Surfing or flowing? How to retain e-customers on the internet

¿Surfear o fluir? Cómo retener clientes en internet

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Abstract
Purpose – Social commerce websites entail a completely new scenario for retaining e-customers due to the richness of their social interactions. Nowadays, users can interact with companies and with other users; hence, it is considered important to study how social stimuli affect users. Drawing on the Stimulus Organism Response framework and Flow Theory, this paper aims to propose that the social stimulus (sPassion) has a positive effect on the organism (state of flow) causing positive responses from users (flow consciousness, trust and eLoyalty).

Design/methodology/approach – The data were collected through an online survey. The sample consists of 771 users of social commerce websites, of which 51 per cent are male and 49 per cent female, aged between 16 and 80 years. The structural equation model statistical software EQS 6 was used to test the model.

Findings – The empirical results confirm that passionate users are prone to experience state of flow, and, as a consequence, they are conscious of this optimal experience, resulting in an increase in trust.

Originality/value – The originality of this research stems from analysing how users’ passion on social commerce creates an optimal experience that boost customers’ retention.

Keywords Flow theory, Customer retention, Social commerce, sPassion, SOR model

Paper type Research paper

Resumen
Objetivo – Las páginas web de social commerce ofrecen un escenario completamente diferente al estudiado hasta la fecha, favoreciendo la retención de clientes en Internet gracias a la riqueza de las interacciones sociales del medio. En la actualidad los usuarios pueden interactuar tanto con la compañía como con otros usuarios, de ahí que se considere importante estudiar cómo los estímulos sociales afectan a los usuarios. Enmarcado en el modelo SOR (del
1. Introduction

Flow is an optimal state experienced by users in which they can be so absorbed in and concentrated on an activity that they lose their sense of time and self-consciousness, enjoying every single minute and leading them to repeat the sensation (Csikszentmihalyi, 1975). Flow state has been widely studied in various disciplines and in several contexts (Csikszentmihalyi and Csikszentmihalyi, 1988). The interest in Flow Theory for e-commerce is that the state of flow involves an increase in intention to purchase, repurchase and return to the website (Kamis et al., 2010; Ettis, 2017). This state also improves loyalty towards a website (Huang et al., 2017a) and the intention to spread positive word of mouth (WOM) (O’Cass and Carlson, 2010).

Previous research in Web navigation has analysed state of flow, collecting individuals’ perceptions through different constructs and considering various factors such as antecedents (see the meta-analysis of Fong et al., 2014). But these investigations do not take into account that people are not always aware of everything they experience (Lamme, 2003). Therefore, it is possible that those individuals who have had a rewarding experience when surfing a website may not link the fact of experiencing flow with the cause and do not seek to repeat this sensation on the same website. Companies must understand not only how their websites can generate flow but also how to ensure that users associate this sensation with the website so that they return to it to experience the state of flow again. Hence, we consider it of interest to study the consciousness of the flow state as a different variable from the flow state.

Social commerce websites allow users to enjoy, to concentrate and to lose track of time when surfing and interacting with other users and, in the end, to experience the state of flow (Gao and Bai, 2014; Zhang et al., 2014). In recent years, many e-commerce websites have evolved towards social commerce (Zhang and Benyoucef, 2016; Lin et al., 2016). Social commerce websites challenge companies to pay attention to cognitive and affective dimensions during the purchasing process, as it is not only the website that influences users but also the affective experience they can have on it (Chen et al., 2017). Hence, due to the intrinsic characteristics of social commerce contexts, it has revolutionized companies’ organization regarding website management, online advertising and user-generated content, among other things (Lin et al., 2016). One of the distinguishing features of this kind of website is its ability to involve customers in the firm, giving them active roles and optimizing their social experience by allowing them to generate and share information (Brodie et al., 2013). This highly interactive environment, shaped by social interactions, can contribute to boost passion, a primarily affective, extremely positive attitude that leads to emotional attachment and influences relevant behavioural factors (Bauer et al., 2007); in the
social commerce context, we coin the term social passion (hereafter sPassion), which is a positive affective feeling created as a result of navigating, interacting and socializing with other users and the website, which leads to the individual being emotionally and commercially engaged with the social commerce website (Herrando et al., 2017).

Some authors have studied the positive relationship between passion and flow (Carpentier et al., 2012; Lavigne et al., 2012; Vallerand et al., 2003); however, to the best of our knowledge, it has not been analysed as the social stimulus in the Stimulus Organism Response framework (SOR framework) to study how to retain customers through experiencing the state of flow. This study posits that if users are conscious of having experienced flow, they will be more willing to trust and be loyal to the social commerce website, and, as a consequence, it should be easier for companies to retain e-customers on the internet. Based on the SOR framework (Donovan and Rossiter, 1982; Eroglu et al., 2001; Eroglu et al., 2003; Mehrabian and Russell, 1974) and Flow Theory (Csikszentmihalyi, 1975), this study analyses the role of sPassion as the social stimulus and its positive effect on the state of flow, the organism, achieving as a response an increase in flow consciousness, trust and loyalty. To do so, and as there is not a consensus about the dimensionality of the concept of flow and about the variables used for its measurement (Ghani and Deshpande, 1994; Hoffman and Novak, 1996), first, we will empirically test the flow concept and, then, we will analyse the SOR model. Hence, the analysis of this study is divided into two parts; first, the study of the dimensionality of the flow state and, second, the study of the SOR model.

