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# THE IMPACT OF THE ENVIRONMENTAL DIMENSIONS AND THE RELATIONSHIP BETWEEN ABSORPTIVE CAPACITY AND SUSTAINABILITY PRACTICES

# Luccas Santin Padilha<sup>1</sup>, Andrezza Aparecida Saraiva Piekas<sup>1</sup>, Edson Luis Kuzma<sup>1</sup>, Sergio Begnini<sup>1</sup> and Carlos Eduardo Carvalho<sup>2</sup>

<sup>1</sup>Doctoral Student in Administration at the University of the West of Santa Catarina (UNOESC) <sup>2</sup>PhD in Strategy and Competitiveness from the UNOESC

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\*Corresponding author: Lila Teixeira de Araújo

### ABSTRACT

This study measures the extent to which the Absorptive Capacity (AC) exerts influence on the adoption of sustainability practices of the firm, and whether the AC measures the relationship between the dimensions of the environment and sustainability practices. We collect quantitative data from a survey type survey, with a seven point likert scale. The questionnaire was applied electronically, and was structured based on the constructs and variables observed for environmental dimensions, CA and sustainability practices. The data were analyzed by modeling structural equations with the help of Smart PLS2.0 software. The empirical contribution of the research is that CA acts as a mediator in the relationship between munificence and dynamism in relation to the adoption of sustainability practices by the commerce and services sector. It reinforces that CA of the firm favors the adoption of sustainability practices.

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# **INTRODUCTION**

CA can drive organizational behavior change and consequently sustainability practices. However, research points to a gap between the themes, the low number of empirical papers published (Dzhengiz and Niesten, 2019). Sustainable practices permeate not only environmental aspects, but also points related to economic, social and cultural factors, taking into consideration the organizational structure and environmental factors (Maletic et al. 2015). At this point, the CA can be a key factor for the adoption of sustainability practices (Liu et al. 2019). More and more firms have been confronted with changes in the environment, which regardless of the sector in which they operate, detect the influence it exerts on strategic decision-making (Azadegan et al. 2013; Meinhardt et al. 2018). Therefore, the environment should be considered a fundamental component in determining organizational strategies, and consequently in the firm's ability to generate learning through external knowledge, since it is capable of shaping the firm's strategic decisions

(Sorensen and Stuart, 2000). In this article we consider the environment from three dimensions; dynamism, munificence and complexity (Carvalho and Rossetto, 2014). It seeks to investigate to what extent the CA of the firm exerts influence on the adoption of sustainability practices, and if the dimensions of the environment can influence such practices, and finally, to understand what is the influence of the CA as a mediator of the dimensions of the environment and sustainability practices?. In this context, this research aims to measure the extent to which the CA exerts influence on the adoption of the firm's sustainability practices, and whether the CA mediates the relationship between the dimensions of the environment and sustainability practices. The survey population is made up of 1401 companies, from 12 municipalities in the western region of Santa Catarina, that operate in the trade and services sector, and are duly associated with the Commercial and Industrial Association of Chapecó-ACIC (ACIC, 2020). The option for the retail sector is due to the low interest in the subject in firms in this segment (Jones et al. 2011), since the literature considers little explored sustainability practices in small businesses, taking into account generally industrial sectors (Da Conceição et al. 2019).

However, the trade and services sector plays a key role in the development of sustainability practices, being income generators and decision makers that directly impact consumers (Silva et al. 2012). We carried out a quantitative survey, of the survey type, with a likert agreement scale of seven points. The application of the questionnaire was done electronically, and was structured based on the constructs and variables observed according to Carvalho and Rossetto (2014) for environmental dimensions, Carvalho, Rossetto and Piekas (2020) for CA and Maletic et. al (2015) for sustainability practices. For data analysis we use structural equations modeling (SEI) with the help of Smart PLS 2.0 software. The research contributes empirically by pointing out that CA acts as a mediator in the relationship between munificence and dynamism in relation to the adoption of sustainability practices by the trade and services sector. It also reinforces the idea that the capacity of companies to seek, assimilate and implement external knowledge favors the adoption of sustainability practices.

