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Additional Information

Exploring the relationship between co-creation and satisfaction using QCA.

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Abstract

Customer behavior is one of the key components of value co-creation. Several authors believe that co-creation generates satisfaction. However, few studies exist that focus on that relationship. This study explores the relationship between value co-creation and customer satisfaction in spa services through a fuzzy-set qualitative comparative analysis (fsQCA). QCA analysis allows exploring the relations between the variables. The main contribution of this article is going beyond identifying the concrete co-creation variables that relate to satisfaction. The sample consists of hotel clients that use the spa service.

Keywords: Value co-creation; customer satisfaction; fsQCA; hotel industry;
Qualitative Comparative Analysis

1. Introduction

In value co-creation, the customer has an active role as a co-creator and thus, businesses can offer their applied resources for value creation. Firms collaboratively create value by following value propositions, but they cannot independently create value. Interaction becomes the way through which firms develop a joint process of value creation. Therefore, the customer is not a simple recipient but is instead a collaborative partner who “creates value with the firm” (Lusch et al., 2007, p.6).

Literature goes beyond revealing a strong link between generated value, customer satisfaction, and business results (Dabholkar & Sheng, 2012; Guenzi & Troilo, 2007; Wu, 2011). Customer satisfaction is essential for companies’ success. Thus, customers are active participants in the value co-creation process (Vargo & Lusch, 2008) and interact with the company in order to reach a greater satisfaction (Grönroos, 2008).

Although several studies analyze co-creation and satisfaction (Cossio et al., 2013; Grisseemann & Stockburger-Sauer, 2012; Vega-Vazquez et al., 2013), these studies do not address the relationship between these variables. This, this study explores the relationship between co-creation variables (specifically those variables relating to customer behavior), and global satisfaction variables using fsQCA on a sample of hotel clients that use the spa service.

Only a few instruments are valid to measure value co-creation in services. This study draws on Cossio et al. (2013), who combine the following two instruments: (1) Yi and Gong’s scale (2012), that measures value co-creation through the analysis of 29 variables from the customer’s perspective and distinguishes two types of consumer behavior, participation behavior and citizenship behavior; (2) a set of variables that reflects the evaluation of global satisfaction with firms.

Furthermore, this study uses fuzzy-set Qualitative Comparative Analysis (fsQCA). QCA allows exploring the relations between the variables used. This method has some strong advantages for analyzing co-creation because this method allows studying how factors combine into configurations of necessary and sufficient conditions that underlie outcomes (Rihoux & Ragin, 2009).

The main contribution of this study is going a step ahead by identifying the concrete co-creation variables that relate to satisfaction.

2. Analytical framework and explanatory factors

Yi and Gong's scale (2012) groups its 29 items in 8 constructs and divides these constructs in two blocks: 4 constructs relate to *customer participation behavior* (variables C1-C4), and 4 constructs relate to *customer citizenship behavior* (variables C5-C8).

C1. Information seeking: Information enables customers to understand and control their co-creation environments and master their role as value co-creators.

C2. Information sharing: Through sharing information, customers can ensure that employees provide the service that meets their particular needs (Ennew & Binks, 1999).

C3. Responsible behavior: For successful value co-creation, customers need to be cooperative, to observe rules and policies, and to accept directions from employees (Bettencourt, 1997).

C4. Personal interaction: Refers to interpersonal relations between customers and employees, which are necessary for successful value co-creation (Ennew & Binks, 1999).

C5. Feedback: Customers are in a unique position to offer guidance and suggestions to employees because they have considerable experience with the service (Bettencourt, 1997).

C6. Advocacy: In this context, advocacy indicates recommending the service.

Advocacy must be voluntary for successful value co-creation.

C7. Helping: Customers usually help other customers instead of helping employees because customers may need help behaving in ways consistent with their expected roles (Groth et al., 2004).

C8. Tolerance: Refers to customers' willingness to be patient when the service delivery does not meet the customer's expectations (Lengnick-Hall et al., 2000).

Furthermore, this study uses Suárez et al.'s (2007) scale to measure customer satisfaction. Customer satisfaction refers to a global evaluation based on the experience throughout time (Anderson et al., 1994). Customer satisfaction also accumulates satisfaction with products or services and overall satisfaction with the company (Bitner & Hubbert, 1994; Czepiel et al., 1980).

2.1. *Internal reliability analysis.*

Building on Ying and Gong's model (2013), this study calculates the internal reliability of each of the model's constructs. Table 1 shows that the Cronbach's alpha values of the variables C2 to C8 exceed the cut-off value of 0.7 (Nunnally, 1994). However, the internal reliability of the construct *information seeking* fails this test.

