

How does altruistic leader behavior foster radical innovation? The mediating effect of organizational learning capability

Abstract

Purpose. *The purpose of this paper is to provide empirical evidence of the relationships between altruistic leader behavior and radical innovation, using organizational learning as an explanatory variable.*

Design/methodology/approach. *To confirm the hypotheses, structural equations were used on a data set from a survey carried out on Spanish firms with recognized excellence in human resources management. The study empirically validates our conceptual model.*

Findings. *Results suggest that organizational learning capability fully mediates the relationship between altruistic leader behavior and radical innovation.*

Research limitations/implications. *The database used in the study is very heterogeneous. Future research might delimit the database by organization size or sector.*

Practical implications. *Results suggest ideas for organizations that want to implement a working environment that fosters innovation performance in order to achieve radical innovations*

Originality/value. *This is one of the few studies to concentrate on altruistic leader behaviors as such. This paper contributes to understanding how altruistic leader behavior affects radical innovation and the key role played by organizational learning capability.*

Keywords: Altruistic leader behavior; altruism; radical innovation; innovation; organizational learning capability.

1. Introduction

Radical innovation is now an essential factor for the growth and success of firms and national economies (Büschgens et al., 2013; Tellis et al., 2009). Radical innovations transform markets, create new markets and stimulate economic growth (Marvel & Lumpkin, 2007). Firms that develop radical innovations tend to dominate markets and increase their international competitiveness (Atuahene-Gima, 2005). Managers, governments and public administrations have consequently become aware of the importance of radical innovation, and are endeavoring to promote and encourage it (Tellis et al., 2009).

There is an ongoing debate on which organizational conditions and capabilities promote or prevent the emergence of different types of radical innovation (Sainio et al., 2012). The success of this type of innovation requires a wide range of facilitators, both within and outside organizations (Yang et al., 2014). Various studies have attempted to unravel what those facilitators are (e.g., Herrmann et al., 2007; Koberg et al., 2003), although some authors consider that, unlike other types of innovation, antecedents and processes related to radical innovation are not well documented (McDermott & O'Connor, 2002; O'Malley et al., 2014).

Leadership style is one of the most important individual factors that promote firm innovation (Aragón-Correa et al., 2007; Mumford et al., 2002). Leaders can take decisions to introduce new ideas into the organization, set specific goals and encourage innovation among their subordinates (Aragón-Correa et al., 2007). They can also create an environment in which employees feel protected, take risks, and are therefore more inclined to innovate (Nutt, 2002). Some authors such as Denti and Hemlin (2012) also call for more research on leadership when what the organization aims is to achieve radical innovations. Chang et al. (2012) argue that many of the main determinants of radical innovation may still be unidentified and propose leadership as one of the issues to be considered in future research.

The levels of integration and interdependence required in the new working environments demand leadership styles such as transformational, authentic, spiritual, servant or ethical leadership, which go beyond classic transactional styles (Bass & Avolio, 1993; Bass, 1997; Avolio et al., 1999; Zhu et al., 2005). Furthermore, although some studies (Elenkov & Manev, 2005; Schweitzer, 2013) have shown that transactional styles can promote innovation, because they focus more on standards and rules their effect is lower than other leadership styles, such as transformational leadership.

Transformational, authentic, spiritual, servant and ethical leadership appear to coincide in one of their most important characteristics, namely, altruism (Brown & Treviño, 2006; Barbuto & Wheeler, 2006). Hence, altruistic leader behavior is regarded as a shared issue that cuts across these contemporary leadership styles. However, Dinh et al. (2014: 42) assert that most extant theories, even transformational leadership, have failed to investigate altruistic leader behaviors sufficiently. Further research on this topic therefore seems necessary.

Moreover, leadership research and theory have been criticized as being too segmented, and calls have been made for more integration of findings from different leadership approaches (i.e., integrating leader traits, leader behaviors, follower cognitions, situational/contextual factors [see Yukl, 2010: 491]). On the other hand, the research on the effects of broadly defined leader behaviors has limitations that make the results difficult to interpret (Yukl, 2012). Rosing et al. (2011) consider that traditionally studied leadership styles are too broad in nature and they can have widely differing effects on the organization because they might both foster and hinder innovation. In light of the above considerations, the present research does not focus on a particular leadership style, but on a specific leadership behavior (altruistic leader behavior), as studied by other authors (Mallén et al., 2015; Owens & Hekman, 2011).

Although altruistic leader behavior is an important topic it has attracted less attention in the literature. To our knowledge, no previous research has linked it with radical innovation. Some studies have related altruism with innovation. Kraiczy et al. (2014), for example, highlight reciprocal altruism as one of the specific characteristics of family firms, and one of the most relevant elements that may facilitate the development of new products. Moreover, previous studies show that new leadership styles—such as those referred to above in which altruism is a main feature—influence the organizational ability to innovate. There are many studies relating transformational leadership to innovation (Aragón-Correa et al., 2007; Birasnav et al., 2013; Gumusluoglu & Ilsev, 2009). For example, Aragón-Correa et al. (2007) observe the simultaneous influence of transformational leadership and organizational learning on innovation. Cheung and Wong (2010) found that the positive relationship between transformational leadership and followers' creativity is stronger when there is a high degree of support from leaders for tasks and relationships. Yoshida et al. (2014) found that servant leadership fosters employee creativity and team innovation through individual relational identification and collective prototypicality with the leader; Rego et al. (2014) evidenced that authentic leadership predicts employees' creativity; Yidong and Xinxin (2013) showed that innovative work behavior was positively related to both individual perception of ethical leadership and group ethical leadership. Fry (2003) considers that

spiritual leadership is essential to achieve a learning organization and that, in turn, such businesses are more creative and innovative. Therefore, leadership seems to clearly influence innovation but the research has not explored which particular leader behavior has this effect, nor on which particular type of innovation, such as radical innovation. Zacher and Roising (2015) state that it remains unclear which specific leadership behaviors best predict innovation.

However, although leadership influences innovation, companies do not always achieve the same results. Rosing et al. (2011) argue that this is because the influence of factors other than leadership has to be considered in fostering innovation. In this regard, many studies have analyzed how certain variables and constructs mediate the leadership-innovation relationship (e.g., Birasnav et al., 2013). Leadership is not a process that can be explained in isolation; it has to be considered within an organizational context (Porter & McLaughlin, 2006). One of the contextual factors identified in the literature that is closely related to both innovation and leadership is organizational learning capability.

The present research empirically analyzes whether altruistic leader behavior influences organizational capability to develop radical innovations through organizational learning capability. To this end, an empirical study was conducted in the Spanish firms most valued by their employees. The study population comprised 402 firms from databases or listings of organizations that regard employees as core elements in their businesses, that employees consider as good firms to work for, and that prioritize human resource management. The main reason for choosing this population is that these organizations can act as a reference for other companies because of their good results. It is therefore relevant to examine what happens in them.

The databases from which the organizations were taken use different criteria to estimate excellence in human resources management, such as environment and work culture, working conditions, talent development (including aspects like motivation, recognition, training and career development), or commitment to the community, the environment and innovation.

The paper is organized as follows: in the next section we briefly discuss the literature on radical innovation, altruistic leader behavior and organizational learning capability. Then, drawing from the previous research, we provide a theoretical review of the relationships between the study variables. Section 4 describes the methodology used to analyze the research hypotheses. Finally, the results, conclusions and proposals for future research are presented, together with some of the study's limitations.

