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DETERMINANTS OF EXPORT INTENSITY AMONG SMALL AND MEDIUM-SIZED FIRMS: AN EMPIRICAL STUDY BASED ON THE HETEROGENEITY OF THEIR RESOURCES

DETERMINANTES DE LA INTENSIDAD EXPORTADORA ENTRE LAS PEQUEÑAS Y
MEDIANAS EMPRESAS: UN ESTUDIO EMPÍRICO BASADO EN LA HETEROGENEIDAD
DE SUS RECURSOS

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Abstract

The purpose of this study is to examine plausible determinants of the firms' export intensity from the perspective of the heterogeneity of its resources. We developed and tested empirically a research model by applying structural equation modeling techniques to a sample of 133 exporting SMEs. The findings suggest that the export intensity exhibited by firms appears to lie in its degree of managerial export commitment along with the intense use of cross-national-border partners. A firm's resource availability to deal with foreign markets impacts export intensity indirectly. Export commitment seems to play a mediating role between a firm's resource availability and the export intensity.

Keywords: Small and Medium-sized Firms, export intensity; resources, structural equation modeling.



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Resumen

El objetivo de este estudio es examinar posibles determinantes de la intensidad exportadora de las empresas desde la perspectiva de la heterogeneidad de sus recursos. Desarrollamos y probamos empíricamente un modelo hipotético de investigación aplicando modelación de ecuaciones estructurales a una muestra de 133 Mipymes exportadoras. Los hallazgos sugieren que la intensidad exportadora de una empresa depende del grado de compromiso exportador de la gerencia junto con el uso intenso de socios internacionales. La disponibilidad de recursos de una empresa para mercados internacionales impacta solo indirectamente a la intensidad exportadora. El compromiso exportador desempeña un rol mediador entre la disponibilidad de recursos y la intensidad exportadora.

Palabras clave: Mipyme; intensidad de exportación; recursos, modelación de ecuaciones estructurales

1. Introduction

The internationalization of small and medium-sized firms (SMEs) is of great interest as a result of the increasing number of SMEs in the international field (Andersson, Gabrielsson, & Ingemar, 2004; Dimitratos & Li, 2014). Internationalization is considered a means of survival and growth for SMEs (Dutot, Bergeron, & Raymond, 2014) and exporting is regarded as the most common and affordable operational way for SMEs to expand their commercial activities into foreign markets (Kuivalainen, et al., 2012; Leonidou *et al.*, 2010).

The scope of export operations and the levels of export intensity achieved by SMEs appear to be determined by the availability of resources to deal with international markets (e.g., Dhanaraj & Beamish, 2003). However, SMEs are typically resource-constrained, an aspect that characterizes them and may reduce their capacity to export (Achtenhagen, 2011; Suárez-Ortega & Álamo-Vera, 2005). Besides, exporting is considered as a challenging (Calabrò, Mussolino, & Huse, 2009) and risky activity for this type of firms (Basly, 2015).

Scholars have devoted efforts to determine why some SMEs involved in foreign market operations achieve higher levels of export intensity than others. A plethora of prior research has addressed this issue (e.g., Darshana, 2015; Leonidou, Katsikeas & Samiee, 2002; Morgan, Kaleka, & Katsikeas, 2004; O' Cass & Weerawardena, 2009). Despite having been extensively researched, no general agreement exists with respect to the determinants of the export intensity achieved by a firm (Stoian, Rialp, & Rialp, 2011; Wheeler, Ibeh, & Domitratos, 2008). Export intensity is one of the most disputed research topics (e.g., Leonidou, Katsikeas, & Coudounaris, 2010).

The Resource-Based View (RBV), originating from the seminal works of Barney (2001) and Wernerfelt (1984), constitutes a general, but helpful, theoretical framework to explain variations in the performance accomplished by a firm, viewed from the perspective of the heterogeneity of the firm's resources.

The aim of this study is to shed light on the effects of a SME's tangible and intangible resources on its export intensity. We seek to contribute to the existing literature on

SME internationalization and exports with the following research questions: (1) To what extent does the level of a SME's tangible resource availability impact its export intensity? (2) To what extent does the export commitment, that is, managerial and organizational resources, impact the export intensity achieved by the SMEs? (3) To what extent do external resources, specifically the use of foreign partners, influence the export intensity achieved by the SMEs? To answer these questions, we conducted developed firm-level empirical research and tested a model underpinned by the basic tenets of the Resource-Based View and insights from extant literature on SME internationalization and export ventures. The model was tested empirically with data from 133 Costa Rican exporting SMEs using structural equation modeling techniques. By examining Costa Rican SMEs, we want to provide findings drawn from a nation with vibrant participation of its SMEs in international markets. Costa Rican exporting SMEs incorporate more new products each year and add more destinations to their export basket compared to other Latin American exporting SMEs (Cepal, 2018). The rest of this paper is organized as follows: First, we present the conceptual framework and describe the research model and hypotheses. Second, we describe the research methodology employed. Third, we present the analysis results. Finally, we focus on our findings and address contributions and limitations of this inquiry.

2. Conceptual framework and hypotheses

2.1 Conceptual framework

In accordance with RBV fundamental tenets, a firm's superior performance results essentially from the availability and exploitation of distinctive and special resources possessed or acquired by the firm (Dhanaraj & Beamish, 2003). Firms are viewed as a bundle of heterogeneous tangible (i.e., capital, assets) and intangible resources (i.e., organizational capabilities, information, and knowledge, among others), that may generate a sustained competitive advantage and support the implementation of strategies to improve the firm's performance (Barney, 2001).

However, within the RBV perspective, not all the resources of a firm are considered strategic, and not all of them can engender sustained competitive advantages. Only resources that fulfill the requirement of being valued, scarce, imperfectly imitable, and non-substitutable might generate sustained competitive advantages (Barney, 2001; Rodríguez, & Rodríguez, 2005). On the other hand, resources are considered to be strategic as long as they increase the efficiency and effectiveness of the firm and provide superior performance to the firm (Barney & Arikan, 2005).

According to RBV, resources controlled by a firm comprise a wide range of tangible and intangible assets (Barney *et al.*, 2015). Resources that are "typically more tangible include but are not limited to a firm's financial capital (e.g., equity capital, debt capital, retained earnings, leverage potential) and physical capital (e.g., the machines and buildings it owns)" (Barney & Arikan 2014, p 139). Intangible resources are considered relevant antecedents and essential for the development of the organizational capabilities of a firm (Schriber & Löwstedt, 2015). Regarding international venture and its relationship to resources, it was seen that the initiation and sustainability of exporting ventures involve the utilization and mobilization of substantial amounts of tangible resources (Junaidu *et al.*, 2012).

Nevertheless, this implies a challenge for SMEs. These firms can be presumed to suffer from liability of smallness, meaning that, compared to larger firms, they are often not well endowed with tangible assets (Gassmann & Keupp, 2007). The lack of tangible assets may constraint a SME's capacity to expand its commercial activities

abroad (Knight, Moen, & Madsen, 2020; Kraja, 2018).

Intangible resources, by their very nature, are regarded as the type of resources that might easily fulfill the requirements for resources that generate sustainable competitive advantage (Rodríguez & Rodríguez, 2005).

Among intangible resources, intellectual capital stands out and has been recognized as a fundamental enabler for creating sustainable advantages for firms (Li, Pike & Haniffa, 2008, González-Loureiro & Dorrego, 2012). The intellectual capital alludes to a bundle of intangible and knowledge assets that allow firms to create and maintain competitive advantages (Martín-de-Castro, *et al.*, 2006).

According to González-Loureiro & Dorrego (2012), it can be said that there is consensus that intellectual capital is basically made up of three main elements: human capital, structural capital, and relational capital. Human capital can be defined as a set of values, attitudes, qualifications, and skills of people that generate value for companies. Organizational (or structural) capital refers to the value created within the organization and its capability to acquire new competencies and knowledge with the purpose of responding to changes. Relational capital is the result of the value generated by companies in their relationships with their suppliers, clients, competitors, shareholders, stakeholders, and society (Gonzalez-Loureiro & Dorrego, 2012).

Among these three subcategories of intellectual capital, organizational capital is of special interest in SME internationalization research. Organizational capital involves the firm's culture as well as in-firm processes, including planning and organizational processes (Javalgi & Todd, 2011), coordinating systems, and reporting structures (Barney *et al.*, 2015).

Firms might also compensate for a relative lack of resources or leverage additional resources through their social capital (Chetty & Stangl, 2010). In general, social capital refers to a firm's external contacts or business partners which can provide extra resources or knowledge. They are also considered external intangible resources, and difficult to replicate (Peng, 2001).

The underlying rationale of RBV is that firm resources, organizational capacities, and social capital do not operate in isolation. They are intertwined. The competitive advantages developed by a firm are often based on bundles of interrelated resources (Barney & Arian, 2005).

Based on these theoretical tenets, a hypothesized research model was developed, as depicted in figure 1. We will argue that export intensity achieved by a SME is the result of the interaction of three major components, namely: availability of tangible resources to cope with foreign markets, the degree of export commitment exhibited by a SME, and the use of foreign partners (i.e., other firms or entities located abroad with which the SME cooperates).

Keupp and Gassmann (2009) have noticed that research on SME internationalization has been "phenomenon-driven," that is, striving to find direct causal connections between factors and international achievements (e.g., export intensity, degree of internationalization, etc.). Little attention has been paid to research models that examine the possible interrelationships and indirect effects between factors that foster a firm's international results. We test plausible direct and indirect links between tangible and intangible resources to explain the variations of the export intensity exhibited by SMEs, underpinned in RBV theoretical tenets. Following Martineau & Pastoriza (2016), in the model we start from the assumption that a SME's resource availability for foreign markets enables them to get involved in international activities and go after international opportunities.

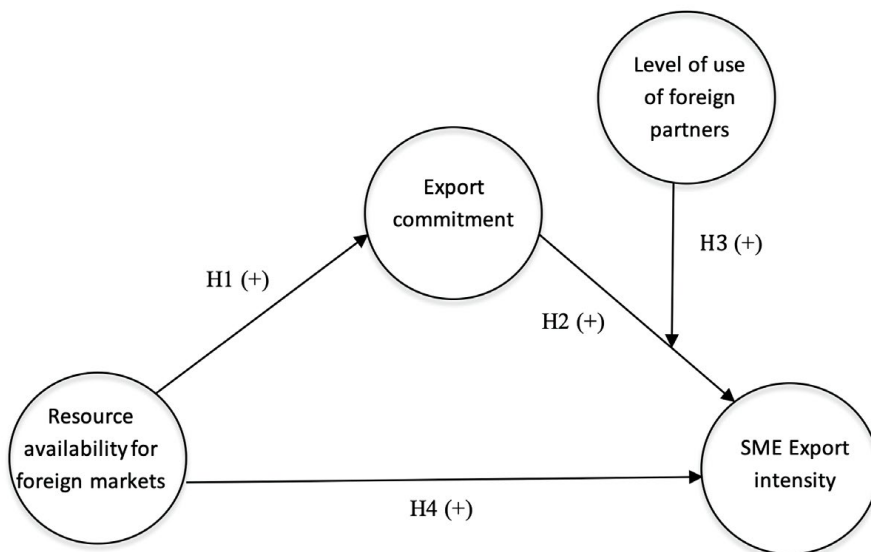
Export commitment and the use of foreign partners are intangible resources. They represent a firm's organizational capital and a firm's social capital in the model, respectively.

According to Navarro *et al.*, (2010) export commitment is an organizational factor that assesses how firms make efforts to improve exports and take advantage of exporting. In addition, it is recognized as "an organizing mechanism that allows companies to exploit the full potential of the resource-based strategy" (p.43). Recent research has embraced export commitment as a variable that distinctively represents the organizational capabilities of the firm, which has been empirically shown to be a determinant for exporting and a key factor for export performance, (e.g., Safari & Saleh, 2020). Export commitment is defined as "a favorable disposition and accompanying manifested behaviors that facilitate the development or maintenance of export as an ongoing course of action" (Faroque, & Takahashi, 2015, p 425). It is manifested in the amount of planning, organizational, and managerial resources dedicated to exports and the extent to which a firm's management is devoted to making the considerable efforts necessary to organize and support the export operations (Chugan & Singh, 2015; Lages & Montgomery, 2004). In the model we surmise that export commitment is an intervening variable between a SME's resource availability and export intensity.

Export venturing literature suggests that cooperative partnerships represent a firm's social capital that is relevant for international operations (Roxas & Chadee, 2011). In our model, the use of foreign partners is considered a moderating factor. Finally, export intensity is influenced directly and indirectly by the aforementioned factors.

For International Entrepreneurship scholars, the evaluation of export performance is of research interest, but it is one of the most disagreed topics among scholars. In fact, there is no single conceptualization and measurement to assess export performance (for a broad and diverse assessment of this construct, cf. Sousa, 2004 and Katsikeas *et al.*, 2000). The assessment of the export performance is not accepted uniformly in research on exporting SMEs. Some researchers measure it as a single indicator, for instance, export intensity (e.g., Javalgi & Todd, 2011; Majocchi *et al.*, 2005). Others measure it as a combination of two or three more dimensions of export operations such as the intensity percentage of export sales, the speed of start of export activity, and the geographical scope of export sales (e.g., Ciravegna *et al.*, 2014), and still others use subjective or perceptual measures on the export activity displayed by a firm (e.g., Madsen & Moen, 2018; Mostafa *et al.*, 2005). Notwithstanding, the ratio between international sales and total sales, (export intensity) is the most frequent measure utilized in research to capture export performance (cf. Sousa 2004, Katsikeas *et al.*, 2000) and is widely used in empirical research to assess the level of export performance achieved by SMEs Javalgi & Todd, 2011; Majocchi *et al.*, 2005; Suárez-Ortega *et al.*, 2005; Xu, Taute, Dishman, & Guo, 2015). The following sections deepen the explanations about the interconnections depicted in the model and underpinned by the extant literature.

Figure 1. Conceptual model.



Note: Author's own

2.2 Hypothesis development

2.2.1. Resource availability and export commitment

Export commitment appears to depend on the availability of resources to support export expansion (Navarro *et al.*, 2010). For instance, firms with more available resources are in a better position to commit resources to support current tasks to boost export undertakings like adapting products and services to foreign customers, contracting international suppliers, moving goods and services across long distances, searching for foreign market opportunities, among others (Naldi, 2008). Further resources are needed to support investments, adjust procedures or customize products to requirements abroad (Verwaal & Donkers, 2002, Barney *et al.*, 2015).

Having more sources available facilitates a firm's commitment to boost international ventures (Hessels & Terjesen, 2010) and fosters a firm's involvement in exports (Al-Rashidi, 2012). Conversely, smaller firms tend to possess less available resources (Naldi, 2008) to cope with export operations. The shortages of resources can limit its capacity to achieve high levels of commitment in overseas markets (Francioni, Pagano & Castellani, 2016).

According to Naldi (2008), international and domestic commercial business operations compete with each other for the limited resources available to SMEs. Having more resources enables firms to adequately commit to daunting projects like entering a new international market. Consequently, we argue that:

Hypothesis 1. Resource availability for foreign markets is positively associated with a firm's export commitment.

2.2.2 *Export commitment and export intensity*

According to some scholars, firm performance is not only a function of resource availability, but also of a firm's managerial competence (Chandler & Hanks, 1994). Firm resources need to be appropriately organized, and several tasks must be planned and coordinated to exploit the bundle of productive resources controlled by a firm (Barney & Arikan 2005). Rodríguez and Rodríguez (2005) hold that the ability to penetrate international markets requires an important degree of competitiveness, which fundamentally resides in intangible resources controlled by the firm. Satisfactory results can be achieved in export markets once specific managerial and organizational structures, as well as specific capacities, are developed (Majocchi *et al.*, 2005).

Theoretically, export commitment captures a firm's readiness to implement actions to achieve advantages in export markets, and the efforts taken to facilitate the development of export operations (Navarro *et al.*, 2010). Firms with a higher level of export commitment often exhibit a more aggressive posture to go after export opportunities (Chugan & Singh, 2015) and dedicate more time to prepare the entry into foreign markets effectively (Navarro *et al.*, 2010). A high level of export commitment enables a firm to focus on international markets with less distractions and difficulties (Navarro *et al.*, 2010). Empirically, Lages Jap & Griffith (2008) found that high levels of export commitment in Portuguese SMEs positively influence international sales. Likewise, studies conducted on Spanish firms found that the level of commitment exhibited by the firm influences their export success (Stoian *et al.*, 2011). Consequently, we posit:

Hypothesis 2. A firm's export commitment is positively related to its export intensity.

2.2.3. *The role of foreign partners*

Foreign business partners are viewed as valued assets that can supply useful resources to support a firm's international exporting efforts. For instance, foreign partners may provide access to privileged market information (Solberg & Durrieu, 2006) and facilitate the recognition of new business opportunities abroad (Musteen *et al.*, 2014). Despite this, a substantial number of SMEs do not make use of foreign partners for several reasons. For instance, building foreign partner relationships could be difficult due to the cultural differences (Ojala, 2015). SME managers are usually reluctant to lose control of the firm's operations (Basly, 2015). Although maintaining control can lower a firm's export intensity (Cerrato & Piva, 2010), some SMEs prefer to keep more control over export operations (e.g., by seeking local vehicles to foster exports such as promotion agencies or subsidies). Moreover, the use of foreign partners and the intensity of the use vary from firm to firm. It is a deliberate strategic choice (Hessels & Parker, 2013), and not a precondition for firm internationalization (Kalinic & Forza, 2012).

Notwithstanding the above, cooperative relationships with foreign partners enable the transfer of trustworthiness and credibility to firms just entering international markets, since firms with diverse cooperative relationships in the targeted markets are considered more reliable than firms without them (Arenius, 2002). Besides, SMEs that cooperate with foreign partners display better levels of export intensity than those exhibiting lower use of foreign partners (Martineau & Pastoriza, 2016). Studies conducted on SMEs involved in exporting operations have shown that maintaining partners abroad boosts the level of export performance (Musteen *et al.*, 2010) and

assists SMEs to overcome resource shortcomings (Dominguez, 2018). Cooperative relationships with foreign partners can speed up the entry into international markets (Casillas & Acedo, 2013) and mitigate the “liability of foreignness” typically suffered by SMEs (Zhou et al., 2010). Based on these arguments, we formulate that:

Hypothesis 3. Foreign partners positively moderate the relationship between a firm’s export commitment and export intensity; so that the effect between export commitment and export intensity is stronger for those firms that make more extensive use of foreign partners.

2.2.4 The mediating role of export commitment

The impact of resources in export performance is not without some dispute. While some research suggests a positive influence (e.g., Dhanaraj & Beamish, 2003; Preece & Baetz, 1999), other studies have not found any relationship. (e.g., Pla-Barber & Alegre, 2007; Westhead *et al.*, 2001). However, according to Roxas & Chadee (2011), having resources for export operations is not sufficient for superior export performance. Firms need to develop capabilities and be strategically organized to exploit their resources to gain sustainable competitive advantage in foreign markets. It was shown that firms with high levels of export commitment are more prone to work harder on demanding tasks to export and implement more tailored marketing strategies such as product adaptation for export markets (Lages, Abrantes & Lages, 2008). High levels of export commitment ensure careful allocation of resources to achieve positional advantages in export markets (Navarro et al., 2010), enhance the likelihood of success in such markets (Navarro et al., 2010), and increase the employees’ feelings of duty in favor of exports (Lages & Montgomery, 2004).

Building on these arguments, we contend that export performance depends, to a great extent, on export commitment, which is manifested in the organization and implementation of strategies to exploit business opportunities abroad. Likewise, we assume that focusing and orchestrating efficiently a firm’s efforts, capacities, and resources in favor of the export operations is of a greater relevance in the case of SMEs, which must make the most of its own, often limited, resources. That leads us to the hypothesis:

Hypothesis 4. Export commitment mediates the relationship between a firm’s resource availability for foreign markets and the export intensity achieved by the firm.

3. Methods and measures

3.1 Data collection and sample

SME is a firm with no more than 250 employees and annual sales not exceeding 50 million dollars or the equivalent (e.g., Acedo & Florin, 2007; Brouthers *et al.*, 2015; Dutot, *et al.*, 2014). Exporting is challenging for SMEs and not all of them are interested in export activity (Calabrò, *et al.*, 2009). Due to the focus of our investigation, we established two restrictions for the selection of firms. We selected exporting SMEs, that is SMEs that export and are pursuing export sales, regardless of the level of export intensity they might exhibit, and second, SMEs with at least five years in export operations. SMEs listed in the Costa Rican Industrial Chamber of Commerce and the Chamber of Technology and Communication were used as sample frames. These

are the most acknowledged chambers in the country whose majority of affiliates are exporting SMEs. This allows us to access a variety of exporting SMEs from different industry branches. With the assistance of the chambers' representatives, a total of 557 exporting SMEs were identified and invited to voluntarily participate in our study. A web-based survey was designed and sent to the top manager of each SME, who is considered the person who typically makes the decisions about expanding sales abroad and the scope of such expansion (Achtenhagen, 2011). Prior to releasing the web-survey, it was pretested to avoid semantic confusions. We also ensured confidentiality of the responses by allowing participants to complete the questionnaire anonymously, in order to reduce possible response bias (Chung & Monroe, 2003). In addition, we assessed non-response bias by means of time trends extrapolation (Armstrong & Overton, 1977). No significant differences were found between earliest and latest responding participants groups. Consequently, non-response bias does not seem to influence the results. A total of 210 questionnaires were returned out of 557. Out of these, 77 questionnaires were discarded due to many unanswered questions. In the end, we yielded a total of 133 exploitable questionnaires, for a 23.9% effective response rate.

Industry branches represented in the sample: Software development (37.6%), IT and communications (27.8%), Packing and plastic (15.8%), Food and beverages (9.8%), Metal-Mechanic (3.7%), Chemical (3.0%) and Legal Services (2.3%). The ratio of international sales to total sales varies from 8% to 100%. The data collection was carried out in 2017-2018 in pre-Covid times.

3.2 Variables and measures

We used multi-item research instruments from prior research to assess the key variables of interest. The firm's level of export commitment was measured with the four-item scale suggested by Lages and Montgomery (2004). Cronbach's $\alpha = .91$.

Resource availability for foreign markets was assessed using the four-item scale created and validated by Preece, Miles, and Baetz (1999). This construct reflects specifically the firm's resource availability to cope with internationalization processes. It is a more suitable measure because domestic and international operations compete with each other for a SME's limited resources (Naldi, 2008). After the depuration process, a single item was dropped. Cronbach's $\alpha = 0.73$. The use of foreign partners was assessed using a three-item scale suggested by Peng and Luo (2000) and adapted by Zhou, Barnes, and Lu (2010). Cronbach's $\alpha = 0.84$. All Cronbach's α scores suggest reliability and internal consistency of the constructs. We opted for this measure because it focuses on how international the social capital of the firm is, referring to the extent to which firms have developed new networks in foreign markets, and have established cooperative relationships with foreign business and cooperative relationships with foreign clients. Export intensity was operationalized as the ratio of export sales to total sales. (e.g., Xu *et al.*, 2015; Majocchi *et al.*, 2005; Suárez-Ortega *et al.*, 2005).

We control for the key variables that, according to previous research, may influence the intensity of exports: industry sector (e.g., Chetty & Stangl, 2010), governmental subsidization to export, firm size, and firm experience in serving foreign markets (e.g., Nakos, Brouthers, & Brouthers, 1998) operationalized as the total number of employees and the total number of years in exports, respectively. Product uniqueness, i.e., the degree to which export products are perceived as unique (Cooper, 1979; Leonidou *et al.*, 2002).

4. Analysis and results

To test our model, we used structural equation modeling methods (PLS-SEM) because it enabled us to estimate simultaneously the strength of all hypothesized relationships depicted in the model, thus making the relative significance of every relationship evident (Hair, Black, Babin,, & Anderson, 2010). The analysis under PLS-SEM using SmartPLS3 software is a two-stage procedure that involves the evaluation of the measurement model and the evaluation of the structural model (Hair *et al.*, 2017).

4.1 Evaluation of the measurement model

Evaluating the measurement model implies examining the construct reliability, convergent validity, discriminant validity for the constructs. We assessed the composite reliability (C.R) to verify for multi-item consistency. According to Nunnally (1978), values of C.R. higher than 0.7 show evidence of multi-item consistency. The C.R. values for all variables yielded between .84 and .94, exceeding the threshold value suggested by Nunnally (1978), suggesting a satisfactory level of construct reliability.

Convergent validity refers to the degree to which the items of a specific construct correlate (Byrne, 2016; Hair *et al.*, 2010). It is demonstrated when item loadings are significant on the respective a priori defined variable (Hair *et al.*, 2010). Results showed that all item loadings were statistically significant at $p < .001$ within the corresponding constructs. Furthermore, following the suggestions of Fornell and Larcker (1981) and Hair and Colleagues (2010), we assessed the average variance extracted (AVE) to check whether the standardized estimates of the items are higher than the suggested threshold, ($AVE > .50$). The AVE values of all constructs yielded from .65 to .79, denoting convergent validity.

We also checked for discriminant validity, meaning the degree to which a construct can be distinguished from other constructs. We examined HTMT ratios (Heterotrait-Monotrait Ratios) as facilitated in PLS-SEM. According to Hair and colleagues (2017), HTMT ratios lower than .90 are indicative of discriminant validity between the constructs. Results showed that HTMT values did not exceed the threshold of .90, evidencing discriminant validity between all constructs.

Lastly, we obtained the variance inflation factors (VIF) to check for collinearity. VIF values higher than 5 indicate a critical level of collinearity and may represent potential threat for the study results (Hair, Ringle, & Sarstedt, 2011). Our VIF values yielded between 1.31 and 2.94, which is evidence that the collinearity should not influence our model's results.

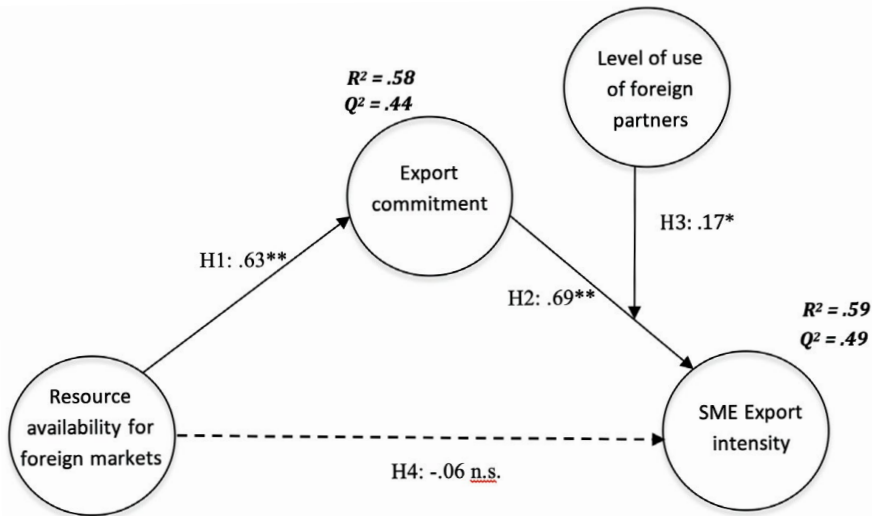
4.2 Evaluation of the structural model

The evaluation of the structural model seeks to answer the question of how well the model predicts our endogenous variables. This implies testing the model's predictive power relevance (Hair *et al.*, 2017). Following recommendations of Hair and colleagues (2017), we evaluated the predictive power of our model by running bootstrap procedures with a total of 5,000 re-samples and assessing the coefficient of determination (R^2 value). This coefficient represents the amount of variance in the dependent variable that is accounted for by the independent variables associated with it. The assessments of the R^2 values indicate that our research model explains 59% of the variance of the export intensity and 58% of the variance of export commitment, denoting a moderate predictive accuracy. Thus, results suggested that the model has

predictive power with respect to dependent variables in question (Hair et al., 2017).

Regarding the evaluation of the predictive relevance of our model, we are interested in testing how well the empirical data can be reconstructed with the help of the model and parameter estimates (Akter, D'Ambra, & Ray, 2011). To accomplish that, we assessed the Stone-Geisser's value (Q^2 value). Following Hair and colleagues (2017), we ran a blindfolding analysis with an omission distance factor of 10 to assess the corresponding Q^2 values of our dependent variables. Q^2 values greater than 0 denote predictive relevance (Hair et al., 2017). The Q^2 value for export intensity yielded .49 while for commitment to exporting was .44. Both results scored above 0, providing support for the model's predictive relevance regarding the dependent variables. Figure 2 shows the results of the predictive power and predicted relevance of our model.

Figure 2. Test results of the model's predictive power and relevance



Note: ** $p < 0.001$, * $p < 0.01$, n.s: non-significant

4.3 Hypothesis test results

The direct association between a firm's resource availability for foreign markets and export commitment is significant and positive ($\beta = .63$, $p < .001$), supporting hypothesis H1. As for the relationship between export commitment and export intensity, it is significant and positive ($\beta = .69$, $p < .001$), supporting hypothesis H2. None of the control variables were significantly related to export intensity or export commitment.

We checked for a moderating effect by running bootstrap procedures with 5,000 resamples and using a two-stage approach. This approach is preferred when using PLS-SEM because it provides a high level of statistical power when the aim is to reveal whether a moderation effect exists (Hair et al., 2017). This effect was significant and in the suggested direction ($\beta = .173$, $p < 0.01$) indicating that the effect between export commitment and export intensity is stronger for those firms that make more extensive use of foreign partners. Thus, hypothesis H3 was supported. We also

computed the effect size f^2 for the moderating effect to determine how much of this interaction effect contributes to explaining the variance in export intensity. The f^2 for the moderation effect was .051. f^2 values of .02, .15, and .35 are the thresholds for small, medium, and large effect sizes, respectively (Cohen, 1988). Consequently, our results reveal a medium contribution of foreign partners in explaining variations in the export intensity. Table 1 summarizes the results obtained.

Table 1. Standardized β -estimates and p-values applying bootstrap with 5,000 re-samples.

Hypothesized relationships	β -estimates	p-values	results
Resource availability → Export commitment	.635	**	H1: supported
Export commitment → Export intensity	.689	**	H2 supported
Resource availability → Export intensity	-.059	.508	n.s.
Export commitment → Export intensity	.173	.008	H3: supported
Control variables:			
Branch → Export intensity	.066	.382	n.s.
Product uniqueness → Export commitment	.090	.170	n.s.
Branch → Export commitment	-.054	.494	n.s.
Firm's age in exports → Export commitment	.129	.079	n.s.
Firm size → Export commitment	-.017	.798	n.s.
Product uniqueness → Export intensity	-.072	.416	n.s.
Governmental support → Export intensity	.022	.825	n.s.
Governmental support → Export commitment	.113	.083	n.s.
Firm's age in exports → Export intensity	.019	.785	n.s.
Firm size → Export commitment	.015	.827	n.s.

Note: **= significant at $p < 0.001$, n.s.= non-significant, after testing the model and mediating effect

4.4 Robustness checks

We also tested the stability of all coefficients by obtaining the bootstrap confidence intervals using bias corrected accelerated approach (BCa). This approach is considered the most salient method (Hair et al., 2017). The BCa intervals of confidence are detailed in table 2. None of the intervals belonging to the supported hypotheses included a zero value, suggesting stability of the parameters.

Table 2.Robustness checks: Standardized estimates and intervals of confidence.
 (Bias-corrected accelerated approach with 5,000 re-samples).

Hypothesized relationships		H	Lower	Upper	Estimate
Resource availability commitment	→ Export	H1 *	.493	.765	.635
Export commitment intensity	→ Export	H2 *	.499	.874	.689
Resource availability intensity	→ Export	n.s.	-.230	.116	-.059
Export commitment x foreign intensity partners	→ Export	H3 *	.035	.294	.173

Notes: H=hypothesis; *=supported; n.s.=non-significant

4.5 Testing for mediating effect

Testing the hypothesis H4 required checking first if the following conditions were met: 1) There must be a significant relationship between the predictor and the outcome variable. 2) The predictor must be related to the presumed mediating variable. 3) The presumed mediating variable must be related with the outcome variable. (Hair, 2017). Then, we ran a bootstrap procedure with 5,000 re-samples to check the significance of the direct effect (i.e., coefficients of the direct path) and the total indirect effect (i.e., path coefficients of the indirect paths). After that, we also tested the stability of the path coefficients by computing the BCa intervals of confidence as recommended by Hair and colleagues (2017). A mediating effect occurs when a change in the strength of the relationship between the predictor and outcome variable (direct path) is markedly reduced by including the presumed mediating variable (Field, 2013). The direct effect, as shown in table 3, ($\beta=.0266$, lower and upper intervals confidence being low= 0.071 and upper=0.455 respectively) originally indicated a positive influence of a firm's resource availability for foreign markets on a firm's export intensity. However, this direct effect is reduced to non-significance when the export commitment variable is considered in the model ($\beta =-.059$, low= -0.241, upper= 0.121) This result supports the hypothesis H4 and provides evidence of a full-mediation effect.

Table 3. Assessment significance of direct and indirect effects

	Paths	Estimates	t-value	lower 4	upper 4
Direct effect ¹	RA-EI	0.266	2.72	0.071	0.455
Total indirect effect ²	RA-EC-EI	0.437	5.34	0.293	0.615
Direct effect ³	RA-EI	-0.059	0.640	-0.241	0.121

Notes: RA: Resource availability, EC: Export commitment, EI: Export intensity,
¹Assessments after controlling the indirect effect in the model, ² It is the product of path coefficients of RA-EC and EC-EI, ³ Assessments when the indirect effect is included, 4BCa intervals of confidence.

5. Discussion and conclusions

The aim of the study was to examine the impact of a firm's resources on export intensity. We proposed a research model grounded in the perspective of the heterogeneity of the resources controlled by SMEs. Four main contributions emerge from the study: It provides a different perspective to the debate regarding export intensity determinants achieved by a SME, suggesting that a SME's export commitment accounts for the relationship between a SME's resource availability and export intensity. Higher levels of export intensity could be attributed to superior committed management to the export activity. This result outlines the more prominent role of the SME's intangible resources as the factor that explains export intensity. The finding supports the assertions of Navarro and colleagues (2010) who consider export commitment as the crucial element of an effective resource-led strategy to cope with foreign markets.

According to Nummela (2004), few studies analyze the effects of foreign partners on international results obtained by SMEs. These studies do not offer much empirical support and are mostly of an exploratory nature with quite diffuse findings. We contribute also to the export venturing literature by providing empirical evidence that intense use of foreign partners complements firms' efforts in pursuing exports and enhances export intensity. This result provides empirical support to the assumptions of Oviatt and McDougall (2005), who theorized that the strength and size of the firm's relationships abroad might moderate the effective and rapid exploitation of export opportunities (Oviatt & McDougall, 2005).

Besides, our study demonstrates that RBV is a helpful theoretical framework in understanding export intensity. In line with its main theoretical foundations, a firm's intangible resources are more likely to be the source of sustainable competitive advantage and the reason for better performance. In this vein, our study provides evidence suggesting that intangible resources (export commitment and foreign partners) may constitute drivers of superior export performance.

Finally, our hypothesized model highlights that the resources available to a SME do not operate in isolation, rather they are entwined. We contribute to the research on exporting SMEs by providing a more holistic approach by examining determinants of export intensity. This supports assertions of Kaleka (2002), who holds that firms consist of an assortment of assets and resources, but it is the synergistic effects generated by their combinations of tangible and intangible resources that matter most.

In addition, the study provides some implications for SME managers. According to studies of OECD (2009), most of the SMEs consider the lack of firm resources, especially financial, and the lack of international contacts as the main obstacles to internationalize (for an overview of major barriers to SME internationalization cf. OECD, 2009). Our findings conflict with the apparent prevailing conventional understanding in SMEs that overemphasizes a lack of resources as a main barrier for SMEs internationalization, while managerial aspirations and poor commitment to exports are overlooked and go relatively unnoticed. For those firms intending to initiate or expand international sales, our findings suggest that they should increase their commitment to export activity, in terms of establishing structures to effectively support the exploitation of international market opportunities, dedicating managerial time and greater focus on exports. In addition, based on our empirical evidence it seems advisable for SMEs to invest efforts in establishing closer cooperative relationships

with partners across-national-borders.

6. Limitations and directions for future research

It should be noted that this study is context-specific, and we cannot rule out that our findings could represent singular characteristics of the SMEs sampled and the country in question. Another limitation refers to the use of self-report data. Even though self-reports are often used in research and have proven to be reliable (e.g., Soininen, 2013), we recognize that self-report data entails the potential risk of having common methods bias (cf. Podsakoff et al., 2003). As previously mentioned in the methods section, we took comprehensive measures to reduce these possible effects. However, it is important to take notice of this limitation in the study. Lastly, our model fails to capture the finer aspects regarding the strategy applied to cope with exports by SMEs. Firms devoting the same quality and quantity of efforts and resources may still undertake quite different competitive strategies. Future research could address what export strategies are deployed by SMEs to boost the export intensity. We acknowledge that there are additional frameworks that might be useful to explain export intensity and SME internationalization (e.g., Albertoni & Horta, 2021). We addressed only a part of the explanation about what may lead to the variations of export performance of the SMEs. Future investigations could take notice of the insights obtained from this study to elaborate more comprehensive research models that aim to explain SMEs exporting intensity.

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COMERCIO ELECTRÓNICO EN TIEMPOS DE PANDEMIA: REEXAMINANDO EL ROL DE LOS ANTECEDENTES CLAVES DE LA INTENCIÓN DE COMPRA

E-COMMERCE IN TIMES OF PANDEMIC:
RE-EXAMINING THE ROLE OF KEY ANTECEDENTS OF PURCHASE INTENTION

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Resumen

La presente investigación tiene por objetivo probar un modelo de formación de intención de compra en el comercio electrónico en periodo de pandemia, con el fin de establecer las similitudes y diferencias que se podrían desarrollar en la relación de estas variables en un contexto de normalidad. Para llevar a cabo ese objetivo, se propone un modelo donde la confianza y la facilidad de uso son los antecedentes más relevantes de la intención de compra online. La disposición a confiar, la privacidad y la seguridad son consideradas como variables determinantes de la confianza, mientras que, las características utilitarias y hedónicas se consideran determinantes de la facilidad de



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uso. Para probar el modelo, se consideró una muestra de 242 usuarios de plataformas de comercio electrónico en Chile; esas relaciones se analizaron utilizando un modelo de ecuaciones estructurales. Como resultado de la investigación, se pudo constatar que el efecto de la confianza y la facilidad de uso se comprueban en este contexto, pero llama la atención un mayor efecto de la segunda variable con respecto a la primera; además, se determinó que el efecto de la disposición a confiar y la privacidad sobre la confianza no es significativo, al igual que el de las características hedónicas sobre la facilidad de uso, dando un rol protagónico a la seguridad y las características utilitarias en el modelo. Los resultados del estudio contribuyen a que los administradores orienten sus objetivos de gestión hacia estas variables en pos de mejorar la intención de compra de los consumidores.

Palabras claves: Intención de compra, comercio electrónico, confianza, facilidad de uso, pandemia.

Abstract

The objective of this research is to test a model for the formation of purchase intention in electronic commerce in the Pandemic period, and in this way, to establish the similarities and differences that could be developed in the relationship of these variables with a context of normality. To carry out this objective, a model is proposed where trust and ease of use are the most relevant antecedents of online purchase intention. Then, on the one hand, the willingness to trust, privacy and security are considered as determinant variables of trust, while, on the other hand, utilitarian and hedonic characteristics are considered as determinants of ease of use. To test the model, a sample of 242 users of electronic commerce platforms in Chile was obtained and the relationships were analyzed using a structural equation model. As a result, it was possible to verify that the effect of trust and ease of use are verified in this context, but a greater effect of the second variable with respect to the first is striking. In addition, it was found that the effect of the willingness to trust and privacy on trust is not significant, as is the effect of hedonic characteristics on ease of use, giving a leading role to security and utilitarian characteristics in the model. The results help administrators to point their management objectives towards these variables in order to improve the purchase intention of consumers.

Keywords: Purchase intention, electronic commerce, trust, ease of use, pandemic.

1. Introducción

De manera general, se puede describir el comercio electrónico como las transacciones comerciales realizadas mediante la transferencia de información a través de Internet (Schneider & Perry, 2000). Con tres décadas de historia en Chile, las funcionalidades y actividades que se pueden hacer a través de los medios

digitales continúan creciendo a nivel global, acaparando y penetrando cada vez más las actividades cotidianas (Ramírez-Correa et al., 2019). Una de las ventajas que se destacan en el uso del comercio electrónico es que las plataformas digitales alcanzan segmentos de la población más dispersos geográficamente (Napier et al., 2006), ampliando el número de proveedores a los cuales pueden llegar los consumidores, la posibilidad de elección y la competencia; además, permite una disminución de costos, e incentiva el aumento progresivo en la calidad y valor de los productos que se transan por estas vías (Saloner & Spence, 2001; Chaudhury & Kuilboer, 2002; Napier et al., 2006).

