

## **CUSTOMER INTERACTION: A META ANALITICAL APPROACH**

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### **Resumo**

Customer interaction (CI) is a source of desire and concern for managers around the world. Different forms of interaction - such as co-creation, coproduction, customer engagement, customer participation and customer innovation - are evaluated in different fields of knowledge, with a gap for the joint analysis of their antecedents and consequents, as well as of possible practical distinctions in the effects between these concepts. Through a meta-analytic approach, we test the arguments of Dong & Sivakumar (2017). The results demonstrate the empirical validity of using customer participation to replace terminologies such as coproduction and cocreation but do not confirm the practical distinction of customer participation with related concepts such as customer engagement. Practical implications and direction for future research are discussed.

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### Abstract

Customer interaction (CI) is a source of desire and concern for managers around the world. Different forms of interaction - such as co-creation, coproduction, customer engagement, customer participation and customer innovation - are evaluated in different fields of knowledge, with a gap for the joint analysis of their antecedents and consequents, as well as of possible practical distinctions in the effects between these concepts. Through a meta-analytic approach, we test the arguments of Dong & Sivakumar (2017). The results demonstrate the empirical validity of using customer participation to replace terminologies such as coproduction and cocreation but do not confirm the practical distinction of customer participation with related concepts such as customer engagement. Practical implications and direction for future research are discussed.

**Keywords:** Customer Participation; Cocreation; Coproduction; Customer engagement; Meta analysis.

### 1. Introduction

Customer interaction (CI) is a source of desire and concern for managers around the world. Global organizations such as Lego, Nike or Harley-Davidson have made continuous efforts to strengthen ties with their customers through actions ranging from the improvement of service channels (Aarikka-Stenroos e Jaakkola, 2012; Heidenreich *et al.*, 2015) to the effective participation of these individuals in the creation and development of new products, involved in virtual communities of brand (Hsieh *et al.*, 2004; Zhao *et al.*, 2015). Customers hitherto seen as mere recipients of products and services offered by organizations have come to be understood as active resources integrated in the creation of value (Lusch e Nambisan, 2015; Vargo e Lusch, 2016).

Given its social relevance, the phenomenon has not stopped being analyzed by the academy (Dong e Sivakumar, 2017). In this sense, concepts such as cocreation, coproduction and customer engagement are central themes of investigations that have sought to identify factors that motivate (such as technology anxiety, need for interaction, threat and usefulness of technology, shared vision and interactivity), moderate (such as customer readiness and innovation orientation) and result (such as customer satisfaction, behavioral intention, willingness to pay, perceived value and behavioral intention) of these practices in different contexts such as self-production (Huynh e Olsen, 2015), use of self-service technologies (Meuter *et al.*, 2005) and product development (Zhao, 2015).

In this sense, Dong e Sivakumar (2017) have argued that in the context of service literature there is still a clear differentiation about the domain and boundaries of different concepts such as coproduction, co-creation, customer engagement and customer innovation, suggesting that "customer participation" may be an integrative construct of some of these terminologies, reducing possible theoretical confusion and explaining possible contradictions in the previous findings.

The objective of this study is, through a meta-analytic approach, to empirically analyze the antecedents, consequents and moderating relations of different kinds of CI. With this approach, We will seek to deepen the research by identifying empirical differences between correlate concepts, such as customer engagement, customer participation, coproduction and cocreation.

## 2. Theoretical background

Suggested as a new marketing paradigm (Storbacka *et al.*, 1994), the CI - in this study understood as the different forms of information exchange, collaboration and cooperation between company and customer - is no longer understood as a punctual element to be a continuous value generator for organizations. Preliminary studies identified the importance of this relationship for organizations, especially to access and understand critical information derived from the market. Customers, in this sense, have been elevated to a condition of business partners, cooperating for their sustainability and development. With the use of this dataset, the company is able to improve its operational efficiency (Patatoukas, 2012) and meet customer needs, factors that lead to better performance and competitive advantage. The empirical evaluation of different levels of CI was used as a basis for propositions that, for example, evaluated success in developing new products (Gruner & Homburg, 2000) and the performance in B2B relations (Krolikowski e Yuan, 2017).

Understanding the factors that predict and derive from customer interaction is one of the central issues in this field. The intensity of these relationships depends on both organizational and individual predictors and, at the same time, has significant consequences on the performance of a process (such as the development of new products) or the organization itself. The main elements that directly relate to the central construct of this study will be discussed below.