2. Literature review

2.1 Radical innovation

Radical innovation is a widely studied concept and its importance for companies has been recognized in numerous studies (e.g., Sandberg & Aarikka-Stenroos, 2014; Story et al., 2014). Radical innovation is often compared to incremental innovation (Koberg et al., 2003; Damanpour & Gopalakrishnan, 1998), although the difference between the two is not always clear (Koberg et al., 2003; Henderson & Clark, 1990). However, it is important to distinguish between these two types of innovation because the competences and skills needed to develop radical innovations clearly differ from those required for incremental innovations (Story et al., 2014). Incremental innovations are based on prior knowledge and consist of substantial product, service or process improvements that, although they have a certain degree of novelty, do not clearly break away from the already existing product, service or process (Jiménez-Jiménez & Sanz-Valle, 2012). In contrast, the main objective of radical innovation is to launch a completely new product or process (O'Connor & McDermott, 2004), or introduce a revolutionary shift in technology (Dewar & Dutton, 1986) and in design (Verganti, 2008). Radical innovations are foundational innovations that serve as the basis for many subsequent technical developments (Datta & Jessup, 2013). In short, through radical innovations organizations move to into “unknown territory” and experiment with new processes, thereby eluding systemization.

The appearance of such innovations causes important and profound changes in the competitive environment. Leading companies can be threatened, and established incumbents are sometimes displaced by new challengers (Ansari & Krop, 2012), destroying markets and creating new ones. When an organization introduces a radical innovation its competitors' products may become obsolete, and the market may be dominated by a new standard (Nijssen et al., 2005). Therefore, radical innovations have the potential to derail incumbent competitors that cannot promptly respond to the challenges posed by competition (Büschgens et al., 2013; Chandy & Tellis, 2000).

Radical innovation is very difficult to achieve and is typically associated with high risk, complex and uncertain projects (Büschgens et al., 2013; López-Cabrales et al., 2008; O'Connor & McDermott, 2004). Such innovation requires major investments in time—it normally involves long-term efforts—and in capital (Story et al., 2011) to develop completely new products and processes

whose success is difficult to predict. Since results cannot be ascertained beforehand, it is hard to know whether these products and processes will ensure a return on investment.

Nevertheless, despite this uncertainty radical innovation can provide multiple benefits to organizations, such as allowing companies to establish themselves or to grow substantially (Herrmann et al., 2007); by improving their competitive position and increasing their market power, their value and sales also improve and they become more profitable (Baker et al., 2014; Nijssen et al., 2005).

Due to the importance of radical innovation, several authors and studies from different disciplines have proposed theories about the facilitators that foster it, taking into account both external and internal organizational factors (Tellis et al., 2009; Damanpour, 1996). Tellis et al. (2009) underline the importance of internal factors, which are related to organizational culture. López-Cabrales et al. (2008) identify organizational characteristics that promote radical innovation as an area of great interest and importance. In this regard, several studies have examined the effect on radical innovation of factors such as employees' experience and education (Marvel & Lumkin, 2007), risk taking (López-Cabrales et al., 2008), experimentation (O'Connor et al., 2008), or informal networks (O'Connor & McDermott, 2004).

2.2 Altruistic leader behavior

House et al. (1999, p. 184) define leadership as the ability of an individual to influence others, motivate them and facilitate their contribution to the effectiveness and success of the organization. Leadership can be considered as the non-coercive action of motivating people to act in a certain way (Popper & Lipshitz, 1993).

Following Simmons (1991), altruism: (1) is the willingness to do things that seek to increase the welfare of others, not one's own, (2) is voluntary, (3) is intentional, involving helping others, and (4) expects no reward. Therefore, altruism is the feeling or tendency to do good for others, even at the expense of personal gain.

Altruistic behavior is a type of prosocial behavior that seeks to help others without considering the personal consequences that it can entail. In the specific case of altruistic leaders, this behavior would seek the follower's growth and development more than his or her own. This type of behavior is voluntary and is characterized by perceiving and understanding others' problems, being

empathetic, and not looking for reward of any kind. In this context, Clarkson (2014) considers that altruistic behavior involves some degree of self-sacrifice. Lemmon and Wayne (2014) state that any egoistic benefits deriving from altruistic concern, such as feelings of benevolence or self-satisfaction, cannot be considered as goals to be achieved through this kind of behavior because they are just incidental consequences of it. Avolio and Locke (2002) distinguish between altruistic behavior and helping others because sometimes help is given for selfish motives, such as getting a project finished or pursuing organizational success.

Rosopa et al. (2013) state that people in companies who behave altruistically are perceived as more emotionally stable, extraverted, open to experience, agreeable, and conscientious. They are also more highly valued than those who do not behave in this way.

The concept of altruistic leader behavior differs from other concepts that include altruism in their definition, such as organizational citizenship behavior (OCB) and some types of leadership (for example, servant, authentic and spiritual leadership). Organ (1988) classified OCB into five distinct dimensions, including altruism. However, although altruism is part of this concept, civic behavior does not imply altruism per se. For example, Bolino et al. (2004) give some examples of civic behavior in organizations that are not at all altruistic, such as promotions, salary increases, the expectation of quid pro quo, etc. On the other hand, altruistic behavior is implicit in some conceptualizations of leadership styles, such as spiritual, authentic and servant leadership, but it is not a style in itself. These styles of leadership are multidimensional constructs, broader than altruistic behavior, and include other possible types of behavior. Therefore, the fact that a leader behaves altruistically does not imply that he or she will necessarily be categorized under one of these theories of leadership, because a broader set of behaviors are involved.

The literature also states that altruistic behavior may have negative consequences for employees who act in this way (Bolino et al., 2013). Behaving altruistically means employees perform functions or tasks that go beyond formal requirements. This includes, for example, working overtime or assuming additional responsibilities that require more effort and can contribute to stress (Bolino & Turnley, 2005).

2.3 Organizational learning capability

Organizational learning capability is defined as the organizational and managerial characteristics or factors that facilitate the organizational learning process or allow an organization to learn (Chiva et al., 2007; Chiva & Alegre, 2009). Organizational learning and its facilitating factors have been shown to have various effects, including a beneficial effect on organizational performance (e.g., Prieto and Revilla, 2006) or innovation (Alegre & Chiva, 2008). Jerez-Gómez et al. (2005) consider that organizational learning capability is a key element to improve efficiency and organizational capacity to innovate and grow, while other authors state that organizational learning capability is one of the strategic means of achieving long-term organizational success (Liao & Wu, 2010).

The organizational learning capability concept has been widely studied and several authors have proposed different dimensions to explain it. Organizational learning capability normally appears as a multidimensional construct (Chiva et al., 2007, Goh & Richards, 1997; Hult & Ferrell, 1997; Jerez-Gómez et al., 2005, Yeung et al., 1999). These authors propose a set of contextual variables that facilitate learning in organizations. The present study follows the approach of Chiva et al. (2007), whose integrative conceptualization of organizational learning capability includes proposals from the social perspective, the individual perspective and learning organization. These authors identified five facilitating factors of organizational learning, namely: experimentation, risk acceptance, interaction with the environment, dialogue, and participation in decision making. This conceptualization of organizational learning capability also takes into account that learning can be either internal or external to the organization.

