

# VALUE CO-CREATION AND TRUST IN SOCIAL COMMERCE: AN FSQCA APPROACH

*Research paper*

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## Abstract

*This study aims to explain how value co-creation, between customers and companies, and key aspects of trust combine to influence customers' purchase intentions in social commerce. Value co-creation is decomposed into two attributes, behavioral alignment, and empowerment and control, while trust is measured through the aspects of trusting beliefs, institutional trust, and disposition to trust. In order to examine the interplay of these factors and their combined effect on purchase intentions in social commerce, a conceptual model is developed and examined on a data sample of 379 users with experience in social commerce, through fuzzy-set qualitative comparative analysis (fsQCA). The findings indicate five configurations that lead to high intentions to purchase in social commerce, and three configurations that inhibit purchase intentions. The outcomes of the analysis show that value co-creation may be more important than trust in achieving high purchase intentions, while avoiding low/medium purchase intentions. This study contributes to the social commerce literature by demonstrating how value co-creation and trust interrelate and how their interplay influences purchase intentions.*

*Keywords: Value co-creation, Trust, Social commerce, Fuzzy-set Qualitative Comparative Analysis.*

## 1 Introduction

In social commerce, a subset of electronic commerce, social media are used for social interactions, communications, and contributions in the online purchase process, which allows people to participate in the marketing, selling, comparing, buying, and sharing of products and services in online marketplaces and communities (Kim et al., 2013; Zhou et al., 2013). Social commerce sites are those that employ social media tools on existing retail websites, a those that implement tools and applications on existing social media sites to facilitate commercial features. For example, "LEGO Ideas" is an online community where users discover creations by others and submit their own designs. Social commerce research has received increased attention in the IS literature as studies examine various perspectives, like user behavior, business strategies, adoption strategies, and privacy policies (Baethge et al., 2016).

Value co-creation through social commerce is emerging, as new business strategies and models are created to support customers' social experiences and to increase cooperation between retailers and social media sites (Zhou et al., 2013). Creation of value is the core purpose of economic exchange, with companies and customers co-creating this value (Prahalad et al., 2004b; Vargo et al., 2008). Further, customers need to trust the companies with which they engage in co-creation, which may also lead to co-development of trust (Abela et al., 2008; Prahalad et al., 2004a). For example, on "LEGO Ideas" customers vote on others submissions, give feedback and the highly voted submissions proceed to creation, while the creator earns a percentage of the sales and is recognized as the creator on all packag-

ing and marketing. Thus, customers trust both the company and the medium, in order to be able to create value together with the company. Value co-creation and trust should be studied together to examine their effects on customers' purchase intentions, considering the multidimensionality of concepts (McKnight et al., 2002; Vargo et al., 2008). Value co-creation comprises of customers' perceptions of *behavioral alignment*, and *empowerment and control* (See-To et al., 2014), while trust is measured through their *trusting beliefs*, *institutional trust*, and *disposition to trust* (McKnight et al., 2002).

Purchase intentions in social commerce has been investigated considering different factors, however, mainly, without studying the existence of different combinations among these factors, which may lead to different models explaining purchase intentions. Extant studies posit that in value creation process customers gain a better understanding of the company and engage in the product or service provided by the company, which in turn may influence their purchase intentions (Payne et al., 2008). Also, customers need to have a certain level of trust, especially towards the company, to participate in the value creation of a product or service (Abela et al., 2008), as well as to have high purchase intentions (Pavlou, 2003). However, there is a lack of theories in social commerce and, mainly, empirical studies examining the combined effects of the aforementioned factors (Baethge et al., 2016; See-To et al., 2014; Zhang et al., 2016). A theoretical framework was proposed for examining, value co-creation and trust on social commerce (See-To et al., 2014), highlighting their significance in explaining customers' purchase intention. Customers' interactions with the firm help build a sense of ownership of the end product and promote feelings of loyalty towards a specific brand, which in turn can lead to higher levels of purchase intention (Luo et al., 2015). For example, customers with different perceptions of behavioral alignment, empowerment and control, trust and so on, might not be represented from the one-model-fits-all produced from the traditional variance based approaches. Such approaches (e.g., multiple regression analysis, structural equation modelling) assume that relations among the variables are symmetric and offer one single best solution explaining the outcome. This may be misleading as within a sample the variables may also have asymmetric relationships, not identifiable by variance based approaches (Woodside, 2014). Multiple configurations of the examined variables that lead to multiple solutions, explaining the same result, representing a larger part of the sample, need to be identified.

To address this gap in the literature, we build on complexity theory and configuration theory in attempt to identify the different causal patterns of factors that influence purchase intentions in social commerce sites. We explore the following research question: *What configurations of value co-creation and trust lead to high and low/medium purchase intentions?* To this end, we perform configurational analysis and employ fuzzy-set qualitative comparative analysis (fsQCA) (Ragin, 2008) to explain how value co-creation and trust combine to lead to high and low purchase intention in social commerce. We examine value co-creation and trust as antecedents of purchase intentions, and employ complexity and configuration theories, which have been proven appropriate for theory building in individual level phenomena (Woodside, 2014). The findings identify multiple, different, and equally effective combinations of value co-creation and trust that explain purchase intentions. The paper contributes to existing literature in three ways. First, it provides empirical evidence on the importance of value co-creation in social commerce, which has remained largely unexplored to date. Second, it examines the combined influence of value co-creation (i.e., behavioral alignment, empowerment and control) and trust (i.e., trusting beliefs, institutional trust, and disposition to trust) on purchase intentions and takes an innovative methodological approach by employing fsQCA to gain a deeper insight on the data.