2. Study of the Stimulus Organism Response model

2.1 Stimulus Organism Response framework

The SOR model was first introduced by Mehrabian and Russell (1974) and later used in retail research by Donovan and Rossiter (1982) and in online retailing research by Eroglu et al. (2001). Stemming from environmental psychology, the SOR framework states that some environmental stimuli affect users’ emotional states, which results in specific behavioural responses (Eroglu et al., 2001). Three different kinds of stimuli have been mainly considered within the SOR framework: social factors, design factors and ambient factors (Baker, 1986; Bitner, 1992). The vast majority of the studies in online environments have focussed on design and ambient stimuli such as interactivity (Huang and Huang, 2013; Jiang et al., 2010; Mollen and Wilson, 2010), whereas few studies have aimed at the social stimuli (Chang, 2013; Liu et al., 2016; Zhang et al., 2014). In social commerce contexts, the SOR framework has been applied in combination with Flow Theory (Gao and Bai, 2014; Liu et al., 2016; Zhang et al., 2014), and it has been also widely used in online consumer behaviour studies (Ha and Im, 2012; Koo and Ju, 2010; Xu et al., 2014; Ettis, 2017).

2.2 Development of hypotheses

2.2.1 Stimulus: sPassion. Passion can fuel motivation to engage in an activity, enhance well-being and lead to greater positive affect during task engagement (Vallerand et al., 2003). These authors differentiate between two opposite types of passion: obsessive passion, when people lose control of the activity they are performing, and harmonious passion, which is related to positive states of mind and feelings such as flow. In marketing strategies on the internet, boosting harmonious passion can be really helpful for companies, as passionate consumers tend to share this excitement and act as brand evangelists (Albert et al., 2013; Bauer et al., 2007; Matzler et al., 2007; Swinberghe et al., 2014). We define sPassion as a positive affective feeling that social commerce users experience when interacting and socializing on a website. Social commerce enables social interaction, active and passive
participation, and sharing of information and experiences with other users. The main
difference between Passion and sPassion is that while passion is linked to being in love with
a brand or company (Batra et al., 2012), sPassion is related to passion for the social
commerce website itself, and not to a specific brand (Herrando et al., 2017). In this study,
sPassion is measured based on the work of Baldus et al. (2015), using the scale items that
reflect brand passion and helping, and contextualizing the role of sPassion in social
commerce. The scale items of sPassion derived from brand passion are related to the
emotional component, and the items related to helping behaviour are associated with
altruistic and evangelistic behaviour, where the difference between passion and sPassion
can be found. That is, sPassion has both an emotional component and an altruistic
component, which contextualizes its usage in social commerce contexts. In contrast to
electronic commerce, social commerce websites do not only sell products but also enable
social interactions through which users can express their emotions and act altruistically by
sharing content and helping others.

Social commerce websites are defined as platforms aimed to boost online purchases and
social interactions (Zhang and Benyoucef, 2016). Hence, it can be said that the social
commerce users’ purchasing process is partly based on an affective experience with other
users. However, for some years, online consumer behaviour research has mainly been
focussed on website design features (Huang and Huang, 2013; Jiang et al., 2010; Mollen and
Wilson, 2010), but with the appearance of social commerce websites, research has begun to
consider not only the cognitive but also the affective dimensions of the websites (Brodie et al., 2013, Chen et al., 2017). Given the importance of social interactions on social commerce
websites, among the factors linked to the SOR framework (social, design and ambient
factors), this study focuses on the social stimulus (Chang, 2013; Liu et al., 2016; Zhang et al.,
2014). Hence, considering that sPassion is formed based on the social interactions that can
be found on a social commerce website, this study considers sPassion as a social stimulus.
According to several authors, passion can stimulate state of flow (Carpentier et al., 2012;
Herrando et al., 2018; Lavigne et al., 2012; Vallerand et al., 2003), a state of optimal
experience. Therefore, in social commerce contexts, an affective and positive feeling such as
sPassion will make users more predisposed to positive responses to the navigation, that is,
to experience a flow state. Hence, we hypothesize that sPassion acts as the social stimulus
that influences state of flow, as the organism:

\[ H1. \text{ sPassion positively affects state of flow.} \]

2.2.2 Organism: state of flow. Flow is a state that can occur anytime and anywhere and is
defined as the holistic sensation that people feel when they act with total involvement
(Csikszentmihalyi, 1975). It is reached “when an individual engages in an activity with total
involvement, concentration and enjoyment, and experiences an intrinsic interest and the sense
of time distortion during his/her engagement” (Chen et al., 2000, p. 263). Flow Theory has
been applied in varied contexts. Research in marketing has analysed topics such as the use
of computer-mediated technologies (Hoffman and Novak, 1996), website effectiveness
(Sicilia and Ruiz, 2007), the interactivity of virtual purchases (Huang and Huang, 2013),
m-commerce (Zhou and Lu, 2011), online experience (Shim et al., 2015), online consumer
behaviour (Richard and Chebat, 2016) and social media (Jiao et al., 2015), among others. In
recent years, there have also been some investigations analysing the impact of social
commerce environments (Gao and Bai, 2014; Zhang et al., 2014), but they are still scarce, and
there is no general acceptance of the definition of flow in Web environments.

