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Article

The moderating role of relational learning on the PACAP–RACAP link. A study in the Spanish automotive components manufacturing sector

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ABSTRACT

Starting from the construct absorptive capacity (ACAP), this paper adopts Zahra and George (2002) conceptualization of absorptive capacity, which considers it as two subsets – potential absorptive capacity (PACAP) and realized absorptive capacity (RACAP). Hence we have hypothesized a positive relationship between PACAP and RACAP. We also hypothesized a positive relationship between relational learning (RL) and RACAP. Finally we have assessed the moderating role of RL in the PACAP–RACAP link. Data were collected from a sample of 110 firms belonging to the Spanish automotive components manufacturing sector. Results from a variance-based structural equation-modeling tool show that RL moderates (reinforces) the influence of PACAP on RACAP. In addition this paper provides evidence about the important role that RL plays as antecedent of RACAP.

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El efecto moderador del aprendizaje relacional en el vínculo PACAP-RACAP. Un estudio en el sector español de fabricantes de componentes para la automoción

RESUMEN

Partiendo del constructo capacidad de absorción (ACAP), este trabajo adopta el concepto de capacidad de absorción propuesto por Zahra y George (2002), que lo conciben como un concepto compuesto por dos – capacidad de absorción potencial (PACAP) y capacidad de absorción realizada (RACAP) – De ahí que hayamos hipotetizado una relación positiva entre PACAP y RACAP. Asimismo hemos hipotetizado una relación positiva entre el aprendizaje relacional (RL) y RACAP. Finalmente hemos analizado el rol moderador del RL sobre el vínculo PACAP-RACAP. Los datos fueron obtenidos de una muestra de 110 empresas pertenecientes al sector español de fabricantes de componentes para la automoción. Los resultados arrojados por una técnica de modelos de ecuaciones estructurales basados en la varianza muestran que el RL modera (reforzando) la influencia de PACAP sobre RACAP. Además este estudio proporciona evidencia empírica sobre el importante papel que desempeña el RL como antecedente de RACAP.

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Introduction

Within the context of the society of knowledge, there are plenty of companies that root their competitive advantage on knowledge.

These knowledge-based or knowledge-intensive firms are generally characterized by their determined orientation or commitment to innovation, and their support of learning and, when needed, unlearning mechanisms. These firms usually rely on the use of project teams in which innovation is a key survival capability.

The automotive components manufacturing sector (ACMS) is composed by firms which suppose quite good examples of this kind of knowledge-intensive companies. Moreover, this sector has been

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one of the fastest growing ones in the last years in Spain. The firms belonging to this sector tend to orientate their production to other firms, principally largest automobile manufacturers (i.e., Renault, Peugeot, Citroen, etc.) providing them with components and highly customized products and services. Most firms in the ACMS sector are SMEs, which in order to be innovative, need to acquire specialized knowledge as well as to foster cumulative learning. This will allow them to be able to differentiate their outputs from their competitors. These new skills and capabilities are necessary to generate new products, services or processes that could lead to the achievement and sustainment of a competitive advantage.

Increasingly, the socio-economic situation in which organizations are involved is characterized by a greater complexity. The business environment has become deeply globalized, and the daily scenario that firms have to deal with is marked by dynamism and diversity. This new scenario in which the excess of information and uncertainty are proliferating, makes companies, as well as the set of adjacent stakeholders, progressively more oriented to the generation of a sustainable competitive advantage toward knowledge management (KM) procedures.

This globalization of economy, markets and production procedures has led organizations to increase their awareness about knowledge. Knowledge can be both internally generated within the organization or externally obtained. The first method is traditionally referred to as "knowledge creation" or "knowledge generation". On the other hand, the second method is named "knowledge capture" or "knowledge absorption". The knowledge creation comprises the firm's internal development of insight, knowledge and know-how. On the contrary, the knowledge absorption deals with the identification and subsequent acquisition of external knowledge by the organization. Once an organization has discovered a specific piece of external knowledge which is interesting for its own activity and goals, the next step deals with absorbing this knowledge.