Experimentation is defined as the degree to which new ideas and suggestions are attended to and dealt with sympathetically (Chiva et al., 2007), and is the most commonly used dimension in the organizational learning literature. Nevis et al. (1995) consider that experimentation involves trying out new ideas, being curious about how things work, or carrying out changes in work processes. Risk taking is understood as tolerance of ambiguity, uncertainty and errors, because taking risks implies the possibility of errors and failures. Interaction with the external environment is defined as the scopes of relationships with the external environment. The external environment of an organization is defined as factors that are beyond the organization's direct control or influence, such as universities, competitors or research centers. Dialogue is defined as a sustained collective inquiry into the processes, assumptions and certainties that make up everyday experience (Isaacs, 1993:25). Dialogue includes communication, diversity, teamwork

and collaboration. Schein (1993, p.47) believes that dialogue is a basic process with which to build a shared understanding. Finally, participative decision making refers to the level of influence employees have in the decision-making process (Cotton et al., 1988).

3. Hypotheses

Based on the above discussion, we propose a conceptual model (figure 1) that integrates the effects of altruistic leader behavior and organizational learning capability on radical innovation. Altruistic leader behavior better explains radical innovation when the mediating effect of organizational learning capability is considered. In other words, this type of leader behavior not only may have a direct effect on radical innovation but may also create an organizational context that fosters experimentation, risk taking, participative decision making, dialogue and interaction with the external environment which, in turn, facilitates radical innovation.

3.1 Altruistic leader behavior and organizational learning capability

Leadership is one of the predictors the literature considers essential to develop organizational learning (Atwood, 2010; Berson et al., 2006). Nevertheless, leaders do not always have a positive impact in promoting learning in organizations, since it is leadership style that plays a key role in this process. Some authors warn that traditional and authoritarian leadership styles hinder or inhibit organizational learning (Aragón-Correa et al., 2007; Berson et al., 2006) while more recent leadership styles such as transformational, servant, spiritual, and authentic leadership encourage learning in organizations (Aragón-Correa et al., 2007; Berson et al., 2006; Fry, 2003; García-Morales et al., 2008; Gardner et al., 2005; Lloréns-Montes et al., 2005). Moreover, Vera and Crossan (2004) clarify the effects of leadership style when stating that transactional leadership fosters adaptive learning, and transformational leadership promotes generative learning. Consequently, it seems that leadership in general, and new leadership styles in particular, have a positive effect on organizational learning capability.

Leadership styles such as servant, spiritual, transformational or authentic leadership that include altruism as one of their main drivers have been identified in the literature as antecedents of organizational learning capability. For example, García-Morales et al. (2008) empirically demonstrate that transformational leadership facilitates the development of organizational learning. Fry (2003) claims that spiritual leadership is essential to achieve a learning organization. The literature has also shown that other constructs related to altruism, such as organizational citizenship behavior, have a positive influence on organizational learning (Chang et al., 2011).

While authoritarian forms of leadership may actually inhibit learning, leadership styles in which altruistic leader behavior is a relevant characteristic encourage individual and team learning by loosening leader control and creating a safe and supportive environment where people feel they can take risks, make mistakes, create dialogue and be supported in a manner that is necessary for learning to occur (Fry et al., 2005).

Leaders who show a deep concern and awareness for their followers' needs create a sense of shared risk taking (Ryan & Tipu, 2013). Jobs that involve risk taking cannot be managed through systems of control and formal monitoring (McDonough & Leifer, 1986) and therefore they require elements that create an atmosphere of trust and support in the organization. Perceptions of support allow followers to feel more autonomy and a level of freedom to challenge the status quo and pursue projects with risks and unknown outcomes (Tierney et al., 1999). People take risks if they feel secure, so by creating a climate of psychological safety, leaders can increase learning from mistakes and failures and encourage members of the organization to suggest novel ideas (Yukl, 2012).

In addition, Sosik et al. (2009) argues that the trend of integrating altruism in leadership research reflects the new business environment that emphasizes ethics, teamwork, and collaboration through a more transparent decision-making process. Clarkson (2014) considers that altruism favors cooperation due to concern for others. Furthermore, the literature suggests that altruism is positively related to information exchange (Daily & Dollinger, 1992) and communication (Gersick et al., 1997). Therefore, it seems reasonable to assert that altruism in organizations enables interaction with others, by positively contributing through dialogue and communication, and also enhances opportunities for interaction with the external environment.

In conclusion, altruistic leader behavior could be related to factors that facilitate organizational learning capability, promoting an organizational climate that allows participative decision making, experimentation, risk taking, interaction with the external environment and dialogue. Therefore, we propose the following hypothesis:

H1: Altruistic leader behavior has a positive effect on organizational learning capability.

3.2 Organizational learning capability and radical innovation

Organizational learning capability and its facilitating factors have a positive effect on innovation performance in organizations (Alegre & Chiva, 2013; Baker & Sinkula, 2007; Jiménez-Jiménez & Sanz-Valle., 2011; García-Morales et al., 2011; Hurley & Hult, 1998, Onag et al. 2014). In addition, organizational learning may be associated to creativity (Amabile et al. 1996), which although it does not involve innovation, is a preliminary step in its development.

Experimentation is one of the organizational aspects that foster innovation (Ryan & Typu, 2013) and authors such as Koberg et al. (2003) highlight it as one of the elements that stimulate radical innovation. Employees have to be managed so that they feel secure to search and experiment with new knowledge (Amabile et al., 1996). Risk taking is necessary to generate new ideas (Amabile et al., 1996). Therefore, organizations must create an environment of trust which encourages employees to raise new proposals that allow organizations to innovate.

Making use of external knowledge has become a critical component in a company's capacity to innovate (Krammer, 2014). Openness to the external environment enables exploitation and transformation of external knowledge, and in turn integrates external elements in the process of generating new products. These external elements could be, for example, consumers (Joshi & Sharma, 2004), universities and research centers (Pedler et al., 1997; Azagra-Caro et al., 2006) or collaborating firms through alliances (Chipika & Wilson, 2006).

Team member diversity, openness to new ideas and communication are part of the dialogue dimension. Smith et al. (2005) and López-Cabrales et al. (2008) consider that introducing new products and services into the market depends on the ability of organizational members to share knowledge. Consequently, teams are essential to generate ideas and knowledge (Thompson, 2003; LópezCabrales et al., 2008). Furthermore, there seems to be a consensus in the literature that multidisciplinary teams have a positive effect on innovation (e.g., Wheelwright & Clark, 1995; López-Cabrales et al., 2008). Koberg et al. (2003) state that links between individuals from different units is one of the factors that favor radical innovation.

Participative decision making increases motivation to learn and stimulates creative thinking, leading to the development of new ideas, which is essential to innovation (Hurley & Hult, 1998).

Many other studies have examined the relationship between organizational learning and innovation. Some studies confirm the proposed relationship by analyzing firms from different

countries such as Iran (Tohidi et al., 2011) or Spain (Santos-Vijande et al., 2012). Fernández-Mesa et al. (2013) find that organizational learning capability enhances product innovation through the mediation of design management capability in small and medium enterprises. These arguments lead to the next hypothesis:

H2: Organizational learning capability has a positive effect on radical innovation.