In social commerce contexts, the SOR framework has been applied together with Flow
Theory, considering the state of flow as the organism of the model, influenced by the
environmental stimuli and generating a behavioural response (Gao and Bai, 2014; Zhang et al., 2014; Liu et al., 2016; Huang et al., 2017b). We consider that state of flow is defined by concentration, enjoyment and temporal distortion on social commerce websites (Wang and Hsu, 2014; Lee and Chen, 2010). This type of website is characterized by being highly interactive, promoting socialization and personalization, which directly affects the state of flow (Zhang et al., 2014). So, online social interactions, like those in offline environments, can come from enjoyable experiences, can absorb users – causing a temporal distortion– and can require users to concentrate; for example, the mere fact that they need to concentrate to share/receive user-generated content, to write referrals and so on.

Once users have experienced the state of flow, it is important that they remember and identify it with surfing this particular website to motivate them to return to it and obtain benefits for themselves and the company. Hence, it is interesting to study whether users remember and are conscious of having experienced flow. Consciousness has been widely studied by neuroscientists, psychologists and philosophers. The debate about consciousness was popularized by Sigmund Freud in Psychoanalytic Theory at the end of the nineteenth century and the functioning of the conscious and the unconscious has still to be deciphered. As an example, consumption has been considered as a conscious experience (Holbrook and Hirschman, 1982), and it has been highlighted that people are conscious of the activities that they carry out when they are concentrated (Cahill and McGaugh, 1998; Lamme, 2003). Moreover, emotionally arousing experiences tend to be well remembered because of their novelty, concentration or frequency (Cahill and McGaugh, 1998). If the moment of optimal experience when surfing is remembered and linked to the navigation, users may try to repeat it, leading to purchase and repurchase on the website (Kamis et al., 2010) or to spreading positive WOM (O’Cass and Carlson, 2010), a key aspect for the success of a social commerce website.

If users who surf a social commerce website achieve a state of concentration that brings enjoyment and makes them lose track of time, they will not only surf, they will flow. However, are users aware of what has caused that feeling of flow? If the answer is yes, they will try to repeat that experience. This study proposes that this is not always the case. Therefore, besides considering it necessary to study the state of flow, we also believe it is appropriate to specifically analyse flow consciousness, that is, the perception of users of having experienced the flow state in social commerce contexts. On the basis of all this, we propose that the first response of the state of flow as the organism of the SOR model is for users to be aware of having experienced it:

\[ H2 \] The more intense the experience of flow, the greater the awareness of having achieved it (flow consciousness).

2.2.3 Response: flow consciousness, trust and loyalty. Trust is defined as the users’ necessity to control the social environment where they live and interact (Gefen and Straub, 2003). Trust has been widely studied in online commerce environments (Gefen and Straub, 2003; Grabner-Kräuter and Kaluschka, 2003; Ng, 2013; Sharma and Crossler, 2014). Grabner-Kräuter and Kaluschka (2003) review the literature about trust in the e-commerce context and state that there is a common belief that trust only exists in an uncertain and risky environment. In social commerce, trust has been defined as the willingness of s-commerce users to trust in the ability, generosity, integrity and predictableness of a seller based on the belief that the seller would take certain action crucial for its customers regardless of their capability to monitor or control the seller (Kim and Park, 2013, p. 325). Therefore, the information contained on the website could contribute to trust. In social commerce context, users may develop their trust based on the information from the social community
(Ng, 2013). The information on a social commerce website consists of a combination of user-generated information and company-generated information, so users can become informed and develop their trust online based on cognitive and affective aspects. Following the line of research of the affective dimension of the website, users can develop their trust response towards the social commerce website based on experiencing the state of flow, as flow is a positive emotional state, and this flow experience turns into being conscious of having experienced this optimal positive state. Even though it is true that the state of flow contributes to the generation of trust (Bilgihan, 2016; Bilgihan et al., 2015), not all of those who experience flow are aware of it; this is what drives this study to consider the relationship between flow consciousness and trust, positing H3:

\[ H3 \text{. Users' consciousness of having experienced the state of flow strengthens their trust in the social commerce website.} \]