Identifying new external knowledge sources has become an important strategic scope for plenty of firms. Accordingly with Lee and Wu (2010, p. 118), "the ability to create and transfer knowledge internally is one of the main competitive advantages of multinational corporations". In parallel to its acquisition, this knowledge should be effectively shared and disseminated within the different organization areas and departments. "As knowledge is created and disseminated throughout the firm, it has the potential to contribute to the firm's value by enhancing its capability to respond to new and unusual situations" (Leal-Rodríguez, Leal-Millán, Roldán-Salgueiro, & Ortega-Gutiérrez, 2013). In this sense the organizations' capability to absorb knowledge, namely, absorptive capacity (ACAP) facilitates an effective acquisition and utilization of external as well as internal knowledge, which will in turn positively influence the firm's innovative capability and its ability to adapt to the changing environment and hence, remain competitive.

In this study we will adopt Zahra and George's (2002) conceptualization of absorptive capacity as a set of dynamic organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge. According to these authors, ACAP is composed by two subsets: potential absorptive capacity (PACAP) and realized absorptive capacity (RACAP). The first one comprises the acquisition and assimilation of knowledge. This is linked with the effort expended in the identification and acquisition of new external knowledge. The second one deals with transforming, combining and finally exploiting this recently acquired knowledge.

Zahra and George (2002) theorized that the link between PACAP and RACAP is moderated by a series of social integration mechanisms. They suggested that "social integration mechanisms lower the barriers to information sharing while increasing the efficiency of assimilation and transformation capabilities". Taking this suggestion into consideration, we extend this idea by the introduction

of the relational learning construct (RL). This construct can be understood as a joint activity between the organization and one or more parts – supplier, customer, partner, etc. – in which the purpose is to cooperate and share information and knowledge. We propose that RL could moderate the PACAP-RACAP link.

The purpose of this paper is hence to develop a model that: (i) examines the relationship between the absorptive capacity's dimensions (PACAP and RACAP) and (ii) investigates the moderating role of RL in the PACAP-RACAP link. The paper proceeds as follows. Next section presents the theoretical background and hypotheses. This is followed by a description of the research methodology used to test these hypotheses, and then the results of the data analyses. Finally, the implications and future research directions are discussed.

Theory and hypotheses

Potential and realized absorptive capacity

Cohen and Levinthal (1990) coined the term absorptive capacity (ACAP) with regard to a firm's ability to value, assimilate, and apply new knowledge. Kim (1997a, 1997b) also defined it as the firms' capacity of learning and solving problems. This concept inspired an extensive range of research on the knowledge transfer topic. A later Zahra and George's (2002) study aroused a great interest and supposed an important reconceptualization of absorptive capacity.

In this paper, we will focus on the theory proposed by Zahra and George (2002). The central idea of this theory deals with the distinction between "potential absorptive capacity" (PACAP) and "realized absorptive capacity" (RACAP). These authors suggested the necessity to distinguish among four distinct but complementary capabilities, namely acquisition, assimilation, transformation and exploitation. A delimitation of these four capabilities will be assessed in the following paragraphs.

Acquisition refers to the firm's capability of firstly identifying and then acquiring new external knowledge. This is consistent with Cohen and Levinthal's (1990, p. 128) view of the process of identification and evaluation of external knowledge. As they theorized, "The ability to evaluate and utilize outside knowledge is largely a function of the level of prior related knowledge. [. . .] Prior knowledge confers an ability to recognize the value of new information, to assimilate it, and to apply it to commercial ends".

Assimilation deals with the firm's processes, habits, methods and routines that lead them to an effective assessing, processing and understanding of the information captured from external sources (Kim, 1997a, 1997b; Szulanski, 1996). This capability is rooted on individuals' understanding and knowledge interpretation. This phase of ACAP is closer to the individual level than to the collective one. Actually, knowledge assimilation is based on the firm's ability to grasp new external knowledge and link it with its prior related knowledge.