3.3 Altruistic leader behavior and radical innovation: the mediation of organizational learning capability

Characteristics of leaders who behave altruistically include empathy, concern for others, helping others or concern for their welfare. Leadership styles that are able to recognize other people's emotions accurately help to manage anxiety in individuals who work in turbulent, constantly changing, and uncertain environments (Jansen et al. 2009), such as those faced by organizations that develop radical innovations. Consequently, altruistic behavior may foster radical innovation.

Leadership and different leadership styles are related to innovation; however, the results obtained with each type differ significantly. Some authors suggest that the heterogeneity of results may be because to be a good leader for innovation implies complementary processes (Rosing et al., 2011). Leadership in organizations does not take place in a vacuum; it takes place in organizational contexts (Porter & McLaughlin, 2006, p. 559). Avolio (2007) argues that context should be considered in all theories of leadership, because it can affect and be affected by leadership effectiveness. Nevertheless, Dinh et al. (2014) suggest that although context is central to the emergence and manifestation of leadership processes, it is an under-researched topic and needs further investigation. In relation to the subject of the present research, O'Malley et al. (2014) consider that the organizational context required for the development of radical innovations is marked by a high degree of informality, intense communication and cooperation amongst actors, a lack of decision-making rules, and the emphasis on creativity and risk-taking.

One of the contextual factors the literature has identified as being closely related to both innovation and leadership is organizational learning capability and, as noted above, several studies show that it has a mediating effect between some types of leadership and innovation. Brown and Posner (2001) state that "by accentuating the importance of learning and establishing a context where employees want to and are able to learn, leaders will be more capable of strengthening their organizations for future challenges and increasing competitive and innovative abilities". The organizational learning process consists of acquiring, disseminating and using

knowledge, and is therefore closely related to product innovation performance (Alegre & Chiva, 2008:317). Some authors argue that individuals share information because of prosocial attitudes (Constant et al., 1994; Hung et al., 2011). Wang and Noe (2010) explain that altruism is one of the reasons why individuals share knowledge, although Taylor (2006) states that while it is true that high levels of altruism are needed to encourage knowledge sharing, knowledge of the subject may be necessary too. Akgün et al. (2007) show that people who demonstrate care and concern for one another and have the ability to understand others' feelings foster an environment that encourages experimentation, the acceptance of new ideas, information exchange and external openness. Demonstrating care and concern for one another and having the ability to understand others' feelings are dimensions of individuals' emotional capability, and the same authors found that this capability influences organizational product innovativeness via learning capability.

Consequently, leaders who behave altruistically foster the dimensions or factors that facilitate organizational learning, which in turn can enhance radical innovation. These findings therefore imply that:

H3: The relationship between altruistic leader behavior and radical innovation is mediated by organizational learning capability.

INSERT FIGURE 1 ABOUT HERE

4. Research methodology

4.1 Data collection

The study focuses on a population of 402 Spanish firms that are valued by their employees as excellent places to work or companies that stand out for their human resources management. The population was compiled using databases and lists that reflect the Spanish companies with these characteristics. Data was obtained from the CRF Institute's 'Top Companies to Work For' and 'Top Employers', firms from the Great Place to Work consulting company list, and the Merco Personas list of best companies to work for, published by the journal *Actualidad Económica* in August 2010.

The fieldwork was carried out between October and December 2010. The questionnaire was addressed to managers, preferably human resources managers, with at least two years' experience in the firm. We considered that these managers have an overall view and an in-depth knowledge of the organization because of their position and their experience within it. Through their close contact with different departments, they can provide an accurate picture of what happens in their organizations, and are therefore a reliable source of information to evaluate the company as a whole. To encourage participation, respondents' anonymity was guaranteed, and the data were aggregated for the analysis, which encourages respondents to answer more honestly, thereby increasing the reliability of the results.

The questionnaire consisted of 23 items measured using a five-point Likert scale. All indicators were expressed in a positive way and respondents had to express their agreement or disagreement with each statement included in the questionnaire. The survey was completed via telephone interviews since this technique is useful when interviewing people who are hard to reach, as in the case of the directors of major companies in this study. Finally, a sample of 251 valid questionnaires was obtained, representing 62.44% of our sampling frame; this percentage can be considered satisfactory.

The questionnaire was administered in Spanish to all participants. While the organizational learning capability scale was originally designed in Spanish, the altruistic leadership and radical innovation scales were developed in English. In order to ensure the accuracy of the translation, a double-back translation procedure was utilized. This technique involves translating the original Spanish version of measurement scales into English, then retranslating it into Spanish, and comparing it with the original version.

4.2 Measurement instruments

The choice of measurement instruments was based on a previous literature review in order to decide which scales best meet the research needs. The measurement scales selected have already been used and validated by other researchers in previous studies. The scales' reliability was assessed using Cronbach's alpha.

4.2.1 Radical innovation

Gatignon et al.'s (2002) five-item scale was used to measure radical innovation. This construct demonstrated an acceptable reliability, with a Cronbach's alpha of 0.893 (table 2).

4.2.2. Organizational learning capability

The scale developed by Chiva et al. (2007) and Chiva and Alegre (2009) was used to measure organizational learning capability. This scale consists of five dimensions (experimentation, risk acceptance, interaction with the environment, dialogue, and participation in decision making) and a total of 14 items. All the dimensions comprising organizational learning capability are reliable, obtaining values for Cronbach's alpha above 0.8 (table 2).

4.2.3. Altruistic leadership behavior

Barbuto and Wheeler (2006) developed a questionnaire to measure servant leadership with five subscales: altruism, organizational stewardship, persuasive mapping, wisdom and emotional healing. The subscale for altruism covers behaviors that reflect altruistic values. The construct is reliable with a Cronbach's alpha of 0.799.

4.3. Control variables

We used firm size and sector as control variables. Participants were asked to classify their firms according to the number of employees into one of the six categories suggested in the questionnaire (frequencies for each category in our sample appear in brackets): fewer than 50 employees (13.9%), between 50 and 100 employees (21.5%), between 101 and 250 employees (25.9%), between 251 and 500 employees (23.9%), between 501 and 1,000 employees (10.4%), and firms with more than 1,000 employees (4.4%). We also distinguished between manufacturing and service firms: 28.7% of the organizations belonged to manufacturing sectors, while 71.3% were from service sectors.

4.4. Analyses

Structural equations and the statistical software package EQS 6.1 were used to empirically validate the model. We used the maximum likelihood (ML) estimation method with robust estimators. All the Chi square values presented in the paper correspond to the statistical goodness-of-fit tests devised by Satorra and Bentler (1994).

During both the research design and the data analysis stages we followed recommendations to prevent or assess the effect of Common Method Variance (CMV) (e.g., Chang et al., 2010). In the research design stage we first contacted all the participants to explain the motives behind the study and the importance of the research, and to inform them that their anonymity and the confidentiality of their responses would be guaranteed (MacKenzie and Podsakoff, 2012). The questionnaire was structured by separating the items of each construct, and responses were obtained at different moments, with a separation of three months between independent and dependent variables (MacKenzie et al., 2012; Podsakoff et al., 2012). Finally, we also made the commitment to provide all participants with feedback on our research, thus encouraging them to be honest and precise in their responses.