En el caso de Chile, el aumento de las ventas por medio del comercio electrónico ha ido en constante crecimiento, llegando a superar los US \$11.000 millones en el año 2020 (Cámara Nacional de Comercio, 2021). En ese sentido, si bien existe suficiente evidencia del exponencial crecimiento del comercio electrónico, los resultados esperados antes de la pandemia del COVID-19 no fueron del todo satisfactorios, existiendo diferencias relevantes entre las transacciones online y offline (Ramírez-Correa et al., 2019). El comportamiento de los consumidores cambió drásticamente en los últimos años, debido a las medidas que afectaron la provisión de bienes de consumo y a la imposibilidad de desplazamiento que decretaron algunos gobiernos (Guthrie et al., 2021).

Por lo anterior, resulta necesario indagar las motivaciones y actitudes de los consumidores y sus interacciones con los proveedores web, considerando el auge de los medios digitales que se vive actualmente (Ramírez-Correa et al., 2019).

La relevancia del comercio electrónico ha llevado a explorar profundamente las variables que influyen en su adopción por parte de las empresas (Gorla et al., 2017; Grandón & Pearson, 2004; Rahayu & Day, 2015) y los consumidores (Davis et al., 2013; Lee & Lyu, 2016). Sin embargo, debido a la expansión progresiva en su uso, a los cambios relevantes en la conducta (Ramírez-Correa et al., 2019), y al ambiente competitivo, sigue siendo importante investigar y volver a comprobar las variables que afectan el proceso de compra (Fang et al., 2014). Existen muchos estudios sobre la intención de compra como variable a explicar (Arruda Filho et al., 2020; Mohd & Zaaba, 2019; Chen & Barnes, 2007; Everard & Galletta, 2005; Fang et al., 2014; Gefen, 2000; McKnight & Chervany, 2001; Pavlou, 2001; Pollach, 2005; Rosillo-Díaz et al., 2020; Thaw et al., 2009). Incluso, algunos estudios de la intención de compra en el comercio electrónico realizados durante el periodo de pandemia mostraron cambios en el comportamiento de los consumidores y un enfoque distinto del impacto en la intención de compra desde el punto de vista de la relevancia de las variables antecedentes (Gu et al. 2022; Bazi et al. 2022).

Dentro de los muchos antecedentes estudiados, que determinan la intención de compra, la confianza tiende a ser uno de los más relevantes, puesto que se asocia con el nivel de credibilidad y fiabilidad percibida en las plataformas (Rosillo-Díaz et al., 2020). El foco en las preocupaciones o potencial riesgo que perciben los consumidores en el ecommerce identifican a la confianza como uno de los puntos relevantes para reducir la incertidumbre (Gefen & Straub, 2004); eso es más importante cuando el medio de interacción es menos conocido, disminuyendo la inseguridad (San Martín-Gutiérrez & Camarero-Izquierdo, 2010).

En el contexto de pandemia –y bajo las restricciones de desplazamiento que empujaron a las personas a probar el comercio electrónico–, la confianza se transformó en una de las variables relevantes para emplear el internet de manera transaccional (Santo & Marques, 2022). La confianza ayuda a sustentar la credibilidad de un vendedor online, incrementando la probabilidad de venta (Pappas, 2016).

Los aspectos más relevantes, que anteceden a la confianza, son la propia disposición a confiar que tiene el individuo a nivel de características personales (Wang *et al.*, 2015), y la confianza que se genera por la reducción de incertidumbre en dos aspectos cruciales: seguridad y privacidad en la plataforma web (McCole *et al.* 2010).

Los estudios recientes, que han abordado el efecto de la confianza sobre la intención de compra en un contexto de pandemia (Kiam & Liu, 2022), han encontrado que ese factor continúa teniendo un rol fundamental en las decisiones de compra de los consumidores en contextos online.

Otro aspecto importante, es la propia interacción con las plataformas, una vez que el consumidor ha decidido usarlas para reemplazar el comercio tradicional. Desde este punto de vista, la facilidad de uso ayuda al entendimiento de los procesos involucrados en una compra y evita el abandono de un proceso de compra iniciado (Mohd & Zaaba, 2019; Jones & Leonard, 2014; San Martín-Gutiérrez & Camarero-Izquierdo, 2010). Mohd y Zaaba (2019) destacan que únicamente las plataformas web que se encuentren adecuadamente estructuradas y que, adicionalmente, faciliten el proceso de indagación de información para el cliente, referido a las características propias de la usabilidad, podrán atraer a los consumidores para que sean partícipes en la interacción con el proveedor web. De esta forma, la facilidad de uso en el contexto del ecommerce se describe como el nivel en el que un consumidor cree que la acción de utilizar un sistema en específico se encuentra exento de esfuerzo (Kim *et al.*, 2009).

Consecuentemente, diversos estudios (Mohd & Zaaba, 2019; Green & Pearson, 2011; Hong & Cha, 2013; Lee & Turban, 2001) han asociado la facilidad de uso con las características hedónicas y utilitarias, para, finalmente, tener una relación en la intención de compra.

Las características utilitarias pueden describirse como la percepción del desempeño específico esperado de una plataforma transaccional, asociado a la utilidad básica o funcionalidad que se espera en su desempeño (Chen & Barnes, 2007; Green & Pearson, 2011); mientras que, las características hedónicas son atribuibles a una esfera más subjetiva, pudiendo definirse como una evaluación general de los beneficios del proceso de interacción con el proveedor web desde el punto de vista del disfrute o placer que genera la interacción, es decir, una sensación resultante (Bernardo *et al.*, 2012).

Los estudios realizados en contexto de pandemia demostraron que la relación entre facilidad de uso e intención de compra continúa siendo relevante (Soares *et al.* 2022), así como el efecto de las motivaciones hedónicas y utilitarias (Lin *et al.* 2021).

Dado lo anterior, y considerando el contexto en el que se realiza este estudio, es particularmente importante observar si los efectos esperados en un modelo de determinación de intención de compra continúan siendo relevantes, teniendo en cuenta que, para los países con economías en desarrollo, la adopción del comercio electrónico ha estado históricamente rezagada, aunque ha crecido de manera considerable en el periodo de restricciones y pandemia (Kartiwi & MacGregor, 2007; Guthrie *et al.* 2021).

En ese sentido, en el caso particular de Chile, se necesita investigar mucho sobre la conducta de los consumidores y acerca de la formación y adopción del comercio electrónico, a pesar de que la nación es reconocida como uno de los países líderes en América Latina conforme al índice de comercio electrónico prepandemia (Cámara de Comercio de Santiago, 2016), además de tener tasas de penetración de internet en el orden del 66.5 % de los hogares.

Por todo lo antes expuesto, en el remanente de esta investigación, se sentarán las bases teóricas de los constructos involucrados y el planteamiento de las hipótesis

con respecto a las relaciones esperadas entre ellas. Posteriormente, se presentará un modelo de medición y las escalas que fueron utilizadas para su evaluación, para, luego, describir los resultados generales y las conclusiones del estudio.

2.- Revisión de la literatura

Intención de Compra

Internet pasó de ser una tendencia emergente a una realidad habitual, estableciéndose cada vez más con mayor protagonismo y siendo un motivo de interés de empresas, gerentes, usuarios y académicos, e incentivando la investigación sobre las causas que motivan una compra en un contexto particular (Escobar-Rodríguez & Bonsón-Fernández, 2017). Lo anterior, se vio intensificado durante el periodo de la pandemia de COVID-19 debido a las restricciones que presentaron los consumidores en sus libertades para desplazarse y abastecerse (Guthrie *et al.* 2021).

La intención de compra ha sido vastamente estudiada en la literatura académica y, especialmente, en la adopción del comercio electrónico. Su definición en el ambiente digital hace referencia a la voluntad de los consumidores de ser partícipe de cualquier intercambio de valor con empresas, a través de medios o plataformas online (Pavlou, 2002).

Debido a que el comercio electrónico se caracteriza por un distanciamiento físico con el consumidor, existe una mayor incertidumbre, y como consecuencia, una mayor dificultad de ejercer el control sobre el entorno (San Martín-Gutiérrez & Camarero-Izquierdo, 2010), además de un aumento en la percepción del riesgo percibido por parte del usuario. El deseo de adquirir un producto, a través de esta vía, se ve fuertemente influenciado por la confianza hacia el proveedor como una forma directa de disminuir el riesgo (Jarvenpaa *et al.* 2000).

Para llevar a cabo una transacción en un sitio web, se debe necesariamente interactuar con la plataforma, usando el sitio web que se pone a disposición (Pavlou, 2002). De esta manera, la facilidad de uso y la intuición con la que el usuario pueda lograr cumplir sus objetivos son cruciales en una transacción exitosa, por ese motivo los proveedores que utilizan el comercio electrónico han centrado sus acciones en la generación de confianza y en la provisión de un espacio que facilite la interacción de sus usuarios, en un esfuerzo por reducir los intentos fallidos de compra o el uso parcial de las plataformas. Lo anterior, se ha transformado en un problema relevante en el desarrollo de este tipo de comercio, por ejemplo, al evitar los abandonos por dificultades en la etapa de pago (Wang *et al.* 2003).

A partir de lo expuesto –y con las variables antes mencionadas como ejes centrales del estudio–, se establecerá un modelo de determinación de la intención de compra en ambientes web, considerando algunos antecedentes cruciales en la formación y expresión de la confianza y en la facilidad de uso.

Facilidad de uso como antecedente de la Intención de Compra

Por facilidad de uso se entiende el grado en que las personas logran creer que el uso de un sistema en particular no requiere de esfuerzo (Davis, 1989). En términos concretos, y aplicado al uso de plataformas digitales y comercio electrónico, se puede decir que la facilidad de uso está relacionada con el entendimiento y el flujo de navegación lógico que un sitio web entrega al usuario.

En ese sentido, muchas veces se considera la facilidad de uso como un sinónimo de usabilidad percibida, la cual es fundamental para que un usuario perciba la experiencia de interacción como provechosa, por ejemplo, a través de una estética visual de los sitios web que sea sencilla de entender, aprender y operar (Kim *et al.*,

2009). Igualmente, resulta fundamental la medida en la que una plataforma web puede ser empleada por un determinado grupo de usuarios, con la disposición de lograr sus objetivos en forma efectiva, eficiente y satisfactoria (Jones & Leonard, 2014).

Autores como Nielsen (1993) definen la facilidad de uso por medio de cinco características componentes: capacidad de aprendizaje (sistema fácil de aprender), eficiencia (que genere una gran productividad), memorización (fácil de recordar), errores (libre de faltas) y satisfacción subjetiva (debe ser grato de utilizar). Sin embargo, al tratarse de un concepto multidimensional, se cree que, además, existen otros componentes relevantes como la eficacia (precisión con la que los clientes logran las tareas propuestas) (Wang *et al.*, 2003).

Al observar el fenómeno desde el punto de vista de los usuarios, algunos autores afirman que sí se evidencia que los constructos de usabilidad están relacionados al comportamiento del cliente. Las organizaciones o las empresas –y sus equipos de diseño web– tendrán más relevancia a medida que mejor sea su usabilidad; en un ámbito contrario, aquellas empresas que no ponen un esfuerzo en el diseño web, tendrán más motivos para poder plantearse la idea de adoptar la facilidad de uso y llevarlos a cabo en los diseños de sus plataformas web (Green & Pearson, 2011).

Finalmente, se menciona que la usabilidad domina la interacción con los sitios web: si un consumidor no puede encontrar un producto deseado, no se concretará una compra. Por consiguiente, la facilidad de uso es un constructo que predice las intenciones de comportamiento y actitudes de los consumidores (Kim *et al.*, 2009; Davis, 1989).

H1: La Facilidad de Uso de la página web tiene una relación directa y positiva con la Intención de Compra.

Otros estudios se han centrado en comprender la formación de la intención de compra de los consumidores a través de sus motivaciones subyacentes, especialmente en el contexto del comercio electrónico (O'Brien, 2010). Así, se reconoce un componente hedónico, que involucra características ligadas a lo multisensorial, emocional y fantástico (Parker & Wang, 2016), considerando una respuesta subjetiva sobre la evaluación de los beneficios íntegros de la experiencia en sí (Arruda Filho *et al.*, 2020): el placer, la excitación y el escapismo que se genera al involucrarse en una acción (Perea *et al.*, 2004). Estas dimensiones han sido reconocidas como parte del deleite en el proceso de compra por parte de los consumidores (Parker & Wang, 2016). La calidad hedónica puede describirse como el valor que obtiene el usuario al adquirir un bien o servicio, y que se diferencia de la funcionalidad del proceso de compra (Bernardo *et al.*, 2012). Se asume que estas características hedónicas tienen una influencia relevante en la satisfacción del cliente y en la posterior intención de compra en el comercio electrónico (Vázquez-Casielles *et al.* 2009).

Por otra parte, se reconoce un componente utilitario de la motivación (O'Brien, 2010), entendido como el grado en el que una persona percibe que una determinada labor le genera un desempeño provechoso, en términos de eficiencia, eficacia y satisfacción (Davis, 1989); es decir, se enfoca más en conceptos como el rendimiento, el costo y la funcionalidad de lo adquirido (Arruda Filho *et al.*, 2020). Lo anterior, también está relacionado con el nivel de cumplimiento de los objetivos a lograr y las tareas que el usuario espera desempeñar (Safavi, 2009).

Diversos estudios han orientado el efecto de lo utilitario y lo hedónico sobre la

intención de compra de forma conjunta (O'Brien, 2010). No obstante, son más las fuentes que consideran estas motivaciones como independientes y las diferencian desde el punto de vista de la funcionalidad y su desempeño instrumental (lo utilitario); se requiere un diagnóstico cognitivo del consumidor, llevándolo a reflexionar sobre su experiencia de compra, y desde el punto de vista del sentimiento y lo subjetivo (lo hedónico) (Arruda Filho *et al.*, 2020).

Parker y Wang (2016) consideran que la parte utilitaria y hedónica son esenciales en la experiencia de compra a través del comercio electrónico, mientras que McLaughlin y Skinner (2000) argumentan que, para lograr la usabilidad de un procedimiento, es necesario que ese proceso sea motivado por la utilidad y las sensaciones de la interacción, por ende, se especula que la facilidad de uso es un paso intermedio en el efecto que las motivaciones podrían generar sobre la intención de compra (Peiris *et al.*, 2015).

H2: Las Características Hedónicas del sitio web tienen una relación directa y positiva con la percepción de Facilidad de Uso.

H3: Las Características Utilitarias del sitio web tienen una relación directa y positiva con la percepción de Facilidad de Uso.

Confianza en el sitio web como antecedente de la Intención de Compra

La confianza, en un sentido amplio, se relaciona con la necesidad de controlar el entorno en el que los usuarios se relacionan (Gefen & Straub, 2004), enfocándose en la creencia de que la contraparte es fidedigna y que, por ende, bajo su propio consentimiento, una persona puede volverse vulnerable a esta contraparte (McKnight *et al.*, 2004).

Específicamente en el contexto del ecommerce, la confianza hace referencia a la voluntad de los consumidores de confiar en la capacidad e integridad de una empresa en la cual generan sus transacciones (Kim & Park, 2013). La confianza posee un rol clave en la relación entre un consumidor y una plataforma digital, debido a que los clientes realizan transacciones que no son verificables de inmediato y que podrían ser fraudulentas, sin que el consumidor pueda rectificar (Shik & Occeña, 2015). Así, la confianza es crucial en este contexto, pues contribuye a superar las sensaciones de incertidumbre y riesgo, traducándose en la participación de interacciones con los proveedores web y cobrando un mayor significado en el ecommerce, dado sus características atribuibles al desconocimiento.

Por otra parte, el crecimiento sostenido y rápido que ha tenido el comercio electrónico produce una carencia en términos de confianza, dado que existen muchos sitios web no verificados, en los cuales los consumidores podrían iniciar operaciones de compra de bienes o servicios y quedar expuestos a hechos carentes de fiabilidad (Gefen & Straub, 2004).

Desde este punto de vista, la confianza no solo reduce el riesgo percibido, sino que, por consiguiente, aumenta la disposición a comprar (Farivar *et al.*, 2017). A mayores niveles de confianza, se espera un incremento considerable de la intención de compra online, y más allá de la intención, también la concreción de compras (Pennanen *et al.*, 2006; San Martín-Gutiérrez & Camarero-Izquierdo, 2010).

El efecto positivo de la confianza se podría pensar que está exacerbado en los contextos online debido a la mayor incertidumbre, el desconocimiento y la distancia

material (imposibilidad de interactuar de manera física), que inherentemente implican las interacciones por estos medios, así, su rol de reducción de riesgo pasa a tener un rol más protagónico (Lee & Turban, 2014).

Con lo anterior podríamos esperar una relación positiva y significativa entre confianza e intención de compra (Everard & Galletta, 2005)

H4: La Confianza en el sitio web tiene una relación directa y positiva con la Intención de Compra.

La formación de confianza está fuertemente determinada por las características del receptor de la interacción, pero, obviamente, también por las diferencias individuales de quién confía. Desde ese punto de vista, la psicología –que considera la confianza como un rasgo exclusivo de la persona (Yoon & Occeña, 2015)– ha planteado que la confianza está determinada por los antecedentes culturales, el carácter propio de la persona, la personalidad y por las experiencias vividas (Lee & Turban, 2014). Dentro de esta perspectiva destaca la disposición a confiar de las personas, es decir, la voluntad o propensión que tiene una persona en confiar o depender de una extensa gama de situaciones y personas (McKnight *et al.*, 2002); de esa manera, aquellos que tienen una disposición a confiar más alta, tenderán a confiar más en ciertos aspectos que aquellos con una propensión a confiar más baja (Lee & Turban, 2014; Yoon & Occeña, 2015). Los usuarios que muestren una disposición a confiar más elevada tenderán a confiar más en diferentes aspectos de la vida y de las interacciones (incluyendo por ejemplo, el comercio electrónico), que aquellos que tienen una disposición a confiar más reducida (Ridings *et al.*, 2002).

Por otro lado, en el contexto online, se postula que la disposición a confiar es particularmente prominente, ya que daría paso a una formación de confianza más fluida para enfrentar la potencial incertidumbre, el distanciamiento físico entre consumidor y proveedor, las limitaciones de la comunicación y el tipo de información que puede existir entre el usuario y el proveedor web (McKnight *et al.*, 2002). En ese sentido, la propensión a confiar tiene dos áreas componentes: la fe que se tiene en la humanidad –referida al grado de creencia en que otros son dignos de confiar– y la disposición a confiar, entendida como la voluntad natural del ser humano de depender de otros (McKnight *et al.*, 2002).

Al respecto, múltiples estudios han demostrado la validez de la relación entre la disposición a confiar y la formación de confianza en el comercio electrónico (Lee & Turban, 2014; Gefen, 2000).

H5: La Disposición a Confiar tiene una relación directa y positiva con la Confianza del sitio web.

En otra dimensión de la formación de confianza, referida a las características del sitio web, surgen dos conceptos fundamentales en la influencia sobre los consumidores: seguridad y privacidad.

La seguridad en el comercio electrónico está directamente relacionada con la reducción de las amenazas existentes al momento de realizar transacciones en línea. Las amenazas en este contexto son múltiples: ataques a la red por medio de terceros y la transacción no autorizada de datos, a través de acceso no autorizado

vía autenticación falsa o defectuosa (Belanger *et al.*, 2002). Por esto, la seguridad se define como la protección contra estas amenazas (Pennanen *et al.*, 2006) ya que el no combatirlas puede desencadenar en resultados no deseados como el daño a la privacidad, la pérdida de información y el robo de información crediticia (Belanger *et al.*, 2002), generando directamente dificultades económicas para los consumidores.

La seguridad en entornos electrónicos implica la confidencialidad, integridad y disponibilidad que permiten reducir las limitaciones de acceso y que la información sea usable únicamente para los usuarios autorizados, con el objetivo de evitar la divulgación no autorizada; lo anterior es una garantía de que la información compartida se conserve entre la persona y la organización autorizada (Pennanen *et al.*, 2006). La seguridad, finalmente, ejerce influencia directa y positiva sobre la confianza en el comercio electrónico (Chellappa, 2002).

Por otro lado, la privacidad en el contexto de comercio online está relacionada con el resguardo de la información y el cumplimiento del deseo de un usuario de no ser abordado de manera indeseada, es decir, el usuario podría compartir información por su propia voluntad (Belanger *et al.*, 2002). La privacidad tiende a ser un problema grave en el comercio electrónico, dado el poco control que se podría ejercer sobre la entrega de datos falsos (Culnan & Bies, 2016), o el bajo control que los propios usuarios pueden ejercer sobre las decisiones de los proveedores que almacenan su información (Dhillon y Moores, 2001).

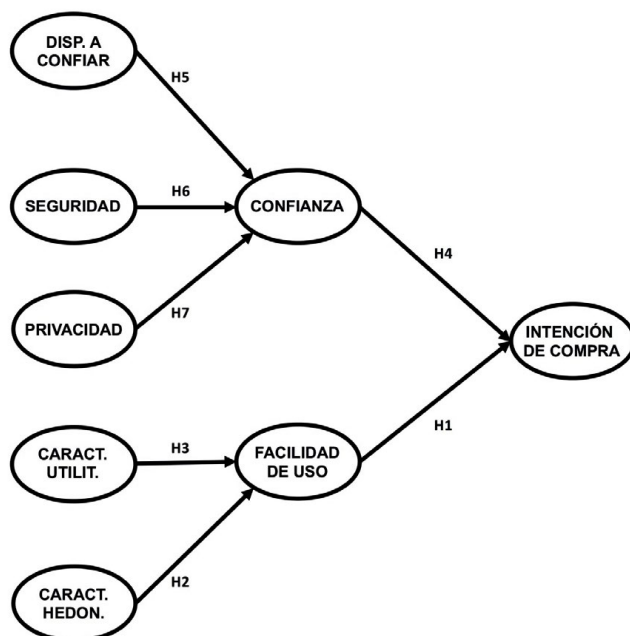
En ese sentido, las políticas de privacidad de los sitios web se han transformado en una de las herramientas fundamentales para asegurar la confianza y para influir en los usuarios al minuto de realizar compras a través del comercio online (San Martín-Gutiérrez y Camarero-Izquierdo, 2010). Los compradores que llegan a tener mayor confianza acerca de la privacidad de sus datos son aquellos que compran en un sitio web y tienden a repetir la compra, debido a la confianza en la seguridad y privacidad de los datos entregados (Yousafzai *et al.*, 2005). Al respecto, existen estudios que señalan que los sitios web que tienen una preocupación exhaustiva en su política de privacidad, realizando, por ejemplo, grandes inversiones en mecanismos informáticos de protección a sus fuentes de información, llegan a mantener a sus usuarios confiando de manera más fuerte y por periodos más prolongados de tiempo (Black, 2005).

H6: La percepción de Seguridad tiene una relación directa y positiva con la Confianza del sitio web.

H7: La percepción de Privacidad tiene una relación directa y positiva con la Confianza del sitio web.

A partir de lo anterior, y considerando el conjunto de relaciones y de antecedentes relevantes, se resume la totalidad de las hipótesis de trabajo en el siguiente modelo:

Figura 1. Modelo de investigación propuesto



Fuente: Elaboración Propia (2022).

3. Metodología

Se desarrolló un cuestionario, el cual se dividió en tres secciones. Primero, se estableció una pregunta filtro que identificó si el encuestado compró en algún sitio web en los últimos 12 meses. Segundo, se presentaron las variables relevantes del modelo de determinación de la intención de compra. Los ítems seleccionados para medir los constructos propuestos fueron extraídos de estudios previos, y estuvieron compuestos por escalas traducidas y modificadas al contexto de estudio, a fin de ajustar su uso a la muestra. Todos los constructos de esta sección se midieron a través de escalas Likert de 7 puntos, con extremos 1 (absolutamente en desacuerdo) y 7 (muy de acuerdo). La escala de al menos 7 puntos es deseable, debido a que permite mayor variedad de opiniones, lo que resulta en una mejor capacidad para reflejar la realidad objetiva de los consumidores (Joshi *et al.*, 2015). Por último, se levantaron algunos datos demográficos de la muestra para presentar una caracterización de esta.

Asimismo, en la investigación, se utilizó una muestra de 242 personas. La muestra del estudio fue de tipo no probabilístico por conveniencia, con una población objetivo de personas residentes de Chile, con una edad comprendida entre 20 y 65 años.

Los participantes del estudio fueron, con respecto a la identificación de su sexo, 52,9 % mujeres y 44,2 % hombres (resto no declara); se logró representar las edades de los encuestados en dos grandes grupos: el primero con edades entre 20-39 años y el segundo entre 40-65, lo que equivale a un 80,6 % y 19,4 % respectivamente. Asimismo, analizando las conductas de los encuestados, se identificó que un 97,1 % de la muestra

utiliza internet con frecuencia; 82,2 % cree que el uso de las tarjetas de crédito es seguro; y, finalmente, un 92,1 % manifestó que realizarían compras en ecommerce en el futuro.

Por otra parte, para la medición del constructo Intención de Compra, se utilizaron 3 ítems, obtenidos de la escala propuesta por Pavlou (2002). En el caso de la Facilidad de Uso, se emplearon 3 ítems de una escala utilizada por el mismo autor. Mientras que, para medir la percepción de las Características Hedónicas, se utilizaron 3 ítems, y para la percepción de las Características Utilitarias, se usaron 4 ítems, ambos casos contruidos a partir del modelo de Montero et al. (2018). El constructo Confianza fue medido a través de 4 ítems, obtenidos del trabajo de Kim y Park (2013). A su vez, Privacidad (con 3 ítems) y Seguridad (también con 3 ítems) fueron basados en el estudio de Thaw et al. (2009). Finalmente, la escala de Disposición a Confiar se obtuvo mediante 5 ítems que derivan del trabajo de Gefen y Straub (2004).

Todas las escalas fueron originalmente utilizadas en el idioma inglés, por ello se adaptaron a una versión en español, a partir de dos traducciones independientes (hechas por dos coautores) y enjuiciadas por un tercer coautor, quien pudo dirimir diferencias y establecer que la traducción al idioma original hiciera sentido con el contexto de uso. Los ítems de cada una de las escalas pueden ser consultados en el Anexo A.

4. Resultados

Evaluación del modelo de medición

En primer lugar, se comprobaron las propiedades psicométricas de las escalas y el ajuste general del modelo de medición por medio de un análisis factorial confirmatorio (AFC). De esta forma, las principales medidas de ajuste fueron satisfactorias, en concreto, los valores de CFI = 0,917; TLI= 0,909; y RMSEA = 0.063, están dentro de los rangos especificados por Hair et. al (2006) (valores sobre 0,9 en los primeros dos casos y bajo 0,08 en el tercero). Con los resultados de estos indicadores, se puede afirmar que el modelo se ajusta a los datos y, por ende, responde al análisis.

En segundo lugar, se probó la confiabilidad de cada uno de los constructos mediante la utilización de tres métodos: Alpha de Cronbach, Varianza Media Extraída (AVE) y Fiabilidad del Constructo Compuesto (CCR) (ver Tabla 1). Basado en estos indicadores, se puede asegurar que los constructos tienen niveles satisfactorios de confiabilidad, concretamente todos los Alpha de Cronbach superan el límite de 0,70, exceptuando el constructo de privacidad. En el caso de este constructo, se decidió mantener la estructura de 3 ítems, principalmente porque las otras medidas de confiabilidad tienen valores suficientes. En el indicador de AVE todos obtuvieron una puntuación superior al límite de 0,50 y según el indicador de CCR todos los valores resultaron mayores al límite de 0,7 (Fornell y Larcker, 1981).

Tabla 1 . Coeficientes de Fiabilidad

Constructo	Alpha de Cronbach	AVE	CCR
Intención de Compra	0,808	0,595	0,81
Facilidad de uso	0,845	0,644	0,84
Características Hedónicas	0,866	0,694	0,87
Características Utilitarias	0,890	0,683	0,90

Construtto	Alpha de Cronbach	AVE	CCR
Confianza	0,874	0,641	0,88
Seguridad	0,811	0,589	0,81
Disposición a Confiar	0,909	0,672	0,91
Privacidad	0,687	0,514	0,74

Fuente: Elaboración Propia (2022).

En tercer lugar, se comprobó la validez convergente de los ítems dentro de sus respectivos constructos. Para ello, se utilizó el criterio de la estimación de cargas estandarizadas, las que se exige que sean mayores o iguales a 0,6 (Steenkamp & Geyskens, 2006); y que sean significativas a un nivel de 95 % de confianza (es decir, con un p-value menor a 0,05). Efectivamente todos los indicadores, con excepción de priv01 cumplieron con este criterio (ver Tabla 2). Al respecto, se evaluó la eliminación del ítem priv01, sin embargo, eso podría poner en riesgo la identificación del modelo, y, debido a que el ajuste general es suficientemente bueno, se decidió utilizar el constructo con su formación de ítems original.

Tabla 2. Validez Convergente

Construtto	Ítem	Carga Estandarizada
Intención de Compra	int01	0,672*
	int02	0,901*
	int03	0,723*
Facilidad de uso	faci01	0,798*
	faci02	0,874*
	faci03	0,729*
Características Hedónicas	hed01	0,821*
	hed02	0,927*
	hed03	0,741*
Características Utilitarias	ut01	0,765*
	ut02	0,919*
	ut03	0,861*
	ut04	0,748*
Confianza	conf_sit01	0,827*
	conf_sit02	0,750*
	conf_sit03	0,796*

Constructo	Ítem	Carga Estandarizada
Seguridad	conf_sit04	0,826*
	seg01	0,825*
	seg02	0,783*
Disposición a Confiar	seg03	0,687*
	disp01	0,664*
	disp02	0,710*
	disp03	0,850*
	disp04	0,889*
Privacidad	disp05	0,950*
	priv01	0,326
	priv02	0,832*
	priv03	0,863*

Fuente: Elaboración Propia (2022).

Finalmente, para comprobar la validez discriminante se evaluaron las correlaciones entre constructos, comparándolas con la raíz del AVE de cada constructo. Para que se cumpla la validez discriminante, el criterio dice que las correlaciones deben ser menores a la raíz de la varianza media extraída (Fornell y Larcker, 1981), por ende, al visualizar la matriz, se puede concluir que existe una diferencia empírica entre los distintos constructos dado que se cumple el criterio propuesto (Ver Tabla 3).

Tabla 3. Validez Discriminante

	INT	FACIL	CAR_HED	CAR_UT	CONF	SEG	DISP	PRIV
INT	0,771							
FACIL	0,579	0,802						
CAR_HED	0,237	0,251	0,833					
CAR_UT	0,582	0,677	0,196	0,826				
CONF	0,463	0,377	0,328	0,420	0,801			
SEG	0,398	0,349	0,375	0,341	0,700	0,767		
DISP	0,124	0,057	0,216	0,085	0,151	0,077	0,820	
PRIV	0,123	0,570	0,268	0,119	0,122	0,328	0,165	0,717

Fuente: Elaboración Propia (2022).

Evaluación del modelo estructural

Para testear las hipótesis propuestas y validar la relación entre los constructos (Figura 1), se aplica un modelo de ecuaciones estructurales (SEM). Es posible ver que el modelo presentó niveles suficientes de ajuste que cumplen con el criterio propuesto

por Hair et al. (2006).

En concreto, los valores de los principales ajustes son: CFI = 0,917; TLI = 0,909 y RMSEA = 0.063. En la Figura 2 se pueden observar los resultados y coeficientes en detalle de cada relación.

Para la evaluación de las hipótesis, se observa la carga estandarizada entre las variables relacionadas y la significancia de la misma, por esto, es posible afirmar que H1 es soportada ya que la carga estandarizada para la relación entre las variables es significativa y positiva, con un coeficiente de 0.53. En el caso de H2, la relación entre variables no es significativa y, por ende, se rechaza la hipótesis. Para H3, la asociación entre variables resulta significativa, con un coeficiente de 0,69, por lo que se soporta la hipótesis, al igual que H4 y H5, donde la relación es significativa con coeficiente de 0,3 y 0,7 respectivamente, por lo cual se soportan las hipótesis. Por último, para H6 y H7 resulta ser no significativo para ambos casos, con coeficientes de 0,12 y -0,9 respectivamente, por lo cual se rechazan las hipótesis 6 y 7. A continuación, se presenta el resumen del análisis de hipótesis (Ver Tabla 4).

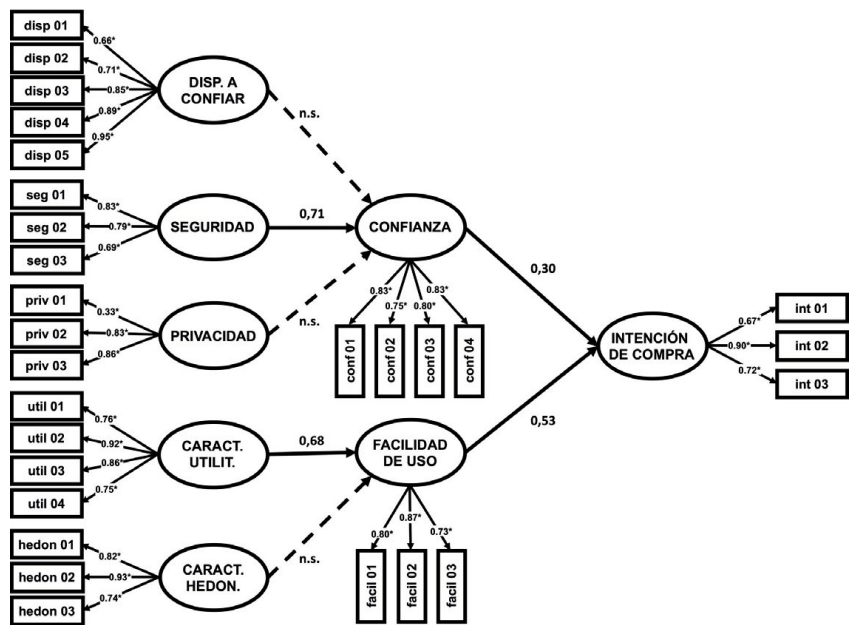
Tabla 4. Resumen de hipótesis y resultados

	Hipótesis	Resultado
H1	La facilidad de uso de la página web afecta significativamente en la intención de compra.	Soportado
H2	Las características hedónicas del sitio web tienen una relación directa y positiva con la percepción de facilidad de uso.	No Soportado
H3	Las Características Utilitarias tienen una relación directa y positiva con la percepción de facilidad de uso.	Soportado
H4	La Confianza del sitio web afecta significativamente en la intención de compra.	Soportado
H5	La Disposición a confiar tiene una relación directa y positiva con la confianza del sitio web.	No Soportado
H6	La percepción de Seguridad tiene una relación directa y positiva con la confianza del sitio web.	Soportado
H7	La percepción de privacidad tiene una relación directa y positiva con la confianza del sitio web.	No Soportado

Fuente: Elaboración Propia (2022).

Con el objetivo de mejorar la comprensión de los resultados, a continuación, se presenta el modelo de investigación, incluyendo los resultados de las cargas factoriales y de las relaciones entre los constructos estudiados.

Figura 2. Resultados del modelo estructural SEM



Fuente: Elaboración Propia (2022).

5. Conclusiones

El interés de los académicos y de los administradores de empresas en el entendimiento de las variables que afectan la intención de compra, sigue estando en una etapa de desarrollo. Más ahora, el auge de los mercados electrónicos ha llevado a que los estudios que ayudan a determinar la intención de compra online sean de especial utilidad y las replicaciones de efectos se tornen relevantes para solidificar el conocimiento de estos fenómenos.

En ese sentido, este estudio aporta un insight relevante para entender la manera en la que la intención de compra se forma, contrastando el modelo con una situación particular de pandemia, la cual cambió los hábitos de consumo. De esta forma, es posible determinar una estructura distinta de antecedentes a la que masivamente plantea la literatura.

Así, esta investigación permitió concluir que, en primer lugar, la confianza como la facilidad de uso muestran un efecto relevante, positivo y significativo sobre la intención de compra. Si bien este resultado es esperado –y respaldado por estudios realizados en contexto de pandemia–, se observó que el coeficiente de determinación es más alto para la facilidad de uso; eso entregaría algunas luces de las herramientas de administración que podrían utilizar los gerentes, puesto que muchos consumidores se vieron “obligados a confiar”, debido a que el comercio electrónico sobrepasaba

algunas barreras del mercado impuestas por el entorno. Ante la premura de satisfacer sus necesidades, los consumidores dieron un paso que, posiblemente, no estaban dispuestos a dar antes, además, utilizaron los sitios de comercio electrónico por sobre los riesgos potenciales que estos podrían representar.

Ante ese escenario, la facilidad de uso, es decir, la facilitación de la lógica de navegación, se tornó más relevante; lo cual podría ser una variable que ayude a determinar a los usuarios qué proveedor utilizar. Sin duda esto es un input de información importante para las gerencias, a fin de disponer sus esfuerzos de administración en la creación de sitios con mejor flujo de navegación, más intuitivos, con mejor diseño y con una lógica que ayude a los consumidores a llegar a las etapas finales de una relación transaccional.

En segundo lugar, se observó una relación no significativa entre la confianza y la disposición a confiar, lo que reafirma las conclusiones anteriores. Al perder relevancia para la utilización de un sitio web, la propensión a confiar se hace menos importante en la determinación de la confianza, dando paso a otras variables que pueden impactar de forma concreta en la sensación de reducción de riesgo, mostrando un resultado que podría resultar contra intuitivo en un contexto de normalidad (Chellapa, 2002).

En nuestro estudio, además, se identifica a la seguridad con un rol preponderante en la determinación de confianza, incluso, por sobre la privacidad, la que pierde fuerza y presenta un resultado no significativo. Este resultado sí tiene antecedentes en la literatura, donde autores como Belanger et al. (2002) señalan que una experiencia placentera fomenta la intención de compra, independiente de las inquietudes de privacidad que podrían surgir. Algunos autores, también, encontraron una correlación negativa entre privacidad y confianza, dado que, la habitualidad en el uso de internet y de plataformas de comercio electrónico, hace a los usuarios menos dependientes de una privacidad que se asume como garantizada (Thaw et al., 2009). De esa forma, los gerentes pueden utilizar los resultados de este estudio para fomentar la confianza en el uso de sitios web transaccionales, sabiendo que los esfuerzos en seguridad serán capaces de mover la aguja en la determinación de la confianza y generando un efecto indirecto en la intención de compra.

Por último, en un contexto de pandemia, se puede decir que la facilidad de uso se ve más afectada por las características utilitarias, por sobre las hedónicas (las que además no son significativas). Se puede deducir, entonces, que las características ligadas a la eficiencia y funcionalidad se hacen más relevantes que otras características de un orden más subjetivo y ligada a la emoción.

Lo anterior, si lo posicionamos en un contexto de pandemia, hace sentido, ya que se podría atribuir el uso de plataformas de comercio electrónico más a una necesidad primaria que a una expresión de disfrute. Así, el comercio electrónico reemplaza hasta cierto punto la factibilidad de compra presencial; y, sobre todo en aquellos consumidores que comienzan a relacionarse con este tipo de plataformas, se busca principalmente la eficiencia. A partir de esa información, los administradores podrían hacer uso de estos resultados para resaltar la funcionalidad en las situaciones de uso, lo que conllevaría un aumento mediado de la intención de compra: asistentes de compra, chats, solucionadores de problemas, FAQ's y otras herramientas automatizadas, los cuales podrían ayudar a los consumidores a mejorar su experiencia de compra, al facilitar el proceso desde una perspectiva holística.

En conjunto, las conclusiones de este estudio son relevantes porque muestran un cambio en la preponderancia de las variables antecedentes de la intención de compra y demuestran un camino más definido para administrar los sitios web, de manera que los mismos permitan una mejor interacción con los usuarios. Lo anterior, se hace

importante en una situación de restricciones extraordinarias, como las que fueron implementadas en los años 2020 y 2021 durante la pandemia de COVID-19 y las que se siguen viendo que afectan la forma de compra de millones de usuarios en el mundo.

Evidentemente, este estudio tuvo algunas limitaciones, las cuales podrían ayudar a desarrollar investigaciones complementarias en el futuro a fin de dar más robustez a los resultados que se presentan. Entre esas limitaciones se encuentra que la muestra (tomada en periodo de pandemia) no permite comparar el modelo con una situación diferente, a fin de comprobar/observar el movimiento de las influencias de las variables relevantes. Una nueva muestra (después de pandemia) ayudaría a entender si el periodo particular es el que genera la variación de los efectos.

Aunado a lo anterior, el término de las restricciones que la pandemia ha conllevado, sugiere que el contexto podría tampoco comportarse de la misma forma que en el periodo prepandemia, puesto que se ha adquirido un acostumbamiento a los sistemas y el descubrimiento de sus particularidades por parte de los usuarios, lo que podría ayudar a mantener una realidad con menor incertidumbre y un menor efecto de la confianza.