The internalization of new external knowledge in existing firms' processes and products is what Zahra and George (2002, p. 190) labeled as transformation capability. They suggested that this dimension "denotes a firm's capability to develop and refine the routines that facilitate combining existing knowledge and the newly acquired and assimilated knowledge". This is achieved by adding or deleting knowledge or by the simple interpretation of knowledge in a different way.

Zahra and George (2002, p. 190) defined exploitation "as an organizational capability that is based on the routines that allow firms to refine, extend, and leverage existing competencies or to create new ones by incorporating acquired and transformed knowledge into its operations". This phase has been traditionally considered as more relevant. If we attend to Cohen and Levinthal's
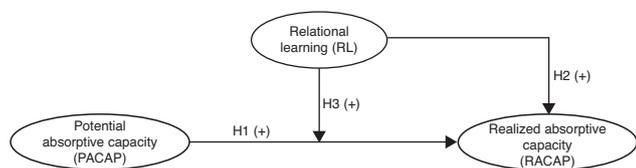
Fig. 1. Structural model results.

Source: Own elaboration.

(1990, p. 128) definition, "employees must be able to apply new external knowledge to commercial ends", this suggests that if all the other phases do not lead to knowledge exploitation, they have not been very useful.

With regard to Zahra and George's (2002) theory, the four capabilities mentioned above are distributed between two constructs or subsets of ACAP. PACAP comprises the acquisition and assimilation capabilities, whereas RACAP involves the transformation and exploitation capabilities. Accordingly with Lee and Wu (2010, p. 124) "Knowledge alone is not enough. A firm needs to have tools to exploit and appropriate this knowledge embedded in new organizational innovations". This means that acquiring and assimilating knowledge may occur but this does not guarantee that it will be transformed and exploited efficiently.

The main idea of Zahra and George's thinking is the complementarity of the PACAP and RACAP concepts. According to these authors, a firm may have the capability to acquire external knowledge. However, it does not guarantee the exploitation of this knowledge. On the other hand, a firm may have the capacity to leverage and exploit knowledge, but is not able to effectively acquire it. Therefore, PACAP and RACAP have different roles yet their effect is not isolated, but rather complementary. Both subsets of absorptive capacity coexist and participate in the improvement of firm performance. This reasoning lead them to rethink the concept of ACAP. Considering all the arguments stated above, we postulate the following hypothesis (Fig. 1):

H1. Potential absorptive capacity (PACAP) is positively related to realized absorptive capacity (RACAP).

The relational learning (RL) as antecedent of RACAP, and the moderating role of RL on the PACAP–RACAP link

Several studies support the importance of external factors for absorptive capacity. Daghfous (2004) suggested that as the firm does not exist alone, but coexists with diverse external agents, the external environment plays a key role for absorptive capacity. As Nonaka and Takeuchi (1995) stated, knowledge-intensive firms operate in open environments, where they are constantly interacting and exchanging knowledge. Several works have identified RL as the sharing of relevant knowledge among the firm and one or more parts – supplier, customer, partner, etc. – This relationship works as a joint activity which is essentially based on information and knowledge sharing. This will contribute to the enhancement of their knowledge bases, capacities and competitive spirits through relational-level learning (Leal-Rodríguez, Roldán, Leal, & Ortega-Gutiérrez, 2013b). RL is therefore a multidimensional construct composed by three first order reflective constructs, namely information sharing, joint sensemaking and knowledge integration. Collectively, these three variables define a general framework where interorganizational knowledge exchange occurs. These components will be described below.

Information sharing refers to the exchange of information between the firm and one or more interested parties (Selnes & Sallis, 2003). Through the exchange of information, both members can benefit from the achieving of operational efficiencies. This

information exchange may comprise matters such as the needs and preferences of the final consumer, market structures and acquisitions, product technologies, the partners' strategies and financial status, as well as the concurrence of unexpected problems.

Joint sensemaking deals with the development of knowledge, insight, and associations between past actions, the effectiveness of these actions, and future actions (Fiol and Lyles, 1985). Organizations differ in the forms in which they take conscience or internally reflect and mature the same information, and hence it may be argued that differences exist as for the mechanisms of construction of a shared vision. These mechanisms usually include meetings, forums, workshops and cross-functional teams. The aim of these mechanisms is to create learning platforms between organizations (Selnes & Sallis, 2003).