### 2.1 Antecedents and consequences of customer interaction

The preliminary analysis of the literature allowed to identify that the direct relations of CI can be classified into two distinct groups: those that relate to the customer and those directly related to the organization. Table 1 shows four categories of direct relations with CI.

**Table 1.** Antecedents and consequents of customer interaction

<b>Characteristics of the involved customers</b>	Definition
<i>Benefit perception</i>	The medium's ability to enhance confidence and status, build reputation and realize self-efficacy (Verhagen <i>et al.</i> , 2015)
<i>Cognitive experience</i>	The medium's ability to provide desirable information and fulfill the desire to learn (Nambisan e Baron, 2009)
<i>Social integration</i>	The desire to attain and develop social and relational ties (Claffey e Brady, 2017)
<i>General trust</i>	The psychological state in which an individual decides to believe other behavior and ignore the possible vulnerabilities
<i>Involvement</i>	The similarities in motivating the individual toward a specific object
<i>Age</i>	Age of individual
<i>Gender</i>	Gender of the individual
<i>Income</i>	Income level of the individual
<b>Characteristics of the involved company's</b>	Definition
<i>Size</i>	Firm size
<i>Quality Orientation</i>	The specific initiatives aimed at influencing both employees and customers to increase the quality outcome
<i>Support to interactions</i>	Firm practices and procedures to make viable the customer interaction

<b>Consequences for Customers</b>	Definition
<i>Intention to consume</i>	The extent to which a user intends to use or seeking information about a brand/product
<i>Purchase</i>	The effective choice to buy a product/service
<i>Repurchase</i>	The intention to repurchase a product/service
<i>Information sharing</i>	The individual behavior to share information about a brand, product or service
<i>Loyalty</i>	The loyalty of the customer toward the company, rather than a specific product or service
<i>Satisfaction</i>	The level of customer satisfaction with a product/service
<i>Commitment</i>	The level of customer satisfaction with a product/service
<b>Consequences for Company's</b>	Definition
<i>Performance</i>	The financial, sales or operational performance of the firm
<i>Product evaluation</i>	The perceived value of a product
<i>Brand connection</i>	The identification between customer and brand

In the set of relations indicated, certain circumstances are potential moderators of the direct effects. According to a preliminary review of the literature, different contexts of application of the studies are capable to interfering in the direct. Such circumstances will be discussed below.

## 2.2 Possible moderators of interaction with customers

The intensity of the relationships between antecedents and consequent of CI can be influenced by other variables. Table 2 present possible moderating effects grouped into four categories: theoretical, institutional, cultural and contextual moderators.

**Table 2.** Moderators analyzed in the meta-analysis

<b><i>Theoretical moderator</i></b>		
<i>Variable</i>	<i>Description</i>	<i>Coding</i>
Form of CI	Indicator based in the typology suggested by Dong and Sivakumar (2017) that consider previous terminologies into the field.	0 = Customer Participation 1 = Customer engagement 2 = Cocreation 3 = Coproduction
<b><i>Institutional moderator</i></b>		
<i>Variable</i>	<i>Description</i>	<i>Coding</i>
Human Developed Index	Indicator that evaluates the quality of life and economic development of a population conducted by the United Nations (UN). We adopt the median of the Human Developed Index as the cut-off point.	0 = low degree of Human Developed Index 1 = high degree of Human Developed Index
<b><i>Cultural moderators</i></b>		
<i>Variable</i>	<i>Description</i>	<i>Coding</i>
Power distance	It is a way of measuring how much less powerful members in a society accept and expect the uneven distribution existing (Hofstede et al., 2010). We adopt the median of the power distance as the cut-off point.	0 = low level of distance power 1 = high level of distance power
Individualism	Measures people's need to care only about taking care of themselves (Hofstede et al., 2010). We	0 = low degree of individualism