#### Literature review and development of hypotheses

Sustainability practices: Sustainability practices are directly linked to the dimensions of sustainability, being economic, social and environmental. This article addresses the practices of sustainability as practical actions used by companies at the three levels of sustainability, as proposed by Maletic (2015). Faced with this, organizations can obtain competitive advantages through sustainability practices, considering that the development of new products, processes and forms of management that involve the premises of sustainability may increase performance (Ozbekler and Ozturkoglu, 2020). However, a company's decision to adopt sustainability practices may occur due to factors related to changes in regulations, stakeholder requirements, or even changes in the management team (Olawumi and Chan, 2019). However, many of the internal decisions of companies require explicit considerations of influences from the external environment, and their context includes social and political considerations that add to traditional economic considerations. In short, it can be said that companies' involvement with socio-environmental issues can become a business opportunity, contributing to the improvement of stakeholders' quality of life and the sustainability of natural resources (Fatega and Kuhn, 2020).

Absorptive capacity and sustainability practices: The ability of a company to recognize the value of external information, assimilate it and apply it for commercial purposes is called Absortive Capacity - CA (Cohen and Levinthal, 1990). The concept was introduced in the strategy literature in the early 1990s. Since then, CA has been investigated to explain how knowledge sharing can make the firm more competitive (Lenox and King, 2004). After thirty years of research, records of work dedicated to investigating the CA under the most different conditions have allowed researchers to provide promising guidance for future research. Apriliyanti and Alon (2017) developed a literature review aimed at presenting the state of the art of CA research. By mapping existing research through bibliometric analysis, the authors highlight the existence of gaps that may serve as a basis for future research. Thus, there is an indication of the need for more empirical research that can fully explore the construction, especially when associated with emerging issues such as sustainability, since recent research suggests that CA can encourage firms to adopt sustainability practices (Dzhengiz and Niesten, 2019). Therefore, it is considered that

CA encourages the company to learn new processes and new practices, which can lead to the development of skills and the adoption of practices that lead to improved performance in different areas, including sustainability (Aboelmaged and Hashem, 2019). The orientation towards the development of new forms of management and production with a focus on sustainable orientation implies the generation of innovative ideas and the conception of differentiated ways of processing the activities. This leads to the implementation of sustainable operations (He et al. 2019). Learning and change, the basis of this orientation, are based on the argument that by accessing external knowledge, the company tends to implement sustainable operations along the supply chain (Albort-Morant et al. 2018). The accumulation of knowledge and the CA can be a key factor in the adoption of sustainability practices (Liu et al. 2019). However, such practices also depend on the context in which the firm is inserted (Aboelmaged, 2018). In this sense, the level of the firm's capacity to absorb and incorporate elements of the environment in which it operates, through the CA, is indispensable for the efficient adoption of sustainable practices. In the same way, the Commission of Audit can expand or limit the effect of the action in favor of sustainability by being transformed into benefits for the firm (Aboelmaged, 2018). By developing their CA, firms improve their operations and sustainable practices (Riikkinen et al. 2017).

Based on the above, we have formulated the first hypothesis of this study:

