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The role of flow consciousness in consumer regret

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Abstract

Purpose – This research aims to identify whether subsequent consciousness of having been in a flow state – that is, flow consciousness – regarding an earlier impulse purchase affects consumers' post-purchase behaviours, specifically their feelings of consumer regret.

Methodology – The study applied a mixed methodology. First, the authors conducted two qualitative studies (focus groups) to establish the relationships between flow, flow consciousness, and regret. Second, the authors conducted a quantitative study using data collected through an online questionnaire. Participants were asked to recall a recent shopping experience. To conduct confirmatory factor analysis, the authors gathered data from 304 consumers who had searched for, and purchased, a product on Amazon (www.amazon.com). Structural equation modelling, based on covariance, was used to test the hypotheses.

Findings – Flow consciousness is found to reduce consumer regret after an impulse purchase.

Originality – This is the first study to examine the effects of flow consciousness on consumer behaviour after an impulse purchase. In particular, research has not analysed the effects that flow consciousness has on negative feelings experienced after the impulse purchase of a product.

Practical implications – Online retailers should make consumers aware of the flow state they have experienced. Flow states lead to increased impulse buying, and if consumers are made aware that they were in a flow state, it may reduce any regret they feel after the purchase.

Keywords – flow theory, impulse buying, consumer regret, flow consciousness, online shopping.

Paper type – Research paper

1. Introduction

Online retailing has become very important, and is expected to become even more so (Deloitte, 2020). Online retailing revenues amounted to €1,725,188m in 2019, far exceeding the €1,246,085m spent in 2017. Furthermore, from 2020 to 2024, revenue is expected to show an annual growth rate of 7.6%, reaching a market volume of €2,660,377m by 2024 (Statista, 2020a). Moreover, the strong impact of the coronavirus disease 2019 (COVID-19) pandemic has inflated these expectations. The limitations that have been imposed on retail shops mean that some products can only be purchased online. In addition, mobility limitations and increased time availability at home have increased the traffic on online retail websites, as several reports have shown (Statista, 2020b).

Despite the great changes in people's habits and routines due to the pandemic, it appears that impulse buying trends have not ceased. The COVID-19 pandemic has not stopped people from spending money online, specifically on impulse purchases. In the United States, consumers have been impulse buying more than ever. In 2020, the average North American spent more than $2,100 impulsively — an 18% jump from the pre-COVID-19 era (Slickdeals, 2020). The same research reported that the main underlying reason for this is that impulse buying can provide an instant mood boost. Of the respondents, 72% said that an impulse purchase had positively affected their mood, and that impulse buying can turn a bad day into a good one.

The growing importance of e-commerce during this period has led to even greater rivalry among online retailers; it has been proposed that they can address this by providing unique and enjoyable experiences for their customers (Constantinides, 2004). Offering a unique experience is indeed key for the consumer. Pine and Gilmore (2011) provided evidence that consumers may value the shopping experience more than the product or service's actual, tangible value. Thus, the shopping experience is a key element, and may be more important than the product purchased.

One way of generating these experiences is to create flow states. Flow is an optimal state in which people can be so focused on an activity that they lose their sense of time and self-consciousness, enjoying every moment (Csikszentmihalyi, 1975). Flow state has been shown to be a crucial aspect in making experiences attractive (Obadă, 2013). These experiences not only bring companies benefits, such as increased consumer satisfaction, loyalty, and improved brand attitude (Agarwal and Karahanna, 2000; Huang and Liao, 2017; Liao et al., 2019); they have also been observed to provide advantages such as increased impulse buying (Wu et al., 2016). Impulse purchases can, however, lead to regret, as individuals may feel they have momentarily let themselves go (Lim et al., 2017). For companies, controlling their clients' regretful feelings is highly beneficial, as these feelings have been associated with reduced customer loyalty and poorer customer attitude towards brands (Keaveney et al., 2007; Tsiros and Mittal, 2000).