Masculinity	adopt the median of the individualism as the cut-off point. The degree of prevalence of values such as aggressiveness, the search for money and material goods and competitiveness. On the other hand, it refers to the degree to which people value relationships and show sensitivity and concern for the well-being of others (Hofstede et al., 2010). We adopt the median of the masculinity as the cut-off point.	1 = high degree of individualism 0 = low degree of masculinity 1 = high degree of masculinity
Avoidance uncertainty	The degree of threat that members of a society feel in uncertain or unknown situations. Otherwise, it reflects the feeling of discomfort that people feel with risks, chaos and situations not previously established (Hofstede et al., 2010). We adopt the median of the avoidance uncertainty as the cut-off point.	0 = low level of uncertainty aversion. 1 = high level of uncertainty aversion.
Long term orientation	The degree to which individuals tend to focus on the future. Attitudes and adaptations are always based on the perspective of a later situation (Hofstede et al., 2010). We adopt the median of the long term orientation as the cut-off point.	0 = low level of long term orientation 1 = high level of long term orientation
Indulgence	Level in a society allows gratification relatively free of basic human needs related to happiness, to enjoy life and have fun (Hofstede et al., 2010). We adopt the median of the indulgence as the cut-off point.	0 = low level of indulgence 1 = high level of indulgence
<b>Contextual moderators</b>		
<i>Variable</i>	<i>Description</i>	<i>Coding</i>
Context of data collection	Indicator based in the context of data collection.	0 = B2B 1 = NPD 2 = Online Brand relations 3 = Service

The theoretical moderator is based on the recent arguments put forward by Dong and Sivakumar (2017), who defined the domain, scope, and frontiers of customer participation in the context of services. In the article, the authors suggest the use of customer participation as a substitute concept for other terminologies such as coproduction and co-creation, while pointing out existing distinctions between customer participation and other close concepts such as customer engagement and customer innovation. In this sense, customer participation was defined as an action that benefits the customer and is associated with specific transactions. In turn, customer engagement and customer innovation would be beyond specific transactions and with mutual benefits (firm / brand and customers). In this way it is expected that direct relations related to cocreation, coproduction, and customer participation have statistical similarities, which motivates the hypothesis 1: *There is similarity between cocreation, coproduction and customer participation proving that they can be grouped into a single concept.*

On the other hand, it is expected that this grouping will be significantly different from customer engagement and customer innovation. This fact motivates hypothesis 2 of the present study: *There are statistical differences in direct relationships with customer participation, customer innovation and customer engagement*

### 3. Method

To reach the objective of this investigation, we initially performed a search for the keywords referred to by Dong and Sivakumar (2017). Although the authors limited their search for "customer participation," "customer coproduction" and "customer cocreation," we preferred to broaden the scope of analysis to eliminate potential losses, using aggregated suggested typologies and correlated constructs. In the same sense, we used the expanded research for "consumer" avoiding possible losses arising from these concepts. Thus, the search key was expressed by "customer participation" or "mandatory participation" or "replaceable participation" or "voluntary participation" or "cocreation" or "coproduction" or "customer engagement" or "customer innovation" or "consumer participation" or "consumer engagement" or "consumer innovation".

Contrary to the methodological procedure used by Dong and Sivakumar (2017), the search was performed on the Web of Science database, on topic and not only in the title of the publications. The research was refined by the type "article" and later refined by the categories "business", "management", and "economics". The initial survey was conducted in October 2017 and resulted in 829 articles. From this database, we excluded articles unavailable for viewing (77), theoretical articles (143), qualitative articles (200) and articles without adherence to the theme (230). In this sense, the sample was composed by 178 articles.

## 4 Results and Discussion

The articles composing the analysis were published in 74 different journals. Although it was included in the initial search, we did not identify studies in our final sample that have evaluated customer innovation, being such a construction not used for our analyzes. The current growth and relevance of the theme can be perceived by the increase of publications in all the concepts in the last 5 years. Especially customer engagement, a concept that until 2010 has only one study in our sample, had 69 publications dedicated to its understanding since then, which corresponds to 38.76% of the total volume of studies analyzed.

The distribution of data collection countries is an important fact in this study. There is a significant concentration of studies performed in the USA, corresponding to 22.47% of the total studies analyzed. On the other hand, it is possible to perceive that certain concepts have received more attention in specific countries (as is the case of coproduction in Taiwan and Customer Engagement in Australia). Finally, the distribution of the theory of the sample in relation to the context reveals the adherence of concepts to specific fields. Coproduction, for example, is a concept rarely studied in online brand relations, but it is important for B2B relationships and services. The preponderance of studies in customer engagement is seen in almost all scenarios (except B2B), but it is more significant in online brand relations (52.23% of the total volume).