The paper is organized as follows. Section 2 presents the theoretical background and proposes the conceptual model. Section 3 describes the research methodology. Section 4 presents the empirical results derived, and section 5 discusses the findings highlighting theoretical and practical implications.

## 2 Theoretical Background

### 2.1 Social Commerce

The evolution of social media has led to the advancement of social commerce, which, has also led to the creation of new commercial online channels and business strategies that can generate economic

value for the firms that actively participate in social commerce (Stephen et al., 2010). Retailers take advantage of social media to provide better services to their customers and form their social commerce strategies, as social media may support and increase value co-creation, consumption and multi-channel activities (Zhou et al., 2013). They may develop and extend their online community by urging their customers to share knowledge, information and experiences with each other. Furthermore, the evolution of social commerce is directly linked with advancements in social media, which may promote different social interactions and trust (Zhou et al., 2013). Such advancements have increased customers' involvement in the purchase process, since they create the opportunity to produce their own content related with the products or the retailers they purchase from (e.g., reviews, comments, etc.).

Social commerce is based on commercial activities, social media tools and technology, and user interaction. The term social media includes social network sites, blogs, forums etc (Constantinides et al., 2008). Retailers may develop their social strategies by implementing social media tools in their existing websites, thus adding a social layer to them in order to facilitate communication and services with their customers. Also, existing social network sites may implement tools and applications in order to support commercial features. Multiple studies examine the different factors that influence the adoption of social commerce [e.g., (Hajli, 2014; Kim et al., 2013; Lu et al., 2016)], as well as studies that provide a literature review in the area (Baethge et al., 2016; Zhang et al., 2016). It is evident that social commerce is not just an extension of online commerce that occurs when adding social networking tools, even if it appears to be as one when adding a social layer to online commerce websites or the opposite (Zhou et al., 2013). Further work is needed to provide an integrated view of social commerce by employing new methods that are able to give more insight into the area.

## 2.2 Value co-creation in social commerce

The value of a product or a service is not created only by the company that offers or builds the product/service, but it also depends on the customer. The company and the customer create the value of a product together, in a unique way to the customer and sustainable to the company (Prahalad et al., 2004b). The company offers the product to customers (creating value), and customers use the product based on their skills and knowledge (co-creating value) (Grönroos et al., 2013; Vargo et al., 2008). Customers may also create value by participating actively in the development process of a product or service (Ranjan et al., 2016). The process of creating value includes customer experiences, customer behavior, business process and relationship marketing, and customers need to engage in the process and to learn more about the company to co-create value together (Payne et al., 2008). Co-creating value by jointly developing a product, needs the customer and the company to be in alignment, as it includes the company's inclination to share control to empower the customer, who in turn will contribute in developing the product (Ranjan et al., 2016). In this study, value co-creation comprises of two constructs, namely *behavioral alignment* and *empowerment and control* (See-To et al., 2014).

Behavioral alignment refers to the situation when the company and the customer need to ensure that the proper behavior is in place, leading to effective and efficient creation of value for both parties (Ng et al., 2010). Empowerment refers to the perception of being able to change others for effective and efficient creation of value, and control refers to the perceptions occurring, for both the company and the customer, by having a system to control the process (Ng et al., 2010). In the context of social commerce, behavioral alignment refers to the situation when both the company and the customers are able to communicate effectively and efficiently to discuss and develop new ideas related with the product and service over social media (See-To et al., 2014). Further, in social commerce empowerment and control describe the situation when customers feel in control on whether to use the information gained through social media into their decision-making process or not (See-To et al., 2014).

Different studies exist that aim to explain value co-creation in different contexts [e.g., (Maglio et al., 2008; Ranjan et al., 2016)]. Marketing literature includes studies that examine value co-creation with experience economy (Payne et al., 2009), relationship marketing (Payne et al., 2008), social exchange (Ng et al., 2010) and social networks (See-To et al., 2014). Nonetheless, investigation of value co-creation is relatively new in marketing, with studies published after 2000 (Ranjan et al., 2016). Thus,

many studies focus on proposing and developing theoretical frameworks and measures to examine the phenomenon of co-creation (Ng et al., 2010; See-To et al., 2014; Yi et al., 2013). For instance, Yi et al. (2013) develop a customer co-creation behavior scale, by examining it as the combination of customer participation behavior and citizenship behavior, which demonstrate distinctive patterns of antecedents and consequences. In the context of social commerce, See-To et al. (2014) suggest measuring value co-creation as the combination of behavioral alignment and empowerment and control. The latter, builds on previous studies that propose value co-creation to comprise of seven dimensions (Ng et al., 2010). Nonetheless, the aforementioned studies do not examine the relation of value co-creation with purchase intentions in social commerce. Hence, there is a need to test value co-creation in a model to verify its importance, as well as the significance of its internal measures, as antecedents of customer intentions to purchase on social commerce environments.