Loyalty, called eLoyalty in online settings, has been defined as the intention to buy on a specific website and not to change to another one (Flavián et al., 2005) and as the intention to revisit and repurchase (Cyr et al., 2007). Online customer loyalty has been widely studied in the marketing literature, and it has been tested considering different theoretical frameworks such as the SERVQUAL scale (Parasuraman et al., 1994), the Expectation–Confirmation Theory (Oliver, 1997) or the Theory of Reasoned Action (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) among others (see the meta-analysis of Toufaily et al., 2013). There are also studies that have confirmed the positive relationship between flow and loyalty in online environments (Alcántara-Pilar et al., 2015; Gupta and Kabadayi, 2010; O’Cass and Carlson, 2010; Jiao et al., 2015). The SOR framework has been used in social commerce contexts (Gao and Bai, 2014; Liu et al., 2016; Zhang et al., 2014), to explain online consumer behaviour (Ha and Im, 2012; Koo and Ju, 2010; Xu et al., 2014), considering flow as the organism of the SOR. Based on the idea that state of flow is an optimal experience that people look to repeat, it has been shown that this feeling of having been conscious of again experiencing the state of flow can contribute to the development of customer loyalty, since return intention is closely related to loyalty response. According to this argument, the combination of both theoretical approaches, SOR framework and Flow Theory, can help to understand how flow consciousness determines the influence on loyalty. Therefore, based on the idea that flow can help to retain customers, we hypothesize that those users who are conscious of their state of flow will be more loyal:

\[ H4 \text{. Flow consciousness positively affects users’ eLoyalty.} \]

Following the idea that customer eLoyalty towards social commerce websites can be the result of the influence of those passionate users who experience an affective state as flow, we also consider that, to show a loyal response, individuals must first trust the social commerce website. That is, it is inconceivable to be loyal if you mistrust; hence, trust is an important determinant of loyalty (Nadeem et al., 2015; Cyr et al., 2010; Cyr et al., 2007; Laroche et al., 2013; Lee et al., 2015). Although it is an obvious relationship, apart from testing the direct relationship of flow consciousness on eLoyalty, we will also analyse the indirect effect on eLoyalty of flow consciousness through trust, as a response to the stimulus of being passionate on the social commerce website and experiencing flow:

\[ H5 \text{. Trust positively affects users’ eLoyalty (Figure 1).} \]
3. Methodology

The data used for the analysis were collected in Spain through an online survey between February and June 2015, using the services of a panel agency to assure the representativeness of the data. The sample consists of 771 users of social commerce websites, of which 51 per cent are male and 49 per cent female, aged between 16 and 80 years, similar to the Spanish users’ profile according to the annual report of the Telecommunications and Information Society Spanish Watch (ONTSI, 2014), to assure the representativeness of the data (Table I). The respondents were all experienced online consumers. At the beginning of the questionnaire, after being given an explanation of the concept of social commerce, participants were asked whether they had recently purchased using a website with the characteristics of a social commerce platform. If they answered "yes", they carried on answering the survey and were asked to name the social commerce website from which they had purchased. Among their answers were Amazon, Aliexpress and Booking. Throughout the questionnaire, the respondents were continuously asked to recall their experience on the website they had chosen.

To ensure content validity, we carried out a thorough review of the literature that used the measurement factors that we use in our model, adapting them to the context of social commerce. sPassion was developed from the scale of Baldus et al. (2015) and consists of six items. This paper developed a scale to measure online brand community engagement; however, instead of using all of its factors, we took only those related to sPassion (brand passion and helping). State of flow was measured through the variables of concentration, enjoyment and temporal distortion, as a second-order reflective model. Concentration was measured with three items from the Flow State Scale (Jackson and Marsh, 1996) and as used by other authors as Huang (2003), Chen (2006) and Lee and Chen (2010). Enjoyment consists of three items, adapted from the scale of Koufaris (2002) and used by Kim and Han (2014), Casaló et al. (2012), Cyr et al. (2007) and Lee and Chen (2010). Temporal distortion was based on the study of Agarwal and Karahanna (2000) and Novak et al. (2000), also used by

![Figure 1. Proposed model](image)

| Age     | Data collected (%) |
|---------|--------------------|
| 15-24   | 135 18             |
| 25-34   | 262 34             |
| 35-49   | 244 32             |
| 50-64   | 109 14             |
| >65     | 21 3               |
| Total   | 771 100            |

| Table I. Demographic detail of the sample |
|-------------------------------------------|
| Gender | Data collected (%) |
| Men    | 399 59             |
| Women  | 372 41             |
| Total  | 771 100            |
Lee and Chen (2010). Flow consciousness was analysed through the adaptation of the narrative description of Sicilia et al. (2005) to social commerce contexts, based on the work of Novak et al. (2000). Trust consists of four items adapted from Kim and Park (2013) and eLoyalty is adapted from Zeithaml et al. (1996) and Cyr et al. (2007) with three items (Table II).

The survey variables were measured on a seven-point Likert scale, ranging from “1 = strongly disagree” to “7 = strongly agree”. Before conducting the online questionnaire, it was checked by various experts. The purpose of this pretest was to ensure that all the questions and texts of the questionnaire were understandable and to assess its length and ease. After