Otra limitante de este estudio fue que el mismo se llevó a cabo en Chile, que si bien es un buen contexto para entender la realidad Latinoamericana, el tiempo de pandemia además coincide con un momento particular en el desarrollo político-social del país, lo que podría afectar los resultados e invita a testear el modelo o modelos similares en otros países de la región.

Por último, la muestra de este estudio estuvo parcialmente desbalanceada hacia una población más joven, lo que, si bien, podría representar la realidad (en muchos hogares los encargados de realizar las compras en el nuevo contexto de pandemia tienden a ser las personas con mayor alfabetización digital), podría también agregar un sesgo en las mediciones. Así, otros estudios en poblaciones de mayor promedio de edad serían relevantes en el entendimiento completo de los procesos que ayudan a la formación de la intención de compra.

6. Anexos

Tabla A1. Escalas de Medidas.

Intención de Compra*

(int01): Si tengo la oportunidad, tengo la intención de utilizar este sitio web.

(int02): Si tuviera la oportunidad, predigo que usaría este sitio web en el futuro.

(int03): Es probable que realice transacciones en este sitio web en un futuro próximo

Facilidad de uso*

(faci01): Mi interacción con el sitio web es clara y comprensible.

(faci02): Encuentro que el sitio web es fácil de usar.

(faci03): Me resulta fácil localizar la información que necesito en el sitio web.

Características Hedónicas*

(hed01): Este sitio web es divertido.

(hed02): Este sitio web es emocionante.

(hed03): Este sitio web es maravilloso.

Características Utilitarias*

Tabla A1. Escalas de Medidas.

(ut01): Este sitio web es efectivo.

(ut02): Este sitio web es útil.

(ut03): Este sitio web es funcional.

(ut04): Este sitio web es práctico.

Confianza*

(conf_sit01): Este sitio web es confiable.

(conf_sit02): Este sitio web quiere ser conocido como una empresa que cumple sus promesas y compromisos.

(conf_sit03): Este sitio web mantendrá sus promesas.

(conf_sit04): Creo en la información que brinda esta firma de comercio electrónico.

Seguridad*

(seg01): Me siento seguro proporcionando información de mi mismo en este sitio web.

(seg02): Creo que la información de pago que ingreso en este sitio web es seguro y accesible solo para las personas previstas.

(seg03): Creo que la información que ingreso en este sitio web no se modifica en tránsito

Disposición a Confiar*

(disp01): Generalmente confío en otras personas.

(disp02): Generalmente tengo fe en la humanidad.

(disp03): Siento que la gente tiene buenas intenciones en general.

(disp04): Siento que la gente es, en general, digna de confianza.

(disp05): Siento que la gente es generalmente confiable.

Privacidad*

(priv01): ¿Cree que tienen control sobre cómo la información que proporciona será utilizada por empresas en línea?

(priv02): ¿Cree que existe un mecanismo eficaz para abordar cualquier violación de la información que brinda a las empresas en línea?

(priv03): ¿Cree que existe un control adecuado para proteger la privacidad de la información personal en línea?

Declaración de conflicto de interés

Los autores del presente manuscrito manifiestan que no existen conflictos de interés con ninguna entidad o institución, ni de carácter personal en esta publicación.

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POST PANDEMIC LEADERSHIP IN LATIN AMERICA: RESPONDING TO WICKED PROBLEMS USING ADAPTIVE LEADERSHIP IN ORGANIZATIONAL CONTEXTS

LIDERAZGO POSTPANDEMIA EN AMÉRICA LATINA: RESPONDIENDO A PROBLEMAS COMPLEJOS UTILIZANDO EL LIDERAZGO ADAPTATIVO EN CONTEXTOS ORGANIZACIONALES

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Abstract

This paper examines the leadership approach to the pandemic in Latin America based on the traditional cultural approach to leadership in this region. Using the framework of challenges proposed by Grint (2020), a response to Covid is recommended based on its categorization as a wicked, as opposed to a tame or critical, problem. Using a framework of adaptive leadership (Heifetz, 1994) and advanced change theory (Quinn, 2000), Ricardo Semler's transformation of Semco is explored as an example of an alternative approach to leadership to address wicked problems in Latin America.

Keywords: Leadership; Latin America; Change; Pandemic Leadership.

Resumen

Este documento examina el enfoque de liderazgo frente a la pandemia en América Latina con base en el enfoque cultural tradicional del liderazgo en esta región. Usando el marco de desafíos propuesto por Grint (2020), se recomienda una respuesta a Covid basada en su categorización como un problema complejo, en lugar de manso o crítico. Usando un marco de liderazgo adaptativo (Heifetz, 1994) y la teoría avanzada del cambio (Quinn, 2000), se explora la transformación de Semco de Ricardo Semler como un ejemplo de un enfoque alternativo al liderazgo para abordar problemas complejos en América Latina.



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Palabras claves: Liderazgo; América latina; Cambio; Liderazgo en pandemia.

1. Introduction

In early 2020, a virus that appears to have emerged in a single city in China swept the globe and left a devastating wake of economic, social, psychological, educational, political, and health issues. While some progress appears to have been made in responding to the virus, its wake will likely take years to address. Like much of the world, Latin America has been dealt a significant blow, economically and socially. In November 2020, Cottani (2020) explained that the economy of Latin America, as a region, will “contract by an estimated 8.1 percent this year [2020], according to the International Monetary Fund’s latest forecast. And while recovery is expected next year, its extent is likely to be limited, leaving economic output well below the pre-covid level by the end of 2021” (p. 1). Countries in Latin America are also among the hardest hit by the virus, in terms of both numbers and death rates (Taft-Morales, 2020). Social and political unrest also appear to be increasing as a result of the virus (Taft-Morales, 2020). The full impact on overall wellbeing as it relates to things like education and other social issues is still unknown.

Unfortunately, much of the blame for the current situation is being directed towards the virus itself. Many lay the problems that we face at the feet of this non-conscious entity that is simply doing what it is designed to do as efficiently and effectively as it can. The nature of the virus is to spread. The issue is not that the virus is spreading, it is how people are responding to that spread that makes the difference between success and failure. An honest examination of the contribution system for the current situation suggests that it is not the virus alone that has contributed most to our downfall. Instead, and despite the lethality of the virus, it is the decisions of leaders and of the followers of these leaders that have shaped national and organizational responses and contributed most to the creation of the current situation. As Grint (2020) suggested, Covid-19 has proven to be a test for “all societies and their leadership” and the way they think about what it means to be a leader (p. 314). Sadly, most societies, including those of Latin America, have largely failed this test and will be dealing with the consequences of that failure for some time. Having said this, to rise from the ashes of the poor political and organizational leadership decision making that has occurred and to avoid making similar mistakes in the future, requires an examination of the paradigms and practices that guided political leadership decision making in Latin America prior to and during the pandemic. In addition, there must also be an examination, acceptance and application of alternative paradigms and practices more ideally suited to the challenges the region faces at the organizational level.

Before proceeding, it is worth noting that the challenges that this paper is addressing are not unique to Latin America. Much of what is covered here is applicable to business leadership throughout the world. Furthermore, nothing in this paper is intended to suggest that there are any simple solutions to the issues addressed here, including what is proposed in this paper. Nonetheless, solutions must be sought for these problems and this paper attempts to provide insight and understanding regarding how this might occur.

2. Historical Paradigms and Practice in Latin America

In relation to the historic paradigms and practices of leadership within the Latin American cultural context, numerous studies have been published that provide important insights regarding the leadership culture of the region (Behrens, 2010; Castano et al., 2013; Irving & McIntosh, 2010; Kryzanek, 1992; Littrell et al., 2009; Osland et al., 2007; Romero, 2004). While some of these studies have focused on the business leadership culture of the region, most of the literature on leadership has focused on the political leadership culture of the region. Indeed, the literature suggests that the concept of leadership is generally considered to relate most to political leadership within the region (McIntosh, 2011). Historically, however, leadership across sectors has often overlapped as political leaders were often also the economic leaders and tended to manifest similar approaches to leadership across both sectors (Hurtado, 1985).

Culturally, leadership in Latin America tends to be high in power distance and characterized by significantly hierarchical social stratification (Hofstede, 2001; House et al., 2004). Positions of power are pursued by leaders to increase personal influence and authority within society (McIntosh & Irving, 2010; Stephens & Greer, 1995). The need to expand one's influence, appears to be rooted in a cultural dependency on ingroup social networks as a means of survival (House et al., 2004). Control of such groups through positional authority facilitates social ascendance and success (Dealy, 1992). These cultural elements tend to foster a person-centered approach to leadership characterized as *personalismo* (Behrens, 2009; Bordas, 2013; Bown & McClellan, 2017), which is common in "countries where institutions such as bureaucracies, political parties, pressure groups, legislatures, and the like are poorly developed" (Neher, 1996).

Another core cultural value is *leisure*. This value appears to be rooted in a belief precolonial assumption that manual labor is "inappropriate" for positional leaders and represents an underlying force that has shaped the leadership culture of the region (Dealy, 1992).

These cultural tendencies appear to promote a focus on local interests (McIntosh, 2011), building political alliances, seeking access to financial resources (McIntosh & Irving, 2010), reciprocal sharing of political privileges with one's ingroup (which often leads to corruption), and self-protective leadership characterized by strong demonstrations of strength and power combined with stifling resistance (Hidalgo, 2012). The result is a tendency for Latin American leadership to be characterized as a "strong man" form of leadership such as that exhibited by *caciques*, *caudillos*, and *patrons* (Coleman, 2006; Kryzanek, 1992; Romero, 2004).

It is worth mentioning, however, that the collectivist values and the paternalistic nature of leadership within the region tends to temper these tendencies to some extent and in some cases (Bordas, 2013; Hofstede, 2001; House et al., 2004). Latin American leadership has generally been seen to possess an element of paternalistic, reciprocity-based concern for followers' needs resulting in a highly person-centered approach to followership (Behrens, 2010; Bordas, 2013; Dorfman et al., 1997; Martz, Fall 1983; McIntosh & Irving, 2010; Osland et al., 2007). An important element of this highly relational culture, is the concept of *simpatia* (Bordas, 2013). Triandis et al. (1984) explained that *Simpatia* refers to a leader's ability to engage others in a way that causes him or her to "perceived as likeable, attractive, fun to be with, and easygoing" (p. 1363). Furthermore, they demonstrate a sense of social "conformity and an ability to share in other's feelings" (p. 1363). In addition, they tend to behave

“with dignity and respect toward others, and . . . strive for harmony in interpersonal relations” (p.1363). These cultural tendencies cause many to avoid interpersonal conflict and emphasize the positive in positive situations and deemphasize the negative in negative situations (Triandis et al., 1984, p. 1363). Thus, these relational, collectivist, paternal practices are a cultural counterweight to the more power-distant aspects of leadership in Latin America.

Additional cultural characteristics include an emphasis on charismatic influence (Behrens, 2010; House et al., 2004; McIntosh, 2011) rooted in values the precolonial cultural values of dignity and grandeur (Dealy, 1992). This emphasis on charismatic influence is likely partially responsible for the tendency towards populist leadership (De la Torre, 2007; Paz & Cepeda, 2010). Latin American charisma is shaped, to some extent, by the concept of machismo and its roots in the underlying value of manliness (Dealy, 1992) and an underlying cultural value for craftiness and deception that often results in dishonesty and corruption (Dealy, 1992; McIntosh, 2011). Together, these characteristics foster a charisma culture based on authority that is rooted in power and a strong social presence (Cabane, 2012).

The research has also suggested that traditional approaches to Latin American leadership may be characterized as less planning and team oriented and less participative, and more conflict avoidant (Dorfman et al., 1997; Romero, 2004; Stephens & Greer, 1995). The Globe study, conducted by House et al. (2004), found that within Latin America, leadership practice is characterized by high levels of power-distance and in-group collectivism with low gender egalitarianism and performance orientation. There is also evidence of a higher-than-average emphasis on charismatic and self-protective leadership. However, significant evidence also exists to suggest that these paradigms are changing as the values in relation to leadership seem to be moving towards higher performance orientation and gender egalitarianism and lower power distance as well as higher participative and team oriented leadership (House et al., 2004).

These traditional paradigms and practices of leadership suggest a tendency for leaders to approach situations such as the pandemic with an autocratic and authoritarian approach to decision-making characterized by a paternalistic approach to leadership. This approach is likely motivated by face-saving, self-protective concerns that emphasize concern for the leader’s positional power and in-group needs. This response is consistent with the commander approach that Grint (2020) suggests is appropriate for dealing with what he calls critical problems. Unfortunately, it is not well suited to problems like a global pandemic, poverty, social injustice, or any of the myriad of challenges Latin America faces today.

3. Types of Problems and Leadership

It is no secret that different situations call for different approaches to leadership. Ever since the early trait and style research studies failed to find a single set of traits or a single style that predicted effective leadership in all situations, researchers have recognized that leadership is situational (Ayman, 2004; Lussier & Achua, 2007; Northouse, 2019). In his work on adaptive leadership, Heifetz (1994) suggested that the nature of the problems one faces partially determines the approach to leadership that should be taken. He postulated that leaders face two types of challenges: adaptive and technical problems.

According to Heifetz (1994), technical problems are based on recurring issues that are well known and understood, as a result, they can be resolved using already

existing knowledge, processes, and responses. In contrast, adaptive challenges are more complex, systemic, and not well understood. Consequently, the knowledge that leaders need, the responses that are required, and the processes that must be employed to address these issues do not exist when the problems arise. As a result, dependency on the “application of current technical know-how or routine behavior” is more likely to exacerbate the problem than to solve it (p. 35). This is evident in the unintended economic, social, political, and educational consequences unleashed because of the initial quarantine responses of leaders to the pandemic.

Grint (2020) offered a more expansive model for thinking about challenges by suggesting that there are actually three types of problems and three corresponding responses. The first type of problem is tame problems, those that occur on a regular basis and for which standard, well-worn and effective responses already exist. He argues that these require only “management” responses. Critical problems, or crises, are challenges that arise that are expected and understood, with set solutions, and require serious, urgent, and timely responses. According to Grint (2020), traditional crisis leadership approaches of acting based on prepared responses using commanding leadership are essential in these situations. Thus, the traditional Latin American approach to leadership, which mirrors this commanding style, is relevant and potentially effective in these situations.

In contrast to these tame and critical problems, are what Grint (2020) terms wicked problems. He argues that these challenges are ones that “are complex” and “may not be solvable.” Nonetheless, they “might be ameliorated with a collective response” characterized by collaborative efforts, systemic thinking, and active experimentation on the part of the collective community. This is the kind of challenge that covid-19 presented to leaders across the globe. In addition, the generally paternalistic, and authoritarian managerial and commanding responses to this wicked problem largely failed to address the virus and, as suggested previously, only created more problems. Grint (2020) argued that this is because authoritative leadership or managerial practices cannot address these kinds of issues. What is needed is leadership. To be more specific, the kind of leadership that Heifetz (1994) referred to as adaptive leadership.

This approach suggests that the work of responding must be given back to the people who need to make the affective, cognitive, and behavioral changes necessary to respond to the problem because these changes must occur in their paradigms and practices. Thus, followers must be enlisted to participate in and take ownership of the responses. This means that, according to Heifetz (1994), leaders must, first, recognize “the adaptive challenge” or “wicked” problem. Then they must “focus attention on the specific issues created by” the problem to help people see the need for change. In doing so, they must also transition from an authority-based approach to a more facilitative leadership approach (p. 99) by inviting others to accept responsibility for taking part in the change and then supporting them in making changes.

Heifetz (1994) recognized that this lack of an authoritative response can lead to distress as people often expect leaders to make decisions for them, especially in high power-distance cultures. Nonetheless, he argued that authoritative responses do not promote the fundamental transformation needed nor do they honor the complexities of the system in which change is being made. Therefore, adaptive leaders must regulate the distress levels people experience (too much and they become overwhelmed, too little and they do not see the need for change) while bringing attention to the need for change and the lack of set answers, and inviting participation in the change process (Heifetz, 1994; Heifetz & Laurie, 1997; Heifetz & Linsky, 2002).

As followers come to the table, the leader must then facilitate the process of solution finding by involving people in dialogue about the need for change and the changes that need to be made based on an understanding of the big picture and through engaging in the work of building relationships, managing attention, providing information, managing conflict, and facilitating decision-making and action (Heifetz, 1994; Heifetz & Laurie, 1997; Heifetz & Linsky, 2002). To do this, people must be willing to either set aside private agendas and political preferences or at least surface these and take them into consideration, and leaders must model the way by encouraging others through their actions and the stories they tell. This requires seeking and sharing accurate information without bias to facilitate the process and avoid groupthink.

Clearly, the current challenges that leaders face in Latin America, and throughout the globe, are of all three types: tame, critical, and wicked. Consequently, all three approaches to leadership are needed. Unfortunately, the commander approach that works well for critical issues appears to represent the traditional approach in Latin America that is used, by default, to address most problems. Effective management and adaptive leadership are needed. Effective management is simpler. There are multiple models for its application throughout Latin America. Adaptive leadership is more challenging, and yet, problems like Covid-19 highlight the need for a greater application of this leadership approach.

As is evident, however, adaptive leadership sharply contrasts with the traditional approach to leadership in Latin America. Likewise, it does not align with follower expectations of how leaders will solve problems for them. Thus, the distress level of such leaders and their followers is likely to be high. Leaders who strive to take the approach advocated for by Grint (2020) and Heifetz (1994) may find themselves rejected based on the incongruence between their approach and the culturally accepted norms for leader-follower relationships, which in Latin America tend to be characterized by paternalism, disloyal opposition, weak political structures, and revolutionary tendencies. What is likely needed is an approach to leadership that incorporates both traditional approaches and more adaptive responses.

4. Combining Approaches

An example of this middle path can be found in the work of Ricardo Semler (Semler, 1993). Semler inherited the family business, Semco, from his father in Brazil. He also inherited a very traditional approach to leadership. However, health problems and other issues led him to a realization that a change needed to occur in his business. As a result, he developed a vision of a highly adaptive, democratic workplace that gave not only the work back to the people but also, ultimately, removed himself as the head of the organization. Interestingly, his approach to implementing these changes was anything but democratic, at least at first. He began by firing his leadership team because they would not support the changes. He then began imposing changes on the workforce in a very authoritarian way. As these changes took hold, the process of change transitioned to a more democratic approach. The result was the creation of what is, perhaps, one of the most democratic organizational cultures in the world. He then used the same approach in a government position to which he was appointed.

Semler used a very traditional, Latin American approach to implement a democratic structure and culture that resulted in his being able to, ultimately, lead in a way that was more consistent with the adaptive leadership model. Latin America may require a similar approach, using more traditional leadership approaches to implement adaptive leadership processes.

The need to apply more effective, adaptive leadership approaches to the “wicked” problems of modern society suggests a need for change in the paradigms and processes of political leadership in Latin America. Fortunately, there is evidence that such changes are desired and occurring because of the introduction of new ways of thinking about leadership and new approaches to leadership (Hidalgo, 2012; Romero, 2004). These changes are evidenced by the shift in leadership values suggested by the GLOBE study (House et al., 2004). As mentioned previously, these include a transition towards higher performance orientation and gender egalitarianism and lower power distance as well as higher participative and team-oriented leadership. It will be interesting to see how these have evolved in the second GLOBE study, which is now in the works.

All of these culture shifts are more aligned with adaptive leadership practices, and are, at least in part, likely a result of the increasing involvement of women and other traditionally excluded social groups as leaders in Latin America (Bown & McClellan, 2017; Jalalzai, 2016; Muller & Rowell, 1997; Osland et al., 1998). Indeed, it may be more than coincidence that women leaders are at the head of some of the countries that have best handled the covid-19 problem. With the changes that are occurring, the cultural context of Latin America may be in the early stages of ripening for the kind of changes that are needed. Nonetheless, culture change occurs slowly and the traditional leader and follower approaches take time to change as well (Schein, 1992). However, as the example of Semler and other similar culture changes suggest, this may be best achieved by leaders who take a more authoritative approach to the effort to initiate change but then use a more adaptive methods to facilitate the actual change.

This is viable if one views the need for change in leadership culture as a critical problem or crisis, one that merits urgency and uses established methods for addressing the problem. Leaders can then use the traditional approach to leadership to enact an adaptive leadership process to facilitate the change and create a more adaptive leadership culture. This would likely involve authoritative decision-making regarding the need for change and the implementation of change, combined with clear communication that the process of adaptive leadership represents a well-established method to facilitate that change. In the process of doing so, they could then shift their own approach to leadership, as Semler did, as the culture ripens for such changes. Quinn (2000) described a process for leading change that is consistent with this approach.

Quinn (2000) called his approach Advanced Change Theory (ADT). It begins with the leader capturing a vision of the potential for change that can only emerge in and through productive community. Quinn defines productive community as “an envisioned set of relationships that are synergistic in which the collective good and the individual good are one” (Loc 3055-3056); or, in other words, a group that is working together in accordance with the principles of adaptive leadership.

Once the leader captures a vision of what can be achieved through productive community, he or she must look within to establish a way of being that is consistent with the kind of leadership that is needed to facilitate adaptive leadership work. Quinn (2004) described this way of being as purpose centered, other focused, internally directed, and externally open. What this means is that the leader must commit to the change at a personal level and then clarify and commit to a clear sense of purpose and vision that takes into account the collective needs and desires of all stakeholders while ensuring that the process is values based and open to feedback and adaptation. This ensures that the leader will be able to make the transition to adaptive leadership as the system becomes more accepting of such an approach.

In order to ensure that the commitment to change is real, the leader then focuses

on recognizing the gaps between his or her desired way of being and acting and his or her actual way of being and acting and strives to close these gaps (Quinn, 2000). In the approach suggested here, this transition takes place slowly and publicly as a symbol for the change that is taking place in the broader community. This process can elicit fear for the leader as his or her hypocrisy is revealed and the community must embrace the realization that while the path to change may be clear (the adaptive leadership approach), there is little clarity about how it will evolve and what the ultimate outcome will be. This fear, as Heifetz (1994) explained, must be maintained within a stable holding environment to move the process forward. This requires balancing conflict with psychological safety (Schein, 1992). According to Quinn (2000) the leader must strive to align follower goals with those of the goals of the group, consistent with the model of transformational leadership (Bass & Riggio, 2006), and embody the collective vision in the story he both tells and enacts through his or her own behavior, as suggested by Kouzes and Posner (2012) and Gardner and Laskin (1995). Having done so, the leader is ready to begin to disturb the system.

The idea of disturbing the system emerges from the theoretical realm of complex adaptive systems (Quinn, 2000). These systems are unpredictable and chaotic and function as “living” organisms that have the ability to self-organize and generate creative responses through initiative, communication, feedback, and relational interaction (McClellan, 2011). They are characterized by adaptive wicked problems and can, therefore, only be engaged with through adaptive leadership processes that involve disturbing the system. In his book, Quinn (2000) specifically states that leaders need to use the adaptive leadership process of Heifetz to engage in the kind of disturbing of the system that this step requires. As they do so, leaders need to influence others with moral power as opposed to legitimate authority. This means ensuring that the leader maintains his or her commitment to the transformation by managing his or her way of being, thinking, and acting so as to align these with the adaptive leadership process that is being pursued. This can be achieved by taking the following actions based on the research reviewed here.

To begin with, leaders need to recognize the problem as a wicked problem and an adaptive challenge. This means realizing that no known solutions exist and that responses will require comprehensive, systemic understanding of the problem and deep cultural change in relation to the solution. Nonetheless, they will need to act in a strong decisive way, consistent with the cultural paradigms of leadership in Latin America, to galvanize support. In doing so, they will need to organize in ways that allow for adaptive leadership approaches that promote cultural change.

Early in the process, leaders will need to do what Heifetz (1994) calls “getting on the balcony”. When an adaptive or wicked problem arises, it is important to get a systemic perspective of the challenges. At the outset of the pandemic many leaders organized Covid response teams. However, these teams were often, at the national level, either made up nearly entirely of politicians and health professionals. Unfortunately, such limited disciplinary teams were incapable of providing the necessary broader insights regarding social, political, economic, educational, and cultural implications of issues such as those created by Covid and, therefore, unable to provide comprehensive systemic solutions that avoid the unintended consequences that the narrowly considered responses often created. An interdisciplinary team is needed to provide the kind of perspective and recommendations that are needed to address complex, multifaceted wicked problems. It is also important that such teams be as non-partisan as possible to elicit trust across the political spectrum of the society.

Unfortunately, this was not the approach taken by most political leaders. As a

result, business leaders were dependent upon information that was largely derived from these myopic bodies to guide their own responses. In the absence of such guiding teams at the political level, organizations may have been better off had they created their own response teams that took guidance not only from these political bodies, but also looked to other sources for more interdisciplinary information on how to respond to the situation.

In addition to broadening the sources from which they glean information, these internal response teams would be wise to establish a set of guiding principles to shape and direct their work, resembling how Semco reorganized their work to embody the principles of democratic participation. The kind of principles needed to facilitate the type of deep change suggested here are embodied in the literature reviewed previously. They include those reflected in the fundamental state of leadership outlined by Quinn and Spreitzer (2006): be purpose centered, clearly articulate the purpose that is being pursued and stay true to that purpose while avoiding partisan goals and ends; be internally driven, establish guiding principles and values and examine and align processes and actions with these values; be other focused, identify and respond to the challenges, needs, and desires of the people broadly; be externally open, and be humble and open to feedback and information even when it goes against one's own perceptual biases. This means communicating the principles widely and seeking feedback to ensure that the work of group is consistent with these principles. As part of this effort, leaders should work to expand a coalition of support, sway the middle, and make sure to include the opposition by readily accepting their feedback without bringing excessive attention to it (Heifetz & Linsky, 2002). The team should regularly reestablish its commitment to its guiding principles and examine its processes to ensure alignment.

Having established guiding principles, the team needs to share significant and valid information widely that allows people to understand the nature and complexities of the problem that is being faced. Currently, most people in Latin America are acquiring their information via the internet and social media (Salzman, 2015). In general, such information is suspect as it is generally highly biased and occurs within networks that facilitate confirmation bias and create echo chambers, in which people's often unfounded political biases are simply reinforced due to a lack of diversity and dialogue (Modgil et al., 2021). At the same time, they should ensure that information that increases the stress on individuals is balanced with information and efforts that provide a sense of psychological safety and support that effectively manages the symbolic holding container within the organizational environment.

The team should then organize and lead change at the local level within the organization. Consistent with the principles of adaptive leadership and advanced change theory, the people who are making the change need to be involved in the effort to bring about the change. As Heifetz (1994) explains, there is a need to "get to the balcony" in order to gain perspective, but changes need to be made "on the dance floor" where the action is taking place. This means identifying lower level and informal leaders of influence within the organization and helping them organize action learning groups armed with information that allows them to propose strategies and take action at their level in collaboration with coworkers to address the issues that arise throughout the organization. Communication between these local elements and the organizations primary response team should be managed carefully to ensure accurate and honest feedback, collaboration across the organization, and alignment with the principles that guide the effort. Given the cultural tendencies of Latin America, it is likely that strong, personalistic, charismatic leadership will be needed to

organize these teams and to communicate the purpose and principles in the process of initiating these teams. This approach will then give way to more principle centered leadership as the teams move forward.

Conclusion

If this sounds like an idealistic and significant challenge, it is. This paper is not meant to suggest that the challenge of achieving the kind of change that is being proposed is small in any way. There is evidence that societal culture changes do not happen quickly or without issues (Neher, 1996). Indeed, the need to change the way we approach political leadership in the face of the wicked challenges that we are encountering is, itself, a wicked challenge. Nonetheless, the global pandemic we have experienced has revealed to us, even more than before, the limitations that the traditional approaches to political leadership in Latin America possess. This is a wicked problem. Fortunately, this problem is also a crisis, in that models of leadership do exist and processes for facilitating change have been provided to meet this challenge. Progress is possible and the potential benefits merit the effort. Leaders can use the traditional, culturally accepted approaches to leadership to initiate these processes and begin to facilitate the kind of transformation that is needed. Using the adaptive leadership process and the ACT model for change, leaders can bring about changes like those Ricardo Semler achieved at Semco. These will likely have to be adapted to meet the unique cultural contexts in which they are applied. Nonetheless, they represent a solid foundation for bringing about change. It also merits reiteration that these challenges are not unique to Latin America. They are global issues, but each cultural context will have to face them in their own way. The approach outlined in this paper is based on the cultural context of Latin America, but may be adaptable to other contexts. Ultimately, however, whether leaders and followers in Latin America, and throughout the world, are ready for these changes, can only be determined as these changes are pursued.

Conflict of interest

The authors of this manuscript state that there are no conflicts of interest with any entity or institution, or of a personal nature in this publication.

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DOES “GOOD ACTING REQUIRES A GOOD CAST?” A REPLICATION STUDY OF HOW TEAM DEEP ACTING DISPERSION INFLUENCE INDIVIDUAL OUTCOMES

“¿LA BUENA ACTUACIÓN REQUIERE UN BUEN ELENCO?” UN ESTUDIO DE RÉPLICA DE CÓMO LA DISPERSIÓN DE ACCIÓN PROFUNDA DEL EQUIPO INFLUYE EN LOS RESULTADOS INDIVIDUALES

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Abstract

Previous research shows that emotional labor, or having to display certain emotions in the workplace, has significant implications for employees and their working environments. In this study, we replicate the claim from Becker and Cropanzano (2015) who suggests that the effect of individual deep acting on job performance would be moderated by team-level deep acting dispersion, such that the relationship between deep acting and performance would be positive and stronger in teams with low dispersion. Our replication included 130 participants with complete data, nested in 23 teams, in a high complexity and high demand public hospital in Santiago, Chile.



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We collected data in December-January of 2021. We focused on testing the interaction term alone but we also replicated the entire original model from Becker and Cropanzano (2015). Although the targeted interaction effect was not significant in our study (not replicated effect), it is interesting to note that other hypotheses in Becker and Cropanzano (2015) were indeed replicated. For example, team-level deep acting dispersion was indeed a significant cross-level moderator of the relationship between individual deep acting and emotional exhaustion. We discuss the main results, the replication conditions, and the managerial implications for a Chilean population.

Keywords: Direct Replication, Emotional Labor, Deep Acting, Teams

Resumen

Investigaciones anteriores muestran que el trabajo emocional, o tener que desempeñar ciertas emociones en el espacio laboral, tiene implicancias significativas para los trabajadores y sus ambientes laborales. En este estudio replicamos los hallazgos de Becker y Cropanzano (2015), los cuales sugieren que el efecto de la actuación profunda en el desempeño laboral puede ser moderada por la dispersión a nivel-equipo de la actuación profunda, de tal manera que la relación entre actuación profunda y desempeño será positiva y más fuerte en equipos con una baja dispersión. Nuestro estudio de replicación incluyó las respuestas completas de 130 participantes, agrupados en 23 equipos, provenientes de personal de enfermería de un hospital público de alta demanda en Santiago de Chile. Los datos fueron recolectados entre los meses de Diciembre-Enero del 2021. Si bien nos enfocamos en probar el efecto interacción por sí solo, también replicamos la totalidad del modelo original de Becker y Cropanzano (2015). A pesar de que el principal efecto interacción no fue significativo (no hubo efecto replicado) en nuestro estudio, sí resultó interesante dar cuenta que las otras hipótesis de Becker y Cropanzano (2015) efectivamente fueron replicadas. Por ejemplo, la dispersión a nivel-equipo de la actuación profunda resultó ser un moderador significativo en la relación entre la actuación profunda individual y el cansancio emocional. Discutimos los resultados principales, condiciones y contexto de la replicación, y las implicancias en gestión de personas para la población chilena.

Palabras claves: Replicación Directa, Trabajo Emocional, Actuación Profunda, Equipos de Trabajo.

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1. Introduction

The literature on emotional labor has consistently grown since the seminal work of Hochschild (1979), who argued that emotional display is a fundamental act of management. This idea argues that individuals either induce or inhibit emotions so as to render them “appropriate” to different types of organizational circumstances. Today, there is extensive evidence suggesting that organizations attempt to regulate the emotional expression of their employees’ through formal and informal expectations (Diefendorff & Greguras, 2009; Rafaeli, 1989). For example, there are multiple situations where workers are required to show specific types of emotions, from the line workers who interact with customers and are asked to be enthusiastic, positive, and helpful; to the CEOs who have to get approval from the board of directors to execute special projects and need to express confidence, excitement, or serenity. Emotional regulation, thus, has become a paramount area of research in organization studies.

The act of displaying emotions within organizations can have either positive or negative consequences for those performing them. The evidence suggests that having to face these organizational expectations of emotional expression frequently conflicts with felt emotions, thus requiring physical and psychological effort in order to meet such expectations (Cropanzano, Weiss, & Elias, 2003; Diefendorff & Gosserand, 2003; Grandey, 2000). Using a “dramaturgical approach,” researchers have suggested that individuals normally engage in two types of strategies when they need to show specific emotions (Cropanzano et al., 2003; Grandey, 2003), and that these strategies create different effects. On one hand, individuals may use “surface acting” or expression of emotions based on the regulation of body and language, without modifying his/her inner feelings. On the other hand, individuals may use “deep acting,” which is based on an actor’s attempt to modify the inner feelings in order to match them with the required emotional displays. Thus, deep acting has been called “faking in good faith” (Rafaeli & Sutton, 1987). Although both strategies require effort and consume cognitive resources, surface and deep acting generate completely different effects on employees (e.g. Diefendorff & Gosserand, 2003; Grandey, 2000, 2003), with more negative effects correlated to surface acting (e.g., emotional exhaustion).

During the last 10 years, researchers have tried to expand this literature by characterizing the social conditions under which the effects of deep and surface acting hold. In 2015, Becker and Cropanzano (2015) proposed that the effect of individual deep acting on job performance would be moderated by team-level deep acting dispersion, such that the relationship between deep acting and performance would be positive and stronger in teams with low dispersion. This claim is reflected in the following statement from their abstract: “Our findings suggested that team-level deep acting effects can foster benefits for team members (lower emotional exhaustion and higher satisfaction) and organizations (higher job performance).” The main argument from this paper is that when team deep acting dispersion is low there should be a team affective convergence, helping individuals deep act with relatively little effort. In contrast, in teams with a high dispersion of deep acting levels, individuals must exert additional cognitive efforts to maintain an emotional display in the face of inauthentic or inappropriate displays by their teammates. In this situation, deep acting should be much more emotionally exhaustive in contrast to teams with a low dispersion of deep acting.

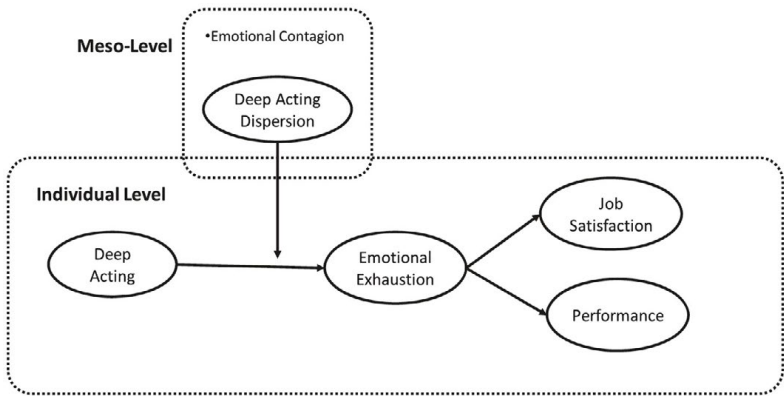
Although Becker and Cropanzano (2015) found preliminary evidence to support

some of their hypotheses, it is still not clear whether their results are replicable in different samples or situations. Replicating this research is important for better understanding emotional regulation at work, as these results have significant theoretical and practical implications. This research suggests that deep acting is not only an individual phenomenon, but it also operates at the team-level such that the convergence of the use of deep acting strategies may be helpful for individual workers. Replications studies are instrumental to expand credibility of original findings, to test allegedly true claims in different contexts, or to find relevant boundary conditions where results hold (Kausse, 2015; Olavarrieta & Diaz, 2021; Ryan, & Tipu, 2022; Stanley, & Spence, 2014). Although replications have been deemed as less “hot” than original papers, they are a fundamental endeavor of scientific development. Antonakis (2017) suggested that organization science is suffering from “neophilia”, or an excessive appreciation for novelty. Fortunately, recent efforts have started to change that trend, with new journals focusing on replications studies (e.g., *Journal of Management Scientific Reports*), traditional journal now accepting replication studies (e.g., *Organizational Research Methods*), or special issues in local journals, like this one in *Estudios de Administración*. In order to increase the confidence of the scientific report published by Becker and Cropanzano, we conducted a direct replication study following the highest possible research standards.

2. Description of Original Study

The original study of Becker and Cropanzano tested the model depicted in Figure 1. Although in their original publication the authors tested 6 hypotheses (Table 1), we will focus on hypotheses 4b, which suggests that there will be a negative interaction between individuals’ deep acting and their work team’s deep acting dispersion on individuals’ in-role performance. In our view, this is the hypothesis with the highest scientific and practical value, as it suggests that team-level deep acting not only has implications for individuals (effects on emotional exhaustion or job satisfaction) but also implications for organizations (effects on job performance). To fully test this hypothesis, the authors presented both the interaction and simple slopes analysis, both of which supported the hypothesis.

Figure 1. Original Becker and Cropanzano’s (2015) Theoretical Model



Source: Original paper Becker and Cropanzano (2015)

The original study of Becker and Cropanzano considered the participation of nurses’ teams at a hospital in the United States. According to the authors, their sample was a strong setting because: (1) they could classify nurses into teams, (2) teams were interdependent, and (3) nurses needed to be engaged in a job that was emotionally challenging and with clear display rules. Later on, it was analyzed to what extent work teams can mitigate or exacerbate the individual effects generated by having to “act” or display specific emotions in the workplace (e.g. showing tranquility, calmness, security, caring, empathy) in variables such as emotional exhaustion, in-role performance, and job satisfaction.

Table 1. Original Becker and Cropanzano’s (2015) Hypotheses

Hypotheses
<i>Hypothesis 1:</i> In mature teams, some teams will demonstrate greater deep acting convergence than others.
<i>Hypothesis 2:</i> Team-level deep acting dispersion will moderate the effect of individual-level deep acting, such that when dispersion is low, individual deep acting will be negatively related to emotional exhaustion.
<i>Hypothesis 3:</i> Emotional exhaustion will mediate the relationship between deep acting and job satisfaction. This indirect effect will be moderated by deep acting dispersion such that the indirect relationship between deep acting and job satisfaction through exhaustion will be positive and stronger on teams with low deep acting dispersion.
<i>Hypothesis 4a:</i> There will be a positive relationship between individual-level deep acting and job performance.
<i>Hypothesis 4b:</i> The relationship between individual-level deep acting and job performance will be moderated by team-level deep acting dispersion such that the relationship between deep acting and performance will be stronger in teams with low dispersion.
<i>Hypothesis 4c:</i> There will be an indirect effect of deep acting on performance through emotional exhaustion that will be moderated by deep acting dispersion such that the deep acting will be positively related to performance on teams with low deep acting dispersion.

The authors collected data using a cross-sectional design through paper surveys in a two-stage process. First, nurses were surveyed. Participants responded to a series of items through 5-point Likert scales. The questions captured the following variables: deep acting, surface acting, emotional exhaustion, and job satisfaction. Second, supervisors evaluated the job performance of their nurse subordinates in a different survey. Later on, data was matched and analyzed using multi-level modeling (Bryk, Raudenbush & Congdon, 1996; Hoffman, Morgeson, & Gerrass, 2003), where level-2 variables (team deep acting dispersion) interacted with level-1 variables (deep acting) to predict level-1 outcomes (emotional exhaustion, job satisfaction, job performance).

3. Description of Replication Study

3.1 Replication Context

In 2019 our research team joined the efforts of the Center for Open Science under

the international SCORE (Systematizing Confidence in Open Research and Evidence) project¹. The development of methods to automate the assessment of credibility of social-behavior is the primary objective of the project. If successful, the project will present evidence of methods to quickly assess the credibility of scientific findings in various fields. This project contemplates various activities, among which is to carry out around 300 replications of scientific studies published between 2009 and 2018 in top academic journals. This project includes multiple researchers from around the world, who will carry out replication studies in a global community scientific effort.

During the first stage of the project, a series of articles were selected for the theme of human behavior research. Our team has been assigned the task of replicating hypothesis 4b in the study from Becker and Cropanzano (2015) entitled “Good acting requires a good cast: A meso-level model of deep acting in work teams” published in the *Journal of Organizational Behavior*. In this context, we had the task of replicating that research in a Chilean context.

Before conducting our replication, we obtained approval from an Institutional Review Board (IRB), or its equivalent, both in Chile and the USA. Later, we pre-registered the study to the Open Science Framework (OSF), where we detailed all our intended procedures. This pre-registration was reviewed by 2 international independent referees and an action editor (Dr. Ernest O’Boyle, Indiana University), who raised questions and made propositions to improve our replication study. The authors of the original paper (Dr. William Becker) also had the chance to respond specific to questions (e.g., what were the specific items from the original scales that were actually used in the analyses?). All these concerns were solved before our data collection process. The preregistration included details of data design, data collection procedures, sample size, use of variables, analysis plan, strategies for data inclusion/exclusion, and missing data treatment plan. Once the action editor approved the replication, we obtained permission from the COS to conduct the study².