Therefore, with the aim of minimising the impact of these feelings, we ask whether psychological states experienced by the consumer that led to impulse buying, such as flow states, could also have an impact on post-purchase feelings. Research has extensively examined the impact that flow has on positive responses such as consumer satisfaction (Gao and Bai, 2014), attitude towards products (Fu et al., 2017), purchase intention, and loyalty (Kim et al., 2013). However, much less research has focused on understanding the impact that flow has on negative consequences (Kaur et al., 2016). Moreover, most flow research has focused on the consequences of the flow state without considering whether the consumers are later aware that they were in this state. While some research has examined this aspect, and shown that flow consciousness creates greater trust in the website (Herrando et al., 2018a), the role flow consciousness can play in reducing the post-purchase negative feelings that consumers may experience has not been analysed.

Consequently, the main objective of the present study is to analyse whether consumers' subsequent awareness that they were in a flow state when they made earlier impulse purchases

affects their feelings of post-purchase regret. In line with the idea that individuals are not always aware of what they are experiencing (Lamme, 2003), people may have experienced states of flow and been unaware of it, which may prevent them from understanding the causes of their behaviours. Thus, it is important to understand the effects of flow consciousness.

To address the objectives of this paper we propose a model that examines the impact of flow on impulse buying and flow consciousness. We also consider the influence of these variables on consumer regret. Thus, this research contributes to understanding of the effects of flow consciousness on post-purchase regret, and to knowledge of the effects that impulse buying may have on flow consciousness.

The remainder of this paper is set out as follows: Section 2 addresses the main concepts of the research (flow, impulse buying, and regret), and presents the hypothesis development. Section 3 describes the mixed methodology used. Section 4 analyses the results of the qualitative research and the dimensions of flow, addresses the validity of the scales used, and presents the empirical results. Section 5 sets out the conclusions and implications of the research. Section 6 concludes the study with a discussion on its limitations and proposed future lines of research.

2. Research framework

2.1 Flow theory

The concept of flow originated in social psychology (Csikszentmihalyi, 1975); it was first conceptualised as an optimal experience in which the individual comes to perceive absolute concentration and enjoyment, which leads to the desire to repeat the experience (Moneta and Csikszentmihalyi, 1996). Flow experience is also characteristically associated with time distortion. People who are focused on an activity, and enjoying themselves, lose their sense of time (Im and Varma, 2018; Rau *et al.*, 2006). As is the case with concentration and enjoyment, information and communication technologies–based studies have regarded time distortion as a dimension of flow state (Agarwal and Karahanna, 2000). However, people are not always aware of everything they experience (Lamme, 2003); thus, they may not always be aware they are in a state of flow. Psychology-based studies have found that both individuals with high and individuals with low degrees of self-awareness recognise the positive things they experience, but only individuals with high degrees of self-awareness are aware of the negative aspects (e.g., Turner, 1978).

Flow emerges from the individual's intrinsic motivation; that is, when they are not motivated by external influences. Although external aspects might facilitate the emergence of the flow state, they are not its origin; the state arises for the individual's benefit, fuses action and consciousness, and is characterised by a lack of awareness (Csikszentmihalyi, 1975). In flow state, attentional resources are completely dedicated to the task at hand, so that objects beyond the immediate interaction do not normally enter the consciousness; one of these objects is the self. In a study conducted by Csikszentmihalyi *et al.* (2005), respondents described a large loss of self-awareness during flow. However, individuals can maintain self-awareness during flow, and not all individuals lose their self-awareness to the same extent, which may lead to different behaviours. This study aims to discover whether being aware of having been in a flow state affects consumers' post-purchase behaviours.