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### Table II. Scale

| sPassion - Developed from Baldus et al. (2015): |
|--------------------------------------------------|
| sPASS1 I am motivated to participate on this social commerce website because I am passionate about it |
| sPASS2 I participate on this social commerce website because I care about it |
| sPASS3 My passion for this social commerce website’s products makes me want to participate in its community |
| sPASS4 I like participating on this social commerce website because I can use my experience to help other people |
| sPASS5 I really like helping other users with their questions |
| sPASS6 I feel good when I can help answer other users’ questions |

| State of flow: |
|----------------|
| CON1 My attention was focussed entirely on what I was doing |
| CON2 I was totally absorbed in what I was doing |
| CON3 I had total concentration |

| Enjoyment – Based on Koufaris (2002): |
|--------------------------------------|
| ENJ1 I found my visit interesting |
| ENJ2 I found my visit enjoyable |
| ENJ3 I found my visit fun |

| Temporal distortion – Based on Agarwal and Karahanna (2000); Novak et al. (2000): |
|-------------------------------------------------------------------------------|
| TD1 Time seemed to go by very quickly when I used this social commerce website |
| TD2 When I used this social commerce website, I tended to lose track of time |
| TD3 I often spend more time on this social commerce website than I had intended |
| TD4 I feel I am in a world created by the social commerce website I visit |
| TD5 Using this social commerce website often makes me forget where I am |
| TD6 The world generated by the social commerce website I visit is more real for me than the “real world” |

| Flow consciousness – Based on Sicilia et al. (2005): |
|----------------------------------------------------|
| FLOWC1 On this social commerce website I have experienced flow |
| FLOWC2 It was a very intense sensation |

| Trust – adapted from the scale of Kim and Park (2013): |
|------------------------------------------------------|
| T1 This social commerce website is trustworthy |
| T2 This social commerce website wants to be known as a company that keeps its promises and commitments |
| T3 This social commerce website will keep its promises |
| T4 I believe in the information that this Web provides |

| eLoyalty – based on Zeithaml et al. (1996) and Cyr et al. (2007): |
|---------------------------------------------------------------|
| eLOY1 I would consider this social commerce website my first choice to buy |
| eLOY2 I would recommend this social commerce website to someone who seeks your advice |
| eLOY3 I would use this social commerce website again |
the comments and suggestions from the pretest, we made minor changes to improve the reading fluency and comprehensibility of certain issues. The analyses were performed using the statistical software SPSS 22 and EQS 6.

4. Results

4.1 Study of dimensionality of the flow state

Due to the lack of consensus about the dimensionality of flow, before analysing the model, first, we tested if state of flow is a factor composed of three dimensions: concentration, enjoyment and temporal distortion. Despite the differences among these three dimensions, we must not forget that they reflect a common concept so, to reach the state of flow, we consider that these three dimensions must be simultaneous and reflective. Therefore, we also tested if the dimensions of the state of flow converged towards a single factor as reflective constructs, through a second-order structure.

As previous studies have already highlighted the multidimensional character of the state of flow, the first step was to identify its dimensions. We began by conducting an exploratory factor analysis of the three factors – concentration, enjoyment and temporal distortion – using the Principal Axis Factoring method and Varimax rotation (Hair et al., 1999; Kaiser, 1970; Kaiser, 1974). The Kaiser–Meyer–Olkin value was greater than the threshold of 0.70 (KMO = 0.905) and Barlett’s sphericity test was significant. As can be seen in Table III, the results show that each item loaded onto its factor so we can introduce the three-factor structure that we hypothesized. These three factors explain 80.13 per cent of the total variance. Moreover, Cronbach’s alpha ($\alpha = 0.927$) was greater than 0.70 (Nunnally, 1978), and it was not improved if any element was removed.

Following the exploratory analysis that suggested the dimensionality of the flow concept, we tested the normality of the variables through the asymmetry and kurtosis values, which were greater than 2.52 and 1.96 (Hair et al., 2010), and the significance of the Kolmogorov–Smirnov–Lilliefors and Shapiro–Wilk statistics, so the distribution of our data did not fulfil the hypothesis of normality. Because of this, we used the robust maximum-likelihood estimation method (Bentler, 1995). Confirmatory analyses were performed with the purpose of analysing the reliability and validity of the proposed dimensions and to confirm the results obtained. The results show that the three factors fit the data well and the coefficients calculated are all significant (Satorra–Bentler scaled $\chi^2 = 504.7682$, 51 d.f., $p$-value = 0.001; Bentler–Bonett normed fit index (NFI) = 0.925; Bentler–Bonett non-normed fit index (NNFI) = 0.912; comparative fit index (CFI) = 0.932; Bollen (IFI) Fit index = 0.932;
root mean-sq. error of approximation (RMSEA) = 0.107; ($\chi^2$/d.f) = 9.898). Nevertheless, we must explain that the value of the normed chi-squared statistic was greater than the cut off of 3 (Kline, 2011). The reason for this is that the chi-squared test is highly sensitive to large sample sizes, not because of internal consistency problems, as all the factorial loadings are significant and greater than 0.50 (Hair et al., 1999), and the goodness-of-fit indexes are above the recommended values.

We also analyse the reliability and validity of the flow dimensions. All the Cronbach’s alpha values are greater than 0.70 (Nunnally, 1978), the composite reliability indexes (CR) exceed the recommended value of 0.70 (Jöreskog, 1971) and the average variance extracted (AVE) shows values higher than 0.50 (Fornell and Larcker, 1981). In addition to studying content validity in Section 3, we carry out convergent and discriminant analyses. Convergent validity was tested to corroborate that the standardized coefficients of all factorial loadings were statistically significant and greater than 0.50 (Hildebrandt, 1984). Discriminant validity was tested with the AVE analysis to compare, in a symmetric matrix, whether the AVE on the diagonal is larger than its corresponding squared correlation coefficients in its rows and columns (Fornell and Larcker, 1981; Hair et al., 1999). Thus, we can conclude that flow state is composed of three dimensions: concentration, enjoyment and temporal distortion.