### 2.3 Trust in social commerce

Trust has a main role in online services and plays a key part in the majority of the different economic and social transactions (Pavlou, 2003), with numerous studies examining it in various ways and contexts. Previous studies in online commerce suggest that trust has four aspects, that is disposition to trust, institutional-based trust, trusting beliefs, and trusting intentions (McKnight et al., 2002). *Disposition to trust* refers to the trust of a person on another person in a general situation. *Institutional-based trust* on the other hand refers to the trust of a person on sociological structure. *Trusting beliefs* refer to a person's beliefs that a company will act according to his or her benefit. Finally, *trusting intentions* refer to a person's intention to engage in trust-related behaviors with a specific company (McKnight et al., 2002). Based on the fact that trusting intentions describe behavior that is related with behavioral adoption, and following previous studies (Awad et al., 2008; See-To et al., 2014), trusting intentions are not included in this study since they are equated by the behavior of exhibiting purchase intentions.

Recent studies have empirically demonstrated the central role of trust in social commerce settings. Trust is an antecedent of purchase intentions and word of mouth intentions over social media [e.g., (Kim et al., 2013)], and it should be used to interpret social behavior in social commerce research (Liang and Turban, 2011). For example, when a person uses an online forum or social network to find information about a product or a seller, he or she is more likely to trust the information and the medium if a reputable member or a friend has provided that information (Lu et al., 2010). Disposition to trust is an antecedent of institutional based trust and trusting beliefs and has no direct effect on customers' behavior (McKnight et al., 2002). Institutional based trust here refers to customers' trust in online shopping in general, it affects their online behavior, and may influence the use of social media as a shopping channel as well. Trusting beliefs describe the beliefs that when customers use social media to purchase, the firms care and are interested about their well-being. These beliefs are influenced by both disposition to trust and institutional trust, and in turn influence behavioral intentions (McKnight et al., 2002). Online retailers employ different tools to increase customers' trusting beliefs and sustain a good relationship with them, such as chat plug-ins in their websites or direct support through social network sites. Such tools create and increase the social presence of an online retailer, and help the customers to better understand the retailer, thus forming trusting beliefs (Lu et al., 2016).

Trust is a complex concept and may have different effects, direct or indirect, on customers' online behavior (McKnight et al., 2002). Studies in social commerce take a unidimensional approach of trust [e.g., (Kim et al., 2013)], focus on trusting beliefs without examining other dimensions of trust. Nonetheless, recent studies in the area examine trust as a multidimensional concept including more than one constructs (i.e., trusting beliefs, disposition to trust, institutional based trust), as well as sub-constructs for trusting beliefs (i.e., benevolence, integrity, competence) (Lu et al., 2016). Thus, it is important to employ a multi-dimensional approach when examining trust to gain a better understanding of the concept and provide better explanations regarding its effect on purchase intentions. This requires an examination of the interplay among the dimensions of trust. The degree of disposition to trust, depending on how high or low is, may increase customers' trusting beliefs or institutional trust. In social commerce, this interplay becomes more challenging, as the presence or absence of one dimension of trust

may lead to different purchase behaviors. For example, high disposition to trust may increase trusting beliefs, when poor implementation of service or customer support may reduce trusting beliefs. It is thus critical to examine trust as multi-dimensional construct in the context of social commerce.

## 2.4 Conceptual model

With the increasing importance of social commerce and the growing number of people using social media for online purchases, it is crucial for retailers to better understand customers' behavior in social commerce. Indeed, previous research examines purchase intentions to predict actual behavior (Hsu et al., 2006; Pavlou et al., 2006), by building on the theory of planned behavior, which suggests that user intention is a powerful predictor of actual behavior (Fishbein et al., 1977). Thus, in the context of social commerce it is relevant to examine customers' intentions, whether they are goal or exploration related, as they are linked with actual behavior. Recent studies develop integrative models, including multiple factors as antecedents of customers' behavior in social commerce, such as purchase intention, word of mouth, and more (Baethge et al., 2016; Hajli, 2014; Mikalef et al., 2013; Zhou et al., 2013), and test these models employing correlation based methods (e.g., structural equation analysis). Among others, value co-creation and trust have been identified as critical factors in determining purchase decisions in online contexts [e.g., (Gnyawali et al., 2010; Kim et al., 2013)]. Trust makes customers less hesitant when purchasing online, and also it may create them the feeling of control over a transaction (Pavlou, 2003), indicating a relation with behavioral alignment and empowerment and control. Interactions between customer and companies need to be built on trust, as it offers support and benefits, which in turn lead to value creation (Hajli, 2014; Liang, Ho, et al., 2011). Nonetheless, further work is needed to provide a validated general overview that describes the role of value co-creation and trust, and their interrelations in predicting purchase intentions in social commerce (See-To et al., 2014).

To address this gap, we examine customer purchase intentions in social commerce by unravelling configurations of causally related sets of factors. Relationships between two factors (e.g., X, Y) are complex, and the presence of one (X) may lead to the presence of the other (Y), indicating sufficiency. Also, factor Y may be present even with factor X being absent, thus the presence of X is a sufficient but unnecessary condition for Y to occur. With the presence of additional factors, X may be necessary but insufficient for Y to occur. We posit that there is a synergy between value co-creation and trust in explaining purchase intention in social commerce. We theorize that there is not one single, optimal, configuration of such values. Instead, multiple and equally effective configurations of causal conditions exist, which may include different combinations of value co-creation and trust. Depending on how they combine they may or may not explain customers' high and low/medium intention to purchase in social commerce.