Table 1 here.

This study tests whether the internal reliabilities of the constructs improve when eliminating an item from the questionnaire. Table 2 shows that none of the eliminations substantially improve the reliability of the results. Thus, this study considers constructs C2 to C8 as valid.

Because the construct *C1 information seeking* exceeds the threshold of 0.7 (Nunnally, 1994), the study eliminates this construct from the model. This construct includes questions about information seeking prior to the spa service delivery (e.g., by consulting other customers or by other means). However, this study focuses on a service that the hotel provides; therefore, the client does not look for information from the spa, but from the hotel itself, which may justify the removal of this construct.

Table 2 here.

Next, the study analyzes the internal reliability of the satisfaction scale by using Suárez et al.'s (2007) questionnaire. In this case, the value of Cronbach's alpha is 0.962, which confirms the reliability of the satisfaction construct.

Figure 1 the conceptual model that this study proposes. In this model, and after the removal of the *C1* variable, the set of variables *C2-C8* arises as causal of satisfaction.

Figure 1 here.

From this model, this study examines the relationship between value co-creation and customer satisfaction in spa services by using fsQCA .

3. Method of analysis

To verify the study's hypothesis, the clients of the hotel spa answered the questionnaire after the spa experience. The questionnaire contained 29 items (Yi & Gong , 2013) and 6 satisfaction variables (Suárez et al., 2007).

Interviewers collected information between September and November 2014. Data collection finished with 103 complete questionnaires. The study used FsQCA through the computer software fsQCA 2.5 (Ragin & Davey, 2014) to analyze the relationship between the set of causal variables (variables *C2-C8*) and the outcome variable (satisfaction).

The advantages of Qualitative Comparative Analysis in comparison with traditional analysis techniques are two: (1) equifinality, which means that different paths can lead to the same outcome (by using Boolean algebra, fsQCA identifies the configurations of conditions that lead to an outcome); (2) asymmetry, meaning that the presence and the absence of the outcome, respectively, may require different explanations.

One of the main limitations of fsQCA is that this method does not allow the analysis of many variables because in case of obtaining a unique model, interpreting that model would be very difficult. However, from a mathematical point of view, the fsQCA has no limit concerning the sample size. Therefore, fsQCA analyses are equally conclusive for small or large N, making fsQCA an appropriate tool for a wide range of research (Fiss, 2011; Woodside, 2012).

3.1. Variables calibration.

FsQCA requires the calibration of all condition and outcomes (Ragin, 2008). Calibration draws on theoretical and substantial knowledge to produce a fuzzy-set score that relates to the degree of membership in a set. To generate these scores, the study specifies the threshold for full membership of the condition (which gets a fuzzy score of 0.95), full non-membership (fuzzy score 0.05), and the crossover point (fuzzy score 0.5), where the condition is present and absent in the same measure. Table 3 indicates the cut-off points for each of the conditions and outcomes this study analyzes. Specifically, the cut-off points for each of the conditions and outcomes were the 90th percentile, the 10th percentile, and the median, respectively.

4. Results

4.1. *Necessity analysis*

The first step in a QCA study is the analysis of necessary conditions. Conventionally, a condition or a combination of conditions is “necessary” or “almost always necessary” if the consistency score exceeds the threshold of 0.9 (Schneider et al., 2010). Table 3 shows the results of this analysis for the presence and for the absence of satisfaction. None of the conditions is necessary for the satisfaction of users because they do not exceed the threshold of 0.9. In the case of dissatisfaction analysis, the absence of advocacy (~ fs_C6) turns out to be a necessary condition.

Table 3 here.

4.2. *Sufficiency analysis*

The study carries out a sufficiency test through the truth table to obtain the possible configurations to achieve the outcome. In this study, the frequency threshold is 2 and a consistency threshold is 0.80, which means that only those configurations that have more than one case are empirically relevant. This practice is appropriate when the sample is large and allows obtaining causal configurations showing a greater empirical relevance (Vis, 2012)

The following sections show the possible causal configurations leading to satisfaction, and to dissatisfaction. The presentation of the intermediate solutions follow Fuerer et al.’s (2015) format. These solutions incorporate all the logical remainders that, according to literature, lead to the presence of the result (Ragin, 2008).

4.3. *Analysis of the outcome variable: satisfaction*

Intermediate solution: $fs_Out = f(fs_C2, fs_C3, fs_C4, fs_C5, fs_C6, fs_C7, fs_C8)$.