2.2 Impulse buying

Impulse buying as a concept was first described by Clover (1950); thus, it has been long debated, yet many facets of this very interesting phenomenon remain unexplored (Badgaiyan *et al.*, 2017). The academic literature has proposed different definitions of impulse buying. Early research defined it as any unplanned purchase resulting from a comparison of alternative purchase intentions with actual outcomes (Kollat and Willett, 1967). Piron (1991) defined it as a

sudden and immediate purchase with no pre-shopping intention. Rook (1987) offered a definition of impulse buying as:

> the acquisition that occurs when a consumer experiences a sudden, powerful, persistent and unexpected impulse that leads him/her to need to buy something immediately. This impulse is hedonically complex and could lead to emotional conflict. Moreover, impulse buying tends to occur without regard to the consequences that may be triggered, as it is more emotional than rational. (p.191)

Other authors have contributed to the conceptualisation of impulse buying by establishing that it has different categories. Stern (1962) identified four distinct types: (1) pure impulse buying; (2) reminder impulse buying; (3) suggestion impulse buying; and (4) planned impulse buying. Solomon (2002) defined the concept and characteristics of unplanned purchases, classifying them into three categories: (1) unplanned purchases, which occur when consumers are under time pressure, unfamiliar with the store, and/or when they remember their need for something in the store; (2) impulse buying, which is a feeling of urgency to buy that the consumer cannot resist; and (3) compulsive buying, which is a result of the consumer's frequent visits to stores because of boredom, anguish, or anxiety. Later, Solomon (2004) distinguished between compulsive buying and impulse buying: impulse buying focuses on a product at a given moment, whereas compulsive buying is continuous purchasing centred on the buying process itself, and not on the purchases.

Despite these authors' contributions, there is no consensus on the theoretical conceptualisation of impulse buying (Chan *et al.*, 2017). In this research, we define the concept as the spontaneous (unplanned) and sudden purchase of a product that the buyer did not intend to buy; this is in line with Rook (1987), who conceptualised impulse buying as a process-outcome mechanism that occurs when a consumer experiences a sudden, often persistent, urge to buy something immediately.

Research into techniques that encourage impulse buying in offline shopping channels has helped companies understand what they must do to encourage consumers to buy products that they did not intend to buy when they entered the store. This research has focused on identifying the different factors that influence impulse buying, such as consumer and product characteristics, store characteristics, and situational stimuli (Leong *et al.*, 2017; Tinne, 2010). In the online channel, the store is reduced to a computer screen (Koski, 2004) and, therefore, many of the techniques designed to encourage impulse buying are not applicable. For example, in the online channel, it is impossible to apply techniques such as product placement, sympathetic lighting, scents, and music; companies must instead rely on well-designed websites (Koufaris, 2002). Adelaar *et al.* (2003) conducted the first study related to impulse buying in the online environment, investigating the impact of the presentation form of information (text, still images, and video) on impulse buying. One year later, Smith and Sivakumar (2004) proposed a model to explain the impact of flow state on online behaviour, using impulse buying as a moderating variable. The stimuli offered by online shops have been shown to be important antecedents of online impulse buying. For example, product images, online advertisements, and prices that are perceived as attractive can stimulate impulse purchases (Madhavaram and Laverie, 2004). While this extensive research is important, it should be acknowledged that the relevant technology has evolved in the last 15 or so years. Today, the development and usability of retail apps allow much greater interaction, and faster and more confident decision-making, due to various technological advances, such as virtual try-on (Hilken *et al.*, 2017). These technological developments have expanded the possibilities of the online environment, and encouraged the implementation of different methods to promote impulse buying in the online environment, making research in this area necessary (Schnack *et al.*, 2020).

