance, only external social capital (β_{41}= 0.18, p<0.05) and radical innovation (β_{43}= 0.39, p<0.001) have a positive effect. Thus, only the impact of internal social capital on market performance is mediated through the radical innovation characteristic (κ_{42}= 0.15, p< 0.001).

TABLE 2: Construct structural model

Linkages in the model	**Standardized parameter estimates**		
	Parameter	Estimate	*t*-value
Hypothesis			
Open-mindedness → External social capital	γ_{11}	0.57	10.06***
Open-mindedness → Internal social capital	γ_{21}	0.64	9.83***
External social capital → Internal social capital	β_{21}	0.23	4.35***
External social capital → Radical innovation	β_{31}	0.06	0.82
External social capital → Market performance	β_{41}	0.18	2.37*
Internal social capital → Radical innovation	β_{32}	0.38	4.49***
Internal social capital → Market performance	β_{42}	0.08	1.08
Radical innovation → Market performance	β_{43}	0.39	4.34***
Indirect effect			
Open-mindedness → Radical innovation	κ_{11}	0.32	5.58***
External social capital → Radical innovation	κ_{31}	0.09	3.17**
Internal social capital → Market performance	κ_{42}	0.15	3.54***

* P<0.05; ** P<0.01; *** P<0.001

4. Conclusions

Despite of calls for an increased focus on the relationship between open-mindedness, capital social, radical innovation, and business performance, little headway has been made in understanding this issue thoroughly (Rhee et al. 2010). This study empirically examined these relationships and deepens the understanding of how open-mindedness, social capital and radical innovation impact on market performance. Moreover, we seek to bridge the gap existent in the literature, since most studies approaching this subject have been conducted in developed countries. To address these gaps in the literature, we developed a model that analyses the relationship between open-mindedness, social capital, radical innovation and its effects on market performance.

The study found that open-mindedness is associated with internal and external social capital, and external social capital mediates the effects of open-mindedness on internal social capital. We also observed that radical innovation mediates the effects of internal social capital on business performance. Besides that, we found that external social capital doesn't present a direct impact on radical innovation, probably doing it indirectly by internal social capital.

Although this result is worthy of further investigation, one conclusion that might be drawn is that since entrepreneurial activity in general, and a turbulent environment in particular, requires customer innovations, many mental models created through internal and external social capital might be counterproductive without the stimulus of an open-mindedness culture. Other conclusion might be that an external knowledge for an enterprise could lead to a market performance, but not to a radical innovation without a necessary internal debate about this knowledge.

One of the findings of this study is that open minded firms promote the generation of radical innovations for developing their activities by the internal and indirectly by external social capital. As we have found, these innovations allow companies to increase their performance in the marketplace. Their activities require that these organizations look for new sources for generating ideas. This finding is consistent with previous studies that indicate that companies who develop radical innovations will present higher levels of performance (Brown and Eisenhard 1995; Damanpour and Evan 1984). Thus, an open minded organization emphasizes the creation of knowledge through a learning orientation.

Our findings regarding the positive effects of open-mindedness, as a dimension of learning orientation, on business performance are supported by previous studies (Baker and Sinkula, 1999, Kropp et al. 2006). That is, firms with open minded posture will achieve higher levels of performance, since they develop better products and are more likely to adapt to the changing marketplace by radical innovation. That influence will be carried by the intensity of internal and external social capital approach. That is to say that when firms are opened to adopt new processes, to review its procedures and exercise the unlearning process, they are more likely to achieve radical innovations in terms of processes and products. That allows them to respond to the changing markets in a better fashion, signifying better results.

4.1 Implications

Based on the findings our study also provides some guidelines for managers regarding the role of radical innovation, social capital, and open-mindedness on business performance. Initially, we suggest that a posture of opened mind should be developed in the company considering its positive indirect effect on firms' performance. In this respect, Baker and Sinkula (1999) suggest that organizational members should be encouraged to think "outside the box" to find different perspectives about the business. Also, those actions may allow firms to improve their ability to thoroughly comprehend the environment which is crucial to achieve better results. In this regard, we follow Rhee et al. (2010) that argue that open-mindedness, as a learning orientation characteristic, can be fostered when the organizations seek to behave entrepreneurially. The authors´ suggestion seems to be appropriate for Brazilian companies who pursue a learning orientation: "the learning orientation appears to have the potential to create intangible assets such as knowledge or proprietary technology in an innovative manner" (p.72). If employees permanently question internal practices firms are more likely to continuously adapt to the changing needs and create new processes, thereby allowing them to achieve higher levels of performance. Thus, companies should foster and reward new ideas and perspectives about markets, technology, and environment (Sinkula et. al, 1997).

Furthermore, a radical innovation approach should be fostered by companies since we found a positive effect of that construct on firms' performance. As Tellis et al. (2009) pointed out firms' R&D activities and organizational culture have a positive impact on radical innovation. Thereby, we suggest that companies engage their employees on research projects

which may provide new ideas for existing products and new ones that may arise from "think tanks" within different departments. Due to the uncertainty and high levels risks involved in radical innovations, we also suggest that firms pursuing major departures from the current knowledge establish networks and cooperative alliances with universities and technological institutes in order to share the risks and take part in the latest findings from scientific investigation. That may demand increasing investment in the long-run but might represent future sources of innovation for products and processes.

4.2 Limitations and Avenues for Future Research

As in any research, our study presents limitations that may indicate opportunities for future avenues of investigation. One of the possible limitations is that the generalizability of our findings may be threatened due to the sample characteristics we used in the study. In order to solve this problem, we claim the new studies should be conducted in different countries applying the same methodology. Such action would provide new data sets to make the comparison possible. We also believe that cultural nuances might influence in the way companies learn and foster entrepreneurial stances. Thus, cross-cultural studies could bridge the gap existent in this area.

Another possible limitation of our study is based on its cross-section design. Although, such design draws a reliable picture in a specific moment of time, it does not allow us to capture the possible dynamics of constructs over time. Despite its difficulty to implement, future research should adopt a longitudinal design to analyze the role played by innovation (radical and incremental) and open-mindedness on business performance over time.

In the present study we only investigated the direct effects of radical innovation on firms´ performance. Due to the results revealed here, we also suggest that future research should be addressed to investigate the mediating role of social capital on the open-mindedness and radical innovation relationship.

Even acknowledging the possible limitations associated to this research, our study contributes to the advance of the literature in many ways, especially regarding the understanding of the role played by learning orientation and radical innovation on business performance.

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