Once the data had been collected, several statistical analyses were run to evaluate CMV. The techniques used were Harman's test, common latent factor (e.g., Johnson et al., 2011) and common marker variable techniques (Lindell and Whitney, 2001). In all three cases the conclusion was that CMV was not a problem in our research.

We then tested the structural models corresponding to the proposed hypothesis following the approach taken by Tippins and Sohi (2003) to verify the existence of the mediating effect of organizational learning capability on the relationship between altruistic leader behaviors and radical innovation (hypothesis 3). This procedure involves estimating two structural models. The first corresponds to a direct effect model that tests the effects of the predictors on the dependent variables. In the present research, it involved estimating the direct effect of altruistic leader behaviors on radical innovation (figure 3). For mediation to exist, the direct effect between altruistic leader behaviors and radical innovation must be significant. The second model is a mediated model that includes the intermediate variable. This model corresponds to hypothesis 3 and considers the following effects: the effect of altruistic leader behaviors on organizational learning capability, the influence of organizational learning capability on radical innovation, and the direct effect of altruistic leader behaviors on radical innovation. Then we tested the mediated model. Certain conditions must be met for mediation to be supported: (1) the significant relationship between altruistic leader behavior and radical innovation, observed in the direct effect model, must decrease considerably or disappear in the partial mediation model; (2) the partial mediation model must explain more variance in radical innovation than the direct effect model; (3) there must be a significant relationship between organizational learning capability and radical innovation; (4) in the mediation model, there must be a significant relationship between altruistic leader behavior and organizational learning capability.

Finally, we used bootstrapping to evaluate the significance of the mediated effect. This is an additional method recommended for testing mediation that does not impose the assumption of normality of the sampling distribution (Preacher & Hayes, 2008). MacKinnon, Coxé and Baraldi (2012) suggest the use of bootstrapping methods to determine the significance of the mediated effect along with a confidence interval for the indirect effect.

5. Results

5.1. Descriptive statistics and psychometric properties of the measurement scales.

The data analysis begins with the descriptive statistics. Table 1 exhibits means, standard deviations, Cronbach's alpha and factor correlations. The psychometric properties of the measurement scales were evaluated by following accepted practices in the literature (Anderson & Gerbing 1988), namely, by studying their dimensionality, reliability, and content, convergent and discriminant validity (Tippins and Sohi 2003).

In the case of the organizational learning capability construct, following Chiva and Alegre (2009) we checked the fit of the second-order factor model (Fig. 2) to support the proposed multidimensionality of this concept, with excellent results (Satorra-Bentler Chi square = 86.40; p value = 0.12; SB Chi square/df = 1.20; BBNFI = 0.930; BBNNFI = 0.984; CFI = 0.987; RMSEA = 0.028).

Regarding the structure of the constructs, in addition to Confirmatory Factor Analyses (CFA), we followed the more commonly used approach (advocated by Anderson and Gerbing, 1988) of assessing a full measurement model that include all the variables. Testing a full measurement model establishes the structure of the variables in the context of other variables measured in the study, and ensures that the measures used in the study are distinct from one another. The overall fit of this general measurement model was as follows: Chi square (df) = 299.56 (222); p = 0.00; CFI = 0.963; RMSEA = 0.037. The Chi square statistic was non-significant and all the standardized estimates were significant and in the expected direction.

The results of the reliability analysis are also satisfactory. Cronbach's alpha coefficient values and the compound reliability values are equal to or exceed 0.8 (Table 2), above the minimum accepted value of 0.7 (Nunnally 1978). In addition, the average variance extracted presents values above the recommended minimum of 0.5 (Nunnally 1978) for the three constructs included in the model.

The procedure followed to select the measurement scales supports content validity. The variables used to measure organizational learning capability were taken from the scale proposed by Chiva et al. (2007) and Chiva and Alegre (2009), who carried out a thorough literature review before proposing and validating their scale. The altruistic leader behavior dimension items were taken from a scale validated in a previous study (Barbuto and Wheeler, 2006), in which altruistic leader behavior was introduced as one component of servant leadership. Finally, radical innovation was measured with the scale validated by Gatignon et al. (2002).

To evaluate convergent validity, the average variance extracted (AVE) should be 0.5 or above (Fornell and Larcker, 1981, p. 45-46). The AVE is above the recommended minimum for all constructs (table2).

For discriminant validity to exist, the square root of the AVE must be greater than the construct correlations, suggesting that each construct relates more strongly to its own measures than to others.

INSERT TABLE 1 ABOUT HERE

INSERT TABLE 2 ABOUT HERE

INSERT FIGURE 2 ABOUT HERE

5.2. Testing the research hypotheses

The results of the direct effect model confirm that a significant relationship exists between altruistic leader behavior and radical innovation. The value of the structural parameter corresponding to the influence of altruistic leadership behavior on radical innovation is statistically significant ($\alpha = 0.256$). Thus, the first condition is satisfied and allows us to continue with the analysis, estimating the mediated model which corresponds to hypothesis 3.

The estimation of the mediated model shows a good fit, according to the values of chi-square and the fit indices (figure 4). As shown in table 3, the partial mediation model explains more variance than the direct effect model (0.213 vs. 0.072). In addition, the significant relationship between altruistic leadership behavior and radical innovation ($\alpha = 0.256$) shown in the direct effect model decreases considerably and is close to zero when it includes the mediating effect of organizational learning capability, and therefore it becomes non-significant ($\beta_1 = 0.012$). Additionally, there is a significant relationship between altruistic leader behavior and organizational learning capability ($\beta_2 = 0.556$), and organizational learning capability influences radical innovation ($\beta_3 = 0.445$), confirming the mediating role of organizational learning capability in the altruistic leadership behavior-radical innovation relationship, as predicted in hypothesis 3.

The estimated indirect effect of altruistic leader behavior on radical innovation is 0.244. The 95% bias-corrected confidence intervals for the indirect effect are between 0.131 and 0.419, with a p-value of 0.001 for the two-tailed significance test. Hence, the standardized indirect effect of altruistic leader behavior on radical innovation is significantly different from zero at the 0.001 level and we can reject the null hypothesis of no mediation effect.

These four points, together with the bootstrap analysis, provide evidence to support our hypotheses, as reported in figure 4.

INSERT TABLE 3 ABOUT HERE

INSERT FIGURE 3 ABOUT HERE

INSERT FIGURE 4 ABOUT HERE

6. Conclusions

In the context of uncertainty and high competitiveness in which organizations operate, innovation has become an essential element to survive and achieve long-term success. Different types of innovation have engaged researchers' interest, particularly radical innovation, which has attracted a great deal of scholarly interest in recent years as reflected in the wealth of publications on this subject. Nevertheless, further knowledge is still needed on how to generate organizational environments in which radical innovations can thrive. Several authors have stressed the need to continue working on the antecedents of radical innovations and emphasize the importance of leadership as a facilitator of this type of innovation (Chang et al., 2012; Denti & Hemlin, 2012). The present study reflects this idea and analyzes a specific leader behavior category, altruistic leader behavior, and its influence on radical innovation. This type of behavior has been little studied (Dinh et al., 2014), despite being present in many relevant leadership styles, such as the transformational style, that are considered as alternatives to individualistic and selfish leadership styles.