This model presents 6 casual configurations that lead spa users to satisfaction (see Table 4). These 6 configurations show a consistency score exceeding 0.85, which means that they are sufficient to produce the outcome.

Table 4 here.

The conditions *information sharing*, *responsible behavior*, *advocacy* and *helping* are relevant conditions because they appear in 3 of the 6 configurations.

Following Ragin (2008), the study analyzes the 2 causal configurations with a higher raw coverage and unique coverage. This is because higher coverage values indicate greater empirical relevance.

Tolerance * Helping

(Raw coverage = 0.596972; unique coverage = 0.060395; consistency = 0.858997).

From the combination above emerges that users with a high level of *tolerance* and *helping* present a higher level of service satisfaction in 59% of the cases.

Feedback*Information sharing

(Raw coverage = 0.565498; unique coverage = 0.066349; consistency = 0.836016).

Interpreting the configuration, users who offer suggestions to employees and provide necessary information to the employees present service satisfaction in 56% of the cases.

4.4. Analysis of the outcome variable: dissatisfaction

Intermediate solution: $\sim fs_Out = f(fs_C2, fs_C3, fs_C4, fs_C5, fs_C6, fs_C7, fs_C8)$.

The dissatisfaction model presents 7 causal configurations (see Table 5), which present a consistency score exceeding 0.80.

Table 5 here.

The absence of *personal interaction* and *tolerance* produces dissatisfaction among the users of the spa. These conditions appear in 5 of the 7 combinations. Specifically, this study analyzes the two solutions with a higher raw coverage and unique coverage.

\sim Responsible behavior * \sim Feedback * \sim Advocacy

(raw coverage = 0.612393; unique coverage = 0.096789; consistency = 0.855608).

The user who has not a *responsible behavior* does not provide feedback to the employee about the service delivery, and does not recommend the service to friends or family shows dissatisfaction with the service in 61% of cases.

\sim Feedback * \sim Advocacy * \sim Helping * \sim Tolerance

(Raw coverage = 0.502036; unique coverage = 0.052465; consistency = 0.914333).

Furthermore, the absence of *feedback*, *advocacy*, *helping*, and *tolerance* causes customer dissatisfaction.

5. Conclusions

This study seeks to identify the specific value co-creation variables that relate to spa customer's satisfaction. The analysis of necessary conditions shows that no variable of value co-creation is necessary to generate satisfaction. However, the absence of advocacy is necessary to generate dissatisfaction. Furthermore, the analysis of sufficient conditions reveals the different possible combinations of value co-creation variables that relate to users' satisfaction or dissatisfaction. Note that the two solutions that this study obtains present relatively high coverage and consistency levels.

Thus, the results show that users presenting satisfaction are those users who either help other customers and are tolerant, or those who have a positive relation with the employees (by providing help or feedback). Users presenting dissatisfaction do not have a responsible behavior, do not recommend the service, and either do not share any information with the employees or do not provide them any feedback.

One of the limitations of the study lies in the sample. The elimination of the construct *information seeking* is possible because this study's sample comprises hotel guests, who do not look for specific information about the spa. Further research should examine whether using a sample from spa services outside a hotel calls for the inclusion of this the variable into the model again.

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Table 1. Constructs and reliabilities

Construct	Composite reliability
C1 - Information seeking	0.648
C2 - Information sharing	0.760
C3 - Responsible behavior	0.952
C4 - Personal Interaction	0.940
C5 - Feedback	0.725
C6 - Advocacy	0.943
C7 - Helping	0.854
C8 - Tolerance	0.758

Table 2. Item total statistics variables for constructs

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
C1-Information seeking				
<i>Iseeking1</i>	7.280	11.812	0.479	0.523
<i>Iseeking2</i>	6.880	10.437	0.509	0.478
<i>Iseeking3</i>	7.500	13.076	0.393	0.635
C2-Information sharing				
<i>Isharing1</i>	12.170	19.296	0.533	0.716
<i>Isharing2</i>	11.440	14.739	0.759	0.577
<i>Isharing3</i>	11.830	15.714	0.717	0.607
<i>Isharing4</i>	9.780	23.979	0.260	0.834
C3-Responsible Behavior				
<i>Respbehav1</i>	17.660	19.442	0.866	0.942
<i>Respbehav2</i>	17.390	18.436	0.943	0.918
<i>Respbehav3</i>	17.140	21.511	0.834	0.952
<i>Respbehav4</i>	17.430	18.580	0.900	0.932
C4-Personal interaction				
<i>Persinterac1</i>	23.730	25.847	0.873	0.919
<i>Persinterac2</i>	23.580	25.559	0.929	0.910
<i>Persinterac3</i>	23.510	26.037	0.928	0.911
<i>Persinterac4</i>	23.760	26.146	0.820	0.929