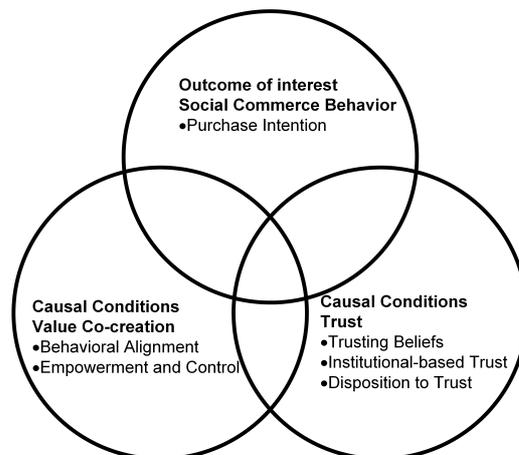


Figure 1. Venn diagram illustrating the conceptual model explaining purchase intentions on social commerce

To conceptualize these relationships, we propose a theoretical model (Figure 1) illustrating three sets of constructs and their intersections. The overlapped areas represent possible combinations among factors, that is areas that one factor may exist together with the rest (e.g., combinations that explain high purchase intentions are included within the outcome of interest area).

Drawing on complexity theory and the principle of *equifinality*, a result may be equally explained by alternative sets of causal conditions (Fiss, 2007). These conditions may be combined in sufficient configurations to explain the outcome (Fiss, 2011; Woodside, 2014). Behavioral alignment, empowerment and control, trusting beliefs, institutional trust, and disposition to trust are important causal conditions for understanding purchase intention in social commerce (See-To et al., 2014), thus they may interact with each other in various configurations. For example, customers' trust in a specific online retailer (i.e., trusting beliefs) are more likely to proceed to a purchase through social media even if they do not trust the online shopping in general. Also, if a customer feels empowered and in control of the transaction he is likely to proceed to a purchase even if he has low levels of trust towards the seller. Thus, high purchase intentions may be achieved in more than one ways.

Further, configuration theory proposes the principle of causal asymmetry, which means that, for an outcome to occur, the presence and absence of a causal condition depends on how this condition combines with the other conditions (Fiss, 2011). Also, causal asymmetry suggests that the causal conditions that explain the presence of an outcome, cannot be assumed as mirror pictures of conditions explaining the absence of the same outcome (Fiss, 2011). For instance, alternative configurations of purchase intention in social commerce may include high disposition to trust in one configuration and low disposition to trust in a different configuration. Thus, the same outcome may be influenced either positively or negatively by a specific factor, depending on how it combines with the other factors. Furthermore, high disposition to trust might be part of a combination that explains high purchase intentions, and might also be part of another combination that explains low/medium purchase intentions. Thus, configurations that explain the presence of an outcome do not suggest that their reverses are also able to explain the absence of the same outcome.

### 3 Research Methodology

#### 3.1 Data collection

In this study, an online questionnaire was developed and administered to participants between October and November 2016. Two methods were employed in order to recruit participants. First, Amazon's Mechanical Turk (MTurk) was used which is able to provide a significantly socio-economically and ethnically diverse population of customers that use social commerce sites (Casler et al., 2013). MTurk is an online platform on which people can be contracted to perform tasks that require human intelligence in exchange for compensation. MTurk has received increased attention regarding participants' attentiveness when answering the questions. Studies have found different results on this issue, and if specific instructions are given to the sample, then MTurk participants have shown higher attentiveness compared to other sample groups (e.g., students) (Hauser et al., 2016). In our case, the respondents were given a definition of social commerce which was followed by a few examples. The respondents were asked to keep this in mind, while answering the questions based on their previous experience. Second, a snowball sampling methodology was also used since it may offer access to a more representative sample. People with previous experience in social commerce were contacted through the different types of social media, that is social network sites, blogs, forums etc (Constantinides et al., 2008). The participants were asked to forward the survey to their personal or business contacts with previous experience with social commerce. A raffle was created with gift cards as a reward to the participants. To support the snowball sampling, an additional incentive was given to the participants for each person they invited and completed the survey successfully. Respondents with no previous experience in social commerce were removed from the study. In total, 452 responses were gathered, out of which 379 were used in this study.

### 3.2 Participants

The sample consists of more men (55.1%) than women (44.9%). Regarding their age, the sample consists of almost equally respondents between 35 to 45 years old (28.8%), and between 30 and 34 years old (27.2%). Further, 21.9% belonged to the age group 25-29, 15.8% were older than 46 years old, and 6.3% were 18-24. The majority of the respondents (53.8%) were holders of a bachelor degree, followed by high school graduates (37.2%). In addition, 9% of the respondents were post-graduates. The vast majority of the respondents checked their social media accounts several times a day, 21.9% about once a day (63.6%), and the remaining 14.5% checked their accounts a few times a week or less. The respondents were asked how much money they spend on average on online shopping in a period of month. The largest group of respondents spent between 25-50\$ (31.9%), followed by those who spent between 50-100\$ (26.9%). Finally, 17.7% spent less than 25\$ in a month, with the remainder of the sample spending over 100\$ (23.5%).

### 3.3 Measures

The questionnaire comprised of two main parts. In the first section, respondents were presented with different questions on the demographics, followed by the second part which included measures of the constructs as they were identified during the literature review. Regarding trust, as it is a multidimensional concept, we adopted specific measures from the three main categories that are in common for trusting beliefs, institutional-based trust, and disposition to trust (i.e., benevolence, integrity, competence) (McKnight et al., 2002). The survey included reflective scales for the constructs of this study. A 7-point Likert scale (1=totally disagree, 7=totally agree) is employed. The definitions of all constructs are presented in table 1, along with their source in the literature. The appendix presents the items used to measure the constructs, their descriptive statistics and their corresponding loadings.