Having identified the three dimensions of flow (concentration, enjoyment and temporal distortion), and corroborated the validity of the scale (none of the items having to be removed), we then tested whether the multidimensional model was more appropriate than the unidimensional model. Using the rival model technique proposed by Anderson and Gerbing (1988) and Hair et al. (1999), we conducted an analysis that consisted of comparing alternative models. The first alternative established a unidimensional model where all items were gathered into a single factor. The second alternative – based on the three dimensions obtained in the previous analyses – proposed a multidimensional model that contains three factors. As can be seen in Table IV, the comparison between the empirical results confirms that the multidimensional model has better goodness-of-fit indexes than the unidimensional model. This confirms that flow is multidimensional and is measured through concentration, enjoyment and temporal distortion.

### 4.2 Factorial analysis of the second-order model

Having determined the three-dimensional model and verified its components, the next step was to test the convergence of concentration, enjoyment and temporal distortion towards a single factor, flow. After reviewing the literature, we proposed a reflective second-order

| Goodness-of-fit indexes | Alternative 1 | Alternative 2 |
|-------------------------|---------------|---------------|
|                         | Unidimensional model | Multidimensional model |
|                         | 12 items – 1 factor | 12 items – 3 factors |
| Satorra–Bentler scaled chi-sq | 1768.078 | 504.7957 |
| Degrees of freedom      | 54            | 51            |
| P                       | 0.000         | 0.000         |
| Bentler–Bonett normed fit index (NFI) | 0.74 | 0.93 |
| Bentler–Bonett nonnormed fit index (NNFI) | 0.69 | 0.91 |
| Comparative fit index (CFI) | 0.74 | 0.93 |
| Bollen (IFI) fit index    | 0.74 | 0.93 |
| Root mean sq. error of app. (RMESA) | 0.203 | 0.107 |
| Confidence interval of RMESA | (0.195-0.211) | (0.099-0.116) |

Table IV. Comparison between unidimensional and multidimensional models
model. Siekpe’s (2005) research analyses the multidimensionality of the flow concept in computer-mediated environments and examines whether flow should be measured in a formative or in a reflective model, showing better fit for the reflective model of flow. Likewise, authors such as Agarwal and Karahanna (2000) and Reychav and Wu (2015) have suggested that cognitive absorption – derived from the state of flow – as reflective, as covariance is expected among the indicators that measure it. Moreover, when measuring psychological constructs that show an attitude or behaviour, it is better to use reflective indicators because they are the origin of the observed variable and their effects are reflected in this variable.

Figure 2 shows the results of the analyses. The three factors are significant at the 0.01 level. According to the findings, we can confirm that flow as a concept is not directly observable but is measured through three dimensions, namely, concentration, enjoyment and temporal distortion. The confluence of the three factors is what allows users to reach the state of flow.

**4.3 Analysis of the measurement model**

After determining the measurement instrument and the structure of flow, the next step was to test the research model based on the SOR framework. The aim is to test whether the social stimulus, represented by sPassion, affects users’ flow state which results in being conscious of experiencing flow and an increase in users’ trust and eLoyalty. With the inclusion of these new factors, exploratory and confirmatory analyses were carried out to assess the reliability of the scale.

First, the psychometric properties were tested (Gerbing and Anderson, 1988). As shown in Table V, all the indexes studied were accepted. The reliability of the scale was corroborated by analysing Cronbach’s alpha (Nunnally, 1978), the composite reliability index (Jöreskog, 1971) and the AVE (Fornell and Larcker, 1981). The Kaiser–Meyer–Olkin value was greater than 0.70, except in the case of the variable flow consciousness, whose value was 0.50, with a medium level of correlation and, therefore, medium acceptance (Kaiser, 1970). Then, we conducted a confirmatory factor analysis with the robust maximum-likelihood estimation method. The results showed that the model fitted the data well and that the coefficients calculated were all significant. The factorial loadings were greater than the accepted value of 0.50 and the recommended value of 0.70 (Table V).

![Second-order model of flow](image)

**Note:** *Signification coefficients at 0.01 level
Discriminant validity was analysed by checking whether the square root of the AVE for each construct is higher than the correlations of this construct and the rest of the constructs in the same row and column (Table VI).