4. Data Collection and Procedures

The data collection site was a big, high-complexity hospital serving the west side of the Santiago metropolitan area in Chile, with 600 hundred beds, 17 surgery rooms, and 50,000 square meters. The site is a public health-care provider, serving low and low/mid-class citizens, most of them relying on public health insurance. The hospital is also an educational site for student residents of a major university in Chile. Although this is one of the most respected hospitals in the country, with high-vocation, high-quality professionals, it normally struggles to get enough public resources to provide optimal health care (providing enough medical supplies, professionals, beds, surgery rooms, etc.) in comparison to private hospitals serving more wealthy populations.

This data setting is very similar to the original study in terms of the organizational mission, employee tasks, nurses’ demand for emotional display, and levels of team interdependence. However, our intended replication was conducted in a different country, and with different environmental conditions. In the following section, we describe the main deviations that we identify from the original study and the approved

1 For more information, visit <https://osf.io/preprints/socarxiv/46mnb/>

2 All the materials used in the replication study are publicly available on the following website: https://osf.io/4h6v2/?view_only=f33e86a1c44342c8b2535051fc4173f7

preregistration.

4.1 Deviations from the Original Study and Preregistration

As the replication was conducted in a public hospital in Chile (vs. a hospital in USA in original study), the instruments were applied in Spanish, using previously validated translations obtained from the “Repositorio de Escalas de Medición” website (escalas.unegocios.cl). Specifically, participants answered four questions on the “Deep Acting” scale and two on the “Surface Acting” scale made by Grandey, Dickter and Sin (2004), five questions from the “Oldenburg Burnout Inventory” adapted from Halbesleben and Demerouti (2005), and three questions from the global scale of “Job Satisfaction” (Seashore, Lawler, Mirvis, & Camman, 1982). Supervisors evaluate the “in-role Job Performance” of each of the participants using a five questions scale adapted from Williams and Anderson (1991).

More importantly, our replication was conducted during a worldwide Pandemic. This condition created three important deviations from the original study and from our approved preregistration. First, during the pandemic, the hospital was constantly at full capacity, workers were experiencing high levels of stress, sometimes accompanied with long shifts, and long periods of time separated from their families. They also experienced different types of interactions with the patients and their families/friends (in comparison to pre-pandemic times), as social contact was minimized. During data collection, the hospital was experiencing high levels of medical leaves and turnover among workers. Therefore, it is unknown whether these conditions may have affected the main claim of this replication.

Second, although the original study was conducted using paper and pencil surveys (we also initially designed our data collection based on paper surveys in our preregistration), we had to change the strategy upon request of the hospital administration and involved worker unions. Government protocols aimed at handling COVID-19 also restricted our interaction with employees to an online format.

Third, the initial power study (conducted by the COS team) provided a target of 1,011 nurses nested within 169 teams. At the time of the pre-registration (January/February 2020), the organization had approximately 1,300 nurses and healthcare technicians clustered in 135 teams, which was our initial group of potential participants. The pandemic started in Chile in March 2020, which put our study on hold. During September/October 2020 the conversations to collect data restarted. At that time, only nurses were still interested in participating in the study, but not healthcare technicians (and their unions), which reduced our potential sample to 454 nurses, nested in 44 teams. The data was collected between December 2020 and January 2021. A total of 281 nurses responded the survey, and we obtained performance evaluations for 235 nurses coming from 44 supervisors. We obtained a perfect match for 130 individuals, clustered in 23 teams. This is clearly a limitation for our replication effort as the main effects may be underpowered.

5. Results and Analysis

Description of the replication data and the original study data is summarized in Table 2 through the comparison of means, standard deviations, and correlations. The original sample was composed by older individuals (44.19 vs 33.45 years, $t = 10.90$, $p < .001$) with a lower mean team tenure (3.25 vs 5.38 years, $t = -4.14$, $p < .001$). The analyses of two independent samples t-tests show that deep acting ($t = 3.97$, $p < .001$), surface acting ($t = 6.84$, $p < .001$), and emotional exhaustion ($t = -3.05$, $p < .01$) were significantly different in the two studies. In contrast, job satisfaction ($t = -.51$, *not*

sig.) and performance ($t = -1.51$, *not sig.*) showed equivalent means. In terms of the correlations, it is interesting to note that some of the dependent variables (i.e., emotional exhaustion and job satisfaction) were significantly related to surface acting but not to deep acting in the original data. In contrast, in our replication, the same dependent variables were significantly related to deep acting but not to surface acting.

In line with the original paper, we used hierarchical linear modeling to replicate all the hypothesis testing. All the hypotheses posed multilevel relationships between team-level deep acting dispersion and individual-level variables. Therefore, hierarchical linear modeling (HLM) was an appropriate analytical approach for investigating these relationships (Bryk et al., 1996; Hoffman et al., 2003). All the analyses were conducted in R, using the “nlme” package. Although some researchers have advised to adjust the p-value to .10 when testing cross-level interaction effects (e.g. Mathieu, Aguinis, Culpepper, and Chen, 2012), we used $p=.05$ to be conservative and more stringent, as this is a replication study.

5.1 Results for Main Claim

This replication tests the claim from Becker and Cropanzano (2015) that the effect of individual deep acting on job performance would be moderated by team-level deep acting dispersion such that the relationship between deep acting and performance would be positive and stronger in teams with low dispersion. To test this claim, job performance was regressed on the cross-level interaction between individual deep acting and team-level deep acting dispersion. The model also included the separate terms for individual deep acting and team-level team acting dispersion, as well as controls at the individual level for age, team tenure, surface acting, and emotional exhaustion, and a control at the team level for deep acting level. The evidence for the claim that we used is the interaction term alone. The interaction effect was not significant ($b=0.16$, $s.e.=0.42$, $p = .7086$)³. Accordingly, we did not conduct a simple slopes analysis. To compare the models tested in the original study and in our replication study, see Model 6 in Table 3 (both in the original and the replication study reports).

5.2 Comparison of Other Hypotheses in Becker and Cropanzano (2005)

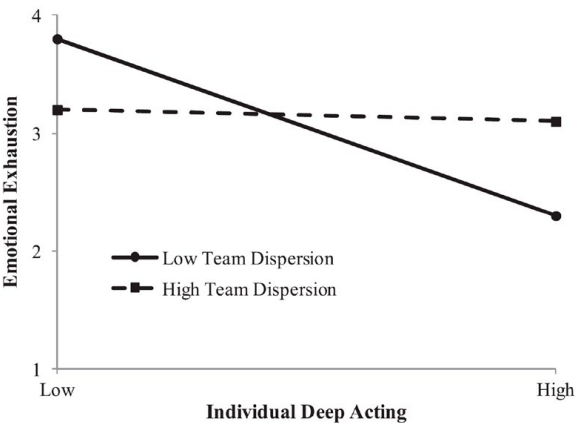
We also tested the rest of the hypotheses proposed by Becker and Cropanzano, which we summarized in Table 1. For hypothesis 1, we only found partial evidence that teams demonstrate greater deep acting convergence than others. Indeed, we found variability in R_{wg} 's (Mean = .76, Min = .34, Max = .95), suggesting that some teams converge in their deep acting levels, and others don't. In contrast to Becker and Cropanzano's study, which found a negative correlation between team deep acting mean level and dispersion, we found that the correlation at the team level was positive, but not significant ($r = .14$, $CI = [-.33; .55]$). The authors suggested that their results “indicated that when teams converged, they tended to converge on higher mean levels of deep acting that was consistent with our meso-level, emotional contagion account.”. In our case, we cannot assert that convergence occurs at any specific level of team deep acting mean.

Hypothesis 2 suggested that team-level deep acting dispersion moderates the effect of individual-level deep acting, such that when dispersion is low, individual deep acting is negatively related to emotional exhaustion. Our results replicated the

³ This model represents Model 6 in Table 2 of Becker and Cropanzano (2015).

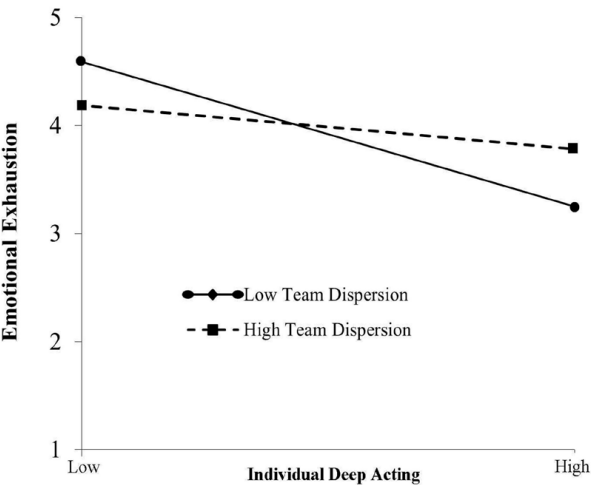
original findings. Table 3 (model 2) shows that team-level deep acting dispersion was indeed a significant cross-level moderator of the relationship between individual deep acting and emotional exhaustion ($\gamma = 0.87, p < .05$). In addition, we also plotted the moderation and found a similar theoretical behavior. Figure 2 shows the interaction plots found for the original study and our own replication study.

Figure 2. a: Original Study
A Replication and Comparison of Replicated Interaction: Moderated relationship between deep acting and emotional exhaustion



Source: Original paper Becker and Cropanzano (2015)

Figure 2.b: Replication Study
A Replication and Comparison of Replicated Interaction: Moderated relationship between deep acting and emotional exhaustion



Source: Original paper Becker and Cropanzano (2015)

Table 2. Descriptive Statistics in Original Study and Replication Study

Student	M	SD	1	2	3	4	5	6	7
1. Age	44.19	11.71							
2. Team tenure	3.25	4.35	.25**						
3. Deep acting	3.90	0.70	.23**	-.06	(.82)				
4. Surface acting	3.23	0.99	.06	-.09	.36**	(.70)			
5. Emotional exhaustion	3.13	0.76	-.18*	.05	.00	.24**	(.74)		
6. Job satisfaction	4.06	0.72	-.01	-.08	-.05	-.26**	-.32**	(.82)	
7. Performance	4.28	0.64	.12	-.08	.08	-.05	-.12	.15*	(.84)

Note: N = 208. Coefficient alpha is provided along the diagonal.
**p<.01, *p<.05.

Table 3. A Replication and Comparison of Main Results.

Student	M	SD	1	2	3	4	5	6	7
1. Age	33.45	6.37							
2. Team tenure	5.38	4.76	.68**						
3. Deep acting	3.57	0.77	-0.05	-0.22*	(0.74)				
4. Surface acting	2.58	0.75	-0.18*	-0.11	-0.03	(0.31)			
5. Emotional exhaustion	3.35	0.56	0.1	0.09	-0.34**	0.05	(0.76)		
6. Job satisfaction	4.1	0.66	0.19*	0.06	0.31**	-0.15	-0.47**	(0.77)	
7. Performance	4.4	0.75	-0.02	-0.04	-0.02	-0.00	-0.05	0.15	(0.92)

Note: N = 208. Coefficient alpha is provided along the diagonal.
**p<.01, *p<.05.

Table 3a. Hierarchical linear modeling results for hypothesis test. Original Study.

Variable	Emotional Exhaustion		Job Satisfaction		In-role performance		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	3.12**	3.10**	4.08**	4.07**	-0.02	-0.02	-0.03
Level 1 variables							
Age	-0.01	-0.01	0.00	0.00	-0.00	-0.00	-0.00
Team tenure	0.02	0.02	-0.01	0.00	-0.02	0.02	0.02
Deep acting	-0.03	-0.20†	0.07	-0.02	0.08	0.17*	0.18*
Surface acting	0.25**	0.25**	-0.25**	-0.15**	-0.05	-0.05	-0.06†

Does “good acting requires a good cast”? A replication study of how team deep acting dispersion influence individual outcomes

Variable	Emotional Exhaustion		Job Satisfaction		In-role performance		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Emotional exhaustion				−0.39**			0.01
Level 2 variables							
Deep acting level		−0.11	0.03	−0.01		−0.03	−0.04
Deep acting dispersion		0.20	−0.33	−0.43		−0.03	−0.01
Dispersion interaction		0.72**	−0.26	0.02		−0.40*	−0.43**
Pseudo- R^2	.22	.23	.27	.39		.27	.28

Note: NL1 = 208. NL2 = 35. Dispersion interaction is the cross-level interaction between individual deep acting and team-level deep acting dispersion. Pseudo- R^2 calculated based on the proportional difference in level-1 variance.

** $p < .01$, * $p < .05$, and † $p < .10$.

Table 3b. Hierarchical linear modeling results for hypothesis test. Replication Study.

Variable	Emotional Exhaustion		Job Satisfaction		In-role performance		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	4.12**	4.15**	3.54**	5.38**	0.64	0.70	1.16†
Level 1 variables							
Age	−0.03*	−0.03*	−0.22†	0.01	−0.01	−0.01	−0.01
Team tenure	−0.03†	−0.03†	−0.01	0.01	0.01	0.01	0.01
Deep acting	−0.18**	−0.26**	0.31*	0.19*	−0.03	−0.08	−0.11
Surface acting	−0.02	−0.02	−0.05	−0.06	−0.14†	−0.16†	−0.16†
Emotional exhaustion				−0.45**			−0.11
Level 2 variables							
Deep acting level		−0.18	0.28	0.21		−0.10	−0.12
Deep acting dispersion		0.34	−0.27	−0.13		0.03	0.06
Dispersion interaction		0.87*	−0.79†	−0.40		0.61	0.70
Pseudo- R^2	0.12	0.17	0.15	0.28	0.03	0.04	0.05

Note: NL1 = 130. NL2 = 23. Dispersion interaction is the cross-level interaction between individual deep acting and team-level deep acting dispersion. Pseudo- R^2 calculated based on the proportional difference in level-1 variance.

** $p < .01$, * $p < .05$, and † $p < .10$.

Hypothesis 3 suggested that team-level deep acting dispersion moderates the indirect effect of deep acting on job satisfaction through emotional exhaustion. First, we estimated the effect of deep acting on job satisfaction in model 3 (Table 3) ($\gamma = 0.30$, $p < .001$). Second, we estimated the effect of emotional exhaustion on job satisfaction controlling for deep acting in model 4 (Table 3) ($\gamma = -0.44$, $p < .001$). Then, we tested the moderated mediation model using an index of moderated mediation, and our results replicated the original findings. The index of moderated mediation was significantly different from zero (Index of moderated mediation = $-0.44 [-0.93; -0.10]$). Similar to

the original result, the indirect effect is stronger at low team deep acting dispersion (Indirect Effect = 0.26 [0.12; 0.46]) than at high levels of dispersion (Indirect Effect = 0.10 [0.03; 0.21]).

Hypothesis 4a predicted a positive relationship between individual-level deep acting and job performance. Becker and Cropanzano did not find a significant relationship, and neither do we ($\gamma = -0.03$, *not sig.*). Thus, we replicated the same result. Hypothesis 4b was detailed in a previous section. Finally, Hypothesis 4c proposed a moderated mediation model, where the indirect effect of deep acting on job performance through emotional exhaustion is moderated by team deep acting dispersion. Becker and Cropanzano did not find a support for this hypothesis, and neither do we (Index of moderated mediation = -0.06 [-0.32 ; 0.15]).

6. Discussion

Although the targeted interaction effect was not significant in our replication study (not replicated effect), it is interesting to note that other hypotheses in Becker and Cropanzano (2015) were indeed replicated. Team-level deep acting dispersion was indeed a significant cross-level moderator of the relationship between individual deep acting and emotional exhaustion. In addition, we also found that team-level deep acting dispersion moderated the indirect effect of deep acting on job satisfaction, through the effect of emotional exhaustion. These results are interesting as they suggest that very similar emotional processes may occur in team samples from different countries and cultures.

More specifically, this study contributes to the field of organizational behavior and emotions in the workplace by replicating and questioning some of the allegedly significant effects of deep acting at the team level on individuals and organizations. Similar to the original study, we found that team-level deep acting dispersion has significant cross-level moderation effects on individual outcomes such as emotional exhaustion and job satisfaction. These results strengthen our confidence on previous scientific claims asserting that managing deep acting in work teams, especially in contexts where emotional exhaustion is significant, is likely to be a productive “act of management.” Thus, training nurses to acquire deep acting strategies could have positive impacts in reducing the dispersion of emotional display, reducing the levels of emotional exhaustion, and increasing the levels of job satisfaction.

In addition, our replication provides more evidence that the dispersion of team members’ deep acting may have an effect on individuals, suggesting that processes of emotional contagion are relevant in this situation and that emotional resources are likely to be shaped by the social environment where individuals work. Our replication study found significant effects in a sample collected in a different country (Chile)—with its unique culture (more collectivistic than the USA), in a significantly different context (COVID-19 pandemic), and with less experienced teams (with significantly lower age and higher team tenure). This evidence supports the claim that team-level deep acting dispersion matters.

Nevertheless, we couldn’t find evidence for the main tested claim that proposed that team-level deep acting dispersion produces a difference in terms of job performance. Several alternative explanations could have explained our inability to reproduce this effect. First, our replication study was underpowered. In fact, due to several complications in the data collection process, we ended up having a smaller sample size in comparison to the original study. Additional efforts in the future should be conducted to replicate this study with a bigger sample size. Second, we

could not find any significant relationship between either emotional exhaustion or job satisfaction, and job performance. We believe it is plausible to think that the pandemic conditions could have blurred these relationships. During the final presentation of our research team to the hospital, the nurse coordination team emphasized that they were “fighting a war” against the pandemic, and that “nurses are really walking the extra mile” during this time despite their exhaustion, stress, or burnout symptoms. Having to work under these conditions was seen at that moment as a sign of heroism, a norm that could have decreased the relationship between emotional exhaustion and job performance. Third, the pandemic could have changed the supervisors’ perceptions of what is considered high performance. For example, small mistakes due to emotional exhaustion may have been seen as normal (or a more tolerant situation) in these extreme conditions, with supervisors putting more weight to more essential functions.

Finally, we have to acknowledge some important limitations. As we tried to provide a direct replication of the original study, we imitated the study design as much as possible, and thus, our study suffers from some of the same limitations as the original study. For instance, although the original study relies on emotional contagion processes to justify the main effects, we did not include any measure to capture this process. Second, our study also focuses on nurse teams, and thus we cannot say whether these results can be replicated in other types of jobs or industries. Third, the cross-sectional nature of the study creates ambiguity in terms of the causal ordering of the variables, and raises questions about common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In contrast, our replication study and its results also have some strengths. First, although cross-level moderation effects in multilevel modeling are extremely underpowered (Mathieu et al., 2012), we were able to replicate some of Becker and Cropanzano’s (2015) findings. This suggests that some of the tested effects are generally strong and with a high external validity. Second, although replication studies are rare and infrequent, and even rarer and more infrequent in a Latin American context (Olavarrieta & Diaz, 2021), we were able to contribute to science development in the region. Finally, this replication study was supported by a broader team of researchers who provided rigorous early feedback. This was particularly helpful to strengthen the design of our direct replication.

Conflict of interest

The authors of this manuscript state that there are no conflicts of interest with any entity or institution, or of a personal nature in this publication.

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A CONCEPTUAL REVIEW OF THE LITERATURE ON BRAND PERSONALITY

UNA REVISIÓN CONCEPTUAL DE LA LITERATURA SOBRE PERSONALIDAD DE MARCA

JEL Classification: M30, M31

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Abstract

The purpose of this study is to contribute to the knowledge of the systematization of the concept of brand personality by exploring examples of its main research via a review of the literature. We conceptually analyze the brand personality construct and review the extant findings regarding it using the antecedents, consequences and moderators identified by Eisend & Stokburger-Sauer (2013) as our methodological framework. Throughout this work, we provide a series of proposals that pose questions that merit review and exploration. Additionally, we identify some antecedents that point to emerging areas of research, and we posit that these will receive important development in the near future. Recently, the concept of brand personality has become increasingly important via greater theoretical and practical development. This situation constitutes a natural response to the social and technological trends that are taking consumer relationships to a new level. Accordingly, our findings underscore the elements that comprise a favorable context for generating brand personality and highlight its consequences and its impacts.

Keywords: Brand personality, Brand loyalty, Hedonic benefits, Brand image, Strength of the brand relationship.



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Resumen

El propósito de este estudio es contribuir al conocimiento de la sistematización del concepto de personalidad de marca explorando ejemplos de sus principales investigaciones a través de una revisión de la literatura. Analizamos conceptualmente el constructo de personalidad de marca y revisamos los hallazgos existentes al respecto utilizando los antecedentes, consecuencias y moderadores identificados por Eisend & Stokburger-Sauer (2013) como marco metodológico. A lo largo de este trabajo, brindamos una serie de propuestas que plantean preguntas que revisión y exploración de méritos. Adicionalmente, identificamos algunos antecedentes que apuntan a áreas emergentes de investigación, y postulamos que estas recibirán un importante desarrollo en un futuro cercano. Recientemente, el concepto de personalidad de marca ha cobrado mayor importancia a través de un mayor desarrollo teórico y práctico. Esta situación constituye una respuesta natural a las tendencias sociales y tecnológicas que están llevando las relaciones de consumo a un nuevo nivel. En consecuencia, nuestros hallazgos subrayan los elementos que componen un contexto favorable para generar personalidad de marca y destacan sus consecuencias y sus impactos.

Palabras Clave: Personalidad de marca, Lealtad de marca, beneficios hedónicos, Imagen de marca, Fortaleza de la relación de marca.

1. Introduction

A brand is a fundamental element in administration since it conditions the way in which people perceive a product (Calkins, 2005). Today, even for successful companies, the creation and management of a brand represents a great challenge. This reality illustrates the importance of considering the concept of the brand, its theories and the guidelines that are associated with brand management (Keller, 2003). In particular, a brand is considered an important intangible asset and can be appreciated via the conceptualization of the value that it brings to a company: brand capital. The definition of this concept incorporates the elements of brand loyalty, brand awareness, perceived quality, brand associations and other brand assets (Aaker, 2012). Thus, through brand performance, it is possible to access value creation in terms of market share, price elasticity and premium prices (Keller & Lehmann, 2003).

Among the concepts associated with a brand that add value to it, there is one of particular interest due to its holistic nature concerning an analogy between a brand and the personality that develops around it. Although this concept of “brand personality” has been used since the 1950s (Ogilvy, 1955) or even earlier, it was not until 1997, when researcher Jennifer Aaker proposed a more elaborate definition of the construct and its dimensions, that the basis for measuring it was established. From that moment, the concept began to gain strength and receive greater prominence in marketing research.

Initially, during the systematization of the concept, its scientific discussion focused

mainly on the interpretation of the dimensions of the brand personality construct (Aaker, 1997; Caprara *et al.*, 2001; Olavarrieta *et al.*, 2010). Then, the focus shifted to its application in different contexts and its connection with specific situations or products (e.g., Hem & Iversen, 2002; Venable *et al.*, 2003; Park *et al.*, 2005). Today, research continues to develop, with various modifications innovating the concept of brand personality.

Although the number of publications on brand personality has increased over time and its research structure has been importantly developed (Llanos-Herrera & Merigo, 2018), there is no concrete definition of brand personality. This seems to be the result, in large part, of the conceptual differences that can be observed in the literature. Hence, there is a need for a formal systematization that adopts the findings of previous research and integrates them through a critical conceptual review that promotes a cross-sectional view of this concept.

Therefore, the objective of this work is to contribute to the literature by reducing this knowledge gap through a systematization of the concept of brand personality and its research via a review of the literature and the approaches of its propositions. To achieve this objective, this work comprises two main parts. First, the concept of brand personality is reviewed, and its conceptual quality is evaluated. Then, the main extant findings on the concept of brand personality are reviewed, including some emerging areas in brand personality research. These areas represent interesting research opportunities, which we present in the form of proposals that we expect to contribute to the consolidation of the concept of brand personality. Ultimately, through our investigation of its relationships with other fundamental current marketing concepts, we intend to show that the concept of brand personality has an important potential to continue developing.

2. Methodology

One of the most important aspects of academic research is to use a methodology that ensures impartiality of the data. For this reason, the first step we carried out was the systematization of the specific information related to the number of salient publications, journals, authors, universities and countries via data obtained on the *Web of Science* (WoS), offered by Clarivate. Although there are other sources of relevant information, this article was based mainly on this database.

For the development of the research, we searched for the concept of brand personality in titles, abstract and keywords to specifically obtain articles directly related to the construct as defined by Aaker (1997). As of May 2021, there were 690 articles that included the concept of brand personality among their topics, distributed across five types of publications: articles (666), early accesses (23), proceedings (15), reviews (19), editorial materials (3), meeting abstracts (1) and corrections (1). To focus on the main articles, the results were filtered by articles and reviews, providing 685 publications for analysis.

To systematize and integrate the research in this selection of articles, we followed the methodologies suggested by Torraco (2005) and Chaffee (1991). Its structure was also based on the results obtained in the meta-analysis developed by Eisend & Stokburger-Sauer (2013). Thus, this work proceeds as follows: In part three, the results of our analysis and our evaluation of the concept of brand personality are presented, and we address the background of the construct, its consequences and the moderators that affect it. In part four, the discussions are presented, and some emerging areas

of research are identified. Finally, in part five, the main conclusions of this work are articulated.

3. Results

3.1. Conceptualization of Brand Personality

3.1.1 Brand personality concept

Since its inception, brand personality has been accepted by the business world and some academics. However, it is a concept that has been criticized for its conceptual and methodological aspects (Aaker & Fournier, 1995). Moreover, today, given the complexity of its structure and its ambitious scope, there are so many elements to consider that it has been difficult to clearly and definitively systematize the components of brand personality. As a result, there is no consensus that clarifies either the concept or how its management benefits can be achieved in brand management.

Notably, important efforts have been made to systematize the results of academic studies that address the concept of brand personality (Eisend & Stokburger-Sauer, 2013; Leung & Law, 2010; Valette-Florence & Barnier, 2013). However, in this work, we propose that this problem has arisen mainly because the concept has not reached a level of maturity in terms of its theoretical development. Among other reasons, a repeated verification of the extant findings to achieve the theorization of the concept has not occurred. Thus, studies that point to academic agreements are insufficient. This situation renders the concept vulnerable to criticism of its constitution due to the lack of a consensus on the role it plays and how it relates to other concepts with greater acceptance in the academic world.

In its practical and academic applications, brand personality has the ability to easily respond to relatively simple and intuitive reasoning. In its broadest sense, brand personality is defined as a metaphor, i.e., an analogy of the personality of people that is applied to a brand (Aaker, 1997). This concept involves a rational and useful logic with the potential to facilitate competitive analysis, improve brand performance and, in particular, manage how brands become part of consumers' lives. According to social and consumer trends, relational marketing has greater prominence (Gretry et al., 2017); hence, this concept continues to play an increasingly important role in brand management as one of the fundamental concepts of relationship marketing.

3.1.2 Conceptual quality

To provide a solid conceptualization of brand personality, researchers must resolve some ambiguities. Following the proposal of Chaffee (1991), for a concept to be clearly defined, two fundamental conditions must be met. First, there must be coherence between what the concept means in itself and in relation to others. Second, there must be a systematization of the concept in terms of its operational definition.

Regarding the condition of coherence, the original concept of brand personality was not located in its own space and was reached via other related concepts. In 2003, Asoulay and Kapferer therefore critically reviewed the composition of the brand personality construct and the methodology used for its initial establishment, which was proposed by Aaker (1997). The authors concluded that the defined construct included, in addition to brand personality, elements such as brand identity and even elements of brand performance, necessitating its refinement.

Concerning systematization, the concept of brand personality has not always been understood or used in the same way. Some authors, for example, have directly adopted

the definition of brand personality proposed by Jeniffer Aaker in 1997, where brand personality refers to the group of human characteristics associated with a brand. However, there have been other proposals. For example, in 2003, Asoulay and Kapferer proposed an alternative definition where brand personality is defined as the group of personality traits that are applicable and relevant to brands. Furthermore, in 2005, Sung & Tinkham suggested an even more divergent definition, which alluded to the symbolic meaning of trademarks. Later, in 2016, Hong-Youl Ha proposed a different definition where brand personality is considered a group of human personality traits that corresponds to the individual and is directly or indirectly associated with a brand.

Nevertheless, despite the difficulties presented by the concept of brand personality, the elements that have given it life should be considered. One of these elements is the theory of self-congruence, which states that customers will prefer brands that have personality traits similar to their own (Valette-Florence & Barnier, 2013). According to Ha (2016), through brand personality, it is thus possible to make sense of why consumers prefer one brand over another when their products are similar. The authors of this study advocate this use of the theory of self-congruence.

To date, however, the concept of brand personality is not robust enough to meet the conceptual criteria proposed by Chaffee (1991). The lack of coherence and systematization of the concept has made it difficult to extrapolate research results to broader conceptual contexts, which has diminished its theorization. Today, brand personality is a concept that continues to be addressed in the academic world; however, the research focus has mostly been on empirical data (approximately 5% of the studies considered utilize qualitative analysis or theoretical development), because such results fit better with specific phenomena.

3.1.3 Conceptualization and proposition

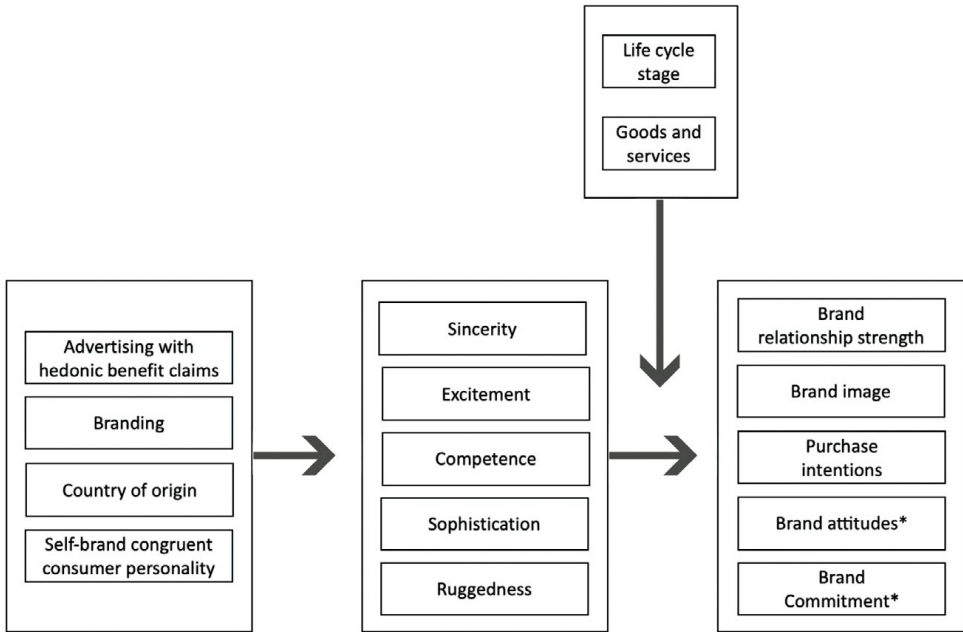
The essence of the concept of brand personality is intuitive, and researchers have basically used this condition to keep it current and attract the attention of the academic and business world; however, the literature also suggests that its conceptualization has not achieved a good level of validity. That is, the meaning of the concept does not have a clear delimitation with the other concepts it will be eventually linked to, entailing a lack of coherence in its interaction with related concepts that impedes locating this construct in its nomological network. On the other hand, the operational definition, rather than being applied with caution, has been adapted and used extensively without further questioning, making it difficult for a large amount of empirical research to be directly related to generalizing results.

Proposition 1: The conceptual development of brand personality requires a review and revision of its construct and its nomological network.

3.2. Main findings

As mentioned above, as a frame of reference, we follow Eisend & Stokburger-Sauer (2013), whose main model is shown in Figure 1. Following the structure that we derived from this meta-analysis and to understand what elements condition and shape brand personality, we have studied the antecedents that drive it. In some cases, these concepts have been expanded based on the literature we obtained in our search for the term brand personality in the main collection of the WoS database.

Figure 1. Referential model based on Eisend & Stokburger-Sauer (2013)



*Consequences of brand personality associated with greater strength with the dimensions of sincerity and competence and with less strength with the dimensions of entertainment and roughness.

Source: Own elaboration based on Eisend & Stokburger-Sauer (2013).

3.2.1 Brand personality background

Our literature review reveals that there is still a need for more empirical research on the antecedents of the brand personality construct. Hence, although the complexity of its meaning and interactions with other variables hinder clearly establishing the specific elements that influence the generation of brand personality, researchers have identified some concepts that fulfill this function, i.e., advertising with hedonic benefits, brand management, country of origin and self-congruence with customer personality (Eisend & Stokburger-Sauer, 2013).

Below, we review the elements incorporated in Figure 1 from a conceptual point of view, expanding its definition and reviewing what has been established by some researchers. We provide a more specific view of what has thus far been proposed in the research concerning each concept under study.

3.2.1.1 Advertising with hedonic benefits

Although indirectly, all the elements of the marketing mix shape brand personality (Lim & Ang, 2008). Due to its properties and, in particular, its scope, advertising seems to be one of the most influential elements. Therefore, for Plummer (1985), brand personality is formed through the influence exerted by direct and indirect contacts that a consumer has with a brand.

On the other hand, the purpose that a product is acquired for regarding its consumption must be considered. This condition could predispose or affect the attitude of a consumer when perceiving a certain brand personality in a product (Bosnjak et al., 2011). Thus, consumer products can be classified as hedonic or utilitarian, as noted by Lim & Ang (2008). Hedonic products are primarily consumed for affective purposes and sensory gratification (Woods, 1960), while utilitarian products have a rational appeal and offer cognitive benefits (Woods, 1960).

Hedonic products have some advantages for achieving a positive brand personality. These products promote a sensory experience based on aesthetic elements, tastes and symbols (Holbrook & Moore, 1981). Through experience, they manage to generate emotional excitement (Mano & Oliver, 1993). When this emotional excitement is positive, the evaluation of a product improves (Isen et al., 1978), which promotes a more attractive brand personality.

Building a brand personality could basically depend on having this connotation of a hedonic product; however, the preference for this type of communication is conditioned by cultural aspects (Lim & Ang, 2008). This predisposition sometimes inclines toward utilitarian communication and sometimes toward hedonic communication. According to the findings of Lim & Ang (2008) in regard to utilitarian products, the use of advertising that appeals to hedonic benefits reinforces consumer attitudes, while in the case of hedonic products, the use of such advertising does not have this effect. Hence, the benefit of this type of communication directly impacts utilitarian products.

Research in relation to communication with hedonic messages is broad and focused on various areas, for example, food consumption, tourism or advertising (Rezaei et al., 2016; Flight & Coker, 2016; Guido et al., 2015 and Lim & Ang, 2008). On the other hand, works such as that of Lin (2009) highlight the importance of the application of hedonic brand personalities in this context.

3.2.1.2 Brand management

The brand management variable, proposed as an antecedent, corresponds to the activities that support the creation of a unique brand that is difficult to imitate (Eisend & Stokburger-Sauer, 2013). A brand can be defined as “a name, term, sign, symbol or design, or a combination of these elements that seeks to identify the goods and services of a seller or group of sellers and differentiate them from those of their competitors” (Kotler 1991; p. 442). Brands have existed since the beginning of civilization, and perhaps this is why few articles address the definition of brand and instead focus on other elements, primarily from the point of view of the consumer (Moore. & Reid, 2008).

The use of this element as an antecedent can be better understood from the perspective of the management that is deployed to create and maintain a brand. Even when the purpose of marketing plans is to increase sales, it is first necessary to establish brand awareness structures so that consumers respond favorably to relevant marketing activities (Keller, 1993). For example, a tourist destination can structure a certain brand personality through different brand management strategies and advertising messages (Kim & Lehto, 2013).

According to Keller (1993), brand awareness results from both brand awareness and brand image. The first concept is related to the strength with which a brand is present in a consumer's memory, entailing the ability to identify the same brand under different conditions (Rossiter & Percy, 1987). The second concept relates to the brand perceptions that reflect the brand associations in a consumer's memory (Keller,

1993). Therefore, included in a brand image are the associations that can be with the brand's attitudes, benefits or attributes.

According to the model proposed by Keller (1993), brand attributes are characteristics related to a product. Some are sought directly by a consumer, while others are attached to a product without being benefits that are directly sought. This classification includes both the user and the use imagined by a consumer, which contribute to brand personality. However, brand personality attributes can also reflect emotions or feelings.

3.2.1.3 Country of origin

Country of origin or country of production is a relevant variable to consider in the formation of brand personality for consumers. The research that proves this relationship is diverse. For example, Wang & Yang (2008) have found that a country of origin with a positive image strengthens the impact of positive brand personality on purchase intention, while a country of origin with a negative image can significantly decrease the positive effect of brand personality on purchase intention. This finding is supported by Fetscherin & Toncar (2010), who have found that place of origin is an important consideration for consumers, given that they develop their brand perception based on brand origin, which also appears to have an effect on their perceived brand personality.

Specifically, the relationship between brand personality and country of origin seems to be especially relevant in the tourism industry. In fact, the concept of brand personality has been intensively applied in tourism in recent years, particularly concerning tourist destinations. Of the total number of articles we considered, more than 15% are related to the tourism sector, a proportion that has been increasing in relative growth in recent years (Gertner, 2010; Stokburger-Sauer, 2011; and Zeugner-Roth & Zabkar, 2015).

Moreover, automobiles are products that seem particularly attractive for the application of the relationship of country of origin and brand personality. For these products, place of origin seems to be especially relevant, given they are purchases with high involvement; however, it is still necessary to understand the impact that this relationship has on products with less involvement (Wang & Yang, 2008; Fetscherin & Toncar, 2010).

3.2.1.4 Congruence with consumer personality

Brands play an important role in consumers' relationship with the self-expression that allows their consumption (Aaker, 1999; Lau & Phau, 2007). Hence, the principle of self-congruence—the greater the congruence between the characteristics a consumer associates with himself or herself with those that a brand projects, the greater the consumer's preference for that brand—should be considered (Sung et al., 2012).

The congruence that exists between brand personality and consumer personality will support brand personality (Eisend & Stokburger-Sauer, 2013). Thus, when a brand presents personality traits congruent with consumers' self-concepts, not only will they have a greater preference for it, but their evaluation of the brand will also be more positive than when there is incongruence (Sung & Choi, 2012.). That is, when there is coherence, consumers not only are more likely to form a favorable attitude toward a brand but also will tend to develop a bias in how they process the utilitarian aspects of the brand (Kressmann et al., 2006).

To express the concept that consumers have of themselves, people buy brands with personalities they perceive to be congruent with their own (Aaker, 1999). Therefore,

consumers who have their own concept of elegance and exclusivity will favor brands with these characteristics. The work of Aguirre-Rodriguez et al. (2012) thus suggests that the effects of congruence are a function of a social self-motivation of seeking to stand out, of brand personality, and of cognitive elaboration, among others. Hence, the environmental aspects related to this concept should also be considered. In particular, the literature highlights the relationship of congruence with one's situation and culture.

The effects of congruence on brand personality depend largely on culture. For example, in Korea, as suggested by Sung and Choi (2012), brand personality structures reflect the importance of Confucian values in its economic and social system. These authors postulate that when a situation of consumption is congruent with a brand personality, interdependent consumers will thus evaluate the brand more favorably than independent consumers. Therefore, this congruence effect between situation and brand personality is important, especially for people with a high level of self-monitoring (Sung, 2011).

Notably, one element has recently been included in some research and is related to consumption situation. Specifically, it has been proposed that congruence with brand personality is not only related to consumer personality but also largely affected by the situation of use or consumption. Despite its theoretical and practical relevance, however, the relationship between the congruence of situation of use and brand personality has not received enough attention (Sung et al., 2012). Indeed, as of the writing of this article, it remains underdeveloped.

3.2.1.5 Additional background elements to consider

Although the work carried out by Eisend & Stokburger-Sauer (2013) importantly contributes to the systematization of the concepts that precede the brand personality construct, the antecedents of this remain a topic whose relevant empirical studies are still scarce (Guido & Peluso, 2015; Maehle et al., 2011).

Thus, we have excluded those elements that have received insufficient attention from researchers. Nevertheless, there is still a need to investigate other potential antecedents of brand perceptions, such as market factors, competitors, and the presence of similar brands in a category (Lovett et al., 2014).

3.2.1.6 Background of brand personality and propositions

Thus far, we have presented the antecedents of brand personality proposed by Eisend & Stokburger-Sauer (2013). Among them, the purpose for a consumer acquiring a certain product conditions a mental state that induces him or her to adopt positive associations about the product and therefore its brand. Accordingly, we have also considered the activities that support the creation and maintenance of a brand at a broader level. These elements are the result of the management carried out for the brand.