Construct	Definition	Source
<b>Value Co-Creation</b>		
Behavioral Alignment	The situation when customers perceive that themselves and the firm communicate effectively and efficiently to discuss and develop new ideas in relation with the firm’s product and service over social media	Ng et al., 2010
Empowerment and Control	The situation when customers feel in control on whether to decide to take information from social media into their decision-making process or not.	
<b>Trust</b>		
Trusting Beliefs	Customers’ beliefs that when they use social commerce the firms care and are interested about their well-being.	McKnight et al. (2002)
Institutional based Trust	Customers’ trust on online shopping in general	
Disposition to Trust	The trust of a person on another person in a general situation.	
<b>Behavior in Social Commerce</b>		
Purchase Intention	Customers’ intention to purchase in social commerce environments.	Mikalef et al. (2013)

Table 1. Construct definition

### 3.4 FsQCA

In this study we employ fsQCA, using fs/QCA 2.5 (Ragin et al., 2014). FsQCA was developed by combining fuzzy sets and logic principles with Qualitative Comparative Analysis (QCA) (Ragin, 2000), and has been applied in various fields, such as business, information systems, technology adoption (Kourouthanassis et al., 2016; Pappas et al., 2016), including social commerce (Chari et al., 2016; Mikalef et al., 2016). FsQCA is able to guide the researchers beyond the traditional MRAs and offer

them the opportunity to identify multiple pathways that are able to explain the same outcome. Furthermore, these pathways (or combinations) of independent variables, may also include variables that are not identified by MRAs because their influence on the outcome occurs only for a small number of cases (Woodside, 2014), in contrast to the main effects. These combinations lead to multiple solutions offered by fsQCA, and include both necessary and sufficient conditions. Such conditions may be present or absent on a solution, or they may be on a “do not care” situation. The “do not care” situation indicates that the outcome may either be present or absent and it does not play a role on a specific configuration. Necessary and sufficient conditions may be present (or absent) as core and peripheral elements. Core elements indicate a strong causal relationship with the outcome, and peripheral elements indicate a weaker relationship (Fiss, 2011).

### 3.4.1 Data calibration

The most important step in configurational analysis is data calibration, that is to calibrate all factors into fuzzy sets with values ranging from 0 to 1 (Ragin, 2008). There are two methods for data calibration, the direct and the indirect. In the direct method, the researcher chooses three qualitative breakpoints, while in the indirect method, the factors should be rescaled following qualitative assessments. Either method may be chosen, depending on the data and the underlying theory (Ragin, 2008). In the direct method, the three values (i.e., qualitative breakpoints) correspond to full-set membership, full-set non-membership and intermediate-set membership, denoting the degree that a case is part of a set (Ragin, 2008). The direct method was employed for this study, and the qualitative breakpoints points were chosen based on percentiles (Dul, 2016). Furthermore, since our data is skewed to the right, data calibration is done by using percentiles. Thus, the 80<sup>th</sup> percentile is the full-set membership, the 20<sup>th</sup> percentile is the full-set non-membership, and the 50<sup>th</sup> percentile is the intermediate set membership. The values of every variable are calibrated based on a logistic function to fit into the three aforementioned anchors, embedded in the fsQCA software. Selecting, instead, the three qualitative breakpoints based on the survey scale (7-point Likert scale) (Ordanini et al., 2014; Pappas et al., 2016) would offer less meaningful results as it is likely to produce only one solution with all the conditions identified as necessary. (Plewa et al., 2016). Thus, the breakpoints are set as follows: Behavioral Alignment; 3.00 - 4.67 - 5.67, Empowerment and Control; 2.34 - 4.00 - 5.33, Trusting beliefs; 3.67 - 4.50 - 5.67; Institutional based Trust; 4.50 - 5.25 - 6.00, Disposition to Trust; 3.50 - 4.83 - 5.83, Intention to Purchase; 1.60 - 3.40 - 5.00. Based on these values, for example, users that responded with a 5 or higher, on the Likert scale, belong to the full-set membership, that is high intention to purchase. Similarly, the same applies to all constructs, with the only exception being Institutional based Trust, on which the users, in general, have responded with high values. Nonetheless, to be consistent, we calibrate Institutional based trust in a similar way with the other constructs. Indeed, the full set non-membership, that is low institutional trust, includes users whose response is mainly under the value 4 on the Likert scale, and ranges between 2 and 4.50.

### 3.4.2 Obtaining the solutions

Following the data calibration, the researcher run the fsQCA algorithm, which produces a truth table of  $2^k$  rows, with  $k$  representing the number of outcome predictors and each row representing every possible combination. Next the truth table is sorted based on frequency and consistency (Ragin 2008). Frequency describes the number of observations for each possible combination, while consistency refers to “*the degree to which cases correspond to the set-theoretic relationships expressed in a solution*” (Fiss, 2011). Setting a frequency threshold ensures that a minimum number of observations is acquired for the assessment of the relationships. For samples higher than 150 cases the threshold should be set at 3, while for smaller samples the threshold may be set at 2 (Fiss, 2011; Ragin, 2008). Thus, the threshold here is set at 3 and all combinations with smaller frequency are removed from further analysis. Also, the threshold for consistency is set at the recommended threshold of 0.75 (Ragin, 2006). The combinations above the consistency threshold are those that fully explain the outcome, which means that for those combinations the outcome variable is set at 1, and for the rest is set at 0.