# *H1:* The firm's absorptive capacity exerts a positive influence on the adoption of sustainability practices.

The Impact of Environmental Dimensions, CA and Sustainability Practices: Firms are increasingly faced with changes in the environment. Regardless of the sector in which they operate, they detect the influence it exerts on decisionmaking (Azadegan et al. 2013), which means that the environment must be considered a central and supporting element for strategic decisions (Meinhardt et al. 2018). In this study, the environment is defined as a set of elements external to the organization that present some kind of influence on its decisions (Li and Liu, 2014). In this case, it should be considered a fundamental component in the determination of organizational strategies, since they are responsible for making existing products and services obsolete (Sorensen and Stuart, 2000). In order to minimize the threat of obsolescence and meet the new demands of the environment in which they operate, firms need to recognize the knowledge coming from the environment and apply it in the organization (Cohen and Levinthal, 1990). Lane et al. (2006) emphasizes that the absorptive capacity is one of the most important constructs to respond to the dynamics of the environment. Each environment expresses its particularities in terms of access and availability of resources and capabilities, so that the possibilities of implementing sustainability practices are also conditioned by the environment. From this conception, solutions or opportunities for action focused on sustainability are only amenable to treatment from the identification and assimilation of environmental and social information, transformed and exploited by the skills placed at the service of the project proposed by the company.

Thus, it is desirable that the activities of the firm are strategically aligned with environmental conditions (Irani *et al.* 2017). In relation to the dimensions of the environment, even

in the field of strategy, there is no consensus on which dimensions of the environment influence the firm's strategy, and little is known about how this influence actually occurs (Irani et al. 2017). In reviewing a sample of 279 articles investigating the dimensions of the organizational environment, Meinhardt et al. (2018) found that the most recurrent dimensions of the environment are dynamism, munificence and environmental complexity, dimensions initially proposed by Dess and Beard (1984). The proposition to use these three dimensions has been used in empirical works over time, like the works of Harris (2004) and Carvalho et al. (2020). Considering this recurrence, in this study we adopted these three dimensions of the environment in order to investigate what influence they have on the adoption of sustainability practices. Environmental dynamism is associated with the volatility (pace of change) and unpredictability (uncertainty) of the firm's external environment (Miller and Friesen, 1983). Therefore, it can be understood as the changes in the competitive environment that affect the decisions of competitors and customers, and how the firm reacts to such changes (Wang and Ang, 2004). These definitions reflect the size and unpredictability of the changes, whether in consumer preferences or in the technology adopted, which implies different strategic positions adopted by the firms (Li and Liu, 2014).

The influence that environmental dynamism has on the firm's strategic decisions has been the subject of several studies, which generally infer that environments marked by a high degree of dynamism force firms to adopt more sustainable strategies to deal with uncertainty and unpredictability (Li and Liu, 2014). Dynamic environments can suppress the firm's ability to respond to change, but can also be a source of opportunities for firms to strengthen and develop new capabilities, especially those related to knowledge (Meinhardt et al. 2018). Environmental complexity is a multidimensional construct (Cannon and St. John, 2007) understood as one of the dimensions of environmental uncertainty (Khandwalla, 1972). An environment is complex when managers perceive a large number of factors and issues as relevant (Craft, 2018). In this environment, there are a large number of interactive relationships that influence the firm's decision making (Porto et al. 2009). Therefore, the more complex the environment, the longer the firm is able to make strategic decisions (Craft, 2018). The munificence of the environment, on the other hand, does justice to the perspective of dependence on resources, thus being a vital factor for the achievement of organizational objectives and the performance of the firm (Gol and Rasheed, 2004). It is understood that the availability and abundance of external resources can support organizational growth (Andrevski et al. 2014).

In high munificence contexts, the firm is more likely to invest in environmental strategy to gain a sustainable competitive advantage because the abundance of resources favors the adoption of sustainable practices that can ultimately help firms gain economic value from a good reputation with their stakeholders (Dögl and Behnam, 2014). Environmental munificence has been measured in different ways, whether based on managers' perceptions, such as the work of Okeyo (2014) who operated munificence from its impacts on the business environment of small and medium enterprises in Kenya, or those based on secondary data, such as the work of Jung *et al.* (2019) who investigated the influence that environmental munificence has on the strategic value of firms' cash reserves. In this work, we tested 9 hypotheses that enabled us to detect to what extent the CA exerts influence on the adoption of sustainability practices of the firm, in addition to the mediation that the CA exercises between the dimensions of the environment and sustainability practices.