Regarding country of origin and consistency with the consumer, although they also have a certain relationship with marketing management, they are more closely linked with elements that are external to a company and more typical of a consumer's feelings. Specifically, country of origin influences brand personality, acting as a reflection of a given culture; when there is congruence between one's own personality and that of a brand, there is a favorable effect on the latter.

Proposition 2: Country of origin will have a lesser effect on brand personality in the case of products with general standards (such as cell phones or other

| *technological devices).*

| *Proposition 3: The influence of congruence with use context has a greater impact than congruence with consumer personality.*

| *Proposition 4: The interaction that is generated between brands collectively influences individual brand personalities.*

3.2.2. Consequences of brand personality

Our literature review shows that more empirical research on the consequences of the brand personality construct is still needed. However, similar to the studies of antecedents of the construct, research has been consolidating some concepts that fulfill this function, i.e., the strength of the relationship with a brand, brand image and purchase intention (Eisend & Stokburger-Sauer, 2013). Below, we review these elements from a conceptual point of view, expanding their definitions and reviewing their advances in the literature.

3.2.2.1 Strength of the relationship with the brand

Key elements for building long-term relationships with consumers are the perceptual insights that consumers have about brands. These insights contribute to a brand personality; they are influenced by the cognitive and affective aspects that are manifested in the communication process (Cervera-Taulet *et al.*, 2013). Such interaction contributes to the generation of a brand personality.

The relationship that may exist between a person and a brand can even lead to a strong emotional relationship (Batra *et al.*, 2012). When these feelings for the brand are present, there is a connection and long-term positive effect; however, this element is focused particularly on the feeling of a consumer, without exploring the role of the personality of a brand. This absence thus offers the opportunity to study how brand personality, driven by affective elements, relates to the attraction that people can feel for a brand.

Some studies express a concern that some brands could be more suited to forming relationships than others, which has led to the investigation of certain elements, e.g., the perceived quality of brands. In their research, Smit *et al.* (2007) thus propose that brands with unique and entertaining personalities better fulfill the role of companion, arguing that it benefits the former to exert the effort needed to develop this type of relationship.

Hence, our literature review suggests that there are possibilities for detailing how relationships are generated according to the demographic characteristics of consumers. There have been some attempts at this. For example, Haryanto *et al.* (2016) postulate that in the case of children, the relationship with a brand is not a consequence of brand personality, entailing that the formation of brand personality or the perception of it is dependent on age group.

3.2.2.2 Brand image

In his 1993 work, Kevin L. Keller defines brand image as the perceptions about a brand that are reflected through associations that are present in a consumer's memory. Brand image is thus related to the attributes of a brand that are perceived by a consumer, such as likeness, prestige or distinction. These attributes are the result of a consumer's drive to achieve his or her own objectives of continuity or verification,

distinction and improvement through his or her consumption of brands (Eisend & Stokburger-Sauer, 2013). Therefore, this concept is mainly based on the associations that a brand has and that in turn contain the meanings that consumers give to brands. Such associations can be subdivided into attributes, benefits and attitudes.

It is difficult to cease relating the image of a brand with the image of a consumer. Consistency via brand image acts as a hub that relates the image of a user and brand personality, contributing to the establishment of an image effect of the user on brand personality (Lee & Back, 2010). The use of imagery as a resource that allows the connection of a brand personality with a specific brand in the mind of a consumer facilitates the inclusion of the concept of imagination, thereby affecting brand personality as its generator and enhancer.

Consumers tend to describe brands with associations of male and female personality traits (Grohmann, 2009). This implies that some differences are manifested in the projection of the gender of a brand, since these associations impact the probability of recommendation, depending on the gender of the target group. Accordingly, brands that are androgenous (that combine both genders) achieve greater brand capital than those that are male, female or indeterminate (Lieven & Hildebrand, 2016).

3.2.2.3 Attitude toward a brand

Attitude toward a brand has been defined as the general evaluation of a brand (Keller, 1993; Eisend & Stokburger-Sauer, 2013). The importance of this concept is its potential relationship with consumer behavior (Aguirre-Rodriguez et al., 2012). In his conceptual model, for example, Keller (1993) proposes that attitudes have a direct relationship with the types of brand associations. However, according to the author, there is no direct relationship between attitude toward a brand and brand personality.

This concept of attitude is related to the elements that allow a greater adjustment by a consumer to a brand. In their study, Sung et al. (2012) point out that consumers will have a more positive attitude toward a brand when it is congruent with a particular situation. This assertion is directly related to cultural elements, which are especially strong in collectivist cultures where the search for harmony is highlighted as a key element.

As the literature demonstrates, the concept of attitude toward a brand has received much attention, with a focus on both its aspects others that are related to it. For example, in their model, Batra et al. (2012) consider the construct “sensitivity of the attitude” in addition to the “strength of the attitude” in terms of frequency of thoughts and certainty/confidence. Another case that uses a variant of attitude is a study by Sung & Yang (2008), where the construct of support attitude is employed to integrate the variables of belonging, pride, trust and interest in a model for evaluating the image of an educational organization. On the other hand, Ang & Lim (2006) show that it is possible to enhance the attitude toward a brand and purchase intention via metaphorical resources in communication. In this case, the situation of use is contextualized metaphorically, which could generate an effect similar to that of congruence with the situation.

Furthermore, attitude toward a brand corresponds to the response to a brand personality. Brands with personalities or personality dimensions that better fit the preferences of consumers should therefore generate more positive attitudes. For example, according to Eisend & Stokburger-Sauer (2013), attitude toward a brand is a consequence of the brand personality construct that entails greater strength in the dimensions of sincerity and competence and a weaker effect of the dimensions of entertainment and roughness.

3.2.2.4 Purchase intention

The relationship between brand personality and purchase intention has received increasing academic attention in recent years. However, studies have developed essentially different models. For example, Gordon, Zainuddin & Magee (2016) include in their model the mediator of “attractiveness of brand personality” (Freling et al., 2011) between brand personality and behavioral intention. In contrast, the model developed by Aguirre-Rodriguez *et al.* (2012) indicates that brand personality plays a role in moderating the effect of self-congruence assessment on consumer attitude, intention and behavior. In this research, the authors find that not all dimensions of brand personality contribute positively to purchase intention.

Other studies point to emotional aspects as drivers of purchase intention. For example, Toldos-Romero & Orozco-Gomez (2015) suggest that the dimensions of success, liveliness (related to entertainment), sophistication, sincerity, emotionality and professionalism explain purchase intention. Likewise, in the model of Batra et al. (2012), behavior is driven by passion, which in turn is composed of the passionate desire to use, the willingness to invest resources and the tasks that have been completed in the past with regard to involvement.

Therefore, brand personality tends to positively impact purchase intention (Eisend & Stokburger-Sauer, 2013). Moreover, purchase intention is linked to a brand’s country of origin (Wang & Yang, 2008). On the other hand, purchase intention is optimized when “favorability”, originality and clarity are at high levels (Freling et al., 2011).

3.2.2.5 Brand commitment

Brand commitment is commonly related to elements that lead a consumer to maintain a certain preference with greater stability. Sung & Yang (2008) propose a definition of brand commitment that is based on an affective relationship that depends on satisfaction, image and reputation. In an increasingly competitive context, brands that have low levels of commitment are thus more likely to be replaced by other brands with higher levels of commitment (Sung *et al.*, 2012).

Individuals with a strong commitment to (and/or a defined attitude toward) a brand tend to trust the beliefs they have and are hardly influenced by other contextual elements. For example, Agrawal & Maheswaran (2005) show that people with strong brand commitment tend to show very minor changes in brand attitude. Conversely, their attitude changes depending on social context. Consumers with a weak brand attitude or commitment will therefore have greater sensitivity to feelings or beliefs in the context of a use situation (Lavine et al., 1998). This position is supported in part by Sung et al. (2012), who note that the effect of brand congruence on use situation could be moderated by the level of brand commitment. In a study by Eisend & Stokburger-Sauer (2013), such brand commitment is most strongly impacted by the dimensions of sincerity and competence and with less force by the dimensions of entertainment and roughness.

The research on the relationship between brand personality and brand commitment is still nascent and thus requires more evidence to confirm its most recent findings and consolidate its foundations (Ha & Janda, 2014). At the time of writing this article, there is still a shortage of research to improve the understanding of the impact of brand personality on perceptions of brand quality, brand trust and brand commitment. Likewise, the effect of brand personality on perceived quality and brand commitment has emerged as a relationship that needs to be addressed.

3.2.2.6 Consequences of brand personality and propositions

The consequences of brand personality have relational marketing elements as their common factor. In this context, brands should be designed to obtain advantages over their competition from the moment of their selection via acquiring aspects such as uniqueness or entertainment. Thus, the concept of attractiveness of brand personality is of vital importance both at the time of its creation and during its maintenance.

Brand image, defined as brand association, is the result of brand personality. However, greater clarity regarding the effects that these elements have on different groups of consumers, e.g., on each age group, is needed. Similarly, the congruence between brand and consumer personality is fundamental to obtaining an adjustment that results in a positive brand attitude.

As mentioned above, emotions play a fundamental role in driving purchase intention. However, in this scheme, imagination plays a preponderant role that influences how people perceive the effects of brand personality.

Proposition 5: Brands that effectively form the perception of a personality achieve a higher quality relationship with consumers.

Proposition 6: When the perception of brand personality is strong in the relational sphere, brand image is formed as a consequence of brand personality and vice versa.

Proposition 7: The attitude toward a brand is conditioned by brand personality, and this relationship is moderated by the congruence between brand and consumer personality.

Proposition 8: The effect of brand personality on brand attitude is moderated by a consumer's capacity for imagination.

Proposition 9: The main consumer-brand relational driver is based on a consumer's emotional aspects with respect to brand personality.

3.2.3. Moderators

In the work of Eisend & Stokburger-Sauer (2013), some variables that could be potential moderators of brand personality are considered. Of these, two are relevant: life cycle, i.e., whether a brand is associated with a product with an early or late life stage; and product type, i.e., good or service.

Additionally, we evaluate the potential moderator role of study design, which in contrast to the moderators mentioned above, reflects a methodological level of research. This element is interesting to analyze because these designs allow obtaining different types of information.

3.2.3.1 Brand life cycle

Eisend & Stokburger-Sauer (2013) have systematized the variables that they consider potential moderators. They find that brand personality is moderated by product life cycle. For the purposes of this research, we thus identified 59 records as mature products and 17 as in early stages.

The support for the inclusion of this variable concerning product life cycle based on the argument that brand personality needs more time to be constructed in the

mind of a consumer, i.e., to become stronger, for mature brands than for younger brands (Jobar et al., 2005). As expected, we found that brand maturity favors stronger brand personality dimensions. Thus, it is possible through brand management to communicate and transfer to the mind of a consumer the associations of attributes that foster brand personality (Keller, 1993). However, such brand personality inevitably tends to vary over time (adopting associations of a particular stage of maturity). Meanwhile, brand personality loses flexibility over time, making it more manageable amid eventual changes.

3.2.3.2 Product type

Given the differences that characterize goods and services, it is reasonable that brand personality could impact each type differently. Some studies implicitly consider these differences; for example, the variable of product type is considered in the work of Aggarwal & McGill (2007), which suggests that the act of anthropomorphism is easier for goods than for services. Thus, brand personality becomes more accessible for goods and there are greater effects on goods than on services (Aggarwal & McGill, 2007).

In the investigations of brand personality, attention has been concentrated mainly on goods. For example, in the study by Eisend & Stokburger-Sauer (2013), goods represent 75% of the studies they consider. This suggests a contradiction; the literature shows that the intangibility of services makes brand personality even more important when designing differentiation strategies. Even so, studies on the role of brand personality in services are still scarce (Kotsi & Valek, 2018; Cervera-Taulet et al., 2013).

The extant research on services in relation to brand personality has defined some important characteristics that make its analysis more complex. For example, given the characteristics of services, the relationships proposed by Keller (1993), which explain brand awareness, are not as clear and direct as the author's classification of attributes, i.e., product characteristics, which consist of related and unrelated attributes. On the other hand, Spielmann & Babin (2011) suggest that consumers describe brand personality by summarizing the benefits provided via services, making it difficult to distinguish brand personality. In addition, the particularities of any service and the different images that a service provider can project with their behavior can cause service brands to differ greatly (Chernatony & Segal-Horn, 2003), increasing the variables that must be considered.

Accordingly, the importance of services is becoming increasingly strong in the literature, as is the need to better understand their differences concerning brand personality compared to goods. One of the arguments that highlight this importance suggests that intangible activities add value to experiences (Zeithaml, 1988). Therefore, the need to consider the emotional and symbolic elements of service brands has been reinforced (Kotsi & Valek, 2018; Chernatony & Segal-Horn, 2003).

3.2.3.3 Brand personality moderators and propositions

When evaluating the moderators of brand personality, it is important to consider how it changes over time. By adopting the same approach to the life cycle of a product, we can infer that brand personality also experiences changes in the course of its life. For example, a new brand confronts the challenge of starting to build a brand personality; however, it has greater flexibility (or instability) regarding its definition. Once its stage of maturity is reached, it thus has less flexibility (or greater stability).

In the case of product type, the literature tends to indicate that goods have a greater capacity to project anthropomorphism than services. the tangibility of goods reasonably indicates that they have a greater capacity for a consumer to clearly interpret their brand personality. However, given that intangible activities generate emotions in experiences, brand personality should also be enhanced in regard to services.

On the other hand, according to the studies we have reviewed, the methodologies based on surveys help consolidate the extant findings; however, methodologies based on experiments apparently allow expanding the development and exploration of this construct. This point requires the attention of the academic community. Through experimental design, it is possible to reveal causal relationships. In particular, this condition is crucial to advance the determination of the relationships of the brand personality construct with other marketing concepts.

Proposition 10: Brand personality has a development that is consistent with the stages of product life cycle, conditioning its ability to change over time.

Proposition 11: Brand personality has a greater definition for services than for goods.

4. Discussion

This research has reviewed the literature on the brand personality construct, its antecedents and its consequences. During this process, emerging areas of research have been found, which invite us to explore some elements of the field of brand personality. These elements represent interesting research opportunities mainly because their level of development does not yet allow reaching a consensus.

4.1 Relationship between brand trust and brand loyalty

In their research, Batra et al. (1993) point out that well-established brand personalities achieve greater emotional ties via brand trust. The transition from brand personality to brand loyalty through trust reflects how brand personality contributes to brand loyalty (Lee & Back, 2010). Figure 2 shows this relationship.

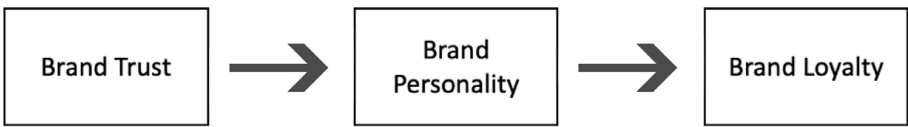
Figure 2. Adaptation of proposed relationships in modality A



Source: Own elaboration.

However, this relationship is not fully established. On the one hand, the work of Haryanto et al. (2016) proposes trust in a brand is an antecedent of brand personality, with brand loyalty being its consequence. Figure 3 shows this relationship. This position contrasts with the model proposed by Ha (2016), where the proposed relationship originates in brand personality, generating trust in a brand, and finally, as a consequence of the latter, brand loyalty. Moreover, Levy & Hino (2015) show how the relationship between trust and loyalty is mediated by satisfaction. On the other hand, Sung & Kim (2010) demonstrate that brand personality can increase levels of trust in a brand and evoke affection for it (in line with Batra *et al.*, 1993.), which in turn increases brand loyalty.

Figure 3. Adaptation of proposed relationships in modality B



Source: Own elaboration.

Notably, many studies that include brand personality consider brand loyalty in their models but do not directly relate it to brand trust (Kim *et al.*, 2001; Brakus *et al.*, 2009; Kima *et al.*, 2010). Accordingly, some relationships can be identified that have not been clearly according to the scientific community. Thus, reflecting the findings of Lovett et al. (2014), we suggest that more research is needed on the relationship between the characteristics of a brand and brand loyalty.

4.2 New media and the construction of brand personality

Another element that the literature should consider is the connection between the characteristics of brands and social networks (Lovett *et al.*, 2014). Accordingly, the characteristics of brands could be related to aspects of social networks, such as the speed at which information is disseminated or the effectiveness of such dissemination, as well as social media users themselves and the behaviors of salient actors, specifically, of the communities where brands interact. This could result show that the actions that communicate brand personality online have different effects than those via traditional media, regardless of whether a communication itself is the same. For example, Okazaki (2006) points out that the internet may not be able to recreate all the dimensions of brand personality.

The methods of communicating have undergone changes to adapt to nontraditional formats. Social networks, for instance, seem to be abandoning push strategies, while users of social networks tend to avoid impersonal communications from companies. Users seem to favor personal contacts, seeking greater involvement with their favorite brands and more participation in the creation of brand personalities (Parent *et al.*, 2011). This also highlights the importance of better understanding how brand personalities are constructed in the online dimension.

4.3 Others

In the recent literature, there has been a significant increase in research that considers brand personality. The extant contributions are diverse, and some are

especially interesting. Specifically, Freling *et al.* (2011) identify a construct called “brand personality appeal”, which is a mediator between brand personality and purchase intention. Including this concept in future models is an interesting proposal that is consistent with the research that distinguishes between some brand personalities, e.g., entertaining or sincere personalities, for example, Aaker *et al.* (2004). To date, however, the attention given to the attractiveness of brand personality remains limited (Willems, 2022; Kumar, 2021).

4.4 Emerging areas of brand personality and propositions

In the development of this work, we have found some relationships that have not been resolved and demand the attention of academia. The constructs that are part of these relationships are brand personality, brand trust and brand loyalty. Given that these are already consolidated constructs in the literature on brand relationships, brand personality’s theoretical development is that much more crucial. As we have shown, certain constructs are still included in the conceptual development of brand personality; over time, evaluating these will thus strengthen the solidity of the concept.

On the other hand, new media pose new challenges. The characteristics of media can be considered a sort of filter that enhances or reduces the effect of brand personalities; new media have their own qualities and styles of disseminating information, with discrete environments and communities. Likewise, the tendency of social media users to avoid impersonal communications functions as a differentiating factor that facilitate and harness the potential of the brand personality effect.

Proposition 12: Brand personality precedes brand trust, which in turn precedes brand loyalty.

Proposition 13: Nontraditional media allow the projection of a more defined brand personality.

5. Conclusions

The purpose of this study is to contribute to the salient literature through a systematization of the concept of brand personality and some of its research via a literature review. Specifically, the brand personality construct was conceptually analyzed, and the main extant findings were reviewed via a methodological framework integrating the concept’s antecedents, consequences and moderators following Eisend & Stokburger-Sauer (2013). This has allowed us to extend their conceptualizations further.

Although our elaboration of these antecedents, mediators and consequences represents progress, we have found that the concept of brand personality is still far from a stage of consolidation. Research has not converged on the development of a theorization. Accordingly, considerable is unclear whether the definition of the construct is sufficient for shaping its nomological network or for locating its place among and link with its related concepts.

From the academic point of view, the aspects presented in this work represent a great challenge to improving the conceptualization of the construct. We have thus provided a series of proposals whose purpose is to generate questions that merit review and exploration. Eventually, the developments of these propositions could

lead to critical individual research. Additionally, in the final section, we have reviewed some antecedents that point to emerging areas of research; we expect that over time, they will reach an important level of development.

For industry, this article also provides some guidelines that allow the improvement of the management and construction of a brand personality. The identified antecedents provide the basis for its construction and indicate, in some cases quite precisely, the conditions that facilitate a stronger brand personality, e.g., communications with hedonic benefits and congruence with consumer personality and the context of their use or consumption. On the other hand, the consequences that we have exposed are also of particular interest, especially the strength of one's relationship with a brand, brand attitude and purchase intention.

Overall, brand personality is a concept that has existed for many years and is far older than its systematization or approaches concerning its dimensions. Although in its beginning it developed slowly, in recent years its growth has increased, entailing greater development. However, the consolidation of the construct is still distant. Nevertheless, according to our findings, the concept has significant potential from both the theoretical and practical point of view.

The present study is not without limitations. Although taking a specific study as a basis has allowed us to extend an ordered methodological framework, we have not considered potential research topics. Our systematization of the concept was based on findings made in the same strand of literature, so the limitations of previous studies are also present here. This can significantly influence the antecedents, consequences and/or moderators that have not been considered in past research. Additionally, the studies we have considered in our literature review were mainly extracted from the WoS database, which while constituting a source of high-quality data, excludes studies that for various reasons have been published in other databases and may eventually contain information relevant to the purposes of this study. Finally, given the amount of information we have analyzed, it is possible that some elements that could have been included in this article have been disregarded. However, we have tried to evaluate each element on its merit by making this analysis as exhaustive as possible.

Finally, future research will allow a better development of the brand personality construct and its relationships with other concepts. Although the possibilities of research that emerge from this work have already been mentioned, some other topics to explore are the existing relationships between brand personality, brand life cycle and the particularities that differentiate brand personality when it is associated with either goods or services.

Declaration of conflict of interest

The author of this manuscript state that there are no conflicts of interest with any entity or institution, nor of a personal nature in this publication.

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COVID-19, GOVERNMENT POLICIES AND THEIR EFFECTS ON LATIN AMERICAN CAPITAL MARKETS

COVID-19, POLÍTICAS GUBERNAMENTALES Y SUS EFECTOS EN LOS MERCADOS DE CAPITALES DE AMÉRICA LATINA

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Abstract

The COVID-19 pandemic has led governments to implement policies that affect households and companies. In this study, we analyze the impacts of government policies and COVID contagion rates on stock market returns for the countries that belong to the Latin America Integrated Market through robust OLS regressions. We find evidence that the daily growth rate of confirmed COVID-19 cases and social distancing measures negatively influence the financial performance of stock indexes, while public awareness campaigns and contact tracking test policies are seen to have had positive effects. These findings are helpful for evaluating government policy impacts and portfolio performances.

Keywords: COVID-19, emerging capital markets, government policies, MILA, social distancing.



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Resumen

La pandemia de COVID-19 ha llevado a los gobiernos a implementar políticas que afectan a hogares y empresas. En este estudio, analizamos los impactos de las políticas gubernamentales y las tasas de contagio de COVID en los rendimientos bursátiles de los países que pertenecen al Mercado Integrado de América Latina a través de regresiones OLS robustas. Encontramos evidencia de que la tasa de crecimiento diario de casos confirmados de COVID-19 y las medidas de distanciamiento social influyen negativamente en el desempeño financiero de los índices bursátiles, mientras que se considera que las campañas de concientización pública y las políticas de prueba de seguimiento de contactos han tenido efectos positivos. Estos hallazgos son útiles para evaluar los impactos de las políticas gubernamentales y el desempeño de la cartera.

Palabras Clave: COVID-19, mercados de capitales emergentes, políticas gubernamentales, MILA, distanciamiento social.

1. Introduction

The pandemic caused by the Coronavirus (COVID-19) is strongly affecting world economic activity and one year on from the onset of the pandemic there seems to be no short-term end in sight (Junior et al. (2021)). The impact on stock markets has been massive and the pandemic is considered the worst in the world's recent history (Baker et al. (2020)). As a result of the greater uncertainty surrounding the performance of the economy and companies, capital markets have experienced strong movements. Stock markets around the world performed negatively in the aftermath of the huge increase in uncertainty when the virus first began to spread in March 2020 (Al-Awadhi et al. (2020), Ashraf (2020), Topcu & Gulal (2020), Zhang et al. (2020)). There were also spillovers to the cryptocurrency market (Corbet et al. (2021)), increases in market inefficiency in India (Okorie & Lin (2021)), the US, and Europe (Frezza et al. (2021)), as well as evidence of a rise in herding behavior in Europe (Espinosa-Méndez & Arias (2021)). Equity and USD indexes were the primary transmitters of shocks before the Coronavirus, whereas the bond index took over this role during the COVID-19 outbreak (Bouri et al. (2021)). The pandemic also triggered changes in business and consumer behavior (Donthu & Gustafsson (2020)). Stock markets reacted to COVID health news (Salisu & Vo (2020)). Ftiti et al. (2021) showed that news related to the number of cases and deaths sparked an increase in overall risk by increasing stock market returns volatility and reducing the level of stock market liquidity. In the same line, Harjoto et al. (2020) showed how stock markets in emerging economies were affected by the number of deaths and cases, whereas developed economies were affected only by cases. Liu et al. (2021) showed that the pandemic also increased the risk of a stock market crash. Seven & Yilmaz (2021) report that economies based on natural resources and tourism are negatively associated with countries' stock market recovery performance. Governments have been taking measures to curb the climate of uncertainty (Wagner (2020); Sebastiani et al. (2020)). Zaremba et al. (2021) provide evidence that information campaigns about COVID-19 facilitate trading activity. These measures include social distancing, public awareness campaigns, quarantine policies,

and programs to support household income, which have had an adverse impact on economic activity (Ashraf (2020)). One of our hypotheses is that stock markets are negatively affected by government rules constraining people's freedom to move around the country or government decisions to close borders to prevent the spread of the virus. Specifically, we follow Ashraf (2020) who quantifies governments' responses to the health crisis through information from the University of Oxford in four indices: The Government Response Stringency Index, the Containment and Health Index, the Index of Economic Support to Households, and the Risk of Openness Index.

To examine our hypotheses, this study focuses on the Latin America emerging economies of Chile, Colombia, Mexico, and Peru, which are the countries that belong to the Latin American Integrated Stock Market (MILA). These countries created a unified stock index in order to promote the development of the region (Yepes-Rios et al. (2015)). The main contributions of this research focus on providing evidence for policymakers and investors concerning the performance drivers of the stock exchange indexes that make up the MILA. First, we find evidence that the daily growth rate of confirmed COVID-19 cases negatively impacts the performance of these Latin American stock indexes, with the exception of Peru. Second, public policies have had a mixed effect on capital markets. Social distancing measures have negatively impacted the financial performance of these economies, while public awareness campaigns and contact tracking test policies have had positive effects. Third, increases in the local volatility of commodities have had a positive effect on capital market indexes, while global uncertainty has had the opposite effect on said indexes. These findings are helpful for evaluating policy impacts for policymakers and portfolio performance for investors.

The remainder of this paper is organized as follows. Section 2 reports the data and methodology. Section 3 provides the results. Finally, Section 4 concludes.

2. Data and Methodology

Our dependent variable is the performance for the main stock indexes of Chile (IPSA), Colombia (COLCAP), Mexico (IPC), and Peru (IGVL). These indexes are based on the most traded stocks, with the number of stocks that make up the index being 30, 20, 35, and 33, respectively. We convert returns to dollars (USD) and use the daily closing price for a daily sample period that covers 2020.

The baseline model for each country is:

$$Y_t = \beta_0 + \beta_1 DGR_{Cov19_t} + \beta_2 S_{Index_t} + \beta_3 CH_{Index_t} + \beta_4 Eco_{Index_t} + \beta_5 Risk_{Index_t} + \varepsilon_t(1)$$

where our dependent variable is Y_{it} , the logarithm return for the stock index for country i at time t . The independent variables are: DGR_{Cov19} , the daily growth rate of confirmed COVID-19 cases. We expect an increase in the rate of confirmed cases to have a negative effect on the performance of the index. S_{Index} is the Stringency Index that records information on social distancing policies. We expect these policies to have a negative impact on the performance of the index. CH_{Index} is the Containment and Health Index that represents public awareness campaigns and contact tracking test policies. We expect these policies to induce greater responsibility and to create better conditions for a positive impact on the performance of the index. Eco_{Index} is the Economic Support to Households Index that represents assistance programs for households. We expect this policy to be associated with a negative context and thus to negatively impact the performance of the index. $Risk_{Index}$ is the Risk of Openness

Index that calculates the measure of risk a country faces in taking an open political stance. This index is associated with better control of the pandemic and thus we expect a positive effect on the performance of the index. Finally, ε_t is the error term.

We also extend the baseline model by considering financial variables that could affect the country's index of stock returns. Thus, the model is:

$$Y_t = \beta_0 + \beta_1 DGR_{Cov19_t} + \beta_2 S_Index_t + \beta_3 CH_Index_t + \beta_4 Eco_Index_t + \beta_5 Risk_Index_t + \beta_6 Spread_t + \beta_7 Local_DVOL_t + \beta_8 DVIX_t + \varepsilon_t \quad (2)$$

where the additional control variables are: Spread, that is based on the difference between the rate of return from long-term bonds (10-year) and short-term bonds (3-month) from the Federal Reserve (FED). A positive difference is associated with a better economic context and thus the effect is positive on the performance of the index; Local DVOL, that proxies the variation for the main commodity volatility of the local countries (we use copper for Chile and Peru, and oil futures for Colombia and Mexico, since they export oil and have an automotive industry, respectively). Therefore, we expect a positive effect on the performance of the index; DVIX, the percentage variation of the CBOE Volatility Index (VIX). VIX is derived from the prices of SPX index options with near-term expiration dates. It generates a 30-day forward projection of volatility and is commonly used to reflect global volatility. We thus expect this variable to have a negative effect on the performance of the index.

Finally, variable definitions and sources of information are explained in detail in Appendix A (Table A1).

3. Results

The summary of the variables and their statistics are reported in the following Table 1 for the daily period for 2020. Latin American countries are affected negatively by the COVID-19 in stock performance, and the high value of the standard deviations evidences wide fluctuations. The growth in confirmed COVID-19 cases has a daily mean of 3.2%, 5.1%, 3.6%, and 3.8% for Chile, Colombia, Mexico, and Peru, respectively. The highest means and volatility are reported in Colombia. Distancing policies, public awareness campaigns and tracking test policies are stronger in Chile and Mexico, while economic support is greatest (lowest) in Chile (Mexico). The risk of reopening the economy is greater for Chile and Colombia, while this risk is much lower for Mexico.

Table 1. Summary Statistics.

VARIABLES	(1) Chile	(2) Colombia	(3) Mexico	(4) Peru
Returns				
Mean	-0.0003	-0.0008	-0.0001	-0.0003
Std. Dev.	0.0231	0.0251	0.0240	0.0180
DGR _{Cov19}				
Mean	0.0321	0.0509	0.0362	0.0382
Std. Dev.	0.0907	0.1925	0.0921	0.1112
S Index				

VARIABLES	(1) Chile	(2) Colombia	(3) Mexico	(4) Peru
Mean	0.2417	0.2363	0.2627	0.1275
Std. Dev.	23.442	29.750	27.391	24.489
CH Index				
Mean	0.2286	0.2084	0.2462	-0.0883
Std. Dev.	17.593	25.455	19.819	46.507
Eco Index				
Mean	0.3984	0.3086	0.2976	0.1969
Std. Dev.	36.865	35.802	47.245	38.449
Risk Index				
Mean	0.0033	0.0032	0.0027	0.0015
Std. Dev.	0.0477	0.0405	0.0471	0.0536
Spread				
Mean	0.5252	0.5235	0.5286	0.5277
Std. Dev.	0.2500	0.2519	0.2474	0.2495
Local DVol				
Mean	0.0011	-0.0005	0.0003	0.0010
Std. Dev.	0.0143	0.0441	0.0426	0.0143
DVIX				
Mean	0.0053	0.0076	0.0038	0.0055
Std. Dev.	0.0962	0.0971	0.0923	0.0956
Observations	251	243	252	254

Notes: DGRCoV19, the daily growth rate of confirmed COVID-19 cases; S Index, the Stringency Index; CH Index, the Containment and Health Index; Eco Index, the Economic Support to Households Index; Risk Index, the Risk of Openness Index; Spread, that is based on the difference between the rate of return from long term bonds (10-year) and short term bonds (3-month); Local DVol, that proxies the variation for the main commodity volatility of the local countries; and DVIX, the percentage variation of the CBOE Volatility Index (VIX).

Source: own elaboration based on data from The University of Oxford, [investing.com](https://www.investing.com) and [ourworldindata.org](https://www.ourworldindata.org).

Table 2 shows the results for the determinants of stock market performance for each country analyzed. In the baseline model, for Chile and Colombia, Covid daily growth rate proves to be significant at 1%, and negatively affects capital market returns. This is in line with our expectations that when there are more daily cases reported people decide to avoid engaging in normal activities, which negatively affects company performance. Mexico presents a negative, but not significant, effect. For its part, Peru shows a positive and significant effect at 1%. Additionally, distancing policies (proxied by the Stringency Index) show a negative effect on stock market returns. The latter is significant at 1% for Chile and Peru, but not significant for Colombia and Mexico. The negative effect of distancing policies on market performance is in line with our expectations, as more constraints on free movement create worse conditions for the normal sale of products and services by companies, thus negatively affecting

their performance. In contrast, public awareness campaigns and tracking test policies (proxied by the Containment and Health Index) generate positive performance in stock market indexes, with this being significant at 5% for Chile and at 10% for Mexico and Peru. These results reinforce the notion that governments need to continue creating awareness amongst the population and to continue testing people for the presence of the virus. Economic support to households does not generate significant impacts on stock index performance, except in Peru, which generates a negative and significant effect at 1%. As we expected for this proxy, government announcements of economic support are associated with poor economic conditions, which generates a negative impact on stock index performances. For its part, the reopening risk index does not significantly affect stock market index returns.

Table 2. Stock market returns and government interventions during the COVID-19 pandemic.

VARIABLES	Chile		Colombia		Mexico		Peru	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
DGRCov19	-0.0519*** (0.0179)	-0.0498*** (0.0159)	-0.0303 *** (0.0083)	-0.0322*** (0.0073)	-0.0234 (0.0165)	-0.0345** (0.0139)	0.0260*** (0.0099)	0.0221 *** (0.0085)
S-Index	-0.0042*** (0.0015)	-0.0032** (0.0014)	-0.0003 (0.0012)	0.0004 (0.0011)	-0.0029 (0.0020)	-0.0024 (0.0017)	-0.0035*** (0.0005)	-0.0023*** (0.0005)
CH-Index	0.00490** (0.0021)	0.0048*** (0.0018)	0.0004 (0.0014)	0.0003 (0.0013)	0.0051* (0.0028)	0.0044* (0.0023)	0.0004* (0.0002)	0.0001 (0.0002)
Eco-Index	0.0007 (0.0004)	0.0002 (0.0003)	-0.0003 (0.0004)	-0.0004 (0.0004)	0.0002 (0.0003)	0.0001 (0.0003)	-0.0011*** (0.0003)	-0.0006** (0.0002)
Risk-Index	0.0442 (0.0300)	0.0493* (0.0266)	0.0626 (0.0390)	0.0599* (0.0347)	-0.0196 (0.0330)	-0.0213 (0.0273)	0.0027 (0.0186)	0.0083 (0.0157)
Spread		0.0086* (0.0052)		0.0132** (0.0057)		0.0016 (0.0053)		0.0034 (0.0035)
Local.DVol		0.4800*** (0.0928)		0.1590*** (0.0340)		0.1250*** (0.0314)		0.4050*** (0.0645)
DVIX		-0.0622*** (0.0141)		-0.0609*** (0.0161)		-0.116*** (0.0148)		-0.0558*** (0.0101)
Constant	0.0010 (0.0015)	-0.0039 (0.0030)	0.0006 (0.0016)	-0.0058* (0.0033)	0.0002 (0.0016)	0.0003 (0.0030)	-0.0006 (0.0011)	-0.0026 (0.0020)
Observations	251	251	243	243	252	252	254	254
R-squared	0.083	0.298	0.068	0.280	0.030	0.346	0.248	0.475

Notes: DGRCov19, the daily growth rate of confirmed COVID-19 cases; S Index, the Stringency Index; CH Index, the Con- tainment and Health Index; Eco Index, the Economic Support to Households Index; Risk Index, the Risk of Openness Index;

Spread, that is based on the difference between the rate of return from long term bonds (10-year) and short-term bonds (3- month); Local DVOL, that proxies the variation for the main commodity volatility of the local countries; and DVIX, the percentage variation of the CBOE

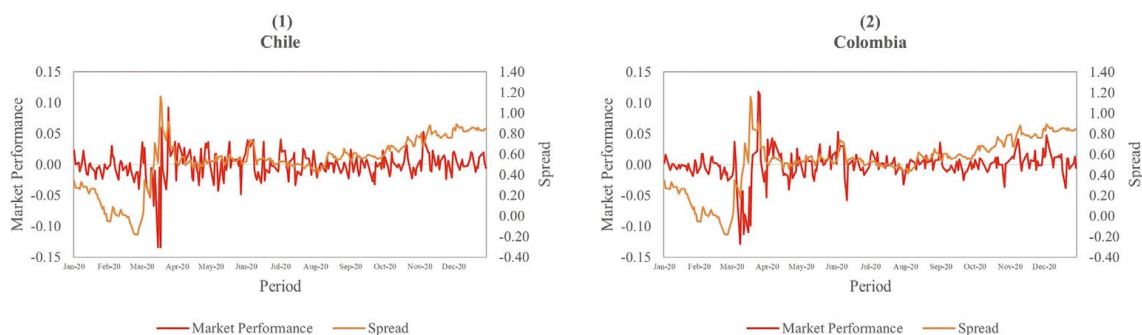
Volatility Index (VIX). Standard errors in parentheses, where *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

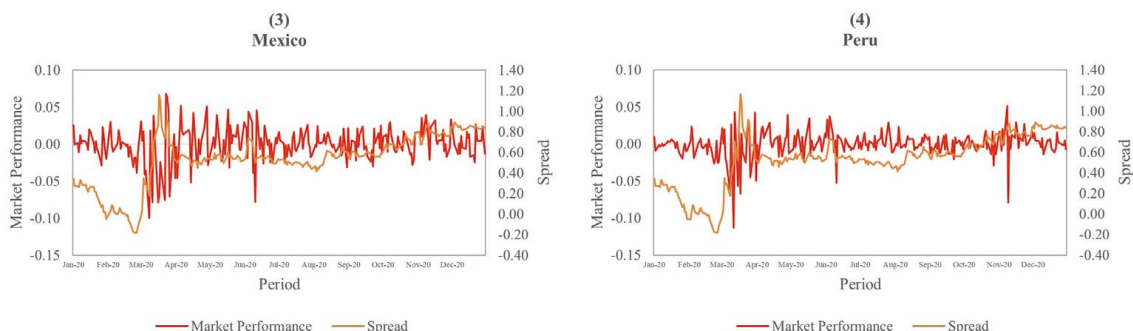
Source: Own elaboration.

Model 2 in Table 2 shows that as the rate of confirmed cases of COVID-19 (DGRCoV19) increases, the expected return on the countries' capital markets decreases, except in Peru, which increases significantly to 1%. Thus, an increase of 1% in confirmed cases implies a daily decrease in stock index returns of 0.5%, 0.32%, and 0.35% for Chile, Colombia, and Mexico, respectively. The results found in these three countries are in line with expectations. Social distancing measures (proxied by the S.Index) show a negative effect on stock returns in Chile and Peru, with a significance of 5% and 1%, respectively. For their part, measures associated with public awareness and contact tracking test policies positively affect the stock market index performance for Chile and Mexico. The latter result shows there is room for government policies that are related to creating awareness and to continuing to track the virus. Government economic support measures are not seen to affect the countries' stock index performance, with the exception of Peru, where the effect is negative, evidencing some degree of substitution effect between government benefits and company performance. The risk of openness index evidences the expected result for Chile and Colombia at a 10% significance level. The latter result is consistent with the idea that reducing the constraints on the normal functioning of the economy increases companies' stock performance.

The rest of the variables are the financial controls and display consistency in their signs. A higher spread in long term bonds and short-term bonds represents better economic conditions and stock index performance is expected to increase. The evidence shows the expected signs for all the countries, although the result is only significant for Chile and Colombia, at 10% and 5% levels of significance, respectively. An increase in local volatility associated with the country's main commodity generates a positive effect on market index performance. This result aligns with our expected outcomes as they are associated with a better future performance for the economies. An increase in global uncertainty, proxied by the VIX, has a negative effect on market performance in all the emerging Latin American economies analyzed. The latter result also makes economic sense, as poorer expected economic conditions send out a negative signal to capital market investors, and company performance worsens since these adverse conditions usually generate sales pressure on stocks.

Figure 1. Market Performance vs. Spread (January - December, 2020).





Source: Own elaboration.

Finally, there is a positive Spearman correlation that occurs between the returns of the main stock indexes of Chile, Colombia, Mexico, and Peru, which proves to be significant, as shown in Table A2. This result is interpreted as a "contagion effect", in line with Celik (2012) and Akhtaruzzaman et al. (2021).

4. Conclusions

The pandemic caused by the coronavirus (COVID-19) is strongly affecting world economic activity which, over one year after its onset, seems to have no short-term end in sight. This has led countries to seek a compromise between promoting measures aimed at trying to stop the spread of the virus whilst striving to maintain economic activity. However, temporary government intervention in both health and expenditure affects economies' stock indexes. In this article, we examine the impact of government policies related to COVID-19 on the capital markets of the emerging countries that form part of MILA (Chile, Colombia, Mexico, and Peru).