<i>Persinterac5</i>	23.590	26.263	0.681	0.959
C5-Feedback				
<i>Feedback1</i>	10.610	7.691	0.520	0.701
<i>Feedback2</i>	9.330	9.400	0.633	0.552
<i>Feedback3</i>	9.260	9.980	0.521	0.669
C6-Advocacy				
<i>Advocacy1</i>	10.730	9.239	0.852	0.940
<i>Advocacy2</i>	10.590	8.734	0.904	0.899
<i>Advocacy3</i>	10.620	9.492	0.891	0.911
C7-Helping				
<i>Helping1</i>	13.140	16.923	0.727	0.801
<i>Helping2</i>	13.040	17.920	0.726	0.805
<i>Helping3</i>	14.500	16.939	0.695	0.815
<i>Helping4</i>	14.930	17.142	0.645	0.837
C8-Tolerance				
<i>Tolerance1</i>	9.010	8.108	0.538	0.732
<i>Tolerance2</i>	7.370	8.372	0.561	0.708
<i>Tolerance3</i>	8.260	6.470	0.678	0.567

Table 3. Analysis of necessary conditions (satisfaction and dissatisfaction)

Conditions	<i>fs_out</i>		$\sim fs_out$	
	Consistency	Coverage	Consistency	Coverage
<i>fs_C2</i>	0.682545	0.704849	0.610131	0.473999
$\sim fs_C2$	0.490643	0.625868	0.620082	0.595052
<i>fs_C3</i>	0.675400	0.855603	0.420850	0.401078
$\sim fs_C3$	0.527220	0.547527	0.848485	0.662898
<i>fs_C4</i>	0.674379	0.840543	0.393035	0.368533
$\sim fs_C4$	0.493365	0.519341	0.829941	0.657235
<i>fs_C5</i>	0.762504	0.803370	0.514473	0.407779
$\sim fs_C5$	0.437904	0.545223	0.751922	0.704300
<i>fs_C6</i>	0.818816	0.922561	0.403890	0.342342
$\sim fs_C6$	0.416298	0.481409	0.908639	0.790478
<i>fs_C7</i>	0.763355	0.815077	0.507689	0.407811
$\sim fs_C7$	0.445389	0.545985	0.769788	0.709906
<i>fs_C8</i>	0.705512	0.762036	0.554274	0.450386
$\sim fs_C8$	0.491153	0.594277	0.707146	0.643681

Table 4. Analysis of sufficient conditions (satisfaction)

Configurati on n ^o	Antecedent Conditions							Coverage		Consistency
	Inf. Sharing	Respo. Behavior	Personal Interact.	Feedback	Advocacy	Helping	Tolerance	Raw	Unique	
1						●	●	0.596972	0.060395	0.858997
2	●			●				0.565498	0.066349	0.836016
3		●			●	●		0.554950	0.004764	0.977232
4		●		●	●			0.550527	0.018374	0.988394
5	●				●	●		0.514971	0.012419	0.970192
6	●	●	●					0.428207	0.015992	0.931533
<i>solution coverage: 0.866111</i>										
<i>solution consistency: 0.793485</i>										

Note: black circles “●” indicate the presence of antecedent conditions. White circles “○” indicate the absence or negation of antecedent conditions. The blank cells represent ambiguous conditions.

Table 5. Analysis of sufficient conditions (dissatisfaction)

Configurati on no.	Antecedent Conditions							Coverage		Consistency
	Inf. Sharing	Respo. Behavior	Personal Interact.	Feedback	Advocacy	Helping	Tolerance	Raw	Unique	
1		○		○	○			0.612393	0.096789	0.855608
2	○	○	○		○			0.485979	0.051108	0.852102
3	○		○	○			○	0.400045	0.015830	0.910917
4		○	○	○			○	0.464722	0.012438	0.908488
5	○		○			○	○	0.392130	0.005201	0.886050
6				○	○	○	○	0.502036	0.052465	0.914333
7		○	○		○	○	○	0.488693	0.051786	0.927468
<i>solution coverage: 0.836952</i>										
<i>solution consistency: 0.802646</i>										

Note: black circles “●” indicate the presence of antecedent conditions. White circles “○” indicate the absence or negation of antecedent conditions. The blank cells represent ambiguous conditions.

Figure 1. Conceptual model proposal (adapted from Yi & Gong, 2013)