### 4.4 Analysis of the structural model

After carrying out the confirmatory analyses, the structural model was examined to test the hypotheses. The model fit indexes showed acceptable values (Figure 3). The results show

![Discriminant validity](image-url)

**Table V.** Analysis of the reliability and validity of the SOR model

| Item      | α Cronbach | CR  | AVE   | Kaiser-Meyer–Olkin | $R^2$ | λ*  |
|-----------|------------|-----|-------|---------------------|-------|-----|
| sPASS1    | 0.933      | 0.933 | 0.697 | 0.879               | 0.739 | 0.860 |
| sPASS2    | 0.705      | 0.840 |
| sPASS3    | 0.734      | 0.857 |
| sPASS4    | 0.712      | 0.844 |
| sPASS5    | 0.661      | 0.813 |
| sPASS6    | 0.632      | 0.795 |
| CON1      | 0.895      | 0.896 | 0.762 | 0.736               | 0.612 | 0.782 |
| CON2      | 0.797      | 0.893 |
| CON3      | 0.878      | 0.937 |
| ENJ1      | 0.900      | 0.904 | 0.761 | 0.717               | 0.601 | 0.781 |
| ENJ2      | 0.796      | 0.892 |
| ENJ3      | 0.878      | 0.937 |
| TD1       | 0.933      | 0.934 | 0.703 | 0.891               | 0.766 | 0.875 |
| TD2       | 0.792      | 0.890 |
| TD3       | 0.601      | 0.775 |
| TD4       | 0.642      | 0.901 |
| TD5       | 0.766      | 0.875 |
| TP6       | 0.650      | 0.806 |
| FLOWC1    | 0.921      | 0.924 | 0.859 | 0.500               | 0.775 | 0.869 |
| FLOWC2    | 0.964      | 0.982 |
| TRUST1    | 0.938      | 0.939 | 0.794 | 0.849               | 0.790 | 0.889 |
| TRUST2    | 0.750      | 0.866 |
| TRUST3    | 0.865      | 0.930 |
| TRUST4    | 0.771      | 0.878 |
| eLOY1     | 0.871      | 0.887 | 0.725 | 0.676               | 0.570 | 0.755 |
| eLOY2     | 0.880      | 0.938 |
| eLOY3     | 0.724      | 0.851 |

**Notes:** Satorra–Bentler scaled chi-sq = 1632.4454, 303 d.f., $p < 0.01$; Bentler–Bonett normed fit index (NFI) = 0.894; Bentler–Bonett nonnormed fit index (NNFI) = 0.898; Comparative fit index (CFI) = 0.912; Bollen (IFI) fit index = 0.912; root mean sq. error of approximation (RMSEA) = 0.075; *significant coefficients at 0.01 level

Discriminant validity was analysed by checking whether the square root of the AVE for each construct is higher than the correlations of this construct and the rest of the constructs in the same row and column (Table VI).

**Table VI.** Discriminant validity

| Item     | sPASS | CON  | ENJ   | TD    | FLOWC | TRUST | eLOY  |
|----------|-------|------|-------|-------|-------|-------|-------|
| sPASS    | 0.697 |      |       |       |       |       |       |
| CON      | 0.289 | 0.762|
| ENJ      | 0.396 | 0.347| 0.761 |
| TD       | 0.340 | 0.438| 0.261 | 0.703 |
| FLOWC    | 0.398 | 0.314| 0.263 | 0.372 | 0.860 |
| TRUST    | 0.125 | 0.137| 0.185 | 0.010 | 0.064 | 0.794 |
| eLOY     | 0.133 | 0.149| 0.203 | 0.017 | 0.069 | 0.729 | 0.794 |

**Note:** Italics values correspond to the average variance extracted
that sPassion has a positive effect on state of flow ($\beta = 0.78$, $t = 13.61$, $p < 0.01$), and, as a response, this influences flow consciousness ($\beta = 0.78$, $t = 14.25$, $p < 0.01$). As we posited at the beginning, we would like to corroborate whether being aware of experiencing flow has positive consequences for retaining customers. Regarding the empirical findings, flow consciousness has a positive effect on users’ trust ($\beta = 0.29$, $t = 6.81$, $p < 0.01$), although it explains only 8.10 per cent of the variance of trust, and a smaller effect on eLoyalty ($\beta = 0.06$, $t = 2.39$, $p < 0.05$). However, the results show that eLoyalty is highly influenced by users’ trust ($\beta = 0.84$, $t = 25.35$, $p < 0.01$). Thus, all the hypotheses are supported, and we can confirm that sPassion positively affects flow state, helping to retain customers by increasing eLoyalty.

5. Discussion and conclusions

Based on the SOR framework, this study analyses the role of sPassion as a social stimulus and its positive effect on the state of flow, the organism, achieving as a response an increase in flow consciousness, trust and loyalty. First, we empirically tested that flow is a multidimensional factor composed of concentration, enjoyment and temporal distortion. When users experience the three dimensions, they reach the state of flow or the optimal experience; they not only surf the website but also flow. Second, we analysed the SOR model to show that passionate users are prone to experience the state of flow and as a consequence they become more trusting. Therefore, experiencing flow can be a way of retaining customers.

We found support for the idea that state of flow is measured through the dimensions of concentration, enjoyment and temporal distortion, and it can be considered a second-order multidimensional factor. As a result, when users experience flow, they focus their attention on the activity they are performing, enjoy it and lose track of time, which leads them to flow on the website, reaching an optimal experience when surfing. The main contribution of these findings is not only to present the structure and dimensionality of the concept of flow in a social commerce context but also to test the difference between state of flow and the consciousness of such a state.