When the rates of confirmed COVID-19 cases increased, the capital markets of the different countries analyzed evidenced a fall in their stock market yields. This shows that investors react to news about COVID and are afraid about the uncertainty related to this pandemic.

In general, we conclude that social distancing policies have a negative effect on the stock market indexes in the countries under analysis. For this reason, policymakers should seek the right balance when they need to implement this kind of policy in order to avoid having any adverse effects on the economy. We also find that governments which promote public awareness campaigns and contact tracing test policies create better conditions for positive stock market performance, a result that reinforces the need to implement in-depth policies amongst the population. In addition, financial aid programs for households have no impact on stock market performance, except for the negative effect seen in Peru. Furthermore, economic reopening has a positive effect on stock market performance in Chile and Colombia, showing that in these countries people react favorably to economic market conditions. Further future research on this topic could benefit from longer time periods of data under the presence of COVID-19, new in-depth policy variables, and by performing sector analysis.

Conflict of interest

The authors of this manuscript state that there are no conflicts of interest with any entity or institution, or of a personal nature in this publication.

Appendix

Appendix A
Table A1. Variables.

Variable	Measurement	Data / Definition	Country	Data Source
Market Returns or Market Performance (Yit)	LN(Index Value t/ Index Value t-1)	IPSA COLCAP IPC IGBVL	Chile Colombia Mexico Peru	www.investing.com
Daily growth rate of confirmed COVID-19 cases (DGRCoV19)	(Cases t - Cases t-1 / Cases t-1)	Cases COVID-19	Chile Colombia Mexico Peru	https://ourworldindata.org/coronavirus-data-explorer?yScale=log&zoomToSelection=true&time=2020-03-23&country=CHL-COL-PER-MEX&region=World&casesMetric=true&interval=total&aligned=true&hideControls=true&smoothing=0&pickerMetric=location&pickerSort=asc
Stringency Index (S Index)	(Stringency Index t - Stringency Index t-1) Records information on social distancing policies. The index ranges from 0 to 100. 0 = Countries that have taken fewer measures. 100 = Countries that have taken more measures	Distancing policies	Chile Colombia Mexico Peru	https://raw.githubusercontent.com/OxCGRT/covid-policy-tracker/master/data/OxCGRT_latest.csv
Economic Support Index (Eco-Index)	(Economic Support Index t - Economic Support Index t-1) 0 = Countries that have taken fewer measures. 100 = Countries that have taken more measures	Assistance programs for households	Chile Colombia Mexico Peru	https://raw.githubusercontent.com/OxCGRT/covid-policy-tracker/master/data/OxCGRT_latest.csv

Variable	Measurement	Data / Definition	Country	Data Source
Risk of Openness Index (Risk Index)	(Risk of Openness Index t - Risk of Openness Index $t-1$) 0 = Lower risk of reopening. 1 = Higher risk of reopening.	Calculates a measure of risk a country faces in taking an "open" political stance (that is, one that does not include political measures to contain the virus through physical distancing measures).	Chile Colombia Mexico Peru	https://raw.githubusercontent.com/OxCGRT/covid-policy-scratchpad/master/risk_of_openness_index/data/riskindex_timeseries_latest.csv
Long-term and Short term Bonds (Spread)	(10-year US Treasury yield at time t - 3-month US Treasury yield at time t)	Treasury Bond Rates	U. S.	https://www.federalreserve.gov/datadownload/Review.aspx?rel=H15
Diff. Local Volatility (Local DVol)	(Variation% of Volatility from one day to another).	Copper Futures (HGZ0) Crude Oil Futures WTI (TZ0) Crude Oil Futures WTI (TZ0) Copper Futures (HGZ0)	Chile Colombia Mexico Peru	www.investing.com
USA Volatility (Global) (DVIX)	(Variation% of Volatility from one day to another).	CBOE Volatility Index (VIX)	U. S.	www.investing.com

Source: Own elaboration.

Table A2. Spearman's correlation coefficient between the returns of the main Chilean stock indices; Colombia; Mexico; and Peru.

Market Performance	Spearman's Rho	Prob. t
Chile; Colombia	0.5088	0.0000
Chile; Mexico	0.4473	0.0000
Chile; Peru	0.3254	0.0000
Colombia; Chile	0.5088	0.0000
Colombia; Mexico	0.4292	0.0000
Colombia; Peru	0.3160	0.0000
Mexico; Chile	0.4473	0.0000
Mexico; Colombia	0.4292	0.0000
Mexico; Peru	0.6511	0.0000
PERU (4); CHILE (1)	0.3254	0.0000
PERU (4); COLOMBIA(2)	0.3160	0.0000
PERU (4); MEXICO(3)	0.6511	0.0000

Source: Own elaboration.

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FACTORES CRÍTICOS DE ÉXITO DE UNA PYME JOYERA JALISCIENSE ANTE EL COVID-19: ESTUDIO DE CASO

CRITICAL SUCCESS FACTORS OF A JEWELRY SME FROM JALISCO TO
COVID-19: A CASE STUDY

JEL Classification: L19, M10, M19

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Resumen

La industria joyera jalisciense, considerada un éxito internacional produce el 70 % de la joyería de México. Por su naturaleza, este sector se maneja con discreción, lo que dificulta su estudio. En este contexto, los resultados de esta investigación proporcionan una evidencia relevante para analizar al sector joyero. De forma longitudinal, entre 2019 y 2021, se efectuó el estudio de caso de una pyme, con más de cuatro décadas en la industria, para analizar su respuesta estratégica ante el covid-19, dados los factores críticos de éxito (FCE) del sector.

Entre los principales hallazgos, se encuentra que la empresa joyera mantiene una ventaja competitiva mediante el uso de seis FCE que, durante el año 2019, fueron, en orden decreciente: precio, calidad, innovación (procesos tecnológicos), diseño (productos nuevos) trato al cliente y reputación. Tras la pandemia, se observa que todos los FCE mencionados siguen siendo relevantes, aunque en la búsqueda de mantener ventaja competitiva, se reconfigura su orden: el diseño se convierte en el más relevante. Se



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concluye que los seis factores identificados son esenciales para mantener el éxito en las empresas de esta industria, con la variante de que su importancia relativa cambia para ajustar la ventaja competitiva a las nuevas demandas del mercado.

Palabras claves: COVID-19, estudio de caso, factores críticos de éxito, pyme joyera, ventaja competitiva

Abstract

In Mexico, the jewelry industry of Jalisco contributes with 70% of the national production. The purpose of this document is to analyze the strategic response regarding the key success factors of a SME jewelry factory of Guadalajara, to cope with the COVID-19 arrival, in order to maintain its competitive advantage. Due its nature, the sector is handled with discretion, which makes it difficult to study. For this reason, this investigation shares relevant information. A longitudinal study was carried out from 2019 to 2021 to a factory with 40 years in the sector.

It has been found that the SME maintains its competitive advantage through six critical success factors of the industry, which in 2019, in order of importance were price, quality, innovation (technological processes), design (new products), customer service and reputation. It was found that, after coronavirus pandemic, the six factors remain the same, but in a different order. Design has taken the first position and the others are behind. It is concluded that these factors are a whole and all of them are necessary to maintain competitive advantage in the jewelry sector, but their relative importance changes after new market demands.

Keywords: Case study, COVID-19, critical success factors, jewelry SME, competitive advantage.

1. Introducción

La relevancia de las actividades que desempeñan las pymes en el desarrollo económico a nivel mundial, sobre todo en mercados emergentes, ha conducido a un creciente interés en analizar los determinantes de su comportamiento (Thompson et al., 2017). Adicionalmente, la globalización ha ocasionado que las empresas productoras de bienes y servicios (de cualquier tamaño), tengan la necesidad de cuidar su gestión e innovar (Olivares, 2009). Por ello, según Ghemawhat (1986) (citado en Martínez et al., 2019), las organizaciones deben buscar distintas fuentes de ventajas competitivas. Sin embargo, McGahan y Porter (1997) señalan que la estrategia competitiva de las empresas debe tomar en cuenta las características de la industria en la que participan.

Por otra parte, existe un amplio consenso en que la ventaja competitiva de la empresa depende fundamentalmente de los recursos y capacidades bajo control de la organización (Barney 1991). Desde esta perspectiva, los factores críticos de éxito (FCE) pueden asociarse a distintos recursos y capacidades de la empresa, mientras que

la industria en la que participa la firma puede afectar la importancia relativa de dichos FCE en su desempeño.

Ahora bien, en 2018, México tuvo un registro de más de 4.1 millones de unidades económicas pertenecientes al conjunto de las pymes de los sectores de manufactura, comercio y servicios privados no financieros (Secretaría de Economía, 2019).

Briseño (2018) señala que la industria manufacturera de la República Mexicana es clave para su economía, debido a que produce bienes intermedios y de consumo final, genera una vasta cantidad de empleos y contribuye, en gran parte, al Producto Interno Bruto (PIB) del país. Para López-Gómez y Blancas (2014), las pymes del sector manufacturero son consideradas las principales contribuyentes en la generación de empleos de México al ser el eje central que impulsa la productividad nacional, incluida la innovación tecnológica.

En ese sentido, uno de los subsectores manufactureros relevantes en la economía de Jalisco (en particular) y de México (en general) es el joyero, dado que la producción de dicho estado representa el 70 % del total de la República Mexicana (Azpeitia¹ en Romo, 2021). No obstante, la industria joyera es de difícil acceso para las investigaciones académicas, debido a que la naturaleza de la actividad obliga a observar un comportamiento reservado por el riesgo² que implica para los participantes brindar información sobre sus actividades. Esa situación dificulta efectuar investigaciones en las empresas que conforman la industria (Carrigan et al., 2016).

En Jalisco, la industria joyera da origen a 20,000 empleos directos y su producción corresponde a la transformación de 70 toneladas de plata y 20 de oro (Azpeitia³ en Romo, 2021). Mientras que, en Guadalajara, conocida como la Capital Joyera de América (Romo, 2022), existen 15 centros joyeros con más de 1500 puntos de venta, en los que se vende todo tipo de piezas de joyería (Parra⁴ en Parcerisa, 2019). En dicha industria, según el IIEG (2018), el 99 % son micro, pequeñas y medianas empresas, consideradas en México como pymes.

Si bien estudiar el sector resulta complejo, profundizar en su análisis es pertinente dada su importancia económica y social, en particular, durante una situación de crisis que pone en cuestionamiento su viabilidad. Al respecto, la pandemia causada por el virus SARS-CoV-2 (covid-19), junto con la recesión económica potenciada por las medidas políticas tomadas por los países para impedir su propagación (Fondo Monetario Internacional, 2020) han tenido un profundo impacto en todas las esferas del mundo contemporáneo. La Organización Internacional del Trabajo (2020) y la Organización Mundial de la Salud (2020) han precisado que la crisis generada por la pandemia a nivel global superó los 20 millones de personas infectadas hasta agosto de 2020, además de producir el confinamiento de más de 300 millones de empleados de tiempo completo, con la pérdida de sus empleos o con horas de trabajo y paga reducidas.

En el caso de México, según demuestran los datos del Estudio de Demografía de los Negocios 2021 (EDN 2021) del Instituto de Estadística y Geografía (INEGI), la tasa de mortalidad de empresas en 2020 fue del 20.81 %, mientras que para el 2021 esa cifra aumentó al 33.02 %, impulsado por la mortalidad entre microempresas (empresas

1 Álvaro Azpeitia Covarrubias. Presidente de la Cámara de Joyería Jalisco de abril de 2021 a la fecha.

2 Entre estos riesgos, los más evidentes son lo de asaltos y otras actividades delictivas en contra de los participantes de la industria.

3 Álvaro Azpeitia Covarrubias. Presidente de la Cámara de Joyería Jalisco de abril de 2021 a la fecha.

4 Sr. Ramón Parra Pedroza. Presidente de la Cámara de Joyería de Jalisco de abril de 2016 a abril de 2019.

con menos de 10 empleados según el criterio de INEGI 2020), que pasó del 21.17 % (en 2020) al 33.02 % (en 2021). El comportamiento de Jalisco, en cuanto a la tasa de mortalidad de las empresas, resulta uno de los mejores a escala nacional, pero aun así muestra un desempeño negativo con un 21.17 en 2020 y un 29.20 en 2021.

En un escenario como el descrito, resulta relevante identificar los factores claves con los que las empresas supervivientes a la crisis en Jalisco pudieron mantenerse en el mercado, porque esto puede ser útil para que un mayor número de empresas, en particular del conjunto de la pyme, logre sobrevivir en otros contextos.

Es importante señalar que, la mortalidad empresarial no es negativa en sí misma, ya que puede expresar los procesos de renovación y ajuste a las demandas del entorno del tejido empresarial. Sin embargo, los cambios abruptos expresan circunstancias anómalas que conviene atender. Por ese motivo, el período que se analiza en la investigación está comprendido entre 2019 y 2021, con el fin de conocer la situación de normalidad previo a la pandemia y los cambios experimentados en las primeras etapas de la crisis.

Para la realización del estudio, la elección de una pyme del sector joyero responde a que este sector tiene características interesantes: utiliza tecnologías tradicionales, por lo que se ubica dentro del sector mayoritario de la pyme, pero, al ser parte de la economía naranja (BID 2017), resulta adecuada para abordar el impacto de la innovación y la creatividad en el desempeño empresarial. Además, en el caso de Jalisco y, en particular, de Guadalajara, su capital, la industria joyera tiene una relevancia que excede la esfera económica, debido a sus connotaciones históricas y culturales. Sus productos, si bien participan en nichos de mercado específicos (asociados al lujo), son comercializados a nivel internacional, por lo que también han sido afectados por las disrupciones a la globalización que generó la pandemia (ver Anexos 1 y 3 en Rodríguez-Aldana y Fong, 2021).

Thompson et al. (2017) observan que la clave en el desempeño y resiliencia de la pyme suele asociarse a algunos factores que parecen ser más relevantes que otros en las actividades de la empresa, por lo que se consideran críticos para el éxito. Por esta razón, Kashyap y Raghuvanshi (2020) explican que existe una necesidad de gestionar los FCE para desarrollar estrategias que contrarresten los efectos del covid-19.

Para entender cómo los FCE repercuten en el desempeño de las empresas de la industria joyera, de qué manera estas fueron afectadas y la forma en la que se enfrentaron los efectos de la crisis del covid-19, se consideró pertinente estudiar el caso de una empresa madura del sector. En términos económicos, usualmente, se relaciona madurez con tamaño, por lo que una organización madura es aquella que ha crecido hasta alcanzar la escala óptima de producción. No obstante, esta idea es rechazada desde la perspectiva de los estudios sobre la pyme (Storey 1994, Burns 1996, Julien 2000, Fong 2020), a partir de la observación empírica de empresas pequeñas con comportamiento y desempeño propios de empresas grandes, como las nacidas globales (Cavusgil y Knight 2015, Monferrer, Blesa y Ripollés 2015, Paul y Rosado-Serrano 2019). En estos términos, en este trabajo se considera que una organización madura es aquella que ha desarrollado los atributos necesarios para actuar eficientemente en el mercado y es capaz de mantener el crecimiento alcanzado, sin tomar riesgos innecesarios (Adizes, 1988).

En ese sentido, la empresa seleccionada para el estudio cuenta con una trayectoria de más de 40 años, por lo que se puede considerar que ha alcanzado la eficiencia suficiente para mantenerse en el mercado y que dispone de los atributos claves señalados por Thompson et al. (2017).

El método de estudio de casos presenta ventajas en la investigación de fenómenos

para los que se requiere del establecimiento de relaciones de confianza con los actores relevantes en el fenómeno que se aborda –como es al análisis de la industria joyera, y además permite realizar investigaciones que cumplen con todos los criterios de calidad en la ciencia contemporánea (Yin, 2014). Esta metodología no busca establecer generalización de resultados desde una perspectiva probabilística, sino verificar empíricamente la corrección de la teoría a partir de su contrastación con los patrones de comportamiento identificados en el caso. Por este motivo la selección del caso no se realizó de forma aleatoria, sino por su idoneidad para el estudio.

El trabajo se llevó a cabo siguiendo los criterios establecidos por Yin (2014) y se incluyó un análisis de la literatura relacionada con FCE, basados en Rodríguez y Fong (2020), y un análisis empírico de los FCE relevantes para la industria joyera jalisciense.

La investigación permitió reducir el listado de FCE reportados en la literatura a un subconjunto de FCE relevantes específicamente en este subsector manufacturero.

El estudio de casos que se presenta fue diseñado tomando en cuenta los resultados antes señalados y se enfocó en verificar si los FCE identificados a nivel de industria son los mismos cuando el análisis se realiza a nivel de empresa. También, se examinó si la gestión de los FCE afecta su desempeño y la respuesta estratégica de la empresa ante la crisis del covid-19, a través del uso de sus recursos y capacidades. De esa manera, el estudio inició previo a la llegada de la pandemia en México, diciembre de 2019, y se finalizó la recolección de datos en junio de 2021.

El documento está integrado con la estructura de un artículo, y, a la vez, incluye la narración del caso. En las siguientes secciones se presenta la revisión de la literatura, la metodología utilizada, la discusión y resultados, así como las conclusiones.

2. Revisión de la literatura

2.1 Los factores críticos de éxito identificados en la literatura y en la industria

Según Primera et al., (2014) los factores críticos de éxito (FCE) han sido señalados en la literatura como aspectos particulares cuya ejecución adecuada es indispensable para garantizar el éxito de una empresa, principalmente porque ciertas áreas específicas requieren un excelente desempeño. Dichos factores, según Bullen y Rockart (1981), son las pocas áreas claves cuyos resultados deben ser forzosamente favorables para el logro de las metas gerenciales. Por su parte, Alfoqahaa (2018) afirma que estos también pueden explicarse como aquellas inversiones que las organizaciones efectúan con el objetivo de desarrollar actividades o habilidades para operar en el mercado en el que se compete. Esto hace necesario que las pymes sean conscientes del entorno que las rodea para aplicar estrategias con las que puedan aprovechar oportunidades y disminuir amenazas (Saavedra & Tapia, 2012).

De igual manera, es relevante considerar el uso de recursos y capacidades de las pymes para gestionar los FCE. Las empresas deben identificar su particularidad para ser valiosas, únicas e inimitables para, con ello, satisfacer las necesidades del entorno y crear ventajas competitivas (Ruiz y Camargo, 2017). En ese sentido, David (2008) sugiere cuidar la gestión de los recursos para que estos generen valor a las organizaciones. Más aún, Ruiz y Camargo (2017) explican que las capacidades deben manejarse de tal forma que se conviertan en habilidades y rutinas individuales en las organizaciones.

Rodríguez y Fong (2020) identificaron –a través de un análisis bibliométrico de 2008 a 2018 en la base de datos Scopus, diversos FCE en la literatura especializada en gestión estratégica de las pymes, que fueron, en orden de importancia: calidad, gestión del conocimiento, software, alianzas y colaboraciones, e-commerce o

internet e innovación; los autores Rodríguez-Aldana y Fong (2021) encuentran que los FCE específicos de la industria joyera son: calidad, precio; reputación, imagen o prestigio; trato, atención al cliente o servicio postventa; diseño de productos nuevos e innovación tecnológica.

La calidad no se define de manera absoluta, sino que responde al acuerdo de conformidad subjetiva de los requerimientos o especificaciones, percepciones, necesidades y preferencias de los clientes (Santos et al., 2009); además, conlleva un gran valor estratégico porque coadyuva a que las organizaciones sostengan ventajas competitivas, gracias a que, con la satisfacción del cliente, se genera su lealtad (Anderson et al., 1994). El precio, según la RAE (2010), se refiere al valor pecuniario en el que se estima algo. En cuanto a la innovación, Salgado et al. (2012) coinciden con las ideas de Schumpeter y refieren a que este concepto implica, entre otros, desarrollar nuevos métodos de producción. Sobre el diseño, Cuevas-Vargas et al. (2020) indican que la creatividad es esencial para mantenerse competitivo y para desarrollar productos nuevos. En cuanto al trato al cliente, Sastre (2004) citado por Caro et al., (2010) explica que este consiste en brindarle al cliente un servicio diferenciado y una garantía de sus productos.

Acerca de la reputación, Fong (2003) la define como información en poder de los diversos stakeholders de la empresa que permiten prever su comportamiento o el de sus productos en distintos ámbitos, pudiendo ser positiva o negativa. Cifuentes y León (2011) consideran que esta se ha consolidado de forma progresiva como un activo intangible y constituye un factor estratégico de ventaja competitiva que toda empresa debe gestionar. Asimismo, Fernández et al. (2012) aseveran que los beneficios de las organizaciones con buena reputación incluyen: (a) obtener un mejor precio por el bien ofrecido, dada la imagen proyectada de calidad de sus productos, (b) pagar menores precios a proveedores, (c) atraer mejor talento, (d) tener mayor lealtad de clientes y empleados y (e) crear barreras de entrada a otros competidores. En este sentido, para Cornelissen y Thorpe (2002) la reputación equivale a un activo intangible manifiesto en el juicio del consumidor, observado a través de su comportamiento de compra.

2.2 Relevancia de los FCE ante el COVID-19

La “Nueva Normalidad” (Ahlstrom et al., 2020), originada por la dimensión del cambio en el entorno, evidencia la necesidad de reflexión y de acción para comprender y tratar de mitigar los aspectos más negativos, pero también permite aprovechar las oportunidades que pudieran surgir de esta nueva situación.

Respecto a la empresa, en especial las pequeñas y medianas, después del shock inicial y la búsqueda de la supervivencia, se originaron diversas cuestiones asociadas al análisis de las estrategias de respuesta ante la crisis (Wenzel et al., 2020).

En ese sentido, el impacto del covid-19 en la industria joyera ha representado una serie de desafíos. En períodos de inestabilidad económica suele aumentar la demanda de metales preciosos como valor de refugio; sin embargo, al inicio de la crisis se consideraba que la volatilidad en los mercados de metales sería de corto plazo (Oroinformación, 2020).

Al ser las joyas bienes de lujo, en momentos de crisis, su mercado global se contrae, por lo que el sector sufre consecuencias directas al momento, lo cual, a su vez, conlleva a que solamente subsistan aquellas empresas con la suficiente adaptabilidad a las nuevas demandas del entorno (Arbaiza et al., 2012).

En ese contexto, se evidencia la necesidad de disponer de información actualizada de factores de éxito específicos para cada industria, que consideren un entorno regional y que facilite a los empresarios establecer estrategias de generación de valor.

Esta necesidad viene de tiempo atrás. Daniel (1961), quien impulsó el desarrollo del término de FCE al someter a discusión la crisis de información gerencial, ya subrayaba la conveniencia de conocer las áreas específicas que deben ser atendidas por las empresas para lograr el éxito. En términos actualizados, Kashyap y Raghuvanshi (2020) indican que existe una necesidad de identificar los FCE para desarrollar estrategias que contrarresten la pandemia del covid-19 desde un enfoque económico.

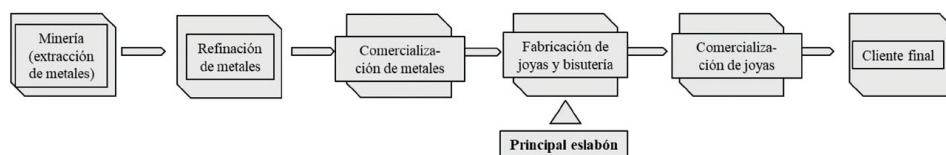
2.3 Contexto de las pymes de la industria joyera de Jalisco

La participación de la industria joyera de Jalisco tiene un gran impacto en la economía nacional, tal como se mencionó en la introducción de este trabajo. La industria se conforma en más del 99 % de pymes (IIEG, 2018). López-Gómez y Blancas (2014) señalan que las pymes manufactureras son una de las principales generadoras de empleos. Según datos de INEGI (2020), esta tipología de pyme aportó en 2018 el 31.9 del total del empleo en México.

Arbaiza et al. (2012) plantean que el principal eslabón de la cadena de valor del sector joyero lo conforman la fabricación de joyería y bisutería (ver Figura 1), debido a que la naturaleza de la actividad obliga al uso simultáneo de procesos tecnológicos automatizados y procesos manuales de carácter artesanal, que se aplican en función de la complejidad del diseño que deba realizarse en distintas fases de la elaboración del producto, a partir de criterios como el nivel de calidad buscado, el costo de elaboración de la pieza y de su carácter exclusivo o masivo. Por este motivo, la fabricación constituye el eslabón medular de la cadena de valor del sector. En consecuencia, se consideró pertinente que el estudio de caso se llevara a cabo en una empresa que incluyera la fabricación en su cadena de valor.

Figura 1. Cadena de valor del sector joyero

Fuente: Elaboración propia con información de Arbaiza et al. (2012).



La evolución de la industria joyera en México experimentó cambios drásticos como efecto de la pandemia del covid-19. En 2018⁵ alcanzó un valor de 10,675.9 millones de pesos mexicanos y se pronosticaba que para 2024 las ventas alcanzarían los 13,717.7 millones. Este escenario, como consecuencia de la crisis del coronavirus, ha cambiado. El impacto de la pandemia se produjo en distintos ámbitos. De hecho, en términos generales, cuando se presentan momentos de inestabilidad económica, la demanda de metales preciosos aumenta, ya que estos son considerados como valor de refugio o depósito. De igual manera, debido a que la actividad joyera es actividad no esencial, la industria se tambaleó a pesar de su fuerza: el último día de marzo de 2020

5 El tipo de cambio promedio en 2018 fue de 19.2373 pesos por dólar americano (Económico, 2020).

se informó que uno de los centros joyeros más importantes en el Área Metropolitana de Guadalajara (AMG), el Magno, cerraría a partir del día 4 de abril (Flores, 2020). Dicha suspensión duró casi tres meses. Así sucedió con los 15 edificios dedicados a vender joyería, que sumaban con otros locales más de 1500 puntos de venta de oro, plata y bisutería, que surtían a la mayoría del comercio nacional de dichos artículos; esos centros, también, eran los responsables de exportar los productos hacia 50 países (González⁶ citado por Toral, 2020).

Como resultado de lo anterior, la industria decreció por varios motivos: (a) la percepción de los consumidores hacia la joyería como artículo discrecional, (b) el aumento del cuidado del gasto por parte del consumidor, (c) las limitaciones para visitar locales, debido al confinamiento, y (d) las restricciones impuestas a los establecimientos para atender clientes (Euromonitor, 2020). Aunado a ello, Euromonitor (2020) pronosticaba que las ventas continuarían disminuyendo entre 2021 y 2022.

Bajo esa perspectiva, se evidencia la importancia de analizar la respuesta de la empresa ante la crisis y el rol jugado por los distintos FCE del sector en su resiliencia.

3. Metodología

El análisis que se presenta es resultado de la realización de un estudio de caso. La metodología seguida es la propuesta por Yin (2014), la cual se eligió debido a su capacidad para abordar un fenómeno con un alto nivel de complejidad, en el que se requiere suficiente flexibilidad para adaptarse y adecuarse a las características del objeto de investigación, en particular su opacidad y lograr obtener resultados de buena calidad (Yin, 2014).

La aportación de los resultados del estudio se considera de valor para la industria, dado el hermetismo que este sector tiene, el cual se manifiesta en el recelo y suspicacia para compartir información relacionada con temas de producción, ventas y determinación de precios (Instituto Español de Comercio Exterior, 2006).

El punto de partida de la investigación fue identificar los FCE descritos en la literatura internacional y luego los que son específicos del sector de la joyería para observar sus diferencias y similitudes.

A partir de los hallazgos encontrados, se consideró conveniente verificar si los conjuntos de FCE relevantes identificados a nivel de industria lo son también en empresas individuales o si se presentan variaciones significativas y, además, si se presentaron cambios relevantes en los FCE identificados a nivel empresa asociados a la pandemia, por lo que el análisis comprende los años 2019, 2020 y 2021.

Con el propósito de analizar el grado de variación de los FCE en dichos años, se utilizó para los tres períodos el instrumento denominado “Perfil de recursos y capacidades de la organización”, tomado del protocolo de Fong (2017), mismo que fue ajustado a las necesidades particulares de este estudio de caso. El instrumento tiene como objetivo original identificar recursos y capacidades presentes en la empresa y su impacto relativo en el desempeño. Como los FCE encontrados como relevantes a nivel de industria joyera pudieron ser caracterizados como recursos o capacidades de la empresa, el ajuste del instrumento se limitó a incluir preguntas para captar situaciones no previstas o FCE externos a la empresa misma. La decisión de utilizar

6 Sergio González Velasco. Presidente de la Cámara de Joyería Jalisco de abril 2019 a 2021.

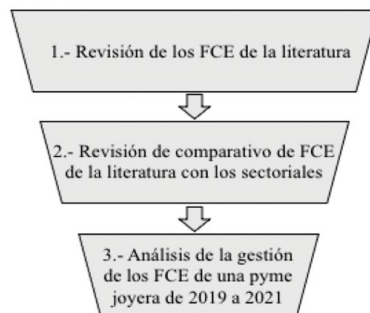
este instrumento responde a su utilidad, dado que se ha validado como mecanismo de obtención de evidencia en diversos trabajos de investigación.

Es relevante señalar el carácter longitudinal de la investigación, ya que se mantuvo contacto cercano durante los tres años señalados con el dueño de la empresa, quien, a su vez, es el director.

En la Figura 2 se muestra el esquema metodológico utilizado.

Figura 2. Metodología de la investigación

Fuente: Elaboración propia.



La Figura 2 muestra las etapas del presente estudio. La primera implicó identificar los FCE de la literatura, con el bibliométrico de Rodríguez y Fong (2020). La segunda incluyó realizar el contraste de los FCE de la literatura con los del sector señalados por Rodríguez-Aldana y Fong (2021). La tercera y última etapa consistió en estudiar el caso de una pyme joyera ubicada en la Capital Joyera de América, Guadalajara, de 2019 a 2021.

3.1 Elección del sujeto del estudio de caso

Arbaiza et al. (2012) consideran que el principal eslabón de la cadena de valor de la industria joyera es la fabricación de joyas y bisutería. Bajo este criterio, se eligió a una pyme fabricante de estos artículos, la cual lleva participando en el sector 41 años. De igual forma, al ser Jalisco el mayor contribuyente en la producción nacional de joyería en la República Mexicana, la empresa elegida se ubica en la ciudad de Guadalajara, capital del estado de Jalisco.

Diversos autores (Eisenhardt 1989, 1991; Dyer y Wilkinns 1991; Yin 1989, 2014) han abordado la conveniencia de incluir narrativas en los resultados de estudios de casos de investigación. Sin embargo, no existe consenso debido al riesgo asociado a las narraciones de sesgos cognitivos que sobredimensionen los aspectos más llamativos en detrimento de cuestiones relevantes dentro del caso. Por otra parte, el análisis de objetos de investigación fuertemente afectados por su contexto pone de manifiesto la utilidad de disponer de narrativas en las que se exprese la complejidad del fenómeno, y que permitan, además de su uso en investigación, su aprovechamiento en una perspectiva docente.

4. Discusión y resultados

4.1 El caso de TAnn⁷, una pyme manufacturera

Diversos autores (Eisenhardt 1991; Dyer y Wilkinns 1991; Yin, 2014) han abordado la conveniencia de incluir narrativas en los resultados de estudios de casos de investigación. Sin embargo, no existe consenso debido al riesgo asociado a las narraciones de sesgos cognitivos que sobredimensionen los aspectos más llamativos en detrimento de cuestiones relevantes dentro del caso. En esta línea, se describe a continuación la empresa.

a) TAnn frente al covid-19

TAnn comenzó sus actividades en 1980. En sus inicios, fabricó durante una década joyería de fantasía. Con el paso de los años cubrió demandas de piezas de oro, chapa y plata. Es desde 1998 que se ha dedicado enteramente a la fabricación de piezas de plata. El metal lo adquieren de proveedores nacionales, y las perlas y zirconias son importadas directamente desde China. Clausell (2010) sugiere que el crecimiento de este sector es quizá resultado del precio relativamente bajo de la plata, comparado con el oro, además de que el inicio de actividades para participar como taller familiar en esta industria no requiere inversiones significativas, dado el costo de los insumos. Otro elemento positivo en la fabricación de joyería de plata se da de manera natural, al ser México el principal productor de este metal en el mundo, al alcanzar las 5,600 toneladas métricas (Díaz, 2021).

Durante poco más de cuatro décadas, la empresa se ha adaptado a las cambiantes necesidades de los clientes y ha invertido en maquinaria para maximizar la eficiencia en costos y mejorar los acabados de las piezas. Al respecto, la producción de joyería requiere procesos de orfebrería que tienen carácter artesanal, pero pueden acompañarse de algunos procesos automatizados para mejorar la calidad en los acabados y el brillo de las piezas fabricadas, lo cual a su vez conlleva a reducir costos (Porter, 1996). Así, TAnn ha adquirido en el transcurso de los años maquinaria de tecnología de punta para mejorar la eficiencia operativa y lograr terminados de calidad en sus piezas en los procesos automatizados que requieren sus productos. Cabe señalar que, el concepto de eficiencia operativa es descrito como un principio básico de negocios por el cual las empresas prosperan al entregar bienes o servicios de calidad a partir de una gestión efectiva de costos.

Por otro lado, el área de Producción consta de 10 empleados, y dos en específico vigilan la calidad, al supervisar cada uno de los procesos de fabricación, así como efectuar la revisión de cada una de las piezas terminadas, es decir, los bienes que han pasado por todo su proceso de producción, listos para su entrega (Páez, 2021).

La organización estudiada está a cargo del hijo del fundador, segunda generación de la empresa familiar, que ha sabido gestionar y aprovechar el conocimiento adquirido del sector. En este sentido, aunque en el análisis de FCE de la literatura de Rodríguez y Fong (2020) se tiene a la gestión del conocimiento como un factor clave, en el análisis comparativo con la industria, inferen que esta se lleva a cabo, mas no es un factor específico para la misma. De acuerdo con Carayannis (1999), la gestión del conocimiento puede ser considerada como un sistema sociotécnico de políticas y prácticas de negocios, tanto tácitas como explícitas.

7 El nombre ha sido modificado para mantener la privacidad de la empresa.

TAnn compite por precio, con piezas ligeras, para mantener precios asequibles, ya que el precio, junto con la calidad son de los factores clave más importantes de la industria, según Rodríguez-Aldana y Fong (2021). Entre los productos que fabrica hay aretes de distintos tipos, juegos de arete con dije, anillos, pulseras y joyería religiosa. La mercancía, vendida a granel, es hecha de plata con circonia o con perla cultivada.

Asimismo, la alta dirección de la empresa explica que, dada la demanda del mercado, es relevante tener capacidad de respuesta a la fabricación de pedidos que les realicen en cualquier momento, para surtir a la brevedad, además de que es indispensable mantener una relación cercana con los consumidores. El segmento de clientes de TAnn incluye mayoristas, locatarios de centros joyeros, joyerías y revendedores. En ese sentido, la empresa cuida especialmente la atención que brinda a sus clientes, gracias a lo cual ha fortalecido durante años su lealtad y relación.

El trato con el cliente es otro FCE en la industria. El dueño de la empresa da seguimiento a las ventas que los mayoristas realizan de sus artículos para llevar un monitoreo de aquellas piezas que necesitan ser resurtidas, o aquellas que no tuvieron aceptación, principalmente porque una parte de la joyería vendida sigue tendencias de moda; por ello, asevera que es esencial observarlas en todo momento.

Al ser la reputación en el medio un tema de gran relevancia, TAnn cuida proporcionar en todo momento el kilataje⁸ ofrecido a los clientes, y quintado⁹ en sus piezas. Los principales clientes realizan, de forma aleatoria, análisis de algunas piezas en laboratorios certificados para analizar metales, justo para precisar que el kilataje comprado coincide con el quintado en los productos.

4.2 Los FCE de la empresa antes y después del covid-19

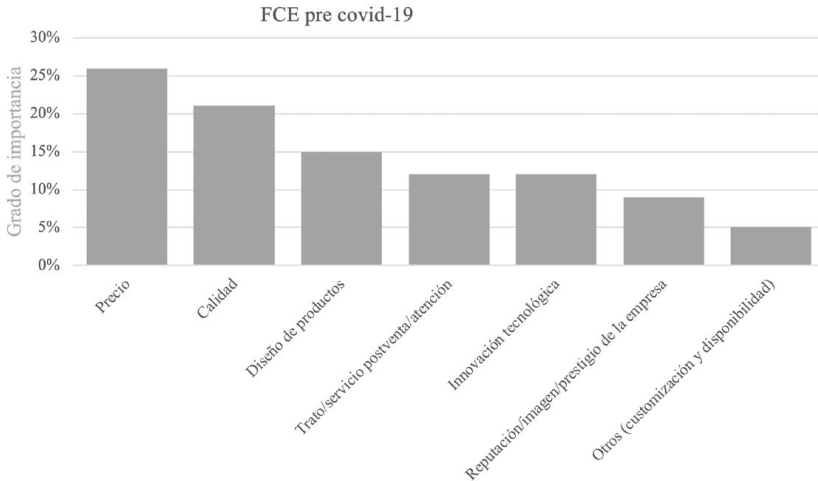
a) FCE de TAnn en 2019

Al utilizar el instrumento exhibido en el Anexo 1, se obtuvo la Gráfica 1, que se muestra a continuación. Como se puede observar en dicha gráfica, desde la perspectiva de la empresa estudiada el factor precio es el más importante, seguido por calidad, diseño, innovación en maquinaria, trato o servicio postventa, imagen o reputación, y en menor grado la customización y disponibilidad. La disponibilidad es un atributo que la empresa da un bajo grado de importancia porque vende a la mayoría de sus clientes sobre pedidos. La customización, según Spring y Dalrymple (2000), sucede cuando se agrega trabajo al diseño originalmente ofrecido, con lo cual es necesario cambiar el proceso que conlleva tanto en diseño como en producción; así, la customización significa hacer el producto a la medida e implica hacer cambios en el proceso.

⁸ Kilataje: Este término se utiliza para referirse a la pureza o a la cantidad de oro o plata, en proporción al metal correspondiente, con el que se elabora la aleación para que tenga mayor resistencia (Nacional Monte de Piedad, 2020).

⁹ Quinto, quintada: Se dice que una joya es quintada, o que tiene su quinto, cuando un número es grabado sobre la pieza. Dicho número expresa la aleación contenida en la pieza, ya sea de oro o de plata. De manera particular, en la joyería de plata, cuando una pieza posee el 92.5 % de plata pura, se quinta con el número 925, cantidad que es la más utilizada y recibe el nombre de plata de ley (Román, 2022).

Gráfica 1 . Factores críticos de éxito de TAnn en situación pre covid-19



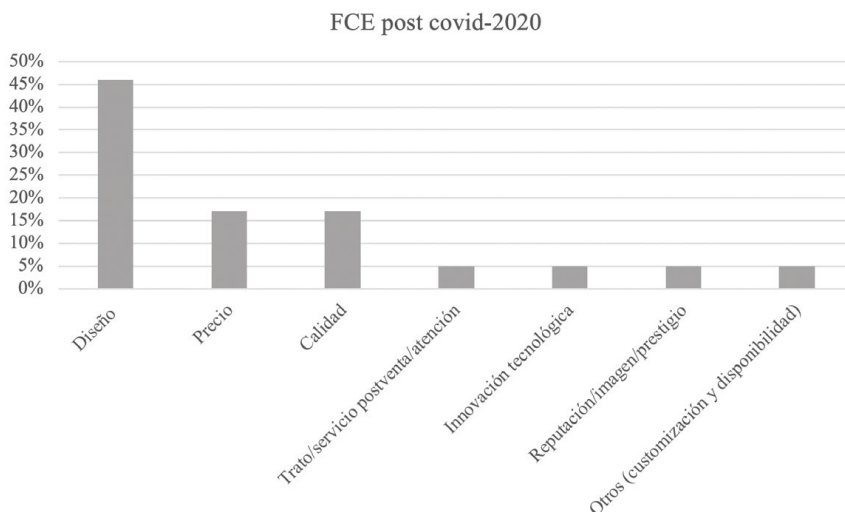
Fuente: Elaboración propia a partir de la información proporcionada por la empresa. La importancia relativa de cada factor fue evaluada por la empresa misma

Para la empresa, la imagen en cuanto a reputación en el medio es tan importante como el diseño y la innovación tecnológica. El director señala que calidad y precio son muy importantes, pero depende del cliente si uno es más relevante que otro. En general, el director considera que sus clientes exigen más precio que calidad. Adicionalmente, también refiere que la dificultad de la competencia para imitar los atributos de calidad, trato o servicio postventa y reputación o imagen es alta; para el precio, disponibilidad, innovación en maquinaria y adecuación o customización de productos a los clientes es media; y el diseño tiene baja dificultad, debido a que la copia de modelaje es sencilla, mientras no esté patentada bajo una marca o tenga derechos de autor.

b) FCE de TAnn en 2020

De la misma forma, se revisó el comportamiento durante 2020. El instrumento utilizado se muestra en el Anexo 2. En la Gráfica 2, se resalta la reconfiguración de diseño al pasar del tercer al primer lugar. Destaca que, en 2019 para este factor, la empresa otorgó el 15 % de importancia, mientras que para 2020 le asignó el 46 %. De la misma forma, el precio recibió una calificación distinta al ser desplazado de 26 % a 17 %. Calidad, que ocupaba en 2019 el segundo lugar con 20 %, fue posicionado con el mismo grado de importancia que el precio, al quedar valorado en 17 %.