Finally, fsQCA provides three sets of solutions (i.e., complex, parsimonious, intermediate) that need to be interpreted by the researcher. The complex solution presents all the possible combinations of conditions when traditional logical operations are applied. Complex solutions are simplified into parsimonious and intermediate solutions, which are simpler and up for interpretation. The parsimonious solution is a simplified version of the complex solution and presents the most important conditions which cannot be left out from any solution, which are called “core conditions” by fsQCA (Fiss, 2011; Ragin, 2008).

## 4 Findings

### 4.1 Measurements

To verify the factor structure of the constructs a confirmatory factor analysis (CFA) is performed. The constructs are evaluated in terms of reliability and validity. Reliability testing, based on the Cronbach alpha and Composite Reliability indicators, show acceptable indices of internal consistency since all constructs exceed the cut-off thresholds of .70. For validity, the average variance extracted (AVE) needs to be greater than .50, the correlation between the variables in the confirmatory model should not exceed .80 points, as this suggests low discrimination, and that the square root of each factor’s AVE is higher than its correlations with the other factors (Fornell et al., 1981). The AVE for all constructs ranges between 0.57 and 0.84, all correlations are lower than 0.80, and square root AVEs for all constructs are larger than their correlations. Since our data are not normally distributed, we employ Kendall’s tau test to measure correlation, which is generally preferred over Spearman's rho, as it is a better estimate of the corresponding population parameter, and its standard error is known (Howell, 2012). The findings are presented in Table 2. Multicollinearity (O’Brien, 2007) is also examined along with the potential common method bias by utilizing the common latent factor technique and the CFA marker variable technique, which are better from other control procedures (e.g., Harman's single factor test) (MacKenzie et al., 2012; Podsakoff et al., 2003). Since the variance inflation factor (VIF) for every factor is lower the recommended value (<3), multicollinearity is not an issue here. Common method bias is not a problem, as variance from the common latent factor technique and the CFA marker variable technique, is 0.08 and 0.21, respectively.

Construct	Mean (S.D.)	CR	AVE	1	2	3	4	5	6
1.Behavioral Alignment	4.39 (1.49)	.94	.84	.92					
2.Empowerment and Control	3.93 (1.57)	.94	.85	.69	.92				
3.Trusting beliefs	4.51 (1.22)	.96	.80	.36	.38	.90			
4.Institutional based Trust	5.49 (.91)	.84	.57	.12	.11	.39	.76		
5.Disposition to Trust	4.58 (1.38)	.96	.80	.13	.15	.32	.32	.90	
6.Purchase Intention	3.4 (1.64)	.95	.80	.44	.45	.39	.07	.16	.90

Note: Diagonal elements (in bold) are the square root of the average variance extracted (AVE). Off-diagonal elements are the correlations among constructs (all correlations higher than 0.1 are significant, p< 0.01;). For discriminant validity, diagonal elements should be larger than off-diagonal elements. CR; Composite Reliability.

Table 2. Descriptive statistics and correlations of latent variables

### 4.2 Results from fsQCA

The results from the configuration analysis with fsQCA are presented in Table 3. In detail, black circles (●) show the presence of a condition, and crossed-out circles (⊗) show its absence (Fiss, 2011). Blank spaces show the “do not care” situation. All conditions presented are core conditions. Also, consistency and coverage are presented on Table 3, for the overall solution and for each solution separately. All values are greater from the recommended threshold of 0.75 (Ragin, 2006). Consistency represents the level that a relation has been approximated, and then coverage determines the empirical rele-

vance of the same consistent subset (Ragin, 2006). Thus, the overall solution coverage presented on Table 3, indicates the extent that high purchase intention in social commerce may be determined based on the set of the configurations, and may be compared to the R-square value (Woodside, 2013). We tested for two outcomes, that is high purchase intention and the negation of high purchase intention (i.e., low/medium purchase intention).

The overall solution coverage of .80 and .75 indicate that the five solutions (1-5) and three solutions (6-9), respectively, account for a substantial proportion of high and low/medium purchase intention in social commerce. Also, fsQCA estimates the empirical relevance for every solution, by calculating raw and unique coverage. Raw coverage is the amount of the outcome explained by a certain alternative solution, while unique coverage is the amount of the outcome exclusively explained by a certain alternative solution. The solutions presented in Table 3 explain a large number of high and low/medium purchase intention, ranging from 22% to 68% cases associated with the outcome.

Configuration	High purchase intention					Low/Medium purchase intention		
	1	2	3	4	5	6	7	8
<b>Value Co-Creation</b>								
Behavioral alignment			●		●		⊗	⊗
Empowerment and Control	●		●	●		⊗		
<b>Trust</b>								
Trusting beliefs		●		●		⊗	⊗	
Institutional based Trust	⊗				⊗			●
Disposition to trust		⊗			●		●	⊗
<b>Consistency</b>	.80	.79	.81	.86	.83	.81	.82	.85
<b>Raw Coverage</b>	.42	.22	.68	.46	.23	.68	.34	.27
<b>Unique Coverage</b>	.06	.03	.07	.01	.01	.26	.03	.04
<b>Overall solution consistency</b>	.77					.78		
<b>Overall solution coverage</b>	.80					.75		
Note: Black circles (●) indicate the presence of a conditions. Circles with "x" (⊗) indicate its absence. Blank spaces indicate a "do not care" condition. All conditions are core conditions.								