- **H2a:** The munificence of the environment has a positive influence on the CA.
- **H2b:** The complexity of the environment has a positive influence on the AC
- **H2c:** The dynamism of the environment has a positive influence on the AC.
- **H3a:** The munificence of the environment has a positive influence on Sustainability Practices
- **H3b:** Environmental complexity has a positive influence on sustainability practices
- **H3c:** The dynamism of the environment has a positive influence on sustainability practices.
- **H4a:** CA measures the relationship between munificence and sustainability practices
- **H4b:** CA measures the relationship between complexity and sustainability practices
- **H5c:** CA mediates the relationship between dynamics and sustainability practices

We present in Figure 1 the model of this study.



Source: based on Carvalho and Rossetto (2014), Carvalho *et al.* (2020) and Maletic *et al* (2015).

#### Figure 1. Conceptual model

#### **METHODS**

The survey population is made up of 1401 companies, from 12 municipalities in the western region of Santa Catarina, which operate in the trade and services sector, duly associated with ACIC. All these firms received the survey questionnaire in their electronic addresses, which was addressed to their managers. After three attempts to send it, we obtained a response from a sample of 173 respondents. The data was collected between January and March 2020.

To adequately verify the sample number required for the survey, we performed the sample size calculation in the G\* Power Software (Faul *et al.*, 2009), specialized in highly reliable sample calculations. We follow the recommendation of Hair *et al.* (2014) by considering two parameters, the power of the test and the effect size.

 Table 1. Predictive Relevance (Q<sup>2</sup>) and Effect Size (f<sup>2</sup>) of the constructions





Source: Smart PLS 2.0 adapted bootstrapping

Figure 2. Calculated conceptual model



Figure 3. Bootstrapping conceptual model

We consider the use of power as 0.80 and  $f_2$  median = 0.15. From that, the sample needed in this investigation would be 44 participants. The choice of this population is justified because the sector of commerce and services is little explored in the literature, when we talk about sustainability (Jones et al. 2011) much of the studies are restricted to investigate the phenomenon in industrial sectors. Therefore, it becomes relevant to observe the relationship between CA and sustainable practices in the trade and services sector. The research subjects were owners/ executive managers, who had knowledge of the firm's strategies in relation to the sustainable practices adopted. Our questionnaire was of the structured type, with a likert agreement scale of seven points. Its elaboration was based on already validated scales. We measured the dimensions of the environment, based on the scale of Carvalho and Rossetto (2014). CA was measured from the scale of Carvalho et al. (2020), while sustainability practices were measured based on the scale of Maletic et al (2015). After preparation, the questionnaire was reviewed by two experts and transcribed to the google docs program, which allowed sending the survey link directly to the firms' email addresses. In possession of the data, we carried out the evaluation of the measurement model and removed, based on the *t* test and bootstrapping below 1.96, the variables of COM2 complexity, DIN2 and DIN4 dynamism and PRA14

COM2 complexity, DIN2 and DIN4 dynamism and PRA14 sustainability practices. We analyze the data based on structural equations modeling (MEE). For the analysis of the

model of structural equations, the control variables are counted: (1) Type of sector: Trade (50.87%)and Services (49.13%); (2) Size of the company: medium size (11.56%), Small Company (35.84%), Large Companies (9.25%) and Micro Company (ME) (43.25%); (3) Time as manager of the company: Less than 1 year (4,62%), from 1 to 3 years (21,97%), from 3 to 5 years (32,37%), from 5 to 10 years (19,08%) and above 10 years (21,97%); and (4) Type of actuation: Local (27,75%), Regional (24,28%), State (21,39%), National (21,97%) and Global (4,62%). The control variables were evaluated with the dependent variable (sustainability practices) and no relationship was found.