Knowledge integration is consistent with Gulati, Lawrence, and Purnam (2005) focus on the combination of cooperation (alignment of interests) and coordination (alignment of actions). Knowledge integration appears when the firms develop memories to store knowledge relating to their relationships, collective cognitions, beliefs, routines, idiosyncrasies and values, as well as the formal and informal procedures associated with the way in which the parts interact. In words of Cheung, Myers, and Mentzer (2011), knowledge integration helps the parts involved in the relationship to more easily meet their views and needs.

Nonaka, Toyama, and Konno (2000, p.12) argued that "knowledge is transferred beyond organizational boundaries, and knowledge from different organizations interacts to create new knowledge. Through dynamic interaction, knowledge created by the organization can trigger the mobilization of knowledge held by outside constituents such as consumers, affiliated companies. . .. or distributors". In summary, the organization interacts with outside constituents to create knowledge and this transcends the boundary between self and other, inside and outside, past and present. RACAP reflects the firm's capacity to leverage the knowledge that has been absorbed, but firms cannot possibly exploit external knowledge without first acquiring it by relational learning activities among the firm and its stakeholders. The above reasoning induces to think that the RL activities form a necessary precedent to develop the transformation and exploitation capabilities (RACAP).

According to Spender (1996), in order to achieve an effective absorption and exploitation of knowledge, it is vital to ensure the sharing of relevant knowledge among partners and organizational members. As a result, the firm's environment will be characterized by a better comprehension and mutual understanding (Garvin, 1993). RL can be very helpful in order to reach this objective. Although knowledge sharing and integration could be thought as critical requirements for innovative and knowledge-based companies, the top management do not always think in the same way.

Zahra and George (2002) posited that the passage from PACAP to RACAP is moderated by a set of social integration mechanisms. This suggests that they essentially consider the knowledge absorption process as a social procedure. The result of the firm's operations with their different stakeholders (customers, suppliers, partners, etc.), sharing information, tends to be an enhancement of their respective knowledge bases and capabilities. Hence, complementing these authors' argument, we propose that RL activities may contribute to reduce the gap between PACAP and RACAP. We therefore posit that the link between PACAP and RACAP will be strengthened (reinforced) when firms engage in organizational and RL activities. This rationale has moved us to suggest the following hypotheses (Fig. 1):

H2. Relational learning (RL) is positively related to realized absorptive capacity (RACAP).

H3. Relational learning moderates (reinforcing) the positive relationship between PACAP and RACAP.

Table 1
Respondents demographics.

	Number	Percentage
Gender		
Male	97	88.2
Female	13	11.8
Age		
30–35	7	6.4
35–40	48	43.6
41–45	40	36.4
45–50	15	13.6
Size of team		
0–10	63	57.3
11–20	41	37.3
21–50	6	5.4

Source: Own elaboration.

Method

Data collection and sample

As population of study we took under consideration the set of companies belonging to the Spanish sector of automotive components manufacturing. We drew our sample from a list of "Sernauto", the Association of Manufacturers of Equipment and Components for the Automotive Industry[1] in Spain. From the total of 906 companies that conform this sector, we identified 427 who met our selection criteria (to be knowledge-intensive firms and to pursue innovativeness). A preliminary version or draft of the questionnaire used in this study was firstly assessed by a group of practitioners and academics specialized in the subject as well as some senior executives. These experts provided us valuable comments and feedback regarding the clarity, completeness, understanding, relevance, validity and legibility of the scales as well as the instructions of the survey. The data compilation took place in the approximate period of three months, from September to November 2012. Each respondent was provided with a package that included an introduction letter, the questionnaire and a postage paid envelope for remitting their response. We identified the respondents who did not answer within the first three weeks after the materials delivery and sent them a second package of survey materials. Hence, we fulfilled two mailing efforts, which yielded 110 usable surveys returned (a 25.7% response rate). Table 1 contains some demographic data about the survey respondents.