Gráfica 2. Factores críticos de éxito de TAnn en 2020, situación post covid-19



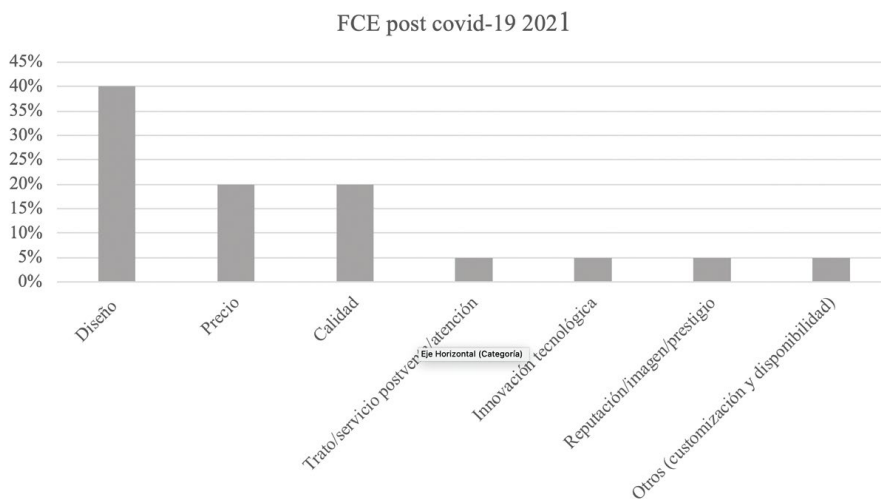
Fuente: Elaboración propia.

El dueño señala que el grado de dificultad para la competencia de imitar los atributos enlistados permanece sin variación. La empresa considera que el principal factor clave es el diseño. Esto resulta de la exigencia de sus clientes mayoristas y revendedores en cuanto a productos nuevos. El precio y calidad se han tornado igualmente importantes. El resto de los factores pasan a segundo término.

c) FCE de TAnn en 2021

El instrumento aplicado en 2021 a TAnn (Anexo 3), arrojó los siguientes resultados (ver Gráfica 3). Se observa que el diseño se mantiene en primer lugar, aunque su grado de importancia decrece de 46 % a 40 %, y el precio y calidad cambian de 17 % a 20 %.

Gráfica 3. Factores críticos de éxito de TAnn en 2021, aún situación post covid-19



Fuente: Elaboración propia.

De esta forma, el diseño continúa como el factor de mayor importancia, aunque disminuyó ligeramente con respecto al año anterior; esto se debió a que el precio y calidad subieron en grado de importancia, porque los clientes comenzaron a demandar piezas más ligeras, por ende más baratas, ya que la plata se vende de acuerdo con su peso. Además, por lo limitado de las ventas de este tipo de artículos en tiempos de pandemia, al ser considerados como bienes de lujo, el director señaló que la calidad también creció en grado de relevancia puesto que los clientes le asignaron mayor peso; de tal forma que este factor quedó ubicado en el mismo nivel que el precio.

Para comparar de forma más puntual los resultados anteriores, se exhibe la Tabla 1 y su respectiva gráfica. En esa tabla se observa que en diciembre de 2019 (previo a la pandemia de covid-19) para TAnn el precio y calidad eran los factores más valorados por sus clientes, al representar el 26 y 20 % respectivamente. El diseño de piezas nuevas fue posicionado en tercer lugar, con 15 %, seguido por la innovación tecnológica con un 12 % porcentual por debajo. El dueño explica que tener maquinaria especializada ayuda con la eficiencia de costos, además de que se logra dar un mejor acabado a las piezas en términos de pulido y brillo.

Tabla 1. Porcentaje de atributos demandados por los clientes con respecto a los productos de la organización TAnn

Atributos solicitados por los clientes	Diciembre 2019	Junio 2020	Junio 2021
Atención al cliente y servicio posventa	12 %	5 %	5 %
Calidad	21 %	17 %	20 %
Customización	3 %	3 %	3 %
Diseño de productos	15 %	46 %	40 %
Disponibilidad	2 %	2 %	2 %
Innovación tecnológica	12 %	5 %	5 %
Precio	26 %	17 %	20 %
Reputación/imagen/prestigio de la empresa	9 %	5 %	5 %
Total	100 %	100 %	100 %

Fuente: Elaboración propia.

Igual que en 2020, en 2021, el director refiere a que continúa sin variación el grado de dificultad para la competencia de imitar los atributos enlistados: calidad,

⁷ La elección de meses se debe a que fue el tiempo que la empresa eligió para cooperar con los datos requeridos de la investigación. Esto como consecuencia de que los meses previos tienen mayor cantidad de trabajo debido a que sus clientes participan en las exposiciones de nombre Expo Joya, organizadas por la CRIJPEJ durante abril y octubre; la empresa, también, surte pedidos adicionales en mayo y noviembre.

trato o servicio postventa y reputación o imagen, precio, disponibilidad, innovación en maquinaria y adecuación o customización de productos a los clientes y el diseño.

La empresa también considera relevantes la atención y servicio posventa al cliente, en el sentido de que sus clientes esperan que, en caso de que alguno de sus productos tenga defecto, le sea reparada o cambiada la pieza, según corresponda.

Asimismo, la imagen o reputación de la empresa son importantes porque el cliente espera obtener el kilataje indicado en la pieza. Dicho kilataje se comprueba con análisis de laboratorios especializados en metales, los cuales realizan los clientes de forma aleatoria en los laboratorios acreditados de su preferencia. Por su parte, el fabricante también realiza análisis de forma periódica en algunas piezas para mostrar los certificados de los resultados a sus clientes actuales o potenciales.

En menor grado queda la customización y disponibilidad, ya que el primero se realiza poco, solamente en medidas de anillos (conforme a los pedidos que realice cada cliente, o por tamaños y colores específicos de la piedra circonia que colocan en sus piezas) y el segundo, por ser sobre pedido, solamente se tienen muestrarios disponibles para que los clientes conozcan el modelaje de los productos que la empresa fabrica. La empresa procura no manejar inventarios, no sólo por costos sino por seguridad (robos), aunado a que la moda en la joyería cambia continuamente.

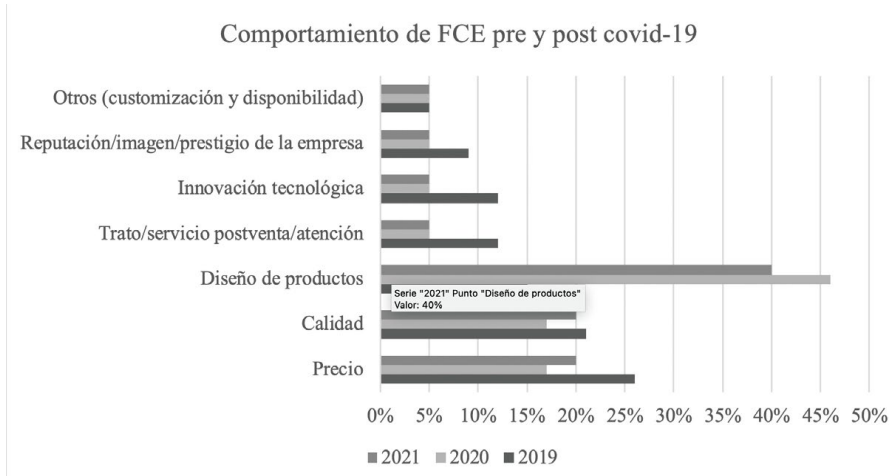
Por otro lado, como se mencionó previamente, hubo un cierre obligatorio de casi tres meses en las labores de la industria joyera por ser una actividad no esencial. Al retomar las labores, como ha podido observarse, la empresa reconfiguró el uso de atributos. Es relevante destacar que, según los comentarios del director, los factores señalados son indivisibles, su presencia varía en mayor o menor grado.

En junio de 2020, la respuesta estratégica de la empresa fue invertir en diseñar productos nuevos, porque con el cierre de operaciones generalizado del medio joyero, los clientes tendrían los mismos productos que no vendieron por la misma razón. En este sentido, como se señaló anteriormente, la joyería es una industria que sigue las tendencias de moda y algunos productos cambian con cierta frecuencia. Entonces, el diseño se desplazó al primer lugar de importancia de dichos factores, y tanto el precio como la calidad quedaron en segundo lugar. La innovación tecnológica, reputación y atención o servicio posventa, quedaron en tercer lugar, y, por último, se mantuvieron con los mismos porcentajes la customización y disponibilidad.

Para junio de 2021, se aplicó nuevamente el instrumento para monitorear cambios al haber transcurrido un año de pandemia. Se encontró que el diseño de modelos nuevos continuaba siendo el factor preponderante, pero que, tras este período, los clientes exigían en mayor grado, pero al mismo nivel, precio y calidad, cuyos porcentajes subieron de 15 % a 20 %, puesto que ahora los clientes buscaban piezas más ligeras, pero de buena calidad. El resto de los factores permaneció sin variación con respecto a junio de 2020.

A continuación, se presenta la Gráfica 4 para visualizar el comparativo de los resultados previos. Esta gráfica permite observar el cambio en el grado de importancia del diseño de productos nuevos, seguido por precio y calidad. Al inicio de la pandemia hubo una ligera reducción en la importancia de estos dos últimos factores, superada por el tema del diseño de productos. No obstante, con la continuidad del covid-19, se prorrateó el grado otorgado al diseño, que decreció ligeramente, y se reconfiguraron el precio y la calidad, los cuales permanecen siendo relevantes para los clientes.

Gráfica 4. Cuadro comparativo de la reconfiguración de FCE de TAnn de 2019 a 2021



Fuente: Elaboración propia.

Los anteriores resultados permiten corroborar lo señalado por el director de TAnn: los atributos son parte de un todo y su reconfiguración varía de acuerdo con las circunstancias.

5. Conclusiones

Con esta investigación se estableció el uso de FCE antes y después de la pandemia para una pyme fabricante de joyería. Los cambios más significativos se observaron en los factores de diseño, precio y calidad.

La reconfiguración de factores críticos de éxito de la empresa estudiada, ante el diseño de nuevos productos, le permitió atravesar una crisis importante ocasionada por la inesperada pandemia del covid-19. Un año más tarde del regreso a la nueva normalidad, el diseño se ha mantenido como fuente primordial de ventaja competitiva, mientras que el precio y la calidad han sido puntos claves exigidos por los clientes mayoristas para vender ellos a usuarios finales.

La investigación permitió observar que, desde la perspectiva de la empresa, el desarrollo de productos nuevos y adaptación de los FCE al entorno de la pandemia, fueron claves para mantener su desempeño, con lo cual han seguido siendo competitivos en su sector hoy en día.

Adicionalmente, destaca que las organizaciones construyen su resiliencia en momentos de crisis al gestionar sus factores críticos de éxito, y de su rápida acción se deriva su continuidad. En este sentido, es relevante que cada empresa tenga claros cuáles son los FCE de su sector para gestionarlos con la pertinencia que estos ameritan. Como se ha observado, el paso del tiempo puede no solamente modificar el orden y

grado de importancia de cada factor, sino que pueden evolucionar: se mencionó que el e-commerce no era de gran relevancia al momento del estudio realizado, aunque se visualizaba como área de oportunidad, lo cual podría derivar en que este factor se torne un FCE en cualquier momento.

Uno de los principales aportes de esta investigación fue estudiar una empresa cuyo sector es de alta reserva, por la naturaleza de los productos fabricados. Este estudio permitió visualizar la relevancia de conocer y atender los factores de éxito de la industria en la que se participa como un mecanismo de defensa para responder a los cambios turbulentos del entorno.

Aunado a lo anterior, se concluye que es importante identificar y vigilar los factores de éxito examinados, con el propósito de lograr una mejor respuesta estratégica de la pyme al afrontar circunstancias inesperadas.

Finalmente, se sugiere llevar a cabo una nueva línea de investigación sobre la gestión, tanto de los recursos como de las capacidades dinámicas.

Declaración de conflicto de interés

Los autores del presente manuscrito manifiestan que no existen conflictos de interés con ninguna entidad o institución, ni de carácter personal en esta publicación.

Anexos

Anexo 1

PERFIL DE LOS RECURSOS Y CAPACIDADES DE LA ORGANIZACIÓN					
Empresa participante en el estudio de casos: TAnn				Clave	Estudio de caso
				Fecha	12/17/2019
				Fuente	Primaria
Datos generales Pyme con 39 años en el medio.				Contacto	
				Dueño	
SOPORTES DEL DESEMPEÑO					
¿En qué porcentaje depende la demanda de productos de la organización de los siguientes atributos?					
	%		%		%
Precio	26	Diseño	15	Trato / servicio postventa / atención al cliente	10
Calidad	20	Disponibilidad	2	Innovación tecnológica (en maquinaria)	14
Funcionalidad	0	Reputación	9	Customización	3
Observaciones: Para la empresa la imagen en cuanto a reputación en el medio, es tan importante como el diseño y la innovación.					
¿Qué dificultad tendría para la competencia conseguir imitar los siguientes atributos del producto?					
		Dificultad alta	Dificultad media	Dificultad baja	
Precio			x		
Calidad		x			
Diseño(productos)				x	
Disponibilidad			x		

¿Qué dificultad tendría para la competencia conseguir imitar los siguientes atributos del producto?			
	Dificultad alta	Dificultad media	Dificultad baja
Servicio posventa/trato	x		
Innovación(maquinaria)		x	
Customización		x	
Reputación	x		
Otros	-	-	-
Observaciones: El director señala que calidad y precio son muy importantes, pero depende del cliente si uno es más relevante que otro. En general, el director considera que sus clientes exigen más precio que calidad.			

Fuente: Elaboración propia, 2020 (basado en Fong (2017)).

Anexo 2

PERFIL DE LOS RECURSOS Y CAPACIDADES DE LA ORGANIZACIÓN					
Empresa participante en el estudio de casos: TAnn				Clave	Estudio de caso
				Fecha	6/25/2020
				Fuente	Primaria
Datos generales Pyme con 40 años en el medio.				Contacto	
				Dueño	
SOPORTES DEL DESEMPEÑO					
	%		%		%
Precio	15	Diseño	45	Trato/servicio postventa	5
Calidad	15	Disponibilidad	5	Innovación(maquinaria)	5
Funcionalidad	0	Imagen/reputación	5	Customización	5
Observaciones: TAnn considera que el principal FCE es el diseño, debido a la exigencia de sus clientes mayoristas y revendedores en cuanto a productos nuevos. El precio y calidad se han tornado igualmente importantes. Los demás factores pasan a segundo término					
¿Qué dificultad tendría para la competencia conseguir imitar los siguientes atributos del producto?					
		Dificultad alta	Dificultad media	Dificultad baja	
Precio			x		
Calidad		x			
Diseño(productos)				x	
Disponibilidad			x		
Servicio posventa /trato		x			
Innovación(maquinaria)			x		
Customización			x		
Reputación		x			
Otros		-	-	-	
Observaciones: El dueño señala que el grado de dificultad para la competencia de imitar dichos atributos permanece sin variación.					

Fuente: Elaboración propia (202) (basado en Fong (2017)).

Anexo 3

PERFIL DE LOS RECURSOS Y CAPACIDADES DE LA ORGANIZACIÓN					
Empresa participante en el estudio de casos: TAnn				Clave	Estudio de caso
				Fecha	6/18/2021
				Fuente	Primaria
Datos generales Pyme con 40 años en el medio.				Contacto	
				Dueño	
SOPORTES DEL DESEMPEÑO					
	%		%		%
Precio	20	Diseño	40	Trato/servicio postventa	5
Calidad	20	Disponibilidad	2	Innovación(maquinaria)	5
Funcionalidad	0	Reputación	5	Customización	3
Observaciones: TAnn considera que el principal FCE es el diseño, debido a la exigencia de sus clientes mayoristas y revendedores en cuanto a productos nuevos. El precio y calidad se han tornado igualmente importantes. Los demás factores pasan a segundo término					
¿Qué dificultad tendría para la competencia conseguir imitar los siguientes atributos del producto?					
	Dificultad alta	Dificultad media	Dificultad baja		
Precio		x			
Calidad	x				
Diseño(productos)			x		
Disponibilidad		x			
Servicio posventa/trato	x				
Innovación(maquinaria)		x			
Customización		x			
Reputación	x				
Otros	-	-	-		
Observaciones: El dueño señala que el grado de dificultad para la competencia de imitar los atributos enlistados, permanece sin variación.					

Fuente: Elaboración propia (2021) (basado en Fong, 2017).

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OPTIMIZACIÓN DEL PROCESO DE BARRENADO PARA EL INCREMENTO DE PRODUCTIVIDAD Y REDUCCIÓN DE RECHAZOS A TRAVÉS DE LA METODOLOGÍA DMAIC: CASO EMPRESA DEL SECTOR AUTOMOTRIZ

OPTIMIZATION OF THE DRILLING PROCESS TO INCREASE PRODUCTIVITY
AND REDUCE REJECTS THROUGH THE DMAIC METHODOLOGY, CASE OF AN
AUTOMOTIVE COMPANY

JEL Classification: M00, M10, M19

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Resumen

La industria automotriz se ha vuelto más exigente en términos de calidad a lo largo de los años, debido a que los procesos requieren una mayor precisión y un mejor control



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con la finalidad de cumplir los requerimientos del cliente. El presente trabajo muestra el caso de la implementación de la metodología DMAIC en una empresa del sector automotriz, específicamente en una planta de maquinado de discos, el cual es uno de los procesos más críticos e importantes del sector, ya que es en donde se perfeccionan las piezas, adecuándose a las características que el cliente pide. El número de parte con el que se trabajó es el D170X, un modelo perteneciente al cliente FCA. El objetivo del proyecto de mejora continua es reducir los reclamos del cliente, las cuales son reflejadas en alertas de calidad. Para la reducción de estas alertas se propone disminuir los defectos encontrados en las piezas, los cuales se realizan en la operación del barrenado ya que se encuentran barrenos desfasados y fuera de especificaciones.

En el presente trabajo se desarrolló la metodología DMAIC (Definir, Medir, Analizar, Implementar y Controlar) para reducir los defectos atacándolos desde la raíz e incrementar el nivel Six Sigma además que se apoyó en la herramienta de calidad AMEF (Análisis del Modo y Efecto de la Falla) para identificar las posibles fallas, y determinar la manera de corregirlas y prevenirlas.

Después del desarrollo e implementación de la metodología DMAIC se evidenciaron cambios favorables en el proceso, siendo la calidad primordial y por ello el cliente se encuentra conforme a sus requerimientos.

Palabras claves: Sector Automotriz, Proceso de maquinado, DMAIC, Calidad, Six Sigma, Optimización de proceso, Productividad.

Abstract

The automotive industry has become more demanding in terms of quality over the years, as processes require greater precision and better control in order to meet customer requirements. The present work shows the case of the implementation of the DMAIC methodology in a company in the automotive sector, specifically in a disc machining plant, which is one of the most critical and important processes in the sector, since it is where they are perfected. the pieces, adapting to the characteristics that the client requests. The part number that was worked with is the D170X, a model belonging to the FCA client. The objective of the continuous improvement project is to reduce customer complaints, which are reflected in quality alerts. In order to reduce these alerts, it is proposed to reduce the defects found in the pieces, which are made in the drilling operation since holes are out of phase and out of specifications.

In the present work, the DMAIC (Define, Measure, Analyze, Implement and Control) methodology was developed to reduce defects by attacking them from the root and increase the Six Sigma level, in addition to being supported by the FMEA (Mode and Effect Analysis) to identify possible failures and determine how to correct and prevent them.

After the development and implementation of the DMAIC methodology, favorable

changes were evidenced in the process, with quality being paramount and therefore the client is in accordance with their requirements.

Keywords: Automotive Sector, Machining process, DMAIC, Quality, Six Sigma, Process optimization, Productivity.

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1. Introducción

A nivel mundial, la importancia de la industria automotriz en las economías nacionales y su papel como motor para el desarrollo de otros sectores de alto valor agregado ha llevado a que diferentes países tengan como uno de sus principales objetivos el desarrollo y/o fortalecimiento de esta industria, en México no es excepción ya que la industria automotriz ha sido un sector estratégico para el desarrollo del país.

En agosto de 2021, el valor de exportación del sector automotriz de México superó los \$10,400 millones, una disminución de aproximadamente \$1,500 millones respecto al valor de exportación de reportado en agosto de 2020. (Szász, et al., 2021; Statista, 2021). Aunque México se ha mantenido tradicionalmente entre los países líderes en la producción mundial de vehículos, ha sido reemplazado gradualmente en la undécima posición desde 2004. Es el caso del centro del país en el que se encuentra el estado de Puebla, ya que es uno de los países más representativos en la industria puesto que es el principal atractivo del capital extranjero en muchos proyectos futuros. Dentro del estado existen varios tipos de empresas dedicadas a la fabricación de autopartes, la industria de fabricación de discos de frenos no es de las más comunes, por lo que es importante para las empresas estar bien posicionadas y ser competitivas para atraer clientes. Dentro de esta perspectiva, es importante señalar que las grandes empresas siguen con éxito las estrategias de calidad basados en las normas ISO 9000, QS 9000 para la industria automotriz de Estados Unidos y Canadá, VDA en la industria automotriz alemana, y Six Sigma para empresas u organizaciones en general, entre otras metodologías de calidad (Chávez et al., 2018). El proceso de fabricación de discos de freno es un tanto complejo y debe estar dentro las especificaciones de las normas mencionadas, ya que el disco está sujeto a varios procesos los cuales están sujetos a altos estándares de calidad y deben ser lo más precisos posible ya que el sistema de frenos es sin duda el componente más importante el automóvil ya que la seguridad de los pasajeros total o parcial depende de él (García, 2015). El proceso de maquinado es importante para cumplir con los estándares de calidad definidos, ya que es la parte que define las características de seguridad requeridas por el cliente en el disco para freno. La calidad de la superficie obtenida en la pieza durante el maquinado depende de la geometría del afilado de la herramienta de corte que utiliza cada máquina en el proceso de transformación del metal (Leyva, 2018). El barrenado es uno de los

procesos más notables, ya que ahí se realiza la perforación, se puede definir como el proceso en el que una herramienta giratoria tiene uno o más bordes cortantes, con la intención de tener las superficies exactas para los agujeros que son una parte importante del ensamblaje de piezas (Camargo, 2010; Tanos, 2010).

La medición es uno de los aspectos clave del control estadístico y la estrategia de mejora de Six Sigma y su metodología es un modelo que sigue un formato estructurado y disciplinado aplicada a la producción como un indicador de la propagación esperada o la variabilidad de los productos fabricados en un proceso. Además, tiene como objetivo eliminar la variabilidad, mejorar la calidad, el costo y el tiempo de ciclo de cualquier tipo de proceso, producción o servicio. Con el enfoque de fabricación ajustada, es uno de los métodos más avanzados y precisos para la mejora de procesos (Manel, 2015). Bajo esta consideración los métodos estadísticos se aplican para sustentar la toma de decisiones, mejorar el rendimiento del proceso y aumentar la satisfacción del cliente (Garza et al., 2016). En un proceso Six Sigma con más de un millón de posibles errores, hay un máximo de 3 o 4 errores. De esta manera, es una métrica que indica el número de errores por millón de oportunidades (DPMO) o cómo funciona el proceso de acuerdo con los requisitos del cliente.

Para su desarrollo en proyectos de mejora se implementa a través de cinco pasos bien definidos conocidos como el ciclo DMAIC (Definir, Medir, Analizar, Mejorar, y Controlar)

Definir: El objetivo de esta fase es identificar, acotar y definir el proyecto a realizar con el fin de que éste sea abordable, beneficioso y tangible.

Medir: Su objetivo es planificar y llevar a cabo una recogida de datos a fin de caracterizar el mismo.

Analizar: Se trata de detectar el estado del proceso y las variables críticas dentro del mismo. Es el momento de la aplicación del análisis de causa raíz para encontrar las palancas que mejorarán el proceso.

Mejorar: Identificar e implantar mejoras a aplicar dentro del proceso y realizar prueba piloto.

Controlar: Establecer mecanismos para asegurar que las mejoras se mantienen en el tiempo.

Un objetivo de la aplicación de la metodología DMAIC es el aumentar la calidad en el proceso, para este estudio se utiliza herramientas lean como el análisis de falla y efecto (AMEF) para medir y cuantificar el problema (Tovar, 2014). La prevención de fallas es un punto clave para la implantación de dicha metodología, ya que previene defectos ya ocurridos con anterioridad y así mejora la calidad (Esquivel et al., 2017).

Lo expresado anteriormente, se formula que todo se relaciona entre sí, ya que el valor de una característica de calidad es un resultado que depende de una combinación de variables y factores los cuales son determinados durante los datos obtenidos con las herramientas de calidad en su aplicación en el proceso de producción. El análisis de los datos medidos permite obtener información sobre la calidad del producto, el funcionamiento del proceso que se examinará y se corregirá, y los lotes de productos que se aceptará o rechazará. En todos estos casos, las decisiones deben tomarse y estas decisiones dependen del análisis de los datos (De la Guerra, 2015). Dado que se propone el análisis de datos, es importante tomar las medidas apropiadas como es el caso del análisis de modo, y el impacto en un proceso falla ya que detecta previamente posibles errores en el proceso. La industria automotriz ha utilizado la herramienta

AMEF, la cual es adecuada para reconocer y bloquear las causas de posibles errores en los productos y procesos.

2. Marco contextual

Para el presente estudio es necesario mencionar que, por razones de confidencialidad, la empresa en la que se desarrolló el trabajo se enuncia como “Empresa del sector automotriz o Empresa A”; para lo cual se ilustran los datos generales de la organización en la Tabla 1.

Tabla 1. Información general de la empresa automotriz.

DATOS GENERALES	
Razón social	Empresa del sector automotriz
Giro de la empresa	Metalmecánico, sector automotriz
Tamaño de la empresa	Mediana, cuenta con 165 empleados
Procesos	Fundición, maquinado y pintura
Clientes	Ford Motors, General Motors, Fiat Chrysler Automotive, Honda, Mitsubishi, Nissan, Toyota, Mercedes Benz, Volkswagen, Maserati y Audi

Elaboración propia.

Procesos de la empresa

La empresa se dedica a la fabricación de componentes para sistemas de frenos; específicamente de discos para frenos. Cuenta con los procesos integrados de fundición, maquinado y pintura para la elaboración de estos, la organización es del giro automotriz, dedicada a producir componentes para sistemas de suspensiones y frenos, destinados a las camionetas pick-up, “minivans”, vehículos utilitarios y automóviles para pasajeros de E.U.A, México, Canadá y Mercosur. Actualmente la empresa abastece más de 50 plataformas de diferentes clientes. Tiene instalaciones en los Estados Unidos, México y Brasil, ubicaciones estratégicas para atender el Norte y Sudamérica.

3. Planteamiento del problema

Debido a lo anteriormente mencionado para la mayoría de las empresas manufactureras, la gestión de los materiales; subconjuntos, componentes, piezas y materia prima es importante debido al riesgo de desabasto de materia prima o rupturas de stock que existe en las empresas, mismos que generan costos logísticos y de producción. Sin embargo, a través de los años para facilitar el cumplimiento de las necesidades del mercado, se ha podido encontrar un sistema básico para la administración y planificación de la producción conocida como MRP. Para la “empresa del sector automotriz”, no es la excepción, con el paso del tiempo ha logrado una derivada cartera de clientes y el principal cliente es Adient a quien le provee 18 ítems de producto terminado, y este a la vez, le provee a VW. El total de ventas que tuvo

en el año 2019, únicamente para el cliente antes mencionado fue de 1,485,171 de piezas con un valor de USD 2,074,554. Para la fabricación de las piezas vendidas la organización se abasteció de 372 toneladas de alambre (promedio de 31 toneladas por mes). Y por otra parte se abasteció de 343 toneladas de acero (promedio de 29 toneladas por mes). Dicho lo anterior, en los últimos meses por falta de planeación de materiales no se adquirió la materia prima requerida a tal punto de no tener para producir componentes, motivo por el cual se consiguió un nuevo proveedor de alambre. Las referencias críticas que se tuvieron a tal grado de parar la línea del cliente fue la referencia 17A 881 559A con un requerimiento promedio por día de 1000 piezas, referencia 5QM 885 305 con un requerimiento promedio de 990 piezas, referencia 3CN 8811 537 con un requerimiento promedio de 300 piezas y la referencia 5NN 881 538 con un requerimiento promedio de 860 piezas.

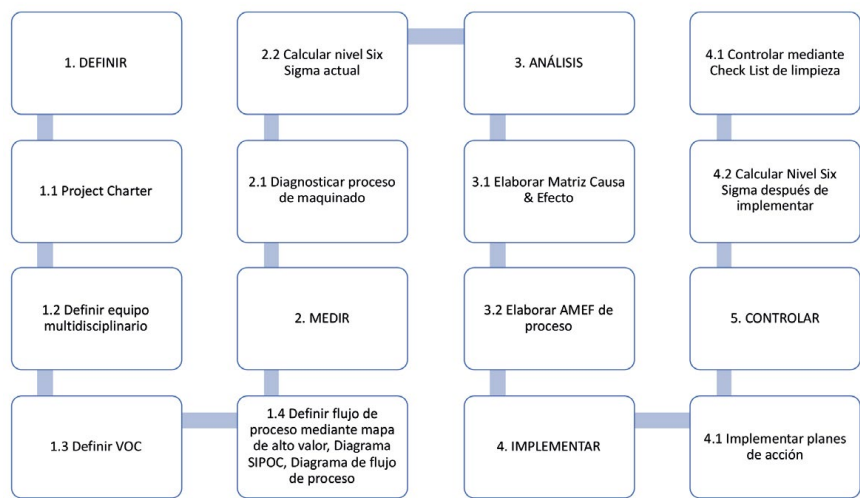
4. Justificación

Toda empresa tiene procesos con variabilidad, rechazos, errores, pero al implementar una mejora continua se pretende tener la reducción de estos, en este sentido se debe mencionar que la empresa automotriz cuenta con un proceso de maquinado, en el cual se encuentra procesando el número de parte D1704S del cliente FCA. De acuerdo con los datos históricos se encuentra como crítico, ya que cuenta con un porcentaje de rechazo fuera de especificación. El objetivo es mantener dentro del 0.9% de rechazo de piezas, pero en los últimos meses este número de parte se ha elevado a un 1.57% de rechazo de acuerdo con el reporte de líneas que se da dentro del área de maquinado. En una corrida del número de parte ya mencionado, se han llegado a presentar un total de 4933 defectos, lo cual ha implicado que en los últimos meses los errores han llegado hasta el cliente, provocando que se emitan aproximadamente 5 alertas de calidad por bimestre. En el proceso intervienen diversos factores que contribuyen a la fabricación de discos con defectos, el principal defecto es el mal barrenado por herramienta rota y de acuerdo con los defectos mencionados con anterioridad se tiene un aproximado de pérdida de \$34,479 cada que existen errores en el proceso, ya que el retrabajo presenta costos lo cual se refleja en pérdidas para la empresa. Por ello se pretende ahorrar esa cantidad con la optimización del proceso de barrenado para el incremento de productividad y reducción de rechazos del número de parte D1704S del cliente FCA a través de la metodología DMAIC en la empresa automotriz.

5. Desarrollo Metodológico

En este apartado se elaboró un esquema basado en la metodología DMAIC (ver figura 1) donde se indican las actividades a realizarse para el alcance de los resultados esperados.

Figura 1. Esquema metodológico.



Elaboración propia.

Etapas de Definir

Es la primera etapa del ciclo de mejora DMAIC, la fase Definir implica describir el problema y determinar de qué forma afecta. Además, en esta etapa se trazan los objetivos que se pretenden lograr; se debe definir el alcance, los límites descritos, los recursos potenciales y los plazos, por lo cual se desarrolló el Project Charter (carta proyecto) donde se detallaron cada uno de los aspectos fundamentales del proyecto, donde se delimitaron los alcances, se fijaron los objetivos, se establecieron los entregables, y se asignaron responsabilidades y planes (financieros, recursos, calidad). El departamento de “Mejora Continua” junto con los integrantes son los que se encargan de seleccionar el proyecto, el cual consiste en la reducción de rechazo del número de parte.

Roles y responsabilidades

Se elige al equipo multidisciplinario como se muestra en la tabla 2, teniendo en consideración que los nombres se omiten intencionalmente y se las personas quienes participarán en el proyecto, sin embargo, es necesario mencionar que el equipo está compuesto por cargos altos, medios y bajos.

Tabla 2. Equipo multidisciplinario Six Sigma

Responsable/Área	Rol
Gerencia de maquinado	Champion
Producción de maquinado	Líder de proyecto
Calidad	Green belt
Mejora continua	Soporte
Finanzas	representante financiero

Responsable/Área	Rol
Producción de maquinado (mando medio)	Encargado de línea
Producción de maquinado (operativa)	Operador de línea

En esta etapa se escucha la voz del cliente (ver Tabla 3), se recopilan las alertas de calidad emitidas por el cliente FCA, se pretende reducir el porcentaje de rechazo de un número de parte D1704S, para analizar cómo afecta los indicadores de calidad de acuerdo con las alertas de emitidas por el cliente, el ingeniero de garantías proporciona el dato de 5 alertas de calidad emitidas por bimestre debido a los defectos encontrados en las piezas.

Tabla 3. CCR´s (Requerimientos críticos del cliente)

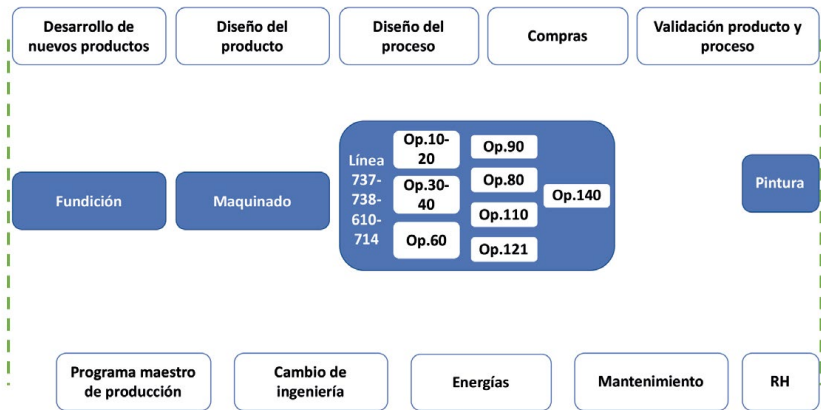
Voz del Cliente	Requerimientos críticos del cliente	Después de aclarar, el tema es...
No se aceptan piezas con defectos	Existen alertas de calidad de piezas defectuosas	Promedio de 5 alertas de calidad de FCA por bimestre

El crítico de satisfacción que permite mantener el estándar establecido por el cliente es el “crítico de calidad” (CTQ), FCA no permite mal acabado en barrenos, los cuales son el motivo principal para emitir las alertas de calidad como se observa en el anexo 1, el defecto encontrado en una pieza (número de parte D1704S), muestra el desfase de 2 de los barrenos que se encuentran en la brida exterior del disco, lo cual implica una queja de cliente ya que puede atentar contra la seguridad del usuario.

Descripción del proceso

Se debe tener un esquema general del proceso para identificar la operación se está provocando el defecto del disco, es para ello que se realiza un mapa de alto nivel (ver figura 8) para mostrar un panorama general de las áreas y los procesos involucrados en la fabricación de discos para frenos.

Figura 2. Mapa de alto nivel



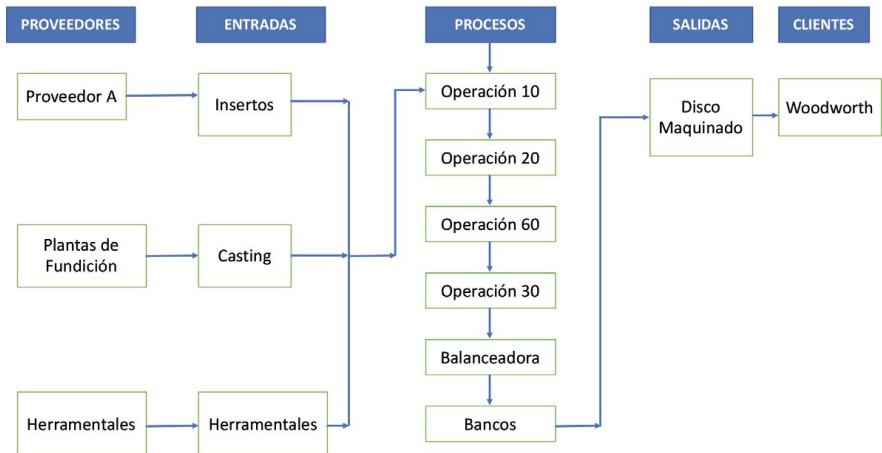
Elaboración propia.

Este trabajo se enfoca en el proceso de maquinado, del cual se despliegan las operaciones que se llevan a cabo en él.

Diagrama SIPOC

A continuación, se presenta un diagrama (ver figura 3) la cual sirve como guía para una para caracterizar el proceso de maquinado en particular, y así facilitar identificación de elementos claves como: Proveedores, Entradas, Procesos (subprocesos), Salidas y Clientes.

Figura 3. Diagrama SIPOC.



Elaboración propia.

Como proveedores se tienen externos e internos, dentro de los internos se encuentran las plantas de fundición que proporciona la pieza ya como disco o también conocido como casting. En las entradas se encuentran las materias primas que son las que aportan valor al proceso, en este caso los insertos, herramientas en general y los discos. El proceso se compone en general de operaciones en las cuales se encuentra el barrenado con la que se trabajará posteriormente. Por último, en la salida se obtiene la pieza o disco ya con las especificaciones que pide el cliente, libre de defectos y listo para ser enviado al cliente interno el cual es pintura.

Diagrama de flujo

Para comprender el proceso completo se muestra a continuación (ver anexo 2) un diagrama de flujo, donde se muestra el proceso desde que la pieza sale de la planta de fundición y hasta que sale de la planta de maquinado, se indica el número y la descripción de la operación.

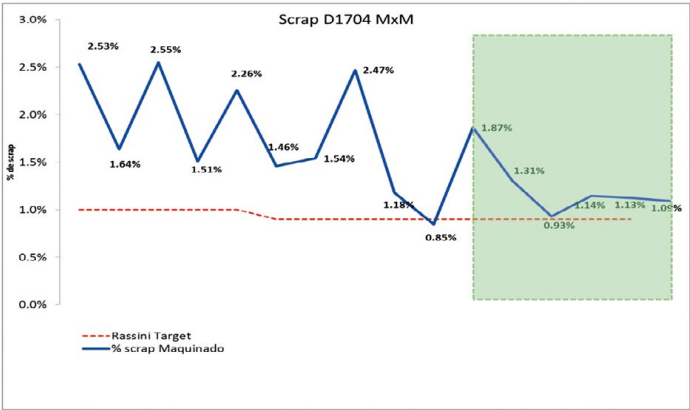
Etapas de Medir

En esta etapa se tiene como objetivo establecer la medición de la situación actual contra la cual se pretende mejorar, aquí se identifica las restricciones proceso, así como las posibles áreas de oportunidad.

Diagnóstico

En la siguiente gráfica estudia el porcentaje de rechazo general de la planta de maquinado, los meses que se comprendieron van desde febrero 2019 hasta enero 2020. Se observa que a partir del mes de Julio 2019 hubo un incremento considerable en el porcentaje de rechazo, rebasando target o scrap ideal el cual corresponde al 0.9%. Al realizar el promedio aproximado de los meses estudiados da como resultado un 1.38% de rechazo, teniendo un 0.48% arriba del target. Lo cual nos indica que el proceso de maquinado no está siendo productivo, representado en la figura 4.

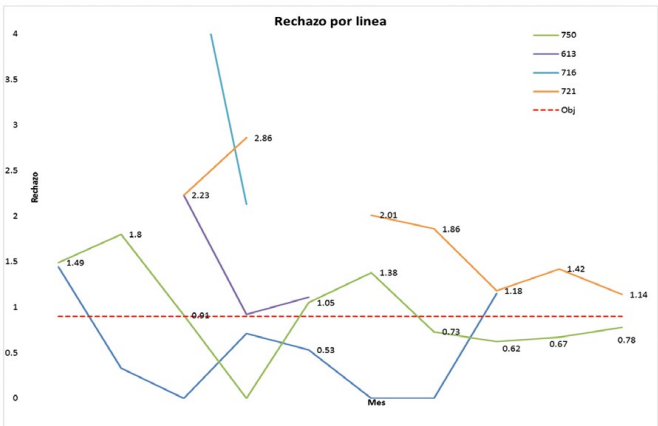
Figura 4. Gráfica de porcentaje de rechazo de maquinado.