Analysis and discussion of data: We started with the normality test, performed through the kurtosis (>2) and asymmetry (<6) test, where the data of this sample are considered quasi-normal. Thus, the authors Finney and Distefano (2013) consider that this type of data can be used in the analysis of structural equations. The convergent reliability and validity were evaluated through the internal consistency of the constructs using the Cronbach's Alpha and the Composite Reliability (CC) of each construction. The data presented Cronbach's alpha suitable for all constructions: CA with  $\alpha$  = 0.824, environmental dimensions (Municipality with  $\alpha$  = 0.789, Dynamism with  $\alpha = 0.703$  and Complexity with  $\alpha =$ 0.817) and sustainability practices with  $\alpha = 0.943$ , all considered acceptable (Nunnally and Bernstein, 1994). In relation to CC, CA = 0.884, environmental dimensions (Munificence = 0.863, Dynamism = 0.808 and Complexity = (0.872) and sustainability practices = (0.950), therefore, were all acceptable. In order to obtain a high convergent degree of validity it is necessary that the AVE value be 0.50 or greater, and the data obtained represented the following AVE values, CA= 0.560, environmental dimensions (munificence = 0.612, Dynamism = 0.514 and Complexity = 0.634) and sustainability practices = 0.582, that is, all accepted.

The predictive relevance  $(Q^2)$  analyzes the accuracy of the adjusted model and has as evaluation criteria values greater than zero (Hair *et al.*, 2014). We also observe the size of the effect (f<sup>2</sup>) based on the value that is obtained by the inclusion/exclusion of the constructs, where values between 0.02 and 0.15 are considered small; values between 0.15 and 0.35 are average and values above 0.35 are large (Hair *et al.*, 2014). Therefore, the values of predictive relevance (Q<sup>2</sup>) were greater than zero and the size of the effect (f<sup>2</sup>) of each construct, except Complexity, represents mean or great relevance. The values can be verified in Table 2.

Hypothesis testing: Once the evaluation of the quality of adjustment of the model is concluded, we perform the interpretation of the path coefficients, which are interpreted by the betas (b) of simple or ordinary linear regressions, and by the value of T. In Figure 2 we present the capulated model, already in Figure 3 we present the path coefficient of the PLS structural model, which can also be interpreted as beta-b (standardized regression coefficients) of least squares, which are used for a direct comparison between coefficients and their relative powers of explanation of the dependent variable (Hair et al., 2014). The path coefficients indicate how much one construct relates to another. We observed that the constructs presented a positive relation in relation to the value of b. According to Hair *et al.* (2014), values vary from -1.0 to +1.0, and values close to 1 indicate a very strong positive relationship between the constructs. Therefore, values close to

-1.0 indicate a negative or low relation between two constructs. Close to zero indicate weak relationships (Hair et al., 2014). Hypothesis 1, which advocates the existence of a relationship between CA and sustainability practices, was supported. The data corroborates with the theory that quotes that trade and services firms have actions directed to the development of sustainability practices through the absorption of external knowledge. In the firms that make up this study, we realize that intellectual capital has a positive influence on sustainability practices. Collaborating with the result of Gallego-Alvarez et al. (2011) which mentions that there is, in the current context, a tendency to incorporate corporate sustainability practices into business. Hypothesis H2a, which highlights the existence of a positive relationship of the munificence in the CA of the firm was supported. This means that if the environment is harmonious, i.e. there are customers and resources available to all, customers, companies and suppliers, it is more likely that the company seeks external information to expand its knowledge base, this can support organizational growth and generate economic and social gains (D'Aveni et al. 2010).