Measures

We have composed the questionnaire on the basis of the bibliographic review. We have adapted and used existing validated scales taken from the literature. All the items and responses appear on a seven-point Likert scale which ranges from "I completely disagree" to "I completely agree". In order to evaluate ACAP, we have used items that were previously used by Jansen, Van Den Bosch, and Volberda (2005) and Cepeda-Carrión, Cegarra-Navarro, and Leal-Millán (2012). PACAP was measured through the use of nine items, while RACAP was assessed with a total of twelve items. We measured RL by adapting the items from a Selnes and Sallis (2003) work. We followed their theorization for the three dimensions of RL. The final construct is measured through 17 items.

Table 2
Measurement model: cross-loadings.

	PACAP	RACAP	RL
pacap1	**0.896**	0.234	−0.061
pacap2	**0.894**	0.197	−0.074
pacap3	**0.798**	0.181	−0.050
pacap4	**0.766**	0.217	0.050
pacap5	**0.911**	0.206	−0.069
pacap6	**0.902**	0.229	−0.032
pacap7	**0.890**	0.290	0.033
pacap8	**0.912**	0.267	−0.052
pacap9	**0.913**	0.287	0.052
racap1	0.300	**0.924**	0.690
racap2	0.268	**0.896**	0.621
racap3	0.253	**0.890**	0.668
racap4	0.418	**0.826**	0.573
racap5	0.350	**0.727**	0.579
racap6	0.146	**0.897**	0.725
racap7	0.227	**0.927**	0.668
racap8	0.206	**0.855**	0.605
racap9	0.038	**0.778**	0.567
racap10	0.189	**0.919**	0.702
racap11	0.222	**0.850**	0.623
racap12	0.195	**0.927**	0.638
KI	−0.034	0.717	**0.993**
ISH	−0.031	0.739	**0.992**
JSM	0.004	0.734	**0.989**

Note: PACAP: potential absorptive capacity; RACAP: realized absorptive capacity; RL: relational learning; KI: knowledge integration; ISH: information sharing; JSM: joint sense-making.
The bold numbers reflect the loading of each indicator/dimension to its own construct.
Source: Own elaboration.

Data analysis

We have tested the research model by the use of Partial Least Squares (PLS), a variance-based SEM technique (Roldán & Sánchez-Franco, 2012). PLS simultaneously evaluates the measurement model and the structural model. We decided to apply this technique for the following reasons: (1) the sample size ($n = 110$) is small and, according to Reinartz, Haenlein, and Henseler (2009), PLS should be applied when the number of observations is lower than 250; (2) this study is oriented toward the prediction of the dependent variables (Chin, 2010); and (3) compared to covariance-based SEM, PLS presents a number of advantages in terms of the estimation of interaction effects (Chin, Marcolin, & Newsted, 2003). In order to carry out the PLS analysis we used the SmartPLS software (Ringle, Wende, & Will, 2005).

Results

In a single, systematic, and comprehensive analysis, Partial Least Squares evaluates (Roldán & Sánchez-Franco, 2012): (1) The measurement model: the relationships between the latent variables and their indicators. (2) The structural model: the part of the overall model that proposes relationships among the latent variables.

Measurement model

PLS assesses the reflective measurement models taking into account the individual item reliability, construct reliability, convergent validity, and discriminant validity (Hair, Ringle, & Sarstedt, 2011). Individual item reliability is evaluated by analyzing the standardized loadings. In our study, all indicators and dimensions surpass the basic level of 0.7 (Carmines & Zeller, 1979) (Table 2). Construct reliability is assessed using two measures of internal consistence: composite reliability and Cronbach's alpha (Hair et al., 2011). Nunnally and Bernstein (1994) advocate 0.8 or 0.9 value for advanced stages of research. Since all constructs exceed 0.9, we can defend the reliability of our latent variables (Table 3). Convergent

Table 3
Construct reliability and convergent validity.