Moreover, authors such as Koning et al. (2011) propose considering organizational context when studying the effect of leadership on innovation. Thus, the present study has aimed to empirically test the relationships between altruistic leader behavior, a specific context that fosters learning within organizations (OLC), and radical innovation. Results confirm the proposed conceptual model and the research hypotheses. The findings have important implications for the radical innovation literature, the organizational learning literature, and the leadership literature.

First, altruistic leader behavior is positively related to organizational learning capability, confirming hypothesis 1. Leaders who care for others unselfishly foster an organizational environment in which to experiment, discuss, take risks, interact with the external environment and participate; in short, they create a climate that facilitates learning.

Second, this study offers empirical evidence that organizational learning capability increases radical innovation, confirming hypothesis 2. This result is consistent with previous research that related organizational learning to innovation (e.g., Alegre & Chiva, 2013; Baker & Sinkula, 2007; Jiménez-Jiménez & Sanz-Valle, 2011). It should also be noted that previous work used Chiva et al.'s (2007) instrument and related it directly with innovation (Alegre & Chiva, 2008). However, to our knowledge, no previous studies have related this construct to a certain type of innovation, such as radical innovation. Results confirm that organizational learning capability, measured by Chiva et al.'s scale, directly and positively affects radical innovation development.

Finally, altruistic leader behavior has a positive and indirect effect on organizational capability to develop radical innovations, mediated by organizational learning capability, confirming hypothesis 3. Organizational learning capability plays a key role in explaining how altruistic leader behavior affects radical innovation.

The present research contributes to increase understanding about the antecedents of radical innovation within organizations when the influence of altruistic leader behavior and organizational learning capability on radical innovation is empirically tested in the same model. It also confirms the positive relationship of each construct separately. Despite the growing body of research on radical innovation, to our knowledge this is the first study that relates the concepts of altruistic leader behavior and organizational learning capability to it. On another level, our research contributes to the leadership literature by focusing on altruistic leader behavior. Although altruism is included in different leadership styles, few studies have conceptualized it as such (Mallén, 2015; Sosik et al., 2009). The study also contributes to the organizational learning capability literature by highlighting the role of altruistic leader behavior in promoting an environment that fosters organizational learning and, in turn, radical innovation. Leaders who unselfishly care for others and seek to increase their welfare can foster an environment that facilitates experimentation, dialogue, risk taking, openness to the external environment and participative decision making. Akgün et al. (2007) state that altruism is a feeling of empathy and concern for others that helps one to consider and accept another person's opposing viewpoint. This allows the consolidation of a climate of confidence and trust that fosters innovative and creative ideas by promoting

communication, reducing the risk of unsatisfactory evaluation of the proposed ideas and facilitating decision making. Moreover, altruistic leader behaviors, through helping others, encourage employees to become involved with projects that go beyond their assigned tasks. These initiatives, as well as favoring dialogue between departments and the opportunity to make contact and communicate with the external environment, also promote experimentation when collaborating in completely new tasks.

The contributions of this research go beyond the academic field to the sphere of organizations and business. Our results suggest ideas for organizations that want to implement a working environment that fosters innovation performance in order to achieve radical innovations. Organizations face difficult challenges in a turbulent context characterized by constant and profound shifts, pushing them to innovate in order to be competitive. Organizations should be aware that fomenting altruistic leader behaviors encourages organizational learning, which in turn improves radical innovation. In principle, this idea may seem difficult to implement because promoting altruistic values is an unusual concept in the organizational world and is far removed from the ethos of many businesses.

Most managers work in stressful, time-constrained, and resource-limited environments that foster competition rather than cooperation, and self-interest rather than other orientations (Sosik, 2009:396). Nevertheless, for organizations to develop innovations, they must enable the appropriate environments and conditions that foster learning. By implementing leadership styles that are less egoistic and focus more on cooperation and helping others, they may achieve the radical innovations that are essential to organizational success in turbulent contexts.

For organizations to obtain altruistic leadership profiles, they must manage human resources policies, such as staff selection processes, training or evaluation of employees' performance. When recruiting new staff, for example, it may be desirable to seek profiles of people with a clear vocation for cooperation; altruistic behavior, as defined in the present study, should therefore be taken into account when defining the competences required, especially for managers and middle management. These profiles may, in turn, foster altruistic behavior in the organization. Leaders are models that other employees tend to imitate. Consequently, if leaders behave altruistically, they may help to promote altruistic behaviors in the organization (Kanungo & Conger, 1993). Training may also be relevant when promoting an altruistic culture in the organizational environment. Rosen and Sims (2011) state that altruistic behavior is not necessarily an innate characteristic; they show that it can be promoted and encouraged and, therefore, it can be learnt.

In addition, leadership can be developed (Crossan et al., 2013) and leadership traits such as egoism can be altered and improved through appropriate training programs (Hogan and Curphy, 1994). When evaluating employees' performance, it may be useful to include the altruistic behavior variable. This may help to transmit organizational values, explain the type of behavior required and, in turn, stimulate it. In short, this philosophy should be implemented in every human resources policy, all of which should be congruent with each other and aligned with the organization's strategy. Such initiatives may help to promote a culture and a working environment where concern and care for others override selfish and self-interested behaviors.

Despite the results, our research has certain limitations. The study was carried out on a particular population of organizations, so our results are obviously limited to this type of organization. The present study uses a sample of firms with an excellent human resource management record; our analysis was therefore of a heterogeneous sample in terms of size and industry, an aspect that could affect firms' organizational performance. Future research might consider conducting this study in firms from a single sector and of a similar size. It would also be interesting to perform this analysis in different countries. The survey uses single informants, which is the primary research design in most studies. Using a single informant can affect the results obtained due to the potential presence of common method bias. For this reason, it is advisable to collect responses for the dependent and independent variables from different information sources (MacKenzie et al., 2012; Podsakoff et al., 2012). Future research should consider using different informants for some variables, such as radical innovation. Although HR officers are experienced and have a global understanding of the company, R&D managers are likely to provide a more accurate response to innovation issues.

The study provides evidence of causality but cannot prove it by using cross-sectional data. Future research should attempt to overcome this limitation through longitudinal data. Finally, there is a need for further research on the antecedents that facilitate radical innovation development. In addition, future studies should distinguish between incremental and radical innovation in order to learn whether our findings hold for both types of innovation. Future research should rectify and improve all the limitations detected in the present study.

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APPENDIX : QUESTIONNAIRE

About altruistic leadership: Barbuto and Wheeler (2006).

ALT1. The leaders of this organization put the interests of the people above their own	1-2-3-4-5
ALT2. The leaders of this organization do all they can to help people	1-2-3-4-5
ALT3. The leaders of this organization sacrifice their own interests to meet the needs of others	1-2-3-4-5
ALT4. 4. The leaders of this organization go beyond the call of duty to help others	1-2-3-4-5

Organizational learning capability: Chiva, Alegre and Lapiedra (2007).