Elaboración propia.

En la planta de maquinado se tienen diferentes líneas en donde se procesan mismos números de parte, el D1704S se trabaja en su mayoría en la “Línea 750 y en la 716” ya que tienen una producción constante, las líneas alternativas como la 613 y 721, no siempre procesan ese número de parte por lo que no pueden tomarse en cuenta para un estudio ya que podrían tener lapsos de tiempo donde no se obtendrían datos ni resultados.

Figura 5. Gráfica de total de porcentaje de rechazo por línea.

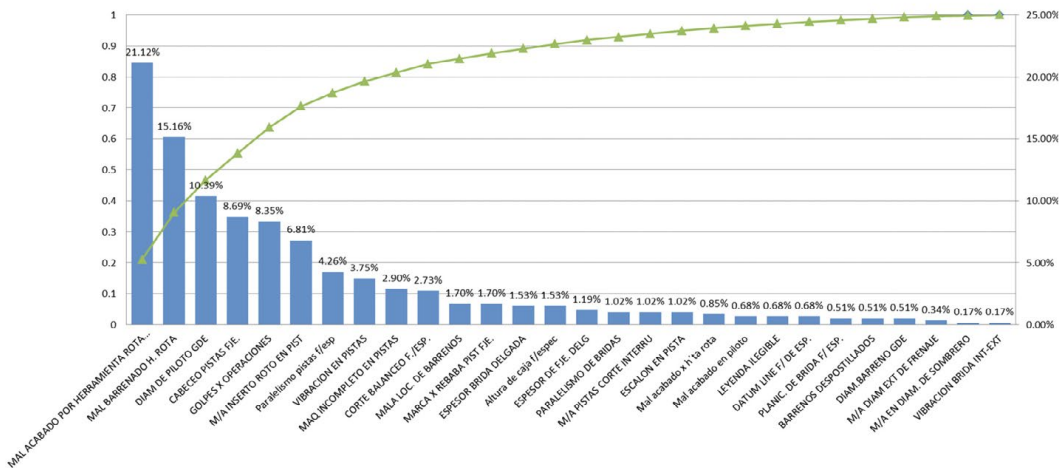


Elaboración propia.

Como se puede observar en la figura 5 en el periodo de julio 2019- febrero 2020, la línea en la cual se encontró un mayor porcentaje de rechazo fue en la línea 750, rebasando así el objetivo y el rechazo global. A partir de este análisis se concluye que el punto inicial para atacar será la línea 550, ya que ahí se procesa el número de parte D1704S, el cual tiene un mayor número de alertas de calidad emitidas por FCA.

Continuando con la identificación de defectos, se realiza una gráfica de Pareto mostrada en la figura 6, para detectar y priorizar el defecto que tiene una mayor repetitividad en el D1074, el cual está provocando que el porcentaje de rechazo sea elevado.

Figura 6. Gráfica de Pareto, defectos de maquinado parte D1704S, L750.

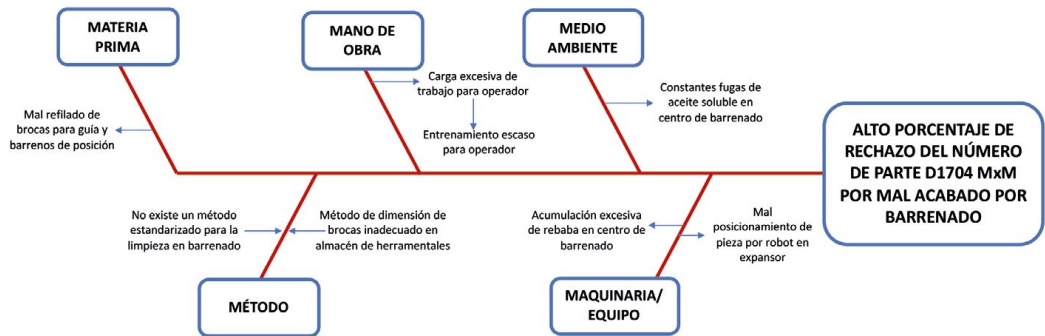


Elaboración propia.

Se muestra en la figura 6 que el defecto que más ocurre en la L750 es el mal acabado por herramienta rota en la operación 60, el cual corresponde a un mal barrenado de la pieza, el cual ya se había mencionado con anterioridad había provocado un reclamo del cliente. Dentro del 80-20 se encuentran diferentes tipos de defectos que ocurren con mayor frecuencia los cuales serán incluidos en los planes de acción para poder eliminar los posibles defectos.

Una vez identificado el principal defecto en el diagrama de Ishikawa se observan las diferentes causas que apuntan hacia el principal problema el cual genera una pieza defectuosa. Las causas más relevantes corresponden a maquinaria y a la mano de obra, ya que son los principales factores que tienen una relación directa con el proceso de barrenado como se observa en la figura 7.

Figura 7. Diagrama de Ishikawa.



Elaboración propia.

Después de realizar el diagnóstico, se concluye que en el área de maquinado se tiene un problema con el número de parte D1704S ya que se tienen un registro de alertas de calidad emitidas por el cliente FCA. Las piezas se están procesando principalmente en la línea 550, y el problema está surgiendo específicamente en operación 60, donde se está realizando un mal barrenado causado principalmente por la inadecuada mano de obra y por el mal uso de la maquinaria.

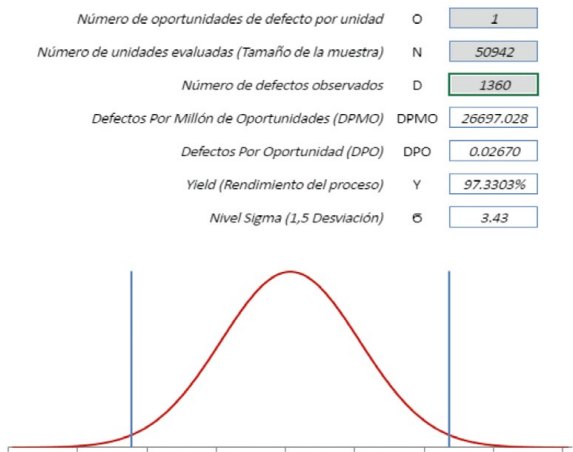
Cálculo de nivel Six Sigma

En el proceso de maquinado del número de parte D1407 se toma como muestra un total de 50942, este número de piezas se tomaron como muestra durante un lapso de 4 meses, con un total de 1360 número de defectos observados que tuvieron como consecuencia un retrabajo.

Luego de realizar el cálculo de los DPMO se tiene un total de 26,697.028 defectos por millón de oportunidades, teniendo un nivel Six Sigma de proceso del 3.43.

Siendo representados de manera gráfica (ver figura 8) indica que las unidades comprendidas entre las barras azules corresponden a las unidades conformes por oportunidades de defectos, y las unidades que se encuentran fuera de la barra corresponden a los defectos del proceso

Figura 8. Calculadora Nivel Six Sigma y DPMO.



De acuerdo con una clasificación de nivel Six Sigma, indica que de acuerdo con los defectos por millón de oportunidades es proporcional al nivel de calidad del proceso como se muestra en la siguiente Tabla (ver Tabla 4).

Tabla 4. Clasificación por nivel de desempeño de Seis Sigma.

Nivel de Sigma	Defectos por Millón de Oportunidades	Nivel de Calidad	Costo de Calidad Promedio	Clasificación
6	3.4	100.00%	Menos del 1% de Ventas	Clase Mundial
5	233	99.98%	5 - 10% de Ventas	Industria Promedio
4	6.21	99.40%	15 - 25% de Ventas	Baja Competitividad
3	68.807	93.3%	25 - 40% de Ventas	No Competitivo
2	308.537	69.20%	No Aplica	No Competitivo
1	690	30.90%	No Aplica	No Competitivo

Chávez, (2019)

De acuerdo con el cálculo anterior, indica que en la fase de maquinado se tiene una baja competitividad con un 93.3% lo cual muestra que el proceso no es competitivo y carece de calidad, en consecuencia a ello, se han visto reflejados en las alertas de calidad que el cliente FCA ha emitido.

Etapas de análisis

Matriz causa & efecto

A partir del principal defecto se realiza una Matriz Causa y Efecto (ver anexo 3) para encontrar el principal motivo que está causando que se tenga un mal barrenado, se evalúan a operadores involucrados en el proceso, se asigna una escala de: “3- bajo, 5-medio, 7-alto”.

Para evaluar y al final sumar puntos, teniendo como resultado que no existe un método estandarizado para la limpieza en la operación del barrenado y quedando como segunda causa la suciedad en “collets”, estas principales causas para un mal acabado en barrenos fueron tomadas del análisis de causa-raíz (ver Figura 7.) los cuales se incluyeron en el AMEF.

Análisis de modo y efecto de falla (AMEF)

Para esta etapa se identificaron las causas que afectan al proceso (variable x), por lo cual se realizó un AMEF para la identificación de las fallas en el proceso y de esta forma evaluar y clasificar de manera objetiva sus efectos y causas (ver anexo 4) es así como, para esta forma, evitará su ocurrencia y se tendrá un método documentado de prevención. A continuación, se muestra el análisis. De acuerdo con este estudio el número de prioridad de riesgo (RPN), es el producto de la multiplicación de la severidad, ocurrencia y detección. El RPN es un número que indica la prioridad que se le debe dar a cada falla para eliminarla; se considera que un RPN superior a 30

requiere de un tratamiento de modo de falla, y el RPN corresponde a 60. De esta forma se identifica que las acciones que se deben tomar están en la falla que se da en la operación 60 que corresponde al barrenado, específicamente en el diámetro de barrenos de sujeción, los cuales se mencionaron con antelación que tuvieron defectos encontrando barrenos desfasados en piezas. En el análisis del AMEF se colocan las acciones para controlar esa posible falla, las cuales serán relacionadas con la “Matriz Causa & Efecto”.

Etapas de mejora

Recapitulando con las fases de definición, medición, análisis, se procede a la etapa de mejora; es aquí en donde se pretende actuar para mejorar el proceso y así reducir el rechazo. Esto se llevará a cabo mediante planes de acción con actividades que las personas involucradas con el proceso tienen que seguir.

Para la implementación de cada mejora se establecieron fechas de cumplimiento y el plan de implementación se colocó a la vista de todos los colaboradores para darle seguimiento como se establece en el anexo 5.

Control y resultados

En esta etapa se muestra los resultados obtenidos a lo largo de las etapas del diseño metodológico (ver Figura 1) los cuales se controlarán en un futuro para seguir teniendo mismos resultados. De acuerdo con los nuevos datos proporcionado por el ingeniero de garantías, se asegura que la calidad tuvo un cambio significativo y favorable ya que el número de alertas de calidad se redujeron, quedando de la siguiente manera resumido en la Tabla 5:

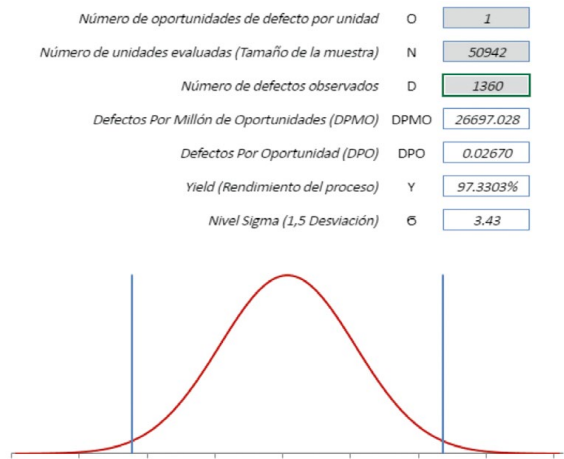
Tabla 5. CCR’s después de implementación (Requerimientos críticos del cliente).

Voz del Cliente	Requerimientos críticos del cliente	Después de aclarar, el tema es...
No se aceptan piezas con defectos	Existen alertas de calidad de piezas defectuosas	2 alertas de calidad de FCA

Se redujeron 3 alertas de calidad comparando con el CCR’s antes de la implementación de la metodología DMAIC. Lo cual coadyuva al objetivo de monitorear los índices de productividad y nivel de aceptación para la reducción del número de alertas de calidad del cliente FCA. En la muestra tomada para comparar el nivel Six Sigma después de implementar la metodología se toma de un total de 25689 piezas, las cuales fueron en un lapso 1 mes con un total de 452 número de defectos observados. Luego de realizar el cálculo de los DPMO se tiene un total de 17595.07 defectos por millón de oportunidades, teniendo un nivel Six Sigma de proceso del 3.61.

Representando nuevamente de manera gráfica como se observa en la figura 10 se indica que las unidades comprendidas entre las barras azules corresponden a las unidades conformes por oportunidades de defectos, y las unidades que se encuentran fuera de la barra corresponden a los defectos del proceso, lo cual indica que las unidades que se encuentran fuera de las barras azules son menores en comparación a la primera muestra del nivel Six Sigma, el cual tuvo un cambio favorable ya que aumentó con un 0.18, siendo un cambio no tan significante pero favorable.

Figura 9. Calculadora Nivel Six Sigma y DPMO (Resultados después de la mejora)



De acuerdo con el siguiente análisis mostrado en la Tabla 6 se demuestra que implementación de la metodología DMAIC para la optimización del proceso de barrenado y reducción del porcentaje de rechazo del número de parte D1704S del cliente FCA fue exitoso ya que se tuvo una mejora del 0.4%. Como se menciona en el diagnóstico realizado; el target o porcentaje de rechazo ideal es del 0.9%, después de la mejora el promedio ya se encuentra dentro del porcentaje ideal correspondiendo a un 0.98%.

Tabla 6. Comparativa Antes-Después de mejora aplicada

DATOS DE ATRIBUTOS	ANTES DE LA MEJORA	DESPUÉS DE LA MEJORA
N° de defectos observados	1,360.00	452
N° de oportunidades	1	1
N° de unidades (Tamaño de muestra)	50942	25689
Defectos por millón de oportunidades (DPMO)	26,697.00	17,595.07
PROMEDIO DE % DE RECHAZO	1.38%	0.98%

Al llegar a los resultados esperados se comprueba que las diferentes áreas de la empresa tienen la capacidad de tener procesos óptimos, solo es cuestión de estrategias de mejora para implementar y trabajar en ellas. Tal es el caso de la metodología DMAIC implementada a lo largo del proyecto.

6. Resultados y Conclusiones

El trabajo considero todas las etapas y herramientas de apoyo correspondientes en la aplicación de un DMAIC, lo que facilitó el análisis y la aplicación, puesto que se encontró la causa específica que estaba generando el principal problema en el área de

maquinado. Todas las etapas fueron sustentadas con datos reales y específicos, con el fin de tener una comparativa cuantitativa y así demostrar la efectiva implementación. Los resultados obtenidos a lo largo de varios meses demuestran que el departamento de calidad en conjunto con el área de maquinado tiene la capacidad de desarrollar nuevos proyectos de mejora continua con otros números de parte que han presentado problemas, lo cual ya se ha planteado después de los resultados obtenidos con esta implementación. En la empresa en general ha presentado un ahorro de un aproximado de \$20,688 ya que al tener solo dos alertas de calidad del cliente se tiene menos pérdida comparada con la inicial. El porcentaje de rechazo disminuyó lo cual se ve relacionado directamente con la calidad y con los costos de retrabajo. Cabe mencionar que la disciplina del equipo multidisciplinario fue un factor clave para la implementación, puesto que se podrá contar con todos los recursos necesarios pero el recurso humano se convierte en el prioritario ya que es el encargado de llevar el correcto análisis, la implementación y el control.

Por lo que se concluye que en el área de maquinado y se identifica que el porcentaje de rechazo se encontraba en 1.8%, rebasando el ideal establecido que corresponde a un 0.9% (ver figura 11) ya que se tiene un total de 26,697 defectos en el proceso de barrenado, debido a una mala implementación de rutinas de limpieza en el centro de barrenado y la mala capacitación del personal a la hora de colocar el herramental necesario en cada cambio de modelo, con lo cual se trabajó a lo largo del proyecto, atacando específicamente las causas detectadas.

Se desarrolló la metodología DMAIC con la aplicación de herramientas de apoyo en cada el principal problema y sus causas por medio de herramientas de calidad, el desarrollo del proyecto se basó por medio del diseño metodológico establecido como se muestra en la figura 3. Durante la elaboración y análisis del diagnóstico, se detectó que el mal acabado en piezas se debe al mal acabado por la herramienta rota provocado por dos principales factores incluidos en la mano de obra y la maquinaria, en este sentido, también el AMEF tuvo como propósito atacar y prevenir esas posibles fallas.

Se reduce a 2 alertas de calidad emitidas por el cliente FCA, no se eliminan en su totalidad ya que el total de ellas antes de la implementación era 5, aún se requiere de trabajo y constancia, pero los resultados fueron los esperados

El nivel Six Sigma antes de implementación tenía un valor de 3.43σ después de la implementación se encuentra actualmente con una mejora, puesto que ahora el nivel Six Sigma corresponde a un 3.6σ aunque representa solo un 5% todavía se encuentra en la fase de crecimiento en el nivel por lo que se espera que avance hasta 4σ , por lo que el proceso de barrenado es productivo, reflejando un porcentaje de rechazo del número de parte D1704S dentro del target mencionado.

Recomendaciones

Como recomendaciones se propone trabajar en las dos alertas de calidad de FCA pendientes, para obtener mejores resultados y datos estadísticos precisos para una mejor comparativa y una mejora continua completa en cuanto al número de parte D1704S. Se recomienda trabajar e implementar proyectos similares en problemas detectados con el número de parte D1904 ya que de igual manera presenta defectos y reclamos de cliente.

Es necesario continuar monitoreando que las acciones propuestas en el plan de acción continúen siendo llevadas a cabo por los operadores, ya que la limpieza

del centro de barrenado depende de que no se presenten nuevamente los defectos detectados.

Es preciso que el personal se mantenga en constante capacitación para un buen uso de la maquinaria, además de que debe saber interpretar un AMEF para tener conocimiento de las posibles fallas que se puede presentar y ser capaces de corregirlas por sí solos.

Es importante señalar, que para que se obtengan cero defectos se recomienda implementar un sistema de control de calidad en donde se desarrollen manuales y procedimientos, así como auditorías por capas (LPA), entrenamiento a los operadores para identificar los defectos y parar la línea en el momento justo, también se recomienda hacer una empresa sustentable implementado el sistema de calidad para poder llegar a cero defectos y cero quejas, para ello se requiere sistematizar a un más el proceso, y hacer uso de las alertas de calidad, además se recomienda emplear la filosofía “No hago piezas defectuosas, no paso piezas defectuosas y no envío piezas defectuosas”.

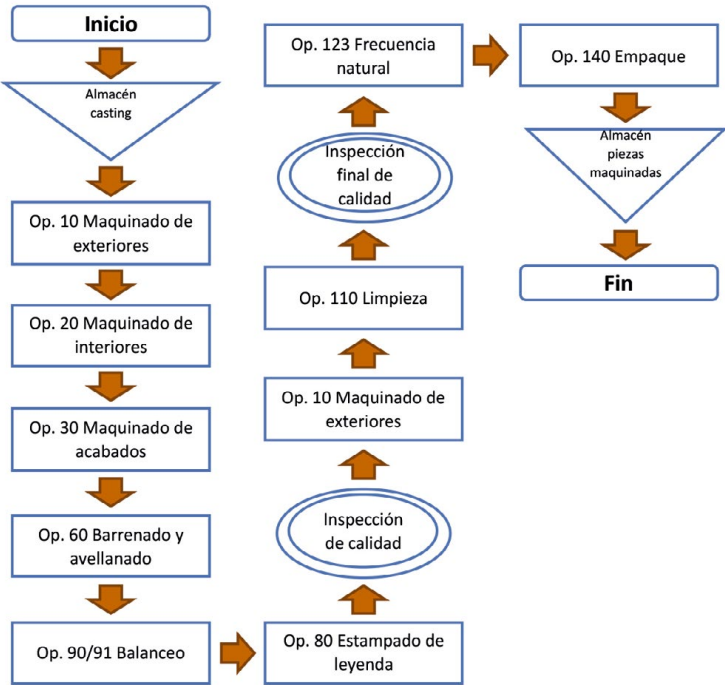
Apéndices

Apéndice A Parte con defecto de barrenado

Figura A1. Parte con defecto de barrenado



Apéndice B. Flujo del proceso de maquinado
Figura B1. Diagrama de flujo del proceso de maquinado



Apéndice C. Análisis causa y efecto
Tabla C1. Matriz causa y efecto

MATRIZ CAUSA & EFECTO						
MAL ACABADO EN BARRENOS						
SALIDAS	Evaluadores					TOTAL
DESCRIPCIÓN	S. Pérez	A. Méndez	A. Reyes	E. Ortega	R. Serrano	
Mal reafilado de brocas para guía y barrenos de posición	3	3	3	3	5	17
Suciedad en collets	7	7	7	7	5	33
Carga excesiva de trabajo para operador	3	5	5	3	5	21

MATRIZ CAUSA & EFECTO						
MAL ACABADO EN BARRENOS						
SALIDAS	Evaluadores					TOTAL
DESCRIPCIÓN	S. Pérez	A. Méndez	A. Reyes	E. Ortega	R. Serrano	
Entrenamiento escaso para operador	3	3	3	3	3	15
Constantes fugas de aceite soluble en centro de barrenado	5	3	7	3	5	23
No existe un método estandarizado para la limpieza en barrenado	7	7	7	7	5	33
Método de dimensión de brocas inadecuado en almacén de herramientas	3	3	3	5	3	17
Acumulación excesiva de rebaba en centro de barrenado	5	5	5	3	5	23
Mal posiciamiento de pieza por robot en expansor	5	5	5	5	5	25

Apéndice D. Análisis AMEF
Tabla D1. AMEF

DESCRIPCIÓN DEL PROCESO	REQUERIMIENTOS	MODO DE FALLA POTENCIAL	EFFECTO POTENCIAL DE FALLA	SEV.	CAUSAS/ MECANISMOS POTENCIALES DE FALLA	OCU	CON-TROLES ACTUA-LES DE PREVEN-CIÓN	CONTROLES ACTUALES DE DETECCIÓN	DETE	NPR
BARRENADO	De acuerdo a requerimientos específicos de diente	Mayor a la especificación	Tiempo muerto por ajuste de proceso	5	Centro de barrenado con exceso de rebaba	3	Se cuenta con métodos de limpieza para centro del barrenado y collets	Frecuencia: 5 piezas continuas cada cambio de broca	4	60
			Falta de encaje con barreno de fijación		Rotura de herramienta por mala localización por parte de operador	3	Cumplimiento con no. de broca y no. de pieza por filo en la hoja comparativo vs hoja de diseño	Validación: Gauge de barrenos		60
			Localización de barrenos fuera de especificación		Desajuste de offset de la herramienta	3	Se cuenta con hoja de método de trabajo estándar	Inspección Visual: IPza cada tendido		60
			Dificultad de ajuste y apriete en vehículo		Desgaste de la herramienta	3				60
			Problemas de localización de barrenos con poma yoke		Centrador fuera de especificaciones de diseño. Mala posición de herramienta	3	Instructivo de cambio de insertos			60

Apéndice E. Plan de acción
Tabla E1. Presentación del Plan de Acción

	Formato para Plan de Acción					
	FECHA DE ACTUALIZACIÓN					
	14/04/2020					
ITEM	ACTIVIDAD	RESPONSABLE		FECHA		COMENTARIOS DE AVANCE
				P	A	
1	Cambiar sin fin nuevo, ya que se encuentra con juego por problemas con variación de espesores, problemas con diámetro de tambor.	Mantenimiento	S	23-ene-20	23-mar-20	Monitorear rechazo por problemas con diámetro de tambor.
2	Cumplir con check list de limpieza, al menos cada cambio de modelo	Martin Gutiérrez/Supervisores	S	25-ene-20	25-mar-20	DD del titular, ADRIAN JUÁREZ MARTÍNEZ CLAVE 63963 cubre en línea 721=9.19%
			F	26-ene-20	26-mar-20	DD del titular, ADRIAN JUÁREZ MARTÍNEZ CLAVE 63963 cubre en línea 750=4.88%
3	Capacitación a personal para el ajuste de brocas	Martin Gutiérrez/Supervisores	S	27-ene-20	27-mar-20	DD del titular, ADRIAN JUÁREZ MARTÍNEZ CLAVE 63963 cubre en línea 721=9.09%
			F	28-ene-20	28-mar-20	DD del titular, ADRIAN JUÁREZ MARTÍNEZ CLAVE 63963 cubre en línea 750=5.88%
4	Limpieza con personal TDP para capacitación sobre posibles fallas y acciones en operación 60	Martin Gutiérrez/Supervisores	S	29-ene-20	29-mar-20	Asistió el titular Omar Rojas 2.76%
			F	30-ene-20	30-mar-20	PP 217 6 de rechazo L750 no procesa
5	Trabajar con personal TDP para capacitación sobre posibles fallas y acciones en operación 60	Martin Gutiérrez/Supervisores	S	31-ene-20	31-mar-20	26-10-19 DD del titular, ADRIAN JUÁREZ MARTÍNEZ CLAVE 63963 cubre en línea 721=0.39%
			F	01-feb-20	01-abr-20	27-10-19 del titular, Luis Angel Pérez Cazabal, cubre en línea 750%
6	Trabajar con personal TDP	Supervisores	S	02-feb-20	02-abr-20	
			F	03-feb-20	03-abr-20	
7	Modificar actividades de TPM y 5's de 5 a 15 minutos	Operadores	S	04-feb-20	04-abr-20	
			F	05-feb-20	Continuo	

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Declaration of conflict of interest

We, the authors, declare that there is no conflict of interest with any entity, institution or person in this publication that could have improperly influenced or biased our work.

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Información editorial

CONTENIDO GENERAL

Estudios de Administración [ISSN: 0717-0653, e-ISSN: 0719-0816] es una revista de negocios revisada por pares a doble ciego, publicada semestralmente por el Departamento de Negocios de la Universidad de Chile desde 1994, creada para brindar un foro académico para la comunidad académica de negocios chilena y latinoamericana. Estudios de Administración publica artículos de investigación empírica, artículos metodológicos, revisiones sistemáticas de literatura, artículos conceptuales y estudios de casos en todas las disciplinas empresariales tanto en inglés como en español.

Manuscritos de investigación originales y casos de enseñanza no publicados anteriormente en otros lugares, que abordan temas de Estrategia, Finanzas, Marketing, Contabilidad, Operaciones, Innovación, Gestión y Desarrollo de Recursos Humanos, Cambio Organizacional, Sistemas de Información, Cadena de Suministro, Emprendimiento y Toma de Decisiones, entre otros temas relevantes para los negocios latinoamericanos son el principal foco de publicación.

ÁMBITO Y OBJETIVOS

Apuntamos a lectores de académicos, estudiantes graduados y ejecutivos de negocios de Iberoamérica y del mundo que buscan un conocimiento nuevo y sólido en el campo. Alentamos a autores e investigadores de la comunidad académica a presentar sus manuscritos para ser sometidos a revisión por pares en cualquiera de las siguientes categorías:

- **Artículos de investigación empírica:** Resultados de proyectos de investigación originales con análisis de datos empíricos (cualitativos, cuantitativos y / o mixtos) asociados con la literatura existente y réplicas de investigación con resultados consistentes o no consistentes.

- **Métodos, enfoques metodológicos e instrumentos de medición:** Manuscritos que presenten el uso de diferentes metodologías y la aplicación de modelos en diferentes contextos, así como estudios que validen instrumentos de medición, bibliometría, metaanálisis o verificaciones de procedimientos experimentales, que puedan ser replicados son bienvenidos.

- **Reseñas de literatura:** Artículos contemporáneos que sintetizan, integran o adelantan conceptual y teóricamente diferentes ámbitos en las disciplinas de la administración de empresas, particularmente en América Latina y países emergentes.

- **Casos de enseñanza:** Artículos de investigación basados en situaciones reales de negocios, diseñados para instruir a los estudiantes en las facultades de administración y empresa, proporcionando experiencias organizacionales sujetas a la realidad, que permiten aplicar proposiciones teóricas y conjugarlas con simulaciones prácticas y la toma de decisiones.

- **Conexión con la práctica:** Estudios que respondan a la creciente necesidad de un mayor enfoque en

cómo funcionan la gestión y la administración de empresas, o en la forma en que los profesionales (practitioners) desempeñan su labor en la práctica organizacional. Aproximaciones a la investigación como Strategy-as-Practice (SAP), Marketing-as-Practice (MAP), Innovation-as-Practice (IAP), Entrepreneurship-as-Practice (EAP), etc. son bienvenidas.

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Los textos de informes de investigación tradicionales suelen incluir las siguientes secciones: 1) Introducción; 2) Revisión de la literatura o antecedentes teóricos - que pueden o no servir de base para formular hipótesis -; 3) Métodos de investigación; 4) Resultados y análisis; 5) Discusión; 6. Conclusiones; 7) Limitaciones e implicaciones de la investigación (si las hay); 8) Implicaciones prácticas o de gestión (si las hay); 8) Direcciones para futuras investigaciones (si las hay); 9) Apéndices (si los hay); y 10) Referencias.

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Apéndice D

Indicadores y proyecciones económicas para América Latina y el Caribe

La Tabla D1 muestra los indicadores económicos más importantes de...

TABLAS, FIGURAS, ECUACIONES Y FÓRMULAS

Las Tablas y las Figuras (si es posible) deben enviarse como texto editable y no como imágenes

para facilitar el proceso de revisión. Las Figuras y Tablas se pueden colocar junto al texto relevante en el artículo o en páginas separadas al final. Si se presentan en páginas separadas, se debe hacer referencia a ellos dentro del cuerpo del manuscrito para indicar su ubicación en líneas separadas como "INSERTE LA TABLA X AQUÍ".

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serán colaboradores, y deberán ser mencionados en la sección de agradecimientos del artículo.

Responsabilidad ética y buenas prácticas de los autores

Al someter a revisión para publicar una obra académica en Estudios de Administración, todos los autores aceptan las normas de ética, publicación y de propiedad intelectual de la revista. Los artículos son evaluados en sistema de doble ciego (double-blind peer review), debiendo ser manuscritos originales, y no estar en consideración para publicación por otro medio. Los autores deben asegurarse de la inclusión en el manuscrito de aquellas personas que han contribuido significativamente a la investigación. En general, la publicación de materiales idénticos en más de una revista se considera una práctica poco ética y no será tolerada. Los autores deberán asegurarse de la correcta y exhaustiva citación de fuentes de información que sean utilizadas en la elaboración del manuscrito. La información que haya sido obtenida por medios privados no puede ser publicada sin el consentimiento de la persona o institución que corresponda. De la misma manera, los autores deberán informar en el manuscrito sobre las fuentes de financiamiento de su trabajo, así como potenciales conflictos de interés que pudieran de alguna manera incidir en la imparcialidad del trabajo realizado. Cualquier tipo de correcciones o retractaciones solicitadas por el comité y/o el equipo editorial de Estudios de Administración deben ser realizadas por los autores. En cualquier caso, los autores podrán comunicar cualquier anomalía o equivocación en la publicación al correo electrónico de la revista estudios@unegocios.cl. La corrección será enmendada mediante fe de erratas en la siguiente publicación.

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El equipo editorial velará por que exista regularidad en los procesos y normas de publicación, desde su recepción, revisión por pares, hasta su producción y difusión. El equipo editorial asegura evaluar la pertinencia de las obras recibidas con respecto al alcance y objetivos de la revista, así como velar por el cumplimiento de las normas de publicación y éticas de la revista, evitando infracciones de derechos de autor y plagio. El equipo editorial tomará decisiones acerca de los manuscritos enviados a Estudios de Administración, independientemente de la raza, género, orientación sexual, creencias religiosas, origen étnico, nacionalidad o ideología política de los autores. El equipo editorial cautelara la confidencialidad de la información referente a los autores, datos incluidos en el artículo, análisis realizados o conclusiones durante el proceso de evaluación por pares. De la misma forma, el equipo editorial custodiará por el resguardo del prestigio de la revista ante cualquier conflicto ético producto de su accionar como medio de publicación académica.

Responsabilidad ética y buenas prácticas de los revisores

Los revisores son profesionales y/o académicos con conocimiento especializado en diversas áreas

de la administración de negocios, privilegiando su diversidad en cuanto a procedencia y filiación institucional. La asignación de los pares evaluadores se efectúa conforme a criterios del equipo editorial, esperando su actuar conforme a la idoneidad del tema tratado en el manuscrito con su área de conocimiento. Sin perjuicio de lo anterior, el revisor puede solicitar reasignación de su labor ante obras que no se ajusten a su área de especialidad, o algún conflicto de intereses. De la misma forma, si el factor tiempo es una limitante para realizar la revisión por pares de calidad, y de manera oportuna, los evaluadores deben informar al editor, rechazando la invitación extendida a participar como referee. Atendiendo normas de citación, los revisores alertarán acerca de omisión de fuentes relevantes, o la existencia de plagio total o parcial. Estudios de Administración apuesta por la crítica constructiva, por lo que se espera que las críticas realizadas ayuden en lo posible a mejorar la calidad del artículo, siendo hechas de forma neutral y articuladas con base en argumentos razonables. Las recomendaciones deberán ser presentadas en el formato de evaluación de la revista, debiendo aceptar, aceptar con mejoras, o rechazar el artículo científico presentado. Cualquier obra sujeta a revisión es considerada confidencial, por lo que los revisores no podrán presentarla ante terceros, ni total o parcialmente.

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Ante la identificación de conductas no éticas o errores mayores, se deben reportar al editor de la revista, ofreciendo información y pruebas suficientes para dar inicio al proceso de investigación correspondiente. Cualquier denuncia recibida, será considerada con toda la seriedad y tratada indistintamente, hasta que se logre clarificar la situación. Para ello, el editor elige la forma que considere pertinente para realizar la investigación, pudiendo solicitar la asesoría del comité editorial, el par evaluador, o una comisión académica delegada ante la situación. En caso de inhabilitación, se notificará formalmente a los autores sobre la aplicación indebida de conductas no éticas, explicando detalladamente la evidencia existente de la actividad. Estudios de Administración publicará un comentario editorial dando detalle del comportamiento inapropiado, y procederá a retirar o eliminar los trabajos objeto de investigación.

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Editorial information

GENERAL CONTENT

Estudios de Administración [ISSN: 0717-0653, e-ISSN: 0719-0816] is a double-blind peer-reviewed business Journal that has been published on a semester basis by the Business Department of the University of Chile since 1994, created to provide an academic forum for Chilean and Latin

American business academic community. Estudios de Administración publishes empirical research papers, methodological papers, systematic literature reviews, conceptual papers, and case studies in all business disciplines in both English and Spanish.

Original manuscripts not previously published elsewhere, addressing matters of Strategy, Finance, Marketing, Accounting, Operations, Innovation, Management and Development of Human Resources, Organizational Change, Information Systems, Supply Chain, Entrepreneurship and Decision-Making, among other topics, relevant for Latin American business are the main focus of publication.

AIMS AND SCOPE

We target a readership of Ibero-American and world scholars, graduate students, and business executives looking for new and solid knowledge in the field. We encourage authors and researchers from the academic community to present manuscripts for peer review in any of the five categories:

- **Empirical research papers:** Results of original research projects with empirical data analysis (qualitative, quantitative and/or mixed) associated with existing literature, and research replicas with consistent or non-consistent results.
- **Methods, methodological approaches and measuring instruments:** Manuscripts presenting the use of different methodologies and the application of models in different contexts, as well as studies that validate measurement instruments, bibliometrics, meta-analysis, or verifications of experimental procedures, which can be replicated are welcomed.
- **Literature reviews:** Contemporary articles that conceptually and theoretically synthesize, integrate or advance different scopes in business administration disciplines, particularly in Latin America and emerging countries.
- **Teaching cases:** Research articles based on real business situations, designed to instruct students in the faculties of administration and business, providing organizational experiences subject to reality, which allow the application of theoretical propositions and combine them with practical simulations and decision making.
- **Connection to practice:** Research studies that respond to the growing need for a greater focus on how business management and administration function, or on the way in which practitioners carry out their work in organizational practice. Research approaches such as Strategy-as-Practice (SAP), Marketing-as-Practice (MAP), Innovation-as-Practice (IAP), Entrepreneurship-as-Practice (EAP), etc. are welcome.

AUTHOR GUIDELINES

Editorial Process

To publish manuscripts in Estudios de Administración, authors should send their contribution via the Open Journal Systems platform

by registering or logging in at the platform.

The Editor will review the manuscript and will return it to the author(s), in no more than a week, indicating whether or not the manuscript will be sent for peer review, suggesting different paths for the manuscript.

Manuscripts will be blind reviewed by two referees according to different criteria including: clarity, literature review and conceptual development, method and data analysis, implications and relevance for theory and practice, and contribution to the discipline.

Reviewers may suggest: Acceptance; Acceptance with minor revision; Conditional acceptance with major revision; Rejection of the manuscript.

In any event, the Editor of Estudios de Administración will make the final decision. In most cases, the final decision will be made within sixty (60) days following the Editor's first communication. The author(s) will have to make the final corrections and prepare the final version of the manuscript within thirty (30) days following the Editor's decision in order to go to press.

PREPARATION

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

ETHICAL STANDARDS FOR AUTHOR

- Confirm that the manuscript has been submitted solely to this Journal and has not been published, is not in press, nor has it been submitted elsewhere.
- Confirm that all authors who have contributed significantly to the research are named in the manuscript.
- Confirm that all the research meets the Journal's ethical guidelines, including adherence to the legal requirements of the study country
- Confirm that there are no conflicts of interest with any entity or institution, or of a personal nature that could inappropriately have influenced or biased this work.
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LENGTH OF THE ARTICLE:

- Manuscripts should be between 5,000 and 7,000

words in length (including references, tables, and figures) in English or Spanish.

- They must include a 250-word ABSTRACT in both English and Spanish, synthesizing the main topic addressed by the paper, the method used in its preparation and its major findings.

- The author(s) must also provide from three (3) to six (6) KEYWORDS, and at least three (3) JEL Codes (Journal of Economic Literature codes) for indexing and search.

GENERAL FORMAT:

- Submission files must be in Microsoft Word, Open Office or Word Perfect file format.

- Font: 12-pt Times New Roman.

- Double-spacing is required throughout the document.

- Paragraphs should be indented 5-7 spaces or ½ inch. Use tab stops or other commands for indents, not the spacebar.

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- For equations, use MathType or Equation Editor.

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Articles must include a first page with the title and information on the author(s). The title should be no longer than 20 words in Times New Roman, font 14 (bold).

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All authors must include given name(s) and family name(s), institution, email and ORCID id (if applicable). Please check that all names are accurately spelled. Avoid identifying the author(s) in the rest of the manuscript in order to ensure anonymity.

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NOTE: Estudios de Administración will translate the English Abstract, Keywords and Declarations for those non-English-speaking authors.

BODY OF THE MANUSCRIPT

SECTION TITLES, LABELS AND SUBDIVISIONS

Texts in traditional research reports usually include the following sections: 1) Introduction; 2) Review of literature or theoretical background - which may or may not serve as grounds for formulating hypotheses -; 3) Research methods; 4) Results and analysis; 5) Discussion; 6) Conclusions; 7) Limitations and implications of the research (if any); 8) Practical or managerial implications (if any); 8) Directions for future research (if any); 9) Appendices (if any); and 10) References.

Similarly, for Literature reviews, Teaching cases and Connection to practice articles, divide your manuscript into clearly defined and numbered sections and subsections, always including the References section at the end.

Titles and Subtitles must be brief, clearly defined, and on their own separate line. Number your headings so that top-level headings are numbered 1, 2, 3, for example, starting with the Introduction section, and finishing in the Conclusions section. Second-level subheadings must be numbered 1.1, 1.2, 1.3, etc.

Do not use field functions.

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If your manuscript needs to include Appendices, identify each separate topic, and label it with a letter in sequence (Appendix A, Appendix B, Appendix C, etc.), according to the order in which they are mentioned in the body of the manuscript. To refer to an Appendix, use parenthetical citation. For example, write in the body of the manuscript (see Appendix D for Economic indicators and projections for Latin America and the Caribbean), or just (see Appendix D). Any citation within the Appendix must be included in the References list.

If your appendices include Tables, Figures, Formulae and/or Equations, add the letter of the Appendix, giving separate numbering: For example, number the third Figure in Appendix D, as 'Figure D3'.

Each Appendix section label follows a 'Level 1 Format Heading', and must have a subtitle, headed with a 'Level 2 Format'. For example:

Appendix D

Economic indicators and projections for Latin America and the Caribbean

Table D1 shows the most important economic indicator of the ...

TABLES, FIGURES EQUATIONS AND FORMULAE

Tables and Figures (if possible) should be submitted as editable text and not as images to facilitate the revision process. Figures and Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. If they are presented on separate pages, they must be referenced within the body of the manuscript to indicate their location on separate lines as "INSERT TABLE X HERE".

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