	CR	Cronbach α	AVE
PACAP	0.968	0.962	0.769
RACAP	0.974	0.970	0.757
RL	0.994	0.991	0.983

Notes: CR: composite reliability; AVE: average variance extracted; PACAP: potential absorptive capacity; RACAP: realized absorptive capacity; RL: relational learning.
Source: Own elaboration.

Table 4
Discriminant validity.

	PACAP	RACAP	RL
PACAP	**0.877**	0	0
RACAP	0.273	**0.87**	0
RL	−0.020	0.736	**0.991**

Notes: Diagonal elements (bold) are the square root of the variance shared between the constructs and their measures (AVE). Off-diagonal elements are the correlations among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements.
Source: Own elaboration.

validity is usually assessed by the average variance extracted (AVE) (Fornell & Larcker, 1981). AVE values should be greater than 0.50. This means that 50% or more of the indicator variance should be accounted for. Consistent with this suggestion, AVE measures for all LV are above of 0.769 (Table 3). Finally, the three main constructs achieve discriminant validity both via the comparison of the square root of AVE versus correlations band the cross-loadings table (Table 4) (Roldán & Sánchez-Franco, 2012).

Structural model

The structural model is assessed considering the algebraic sign, magnitude and significance of the structural path coefficients, and the R^2 value (Roldán & Sánchez-Franco, 2012). We used bootstrapping (5000 resamples) (Hair et al., 2011) to produce standard errors and t-values, which allow evaluating the statistical significance of the path coefficients. In addition, the bootstrapping confidence intervals of standardized regression coefficients are reported. "If a confidence interval for an estimated path coefficient w does not include zero, the hypothesis that w equals zero is rejected" (Henseler, Ringle, & Sinkovics, 2009, p. 306). We have particularly applied the percentile approach, which has the advantage of being completely distribution free (Chin, 2010). Both direct effects hypothesized in Fig. 2 (baseline model) are significant. This conclusion is also achieved observing the percentile bootstrap 95% confidence interval (Table 5, baseline model). Consequently, both H1 and H2 are supported. In this respect, the important role that Relational Learning plays as antecedent of RACAP. RL explains 54.61% of the variance of RACAP has to be underlined. Furthermore, RACAP achieves a R^2 value of 0.625 (Table 5). This can be considered very near to substantial (0.67) according to Chin (1998).

Following Henseler and Fassott (2010), we have used the product-indicator technique to test the moderating relationship included in our research model (H3). As in regression analysis, the predictor (affective trust) and the moderator (familiarity) variables are multiplied to obtain the interaction term. Chin et al. (2003) recommend the standardization of the product indicators. In our study, the coefficient of PACAP × RL → RACAP (0.146) is statistically
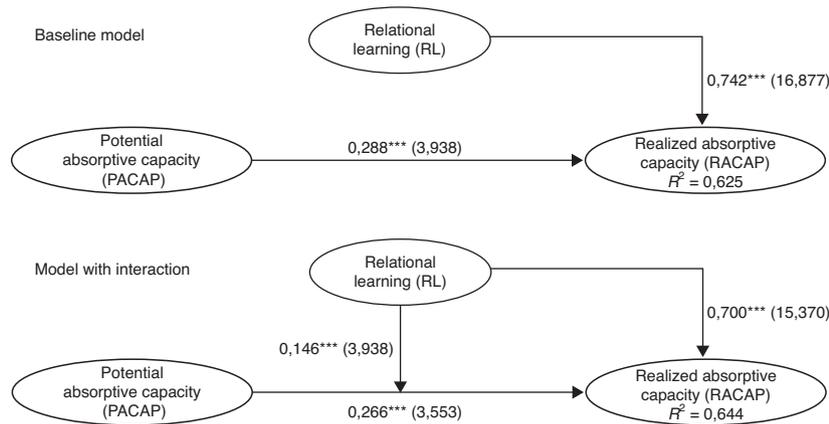

Fig. 2. Research model.

Source: Own elaboration.

Table 5
Structural models.