Table 3. Configurations that lead to high and low/medium intention to purchase

Solutions 1-5 present combinations that lead to high purchase intention in social commerce, on which value co-creation and trust may either be present (i.e., high) or absent (i.e., low). In detail, the presence of empowerment and control leads to high purchase intentions when institutional based trust is absent, regardless of the other factors (solution 1). Next, when trusting beliefs are present high purchase intention may be achieved with disposition to trust being absent, regardless of the other factors (solutions 2). Further, the combination of behavioral alignment and empowerment and control leads to high purchase intention in social commerce, regardless of any type of trust (solution 3). Also, the presence of empowerment and control combined with trusting beliefs lead to high purchase intention, when the other factors are neither present or absent (i.e., "do not care" condition). Finally, the combination of behavioral alignment with disposition to trust leads to high purchase intention, when disposition to trust is absent and empowerment and control and trusting beliefs are on a "do not care" condition.

With fsQCA we also examined the negated outcome, which tests for not having high purchase intention (or having low/medium intention) (solution 6-8). In detail, the absence of empowerment and control and trusting beliefs leads to low/medium purchase intention regardless of the other factors (solution 6). Further, the absence of behavioral alignment and trusting beliefs together with the presence of disposition to trust, regardless of empowerment and control and institutional trust, lead to low/medium purchase intention (solution 7). Also, the combined absence of behavioral alignment and disposition to

trust leads to low/medium purchase intention with the presence of institutional based trust, regardless of empowerment and control and trusting beliefs (solution 8).

## 5 Discussion

The presents study proposes that in social commerce, value co-creation and trust combine with each other to form configurations that explain purchase intentions. Building on complexity theory and configuration theory a conceptual model is created to identify such configurations. The model includes five constructs of social commerce adoption, that is behavioral alignment, empowerment and control, trusting beliefs, institutional-based trust, and disposition to trust. The findings identify multiple recipes leading both to high and low/medium purchase intentions, and showcase the significance of value co-creation over the values of trust, as the presence of value co-creation is part of solutions that lead to high purchase intention, and its absence is more likely to be part of those solutions that lead to low/medium purchase intentions. It should be noted that value co-creation and trust influence each other, since the presence (or absence) of one influences the presence (or absence) of another, so for example, high behavioral alignment is likely to increase trusting beliefs. Here we focus on core conditions to highlight the different roles of value co-creation and trust on increasing purchase intention.

In detail, solutions 1-5 present how high behavioral alignment and high empowerment and control are able to overcome low disposition to trust or institutional trust, to create high purchase intentions, regardless of the level of trusting beliefs that the customers have. Firstly, this indicates that when the customer and the firm use an established method of communication that enables effective and efficient interaction over social media, trusting values are less important in the purchase process. Furthermore, when customers feel in control about making a decision, they do not need to have high institutional based trust. For example, customers that do not trust online vendors, may proceed to a purchase if they feel in control over the information received from them. Interestingly, when behavioral alignment and empowerment and control are both at high levels, they are likely to lead in high purchase intentions even without trust being an important factor. The findings provide a deeper understanding on the role of value co-creation over trust values, since extant studies highlight the existence of trust for successful social commerce adoption (Kim et al., 2013; Lu et al., 2016). Instead, our study indicates that high purchase intentions may be achieved regardless of trust or even when trust is at low levels, by having high value co-creation. These findings lead to the creation of new propositions and hypotheses,

The present study also identifies how behavioral alignment and empowerment and control may explain low/medium levels of purchase intention in social commerce (solutions 6-8). The results show that inverted explanations for the presence of purchases intentions cannot be interpreted as explanations for the absence of purchase intentions. This means that different combinations of the same factors should be considered, to explain low/medium purchase intentions. The findings show that when one of the conditions for value co-creation is low, purchase intentions are also likely to be low, combined though with low levels of one of the trust values. Furthermore, low levels of behavioral alignment are able to diminish high levels of institutional-based trust and disposition to trust, and lead to low purchase intentions. These results add to the importance of value co-creation in social commerce, as for example trusting the online retailer is not enough, if the customer and the retailer do not have an established method of communication that can provide efficient interaction over social media, or if the customers feel that they are not in control of the information on social media. It should be noted that the existence of low levels of value co-creation may create the low levels of trusting beliefs.

This research has both theoretical and practical implications towards the adoption of social commerce. First, it complements extant research in the area (Lu et al., 2016; Stephen et al., 2010) by offering an alternative view on the purchase process and showing how important antecedents of customers' behavior are able to combine with each other to predict purchase intentions. Second, we add to the literature of the value co-creation process, as we specifically examine the customer perspective of value co-creation, while previous studies have focused on factors influencing the relation between the firm and the customer (See-To et al., 2014). Third, we provide empirical support on how different levels of value co-creation may influence purchase intentions, a relation that had only been hypothesized in the

past (Payne et al., 2008; See-To et al., 2014). Finally, we extend the literature on social commerce by examining trust as a multidimensional concept and considering different types of trust, differentiating from recent studies that take a unidimensional approach on trust (Hajli, 2014) or examine only a specific type of trust (Chari et al., 2016). Our findings highlight the importance of taking a holistic approach to the role of trust in social commerce.

Following the results of this study, practitioners and online retailers can gain insight on how their customers' view value co-creation and trust values in social commerce. This will help them improve their online strategies and business models, by including more actively the customer in the product development in order to increase the value of the product. The latter may lead to higher sales and increased revenues, as well as more satisfied and loyal customers. Furthermore, we identified alternative paths that explain high purchase intentions when certain levels of trust are low. Online retailers, and especially new ones that have not yet developed a strong brand name, may use our findings to focus on increasing value co-creation for more sales, which eventually may increase customers' trusting beliefs.