Hypothesis H2b, which predicted that the complexity of the environment has a positive influence on the AC, was surprisingly rejected. Our data prove that the multiple dimensions of the business environment such as government, third sector institutions, relationships with other companies and clients, do not impact the firm's ability to seek new knowledge. This means that the large number of interactive relationships between firms and their stakeholders does not influence the firm's decision making, or compromise the search for external knowledge, a result already highlighted in the study of Porto et al. The H2c hypothesis was also supported. It highlights the existence of a positive relationship between environmental dynamism and CA. It is suggested that the pace of uncertainty and the amount of changes imposed by the market generate unpredictability, causing the firm to seek external knowledge and adapt it to its context. When the environment is highly dynamic, uncertainty can inhibit an organization's ability to respond to the need for change, making it seek new ways to predict demands, question existing strategic direction and explore new alternatives (González-Benito et al. 2012). The H3a hypothesis also showed a significant relationship between munificence and sustainability practices, hypothesis supported. The result points out that in contexts with low munificence, that is, few available resources, it is more likely that the firm does not invest in environmental strategy, because the lack of resources, whether monetary or not, disfavors the adoption of such practices, ultimately can economically undermine which the sustainability of the organization. Mazza et al. (2014) already mentioned that although the firm needs to simultaneously find economic, social, and environmental balance, often the greatest efforts are even to achieve economic ends. The H3c hypothesis, assumed that the dynamism of the environment has a significant influence on sustainability practices, so firms installed in dynamic environments are more likely to adopt sustainability practices. Our results are in line with the findings of Beske et al. (2014) and point out that the dynamism of the environment reflects the firm's need to employ sustainability practices, whether through top players in the production chain or to meet the needs of the target public.

Our data indicate that the complexity of the environment has no influence on sustainability practices, causing H3b to be rejected. An argument that may help explain this finding has

already been raised by Rondinelli and Vastag (2000) who argue that only the pressures and impositions of stakeholders legitimize the adoption of sustainability practices by the firm. To measure the hypotheses that test the mediation between the constructs, the parameters of the hypothesis test explained by Hair, et. al (2014) were used. The result is related to Variance Accounted For (VAF) which considers that when the values are above 80% the mediation is complete, while when the result is between 20% and 80% the mediation is partial, and below 20% there is no mediation. Our data give partial support to H4a, which presented a VAF of 0.570, which indicates that the CA of the firm in relation to the dynamism of the environment is taken into account (in certain situations), however the dynamism has a stronger positive impact in relation to the absorption of knowledge than in relation to sustainability practices. The partial support also applies to the H4b hypothesis (VAF of 0.401). This hypothesis emphasized the existence of CA mediation between munificence and sustainability practices. This leads us to conclude that the more resources available and the more harmony among stakeholders, the more knowledge can be absorbed. However, the relationship between munificence and sustainability practices is weak. Finally, H4c was rejected as complexity does not generate significant effects in relation to sustainability practices, i.e., there is no need to conduct the test. In view of this, we highlight the need for the firm to improve its CA by reverting it to sustainability practices.

#### Conclusion

The research proposed to measure to what extent the CA exerts influence on the adoption of sustainability practices of the firm, and whether the CA measures the relationship between the dimensions of the environment (Dynamism, Complexity and Munificence) and sustainability practices in firms operating in the trade and services sector. We found that CA has a significant relationship with sustainability practices, a result similar to that found by Irani et al. (2017). However, based on our findings, the complexity did not prove significant for the adoption of sustainability practices. Mediation was partially supported, showing that there is a degree of relationship between CA and munificence and dynamism. However, the direct relationship between CA and sustainability practices is even more significant, as the absorption of knowledge in a more harmonious and unstable environment can strengthen the adoption of sustainability practices. Therefore, the research presented as an assumption that the CA can be a driver of sustainability practices taking into account the dimensions of the environment. Our research makes an empirical contribution by attesting that CA acts as a mediator in the relationship between munificence and dynamism in relation to the adoption of sustainability practices in the sector studied. It also reinforces the idea that the firm's ability to seek, assimilate and implement external knowledge favors the adoption of sustainability practices. Future research may replicate this study, extending it to a longitudinal cut, to test the behavior of variables over time.

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