Hypotheses	Baseline model			Model with interaction			Support
	$R^2_{RACAP} = 0.625$			$R^2_{RACAP} = 0.644, f^2 = 0.053$			
	Path coefficient	Percentile bootstrap 95% confidence interval		Path coefficient	Percentile bootstrap 95% confidence interval		
		Lower	Upper		Lower	Upper	
H1: PACAP → RACAP	0.288*** (3.939)	0.154	0.432	0.266*** (3.553)	0.131	0.420	Yes
H2: RL → RACAP	0.742*** (16.877)	0.645	0.819	0.700*** (15.370)	0.598	0.776	Yes
H3: PACAP × RL → RACAP				0.146* (2.233)	0.026	0.279	Yes

Notes: PACAP: potential absorptive capacity; RACAP: realized absorptive capacity; RL: relational learning.
t values in parentheses.
ns: not significant (based on t(4999), one-tailed test) t(0.05, 4999) = 1.645; t(0.01, 4999) = 2.327; t(0.001, 4999) = 3.092.
* $p < 0.05$.
*** $p < 0.001$.
Source: Own elaboration.

significant (Table 5). The R-square for this interaction model is compared to the R-square for the baseline model, which excludes the interaction term (Chin, 1998). The difference in R-square assesses the overall effect size f^2 for the interaction effect. The effect size f^2 can be calculated as $f^2 = (R^2_{included} - R^2_{excluded})/1 - R^2_{included}$. Values of 0.02, 0.15 and 0.35 indicate that the interaction term has a low, medium, or large effect on the criterion variable. In our case, the interaction term achieves a f^2 value of 0.053. Therefore, hypothesis 3 is supported.

Discussion conclusions and limitations

Building upon the previous literature (Cohen & Levinthal, 1990; Zahra & George, 2002), this paper develops a research model that links both subsets of ACAP (PACAP and RACAP), and RL. The most known and cited model of absorptive capacity in this research field is the one proposed by Zahra and George (2002), in which they theorize that the existing relationship between PACAP and RACAP is moderated by a set of social integration mechanisms. Our model extends this idea by focusing on the moderating effect of RL on the two dimensions of ACAP and identifying potential external contexts and relational capacities that can act as catalysts for these relationships.

Our analysis indicates that PACAP has an important influence on RACAP positively moderated by RL activities including: sharing information on experiences of success and failure related to products/services exchanged with partners, establishing joint project teams to resolve operating problems arising from the relationship with stakeholders, promoting face-to-face meetings to reinforce the personal contact in the relationship with others, etc. Therefore, organizations' managers need to obtain high levels of RL to close the knowledge gap between PACAP and RACAP. In addition, the present study has shown a very intense direct relationship between RL and RACAP. Our findings verify the significance of the role of RL activities when it comes to reinforce the whole process of knowledge creation within organizations. This is, in turn, a critical aspect in order to fostering innovations. Our results support the classical theoretical literature relating to the link between knowledge management, absorptive capacity and innovative ability.

This paper makes some contributions to the management literature. First, this research provides evidence to support the theoretical model on the basis of an empirical test. Even though research in the absorptive capacity area theoretically indicates that RL is a catalyst for the knowledge creation, transformation, and exploitation process (Nonaka et al., 2000; Selnes & Sallis, 2003; Zahra & George, 2002), the literature lacks empirical evidence to support this assertion. Second, the process we followed included an in-depth literature review and an empirical study of a type of knowledge-intensive organizations, in this case firms in the sector of automotive components manufacturing. This method helps to fill the gap in the empirical work in the relational learning and absorptive capacity fields, in which measures of organizational knowledge management and learning are rare, and often rely on crude proxies. Third, the results also shed light on a tangible means for managers to enhance their organization's knowledge outcomes through relational learning activities with others in the supply chain management.

Some apparent practical implications for senior managers can be identified. Firstly, this study provides a theoretical and empirical basis for the successive study of the firms' knowledge absorption mechanisms within the automotive components manufacturing industry. To successfully compete and maintain a significant presence in this sector, characterized as a knowledge-intensive industry, it is important for organizations to implement mechanisms that enable the transition from potential to realized ACAP, allowing them to leverage the newly acquired knowledge, to take advantage of it and to be able to generate new knowledge in combination with the one that already possessed. Secondly, this study provides evidence that demonstrates the importance of RL activities while facilitating this task. Therefore, these knowledge-based companies must actively encourage, foster and engage in activities of information sharing and exchange, the building of joint sense-making or shared vision and knowledge integration.