This paper has methodological implications, as it differs from previous studies in of social commerce employing variance methods, such as structural equation modelling, to examine purchase intentions [e.g., (Lu et al., 2016)]. Here, a configuration analysis is performed with the use of the data analysis tool fsQCA, to examine the asymmetric relationships among the factors. This methodology has recently received increased attention in social commerce (Chari et al., 2016; Mikalef et al., 2016), and when applied together with complexity theory and configuration theory, is able to contribute towards the creation of new hypotheses and theories (Fiss, 2007; Woodside, 2014). To this end, we build on complexity theory and configuration theory, and propose a conceptual model to predict customers' purchase intentions in social commerce. The results show complex causal patterns among the predictor variables and highlight asymmetric relationships that may lead to the same outcome, and the results lead to the development of new hypotheses to be examined. In detail, future studies, should examine direct and indirect effects of behavioral alignment, as well as of empowerment and control on trust and purchase intentions (See-To et al., 2014). Also, social commerce studies need to focus on the relation between value co-creation and trust, as high value co-creation may help overcome trust issues, while low value co-creation may lead to reduced levels of trust. Furthermore, considering the importance of value co-creation over trust in explaining purchase intentions, future studies may hypothesize on the moderating effects of the different dimensions of trust (e.g., low or high trusting beliefs).

As with all empirical studies, there are some limitations. First, the sampling method may limit the generalization of the findings, since MTurk and snowball sampling was used to recruit respondents. Further, the findings are based on self-reported data. Future studies may combine self-reported data with real data from using social media, and extend them with semi-structured interviews, observations, and eye-tracking data which may provide deeper insight on user behavior (Djamasbi et al., 2010). Also, in this study we only examine value co-creation and trust as antecedents of purchase intention. Researchers may include more variables that have been found to influence customers' behavior in social commerce environments (Baethge et al., 2016; Zhang et al., 2016). Moreover, the study controls for social commerce experience by presenting the respondents examples of what is social commerce. In order to increase the reliability of the sample, future studies may ask from the respondents to provide examples of social commerce. Finally, from a methodological point of view, this paper is one of the first to employ fsQCA in social commerce in order to provide a better understanding of customers' behavior. Future studies should follow a similar approach to extend our findings, in the same as well as in different contexts. It should be noted that fsQCA does not identify the unique contribution of every variable for every solution. The goal of fsQCA is to identify the complex combinations of the independent variables, as well as the amount of the outcome that is explained by these combinations. Future studies may combine fsQCA with regression-based techniques to gain a deeper insight on the data and explore the effect of each variable on the outcome, based on the configurations identified from fsQCA.

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## Appendix

Scale items with mean, standard deviation and standardized loading

Construct and scale items	Mean	S.D.	Load.
<b>Behavioral alignment, CA= .91</b>			
On social media, I feel that I can interact with brands and give feedback about my preferences	4.78	1.55	.87
Through social media I feel that I can interact with brands/companies and propose new ideas	4.25	1.71	.94
Through social media I feel that my input on brand pages is in alignment with what is developed/changed in new products/services	4.15	1.63	.94
<b>Empowerment and Control, CA= .92</b>			
I feel that through social media I have control over new products/services	3.64	1.73	.92
Through social media I feel that my feedback is taken seriously by the brands/companies I like.	4.18	1.70	.92
Through social media I feel that I can communicate with brands I like and be actively engaged in the development of new products/services	3.97	1.69	.93
<b>Trusting beliefs, CA= .95</b>			
I believe that vendors on social media would act in my best interest	4.42	1.35	.88
I expect that vendors on social media are well meaning	4.63	1.34	.90
I would characterize vendors on social media as honest	4.37	1.32	.91
Overall, social media sites are effective in providing trustworthy vendors from which I can purchase	4.38	1.47	.92
On social media, I can find excellent vendors for purchasing products/services	4.55	1.45	.89
Vendors on social media would keep their commitments	4.71	1.24	.89
<b>Institutional based Trust, CA= .82</b>			
I am comfortable making purchases on the Internet*	6.16	1.02	.25
I feel that most Internet vendors would act in customers' best interest	5.17	1.24	.95
I am comfortable relying on Internet vendors to meet their obligations	5.55	1.12	.78
Most Internet vendors do a capable job at meeting customer needs	5.76	.95	.60
In general, the Internet is now a robust and safe environment in which to transact business	5.48	1.20	.64
<b>Disposition to trust, CA= .95</b>			
I generally trust other people.	4.56	1.54	.92
I tend to count upon other people	4.19	1.55	.84
I generally have faith in humanity.	4.54	1.60	.92
I feel that people are generally well meaning	4.82	1.49	.91
I feel that people are generally trustworthy	4.64	1.53	.93
I usually trust people until they give me a reason not to trust them	4.76	1.58	.84
<b>Purchase Intention, CA= .94</b>			
I am likely to purchase products/services over Social Media	3.25	1.75	.90
After some time of thought I buy one or more products that I have browsed on Social Media sites	3.57	1.77	.93
Some of my recent purchases were based on information that I found via Social Media sites	3.48	1.92	.90
I buy products I see advertised on Social Media through e-shops	3.33	1.85	.91
I buy products I see advertised on Social Media through shops nearby me	3.36	1.85	.85
* Deleted due to low loading, CA; Cronbach alpha indicator			

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