### 4.1 Analysis of the direct relationships of CI

We begin the meta-analytic procedures by reviewing and coding the sample. This procedure generated 1096 observations that were classified into 20 variables. These variables were then grouped into four categories, considering the recipients / issuers of the effects generated by the relationship (consumer or company) being two antecedents and two consequent. Table 3 presents the 4 categories and the different variables with the following information: number of studies used from the analysis ( $k$ ); number of observations taken from



the analysis of the studies (o); number of accumulated samples of the assessed studies ( $N$ ); weighted average effect and corrected from the sample and the alpha obtained in the studies ( $M_{Na}$ ); degree of significance of the effect size ( $Sig_1$ ); lower confidence interval (LCI); higher confidence interval (HCI); test of heterogeneity at the individual and the aggregate levels (Q); significance level of Q ( $Sig_2$ ); failsafe number or number of items needed for a false result with Rosenthal parameters (FSN\*); and failsafe number or number of items needed for a false result with Orwin parameters (FSN\*\*) (Orwin, 1983; Rosenthal e Rubin, 1991).

**Table 3.** Direct relations with customer interaction

<i>Relations</i>	(k)	(o)	$N$	$M_{Na}$	$Sig_1$	ICI (95%)	ICS (95%)	Q	$Sig_2$	FSN*	FSN**
<i>Individual antecedents</i>											
Benefit perception	9	10	28208	0,420	0,000	0,302	0,525	671,290	0,000	3247	151
Cognitive experience	3	3	1209	0,090	0,110	-0,020	0,198	6,940	0,031	NC	NC
Social integration	14	17	18802	0,320	0,005	0,099	0,511	2696,450	0,000	10017	221
Trust	10	11	6436	0,459	0,000	0,292	0,599	175,500	0,000	1401	68
Involvement	18	40	59210	0,433	0,000	0,209	0,613	5342,880	0,000	82845	130
Age	10	16	12726	0,039	0,037	0,002	0,075	16,850	0,000	14	1
Gender	7	8	5504	-0,085	0,453	-0,300	0,137	448,090	0,000	NC	NC
Income	3	4	2170	-0,028	0,773	-0,184	0,130	40,870	0,000	NC	NC
<i>Firm antecedents</i>											
Size	4	4	1836	0,018	0,851	-0,167	0,201	26,690	0,000	NC	NC
Quality orientation	4	7	4422	0,528	0,000	0,392	0,642	187,410	0,000	2410	75
Interaction Support	2	9	18194	0,316	0,002	0,120	0,488	1553,740	0,000	2732	36
<i>Individual consequents</i>											
Intention to consume	11	14	27618	0,346	0,000	0,270	0,417	408,940	0,000	5184	68
Purchase	19	28	90214	0,325	0,000	0,280	0,369	707,950	0,000	9791	141
Repurchase	5	5	2020	0,217	0,118	-0,056	0,461	151,820	0,000	NC	NC
Commitment	9	17	9175	0,311	0,000	0,230	0,388	95,201	0,000	4037	80
Satisfaction	25	35	63898	0,426	0,000	0,350	0,497	1787,650	0,000	31238	344
Loyalty	12	19	6278	0,384	0,000	0,258	0,497	562,490	0,000	4472	126
<i>Firm level consequents</i>											
Performance	15	20	6501	0,248	0,001	0,106	0,380	545,240	0,000	832	27
Product evaluation	3	7	588	0,160	0,207	-0,089	0,389	52,970	0,000	NC	NC
Brand connection	27	57	19992	0,466	0,000	0,387	0,539	1070,250	0,000	27819	303

Note: NC = Not calculated because the effect size was not significant ( $p > .05$ ).

In the category of the antecedent factors related to the characteristics of the consumers, 8 variables were identified, 5 of them of subjective character (benefit, cognitive experience, social integration, trust, and involvement) and 3 of demographic nature (age, gender and income). In this group, the meta-analytic analysis presented significant and positive effects for benefit perception ( $r = 0.420$ ;  $p < 0.001$ ), social integration ( $r = 0.320$ ;  $p < 0.001$ ), trust ( $r = 0.433$ ,  $p < 0.001$ ) and age ( $r = 0.03$ ,  $p < 0.001$ ).