Finally, we ought to mention that his study presents some limitations that should be considered: firstly, while we provide evidence of causality, causality itself has not been tested. In this sense, Fornell (1982) argued that the causal relationships between variables are always understood or based on the researcher's assumptions, they cannot be proven. Second, this research is based on the respondents' individual insights and perceptions, and in order to obtain or elicit these insights we have employed one single method. Finally, we have carried out this study within a specific geographical context (Spain) and an economic sector (automotive equipments and components manufacturing sector). For these reasons, we must be careful while generalizing these results and conclusions to other scenarios or different contexts.

Appendix.

Questionnaire items

Potential absorptive capacity (PACAP) *(1 = high disagreement and 7 = high agreement) In my company*:

- We have frequent interactions with top management to acquire new knowledge.
- Employees regularly visit other units or project teams.
- We collect information through informal means (e.g., lunches with colleagues, friends, chats with partners).
- Members do not visit other units or project teams (reversed).
- We periodically organize special meetings with clients, suppliers or third parties to acquire new knowledge.
- Members meet regularly with external professionals such as advisers, managers or consultants.
- We are slow to recognize shifts in our market (e.g., competitors, laws, demographic changes, etc.) (reversed).
- New opportunities to serve our clients are quickly understood.
- We quickly analyze and interpret changing client demands.

Realized absorptive capacity (RACAP) *(1 = high disagreement and 7 = high agreement) In my company*:

- We regularly consider the consequences of changing market demands in terms of new ways to provide services.
- Employees record and store newly acquired knowledge for future reference.
- We quickly recognize the usefulness of new external knowledge for existing knowledge.
- Employees hardly share practical experiences (reverse).
- We laboriously grasp the opportunities for our unit from new external knowledge (reverse).
- We periodically meet to discuss the consequences of market trends and new services development.
- It is clearly known how activities within our unit should be performed.
- Clients' complaints fall on deaf ears in our unit (reverse).
- We have a clear division of roles and responsibilities.
- We constantly consider how to better exploit knowledge.
- We have difficulties implementing new services (reverse).
- Employees have a common language regarding our services.

Relational learning (RL): Information sharing *(1 = high dis-agreement and 7 = high agreement) In my company:*

- We exchange information on successful and unsuccessful experiences with products exchanged in the relationship with partners and suppliers.
- We exchange information related to changes in end-user needs, preferences, and behavior.
- We exchange information related to changes in market structure, such as mergers, acquisitions, or partnering.
- We exchange information related to changes in the technology of the focal products.
- We exchange information as soon as any unexpected problems arise.
- We exchange information related to changes in the organizations' strategies and policies.
- We exchange information that is sensitive, such as financial performance and know-how.

Relational learning (RL): Joint sensemaking *(1 = high disagreement and 7 = high agreement) In my company:*

- It is common to establish joint teams to solve operational problems in the relationships with partners, suppliers and customers.
- It is common to establish joint teams to analyze and discuss strategic issues in the relationship with partners, suppliers and customers.
- The atmosphere in the relationship with partners, suppliers and customers stimulates productive discussion that encompasses a variety of opinions.
- We have a lot of face-to-face communication in this relationship.

Relational learning (RL): Knowledge integration *(1 = high dis-agreement and 7 = high agreement) In my company:*

- We frequently adjust our common understanding of end-user needs and behavior.
- We frequently adjust our common understanding of trends in technology related to our business.
- We frequently evaluate and, if needed, adjust our routines in order-delivery processes.
- We frequently evaluate and, if needed, update the formal contracts in our relationship.
- We frequently meet face-to-face to refresh the personal network in this relationship.
- We frequently evaluate and, if needed, update information about the relationship stored in our electronic databases.

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