About experimentation:

EXP1. People here receive support and encouragement when presenting new ideas.	1-2-3-4-5
EXP 2. Initiative often receives a favorable response here, so people feel encouraged to generate new ideas.	1-2-3-4-5

About risk taking:

R1. People are encouraged to take risks in this organization.	1-2-3-4-5
R2. People here often venture into unknown territory.	1-2-3-4-5

About interaction with the external environment:

ENV1. It is part of the work of all staff to collect, bring back, and report information about what is going on outside the company	1-2-3-4-5
ENV2. There are systems and procedures for receiving, collating and sharing information from outside the company.	1-2-3-4-5
ENV3. People are encouraged to interact with the environment.	1-2-3-4-5

About dialogue:

DIA1. Employees are encouraged to communicate.	1-2-3-4-5
DIA2. There is a free and open communication within my work group.	1-2-3-4-5
DIA3. Managers facilitate communication.	1-2-3-4-5
DIA4. Cross-functional teamwork is a common practice here.	1-2-3-4-5

About participative decision making:

DEC1. Managers in this organization frequently involve employees in important decisions.	1-2-3-4-5
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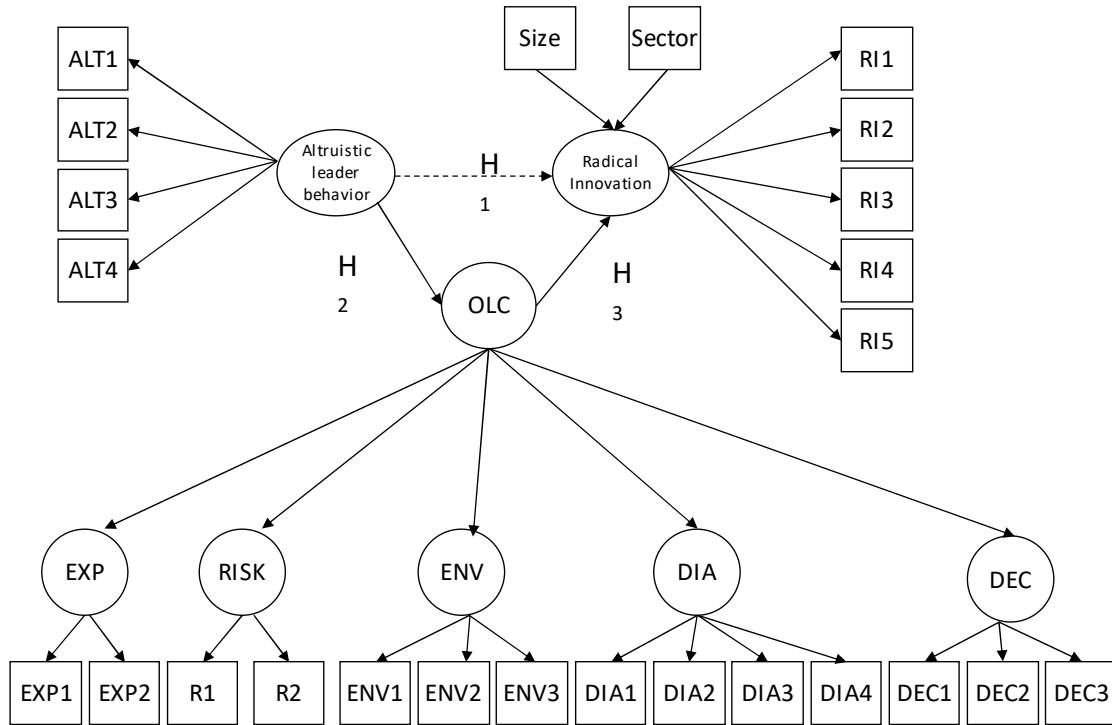
DEC2. Policies are significantly influenced by the view of employees.	1-2-3-4-5
DEC3. People feel involved in main company decisions.	1-2-3-4-5

About radical innovation: Gatignon et al. (2002)

RI1. Innovation is a minor improvement over the previous technology	1-2-3-4-5
RI2. Innovation was based on a revolutionary change in technology	1-2-3-4-5
RI3. Innovation was a breakthrough innovation	1-2-3-4-5
RI4. Innovation led to products that were difficult to replace with substitute using older technology	1-2-3-4-5
RI5. Innovation represents a major technological advance in subsystem	1-2-3-4-5

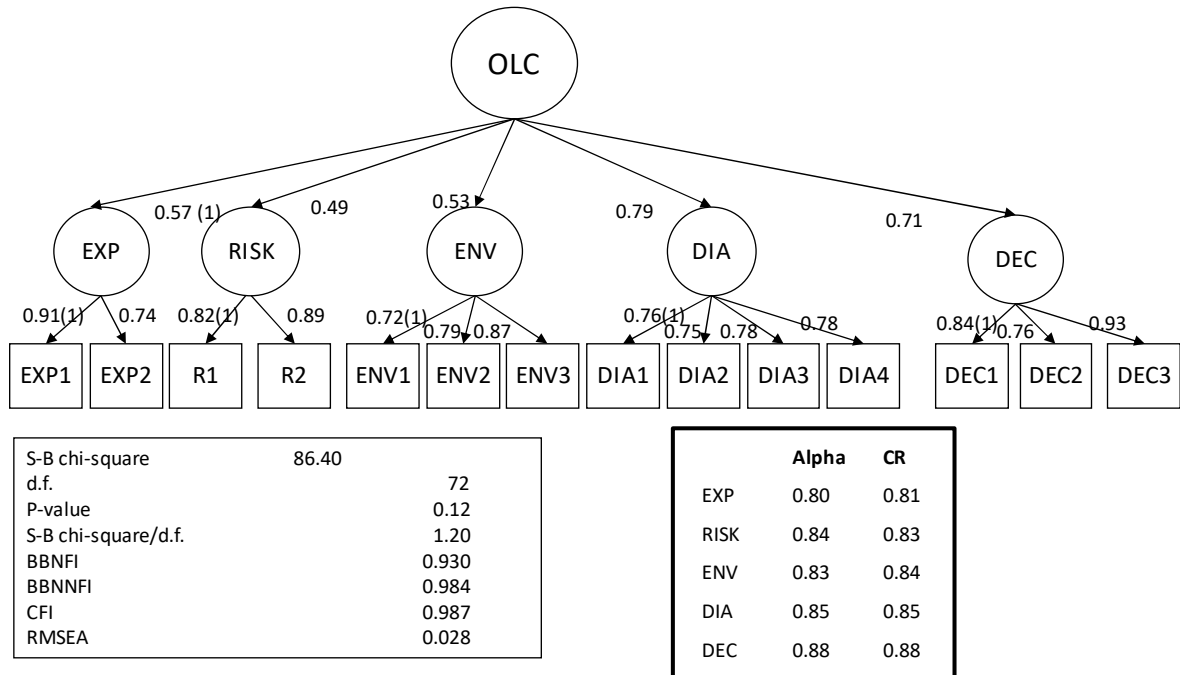
FIGURES

Figure 1. *Conceptual model*



Note: OLC = Organizational learning capability; EXP = Experimentation; RISK= Acceptance of risk; ENV= Interaction with the external environment; DIA = Dialogue; DEC= Participative decision-making.

Figure 2. Confirmatory Factor Analyses for Organizational Learning Capability (OLC)



(1) The parameter was equaled to 1 to fix the latent variable scale. Parameter estimates are standardized. All parameter estimates are significant at a 95% confidence level.
 Note: OLC = Organizational learning capability; EXP = Experimentation; RISK= Acceptance of risk; ENV= Interaction with the external environment; DIA = Dialogue; DEC = Participative decision-making.