The company's specific antecedents category, composed of 3 variables, presented different results. On one hand, strategic factors of the company demonstrated significant positive effects on customer interaction. The quality orientation ( $r = 0.528$ ,  $p < 0.001$ ) and support to interaction ( $r = 0.316$ ,  $p < 0.001$ ) were identified as relevant predictors while there was no statistical significance identified for firm size.

The evaluation of the consequences of the interaction with effects for the customer, composed of 6 variables, presented significant results for the vast majority of relations. In this sense, only repurchase was not confirmed statistically. Among the significant effects, satisfaction showed the most robust results ( $r = 0.426$ ,  $p < 0.001$ ).

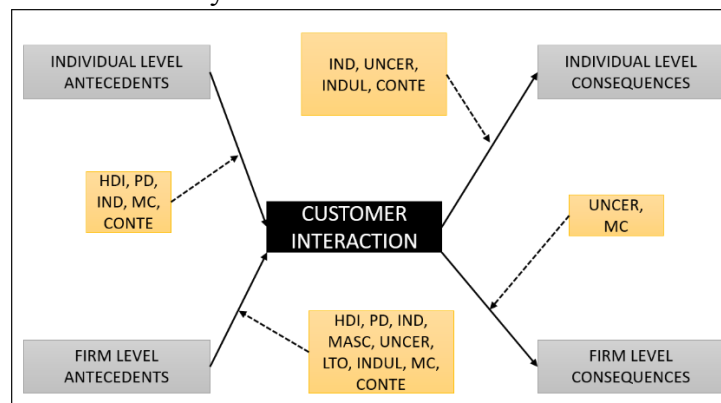
Finally, the results of customer interaction consequences for companies (divided into 3 variables) presented divergent results. Surprisingly, no significant interaction effect with customers was identified in the product evaluation ( $r = 0.160$ ;  $p < 0.207$ ). On the other hand, it is possible to identify a positive and significant relationship of the customer interaction with

the performance in processes and outcomes ( $r = 0.248$ ,  $p < 0.001$ ) and especially with the brand connection ( $r = 0.466$ ,  $p < 0.001$ ).

#### 4.2 Moderating effects and hypothetical tests

To test the moderation, we used the significant direct relationships identified preliminarily grouped in their respective categories and performed the evaluation for 9 possible moderators grouped into four categories: institutional, cultural, theoretical and contextual moderators. In addition, the test of the proposed hypotheses was performed through the significance and homogeneity of the combined effects between the constructs coproduction, cocreation and customer participation (H1) and the evaluation of differences between this group and customer engagement (H2). Figure 1 synthetize the results for moderators

**Figure 1.** Moderator analysis



Note: (HDI) Human Developed Index; (PD) Power Distance; (IND) Individualism; (MASC) Masculinity; (UNCER) Avoid uncertainty; (LTO) Long Term Orientation; (INDUL) Indulgence; (MC) Main construct; (CONTE) Context of study;

Institutional moderators were tested for elements associated with human developed index. In this sense, only previous relationships related to the company were significant ( $M_{Low\ HDI} = 0.679$ ;  $M_{High\ HDI} = 0.439$ ;  $p < 0.01$ ). This evidence suggests that companies located in countries with less institutional development when adopting strategies that value the interaction with the client achieve better results. This fact can be derived from a greater differentiation existing in these contexts for organizations with such strategies.

Cultural moderators were analyzed in relation to power distance, individualism, long-term orientation, masculinity, avoid uncertainty and indulgence. The results were particularly significant for background relations at the firm level. The moderation identified for power distance ( $M_{Low\ PD} = 0.439$ ;  $M_{High\ PD} = 0.604$ ;  $p < 0.01$ ), individualism ( $M_{Low\ IND} = 0.534$ ;  $M_{High\ IND} = 0.503$ ;  $p < 0.1$ ), masculinity ( $M_{Low\ MASC} = 0.503$ ;  $M_{High\ MASC} = 0.569$ ;  $p < 0.1$ ), avoid uncertainty ( $M_{Low\ UNCER} = 0.564$ ;  $M_{High\ UNCER} = -0.045$ ;  $p < 0.001$ ), long term orientation ( $M_{Low\ LTO} = 0.503$ ;  $M_{High\ LTO} = 0.534$ ;  $p < 0.1$ ), e indulgence ( $M_{Low\ INDUL} = 0.534$ ;  $M_{High\ INDUL} = 0.503$ ;  $p < 0.1$ ), reveal consistent effects of cultural factors on the direct relationship between organizational strategies and customer interaction.