Finally, we tested the SOR model and showed that sPassion boosts users’ flow state, which has a positive effect on flow consciousness, that is, on the awareness of having experienced this state on a social commerce website. Users need to be conscious of having reached that state and, to do so, the first step is to experience flow. The reason why we test this effect is because perceiving this rewarding experience will lead users to try to repeat it (Csikszentmihalyi, 1975), with the positive consequences that this entails for companies such as increasing loyalty (O’Cass and Carlson, 2010). Moreover, to date, all flow research has focussed on studying the consequences of the flow state, without regard to whether users were or were not aware of associating the state with the rewarding experience. Analysing

![Figure 3](image)

**Figure 3. Structural equation model**

**Notes:** Satorra-Bentler Scaled Chi-Sq = 1834.2435, 316 d.f., $p < 0.01$; Bentler-Bonett Nonmed Fit Index (NFI) = 0.881; Bentler-Bonett Nonnormed Fit Index (NNFI) = 0.888; Comparative Fit Index (CFI) = 0.900; Bollen (W) Fit Index = 0.900; Root Mean-Sq. Error of Approximation (RMSEA) = 0.079 Significant coefficients: $**p < 0.01$, $*p < 0.05$
the results of the present study, we can state that flow consciousness has a weak effect on customers’ eLoyalty, but contributes to the development of trust, which indirectly affects eLoyalty. Therefore, even though users’ consciousness of having experienced the state of flow contributes to users’ generation of trust towards the social commerce website, loyalty is not determined by flow consciousness, as it has only a weak positive influence. The reason why this relationship is not strong enough could be because the model is based on the study of the perceptions of emotions of the surveyed individuals, while the concept of loyalty has been measured with items related to the cognitive dimension. Therefore, in the same way that some studies of brand image base their scales of loyalty on both cognitive and emotional dimensions (Esch et al., 2006; Albert et al., 2008), future lines of research should incorporate into their loyalty scales some items related to emotional loyalty towards the social commerce website, as a consequence of having experienced emotions such as flow.

6. Implications and future lines of research
The empirical analyses shed light on controversial flow issues that were previously lacking consensus. The literature review showed that there is still no agreement about how to measure the state of flow (Ghani and Deshpande, 1994; Hoffman and Novak, 1996), not only with regard to the variables that compose the experience but also concerning its structure. This gap is an important aspect for companies to consider when developing their websites to become really appealing and to show what social commerce keys generate optimal experiences that enhance users’ positive behaviour. Flow state has been separately considered in studies contextualized on social commerce websites (Gao and Bai, 2014; Zhang et al., 2014), but due to the focus of these kind of websites on generating online experiences, it can be useful for future studies in this field.

The implications of the present study are thus twofold. On the one hand, regarding the academic implications, the study contributes to a deeper analysis of the concept of flow; on the other hand, concerning business implications, the SOR framework helps companies to better understand the consequences of customers experiencing flow. First, we contribute to establishing the basis for measuring the state of flow, its structure, factors and the establishment of a measurement instrument. Our study supports the idea of the multidimensionality of the state of flow and establishes the three dimensions that shape it. It has academic implications for the establishment of guidelines for using Flow Theory in the specific context of social commerce. It is hoped that the creation of the concept of flow consciousness will allow future investigations to focus on how it may enhance the commercial success of these social platforms.

Second, it has been shown that the social stimulus (sPassion) has a positive effect on the organism (state of flow), and this implies positive responses (flow consciousness, trust and weak eLoyalty). Therefore, this formula could help users to strengthen their trust towards the website and to keep the social commerce website in their memories. Given that people who reach the state of flow affirm that it is a rewarding experience that is worth repeating, users who desire to experience this sensation again will return to the same website to find it. This will entail benefits for companies because, on the one hand, returning to the website facilitates user repurchase and, on the other, because it can contribute to customers’ loyalty and engagement. However, the results show that what really has a strong effect on customers’ eLoyalty is trust. Hence, future lines of research should study why, if the flow literature shows that this optimal experience contributes to increase loyalty responses such as an intention to return to the website, the consciousness of flow is not so strongly related. Based on this result, it would be interesting to study if some other aspects can mediate this relationship.
Nevertheless, companies that integrate Flow Theory into their marketing strategies should not forget that surfing and the transaction are as important as the subsequent delivery because, if one of the stages of the purchasing process irritates customers, they may forget that they reached the state of flow and, consequently, the rewarding sensation may vanish. That is, in online purchasing, user surfing time should be considered to be as important as purchase and post-purchase. Hence, flow and engagement are two concepts that should be studied in unison. Engagement is a sensation of passion, is generated slowly and is long-lasting (O’Brien and Toms, 2010), which can contribute to solving minor problems that appear during the purchasing process because engaged users are characterized by their loyalty. Thus, the study of the combination of flow and engagement should be taken into account in future lines of research.

7. Limitations
This research is not without limitations. Data were collected in a single country, so it would be advisable to carry out an international study, which would enable generalization of our results, to observe how state of flow is generated in different cultures because social commerce users surf websites from all around the world. Likewise, as Novak et al. (2003) suggest, the model of flow should be moderated by the hedonic or utilitarian constitution of the consumption experience because it may vary depending on whether it is goal-oriented or experiential.

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