Figure 3. Direct effect model: Altruistic leader behavior and radical innovation

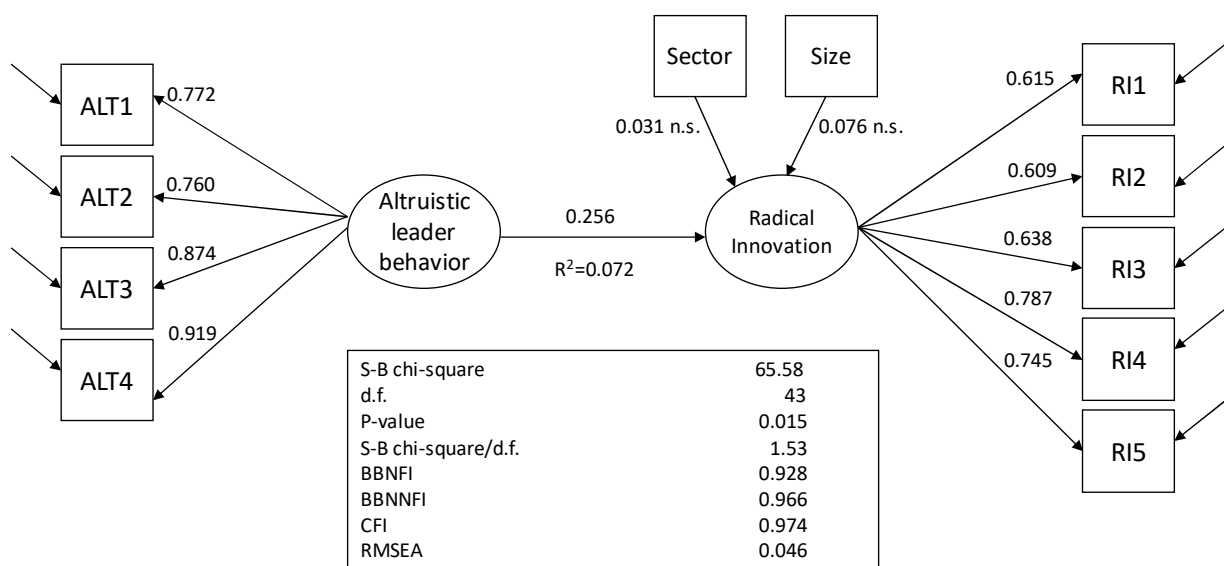
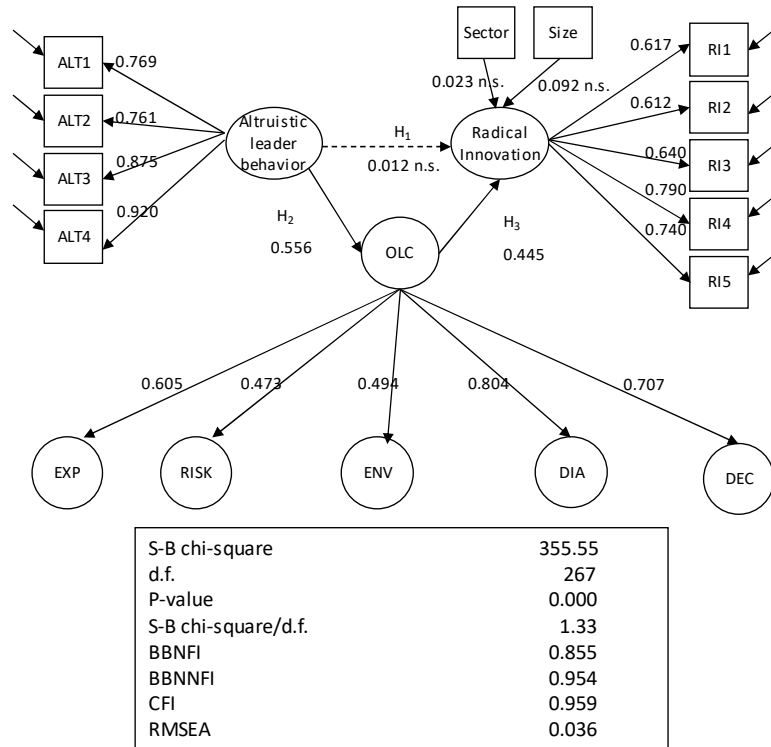


Figure 4. Mediating effect model: Altruistic leader behavior, organizational learning capability and radical innovation.



Organizational learning capability (OLC) is a second-order factor. For the sake of brevity, only the first-order loadings are shown. The item loadings for these first-order factors are all significant at $p < 0.001$.
 Note: OLC = Organizational learning capability; EXP = Experimentation; RISK = Acceptance of risk; ENV = Interaction with the external environment; DIA = Dialogue; DEC = Participative decision-making.

TABLES

Table 1. *Factor correlations, means, standard deviations and Cronbach's alpha*

	Mean	s.d.	AL	RI	Exp	Risk	Env	Dia	Dec
AL	3.43	0.67	(0.89)						
RI	3.79	0.45	0.23**	(0.80)					
Exp	3.99	0.56	0.36**	0.25**	(0.80)				
Risk	3.37	0.85	0.19**	0.15*	0.31**	(0.84)			
Env	3.69	0.67	0.13*	0.16**	0.18**	0.27**	(0.83)		
Dia	4.13	0.55	0.38**	0.33**	0.40**	0.28**	0.35**	(0.85)	
Dec	3.47	0.68	0.37**	0.24**	0.33**	0.32**	0.36**	0.50**	(0.87)

Notes: For the standard deviations and factor correlations, we used the mean of the items making up each dimension. Cronbach's alpha coefficients are given in parenthesis.

** Significant correlation ($p < 0.05$). Other correlations not marked with an asterisk present a significant correlation at $p < 0.01$.*

Note: AL = Altruistic leadership behavior; RI = Radical innovation; EXP = Experimentation; RISK = Acceptance of risk; ENV = Interaction with the external environment; DIA = Dialogue; DEC = Participative decision-making.

Table 2. *Reliability of the measurement scales*

<i>Construct</i>	<i>Composite reliability</i>	<i>Extracted mean variance</i>
Altruistic leadership behavior (4 items)	0.901	0.696
Radical innovation (5 items)	0.811	0.465
Experimentation (2 items)	0.811	0.684
Acceptance of risk (2 items)	0.845	0.732
Interaction with the external environment (3 items)	0.836	0.631
Dialogue (4 items)	0.851	0.589
Participative decision-making (3 items)	0.881	0.713

() The Cronbach's alpha coefficient for the experimentation and risk acceptance dimensions, both with two items, was performed using SPSS 17.0 software; EQS 6.1 software was used for the other dimensions. Following Chiva and Alegre (2009), factor loadings obtained from the second-order organizational learning capability factor model were used to calculate the composite reliability and average variance extracted for these two dimensions.*

Table 3. *Structural equations to test the hypothesis that organizational learning capability mediates in the relationship between altruistic leadership and radical innovation.*

Structural equation	R ²
<i>Direct effect model</i>	
$RI = 0.256*AL + 0.076*SIZE + 0.031*SECTOR$ (t = 3.130) (t = 1.085) (t = 0.486)	0.072
<i>Mediation effect model</i>	
$RI = 0.012*AL + 0.445*OLC + 0.092*SIZE + 0.023*SECTOR$ (t = 0.116) (t = 3.063) (t = 1.390) (t = 0.370)	0.213
$OLC = 0.556*AL$ (t = 4.685)	0.309