Theoretical moderators were tested based on the 4 different concepts identified in our sample - customer participation, customer engagement, cocreation, and coproduction. Only in the scenario of consequent of individual level did not identify significant differences between the moderators tested. The factor with the greatest positive, positive effect occurred in the



analysis of the antecedent effects of organizational strategies ( $Z = 22,765$ ), with cocreation being shown to have a greater positive and significant effect ( $r = .509$ ). The identified evidence points out that organizational strategies are consistent CI inducers, especially when using cocreation resources.

The evaluation of the contextual moderators was carried out from the identification of different contexts in which the preliminary studies were carried out: B2B, NPD, OBR, and Service. Only in the consequent scenario of individual level did not identify significant differences between the tested moderators. The moderation analysis had a greater positive effect in the antecedents at the firm level ( $Z = 39,784$ ). In this context, the main positive and significant effect occurs in online brand relations ( $r = .712$ ). This finding points out that, especially in online and brand environments, the organizations' strategies are determinant for CI. Although they have less effect, these positions remain influential in other scenarios.

The tests were then carried out for the suggested hypotheses. The hypothesis 1 of this study (cocreation, coproduction, and customer participation can be grouped in a single concept) was to evaluate if the theoretical argument proposed by Dong and Sivakumar (2017) especially for the services sector, would have statistical robustness when applied in different contexts. In this sense, in all the scenarios tested, the argument remained valid, with statistical significance ( $p < .0001$ ) for the homogeneity of these constructs. In this way, the confirmation of hypothesis 1 reinforces the theoretical arguments presented preliminarily by Dong and Sivakumar (2017), suggesting the use of customer participation as an integrating construct.

From the confirmation of hypothesis 1, we tested hypothesis 2 (there are differences between customer participation and customer engagement / customer innovation) that aimed to statistically analyze differences between the relationships between these groups of studies. The results demonstrated that the heterogeneity of effects between the two groups is not identified in all scenarios. In this sense, there was no statistical validity ( $p = .524$ ) for differences in impact between customer participation and customer engagement on individual-level consequences. These finding suggests that, although theoretical differences between concepts have been recognized, direct (antecedent and consequent) relations can not be understood as distinct in all cases.

## 6 Conclusions

This study aimed to (i) identify the direct relationships of customer interaction (ii) to analyze possible cultural, institutional and contextual moderators that affect such relationships and (iii) to test the empirical validity of Dong and Sivakumar's arguments (2017) to direct relationships. Through a meta-analytic approach, 1096 preliminary relationships derived from 178 articles were evaluated. We identified 20 variables categorized into 4 distinct groups by the impacted part (customer or firm) and their relation in advance and consequence with the main construct. After the statistical analysis, 14 of these direct relationships had positive and significant relationships with customer interaction, which led to the formation of a model as presented in figure 3. This evidence can serve as a basis for future studies and for the construction of organizational strategies, directing efforts as interest.

The evaluation of the moderators presented robust results for the previous relations of the firm not having the same solidity when evaluated other levels and direction of relations. The category of antecedents of the company - whose significant variables are related to the organizational strategies - besides being identified as the one with the greatest effect on CI was

recognized with great sensitivity to cultural, institutional and contextual factors. In this way, the recognition of these moderating factors can lead to the use of strategies more appropriate for their specific case. Future studies may analyze how this moderation occurs in each context, making the findings more specific.

Finally, the test of the theoretical hypotheses based on the arguments of Dong and Sivakumar presented different results. The validation of the convergence of antecedents and consequences of coproduction, cooperation, and customer participation empirically supported the possibility of using customer participation as an aggregating concept, replacing the others to reduce confusion. It was not possible to confirm, however, the distinction of this concept for customer engagement in all direct relationships. These findings suggest that the use of different theoretical concepts should observe the context of application of the studies and the level and direction of the relations evaluated.

Thus, the study contributes to the literature by consolidating the preliminary studies in different forms of CI, suggesting possible moderations and amplifying the preliminary effort of Dong and Sivakumar (2017). Clear limitations relate to the set of studies analyzed. Unpublished studies have not been taken into account, for example, which may have led to a possible bias. On the other hand, the use of a single base may also reduce its generalization. Future studies could remedy such problems by broadening the scope of research in specific contexts (B2B, service, online brand) which may bring new insights on the subject.

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