2.3 Regret theory

The previous literature has proposed different theoretical conceptualisations of regret. Landman (1993) defined regret as an emotional state in which one feels sorry about various

circumstances, such as one's limitations, losses, and mistakes. Other authors have defined regret as "a negative, cognitively determined emotion that we experience when realizing or imagining that our present situation would have been better if we had acted differently" (Zeelenberg *et al.,* 2001, p.136). In fact, regret is such a negative emotion that people are, first, willing to pay a "regret premium" to avoid feedback on their decision (Bell, 1983) and, second, even "anticipate" the regret to make the experience less unpleasant; that is, they mentally prepare themselves for a negative result. This anticipated regret can be harmful for retailers when it leads individuals to avoid making certain decisions, or to choose between other options (e.g., when consumers choose from a range of cheaper products to avoid the regret they might feel if they bought a more expensive product/service). Thus, consumers are likely to anticipate regret when they have made a decision but do not yet know the results (Zeelenberg and Pieters, 2007). This feeling that individuals have about possible outcomes influences their decision-making, as the anticipation of regret encourages them to make more rational decisions (Janis and Mann, 1977). Some studies have proposed that, regardless of outcome, decision-making can lead to a form of regret. This has been termed process regret (Connolly and Butler, 2006), and is felt when the individual compares the method used in their decision-making with other methods that could have been used (Lee and Cotte, 2009).

When consumers compare the outcomes of their shopping experiences and realise that opting for alternatives could have had better results than those obtained, this generates negative feelings that are also unpleasant experiences (Landman, 1987). When people evaluate outcomes, they compare what they have received with what they could have received if they had made a different choice (Boles and Messick, 1995; Landman, 1987). This is known as outcome regret (Lee and Cotte, 2009; Zeelenberg and Pieters, 2007), and arises when a result is subsequently perceived by the consumer to be less favourable than a result that could have been achieved if a different alternative had been chosen (Bell, 1982; Tsiros and Mittal, 2000). Outcome regret is thus a consequence of decision-making in risky situations and may arise when individuals believe they have made the wrong decision, even if the decision appeared to be correct at the time it was made. This study examines outcome regret; specifically, the authors aim to discover whether outcome regret is reduced if consumers become aware that they were in a state of flow when they made a purchase.

2.4 Hypothesis development
The flow construct has been proposed as one means of measuring consumers' online experiences (Hoffman and Novak, 1996; Senecal *et al.*, 2002). Flow has been described as a state of mind characterised by full involvement, attention to the task, and success in performing the task (Shin and Shin, 2011). Furthermore, in online environments, flow occurs when a user experiences their actions as a perfect sequence, facilitated by the interactivity of the online context (Chang and Wang, 2008).

Consumers make both pre-planned and impulse purchases. Rook (1987) found that the personal experience of pleasure is a possible cause of impulse purchases, and that flow state provides this pleasurable experience because of its affective nature. When consumers experience positive emotions, they develop more positive emotions, which inspires their imagination in regard to the store's goods, in turn increasing their likelihood of impulse buying. Moreover, customers who are experiencing feelings of pleasure tend to overspend (Donovan *et al.*, 1994). In online retailing websites, if consumers have enjoyed pleasant experiences they will continue to explore the online store, which is likely to lead to unplanned purchases (Koufaris, 2002). In this context, research has found a positive relationship between individuals' emotional responses (e.g., enjoyment) and the urge to buy impulsively (Adelaar *et al.*, 2003). Flow state has also been closely related to loss of self-awareness (Nakamura and Csikszentmihalyi, 2014). When consumers are in flow states, their decisions are less well thought out, which can lead to the purchase of products that they had not initially planned to buy. In addition, in online retailing, consumers have complete freedom to browse; that is, they are not under pressure

based on closing times. The absence of direct contact with staff also avoids embarrassment among more introverted consumers. These factors increase consumers' involvement in the process, which leads to unplanned purchasing behaviours (Koufaris *et al.*, 2001). Thus, we hypothesise that:

H1. Flow state has a direct, positive effect on impulse buying.

Flow is a state of complete participation or absorption in an activity that is perceived as rewarding in itself (Csikszentmihalyi, 1990). Previous studies have defined flow consciousness as a consequence of the flow state (Herrando *et al.*, 2018a). In this research, we define flow consciousness as being aware of having experienced flow.

Nakamura and Csikszentmihalyi (2014) argued that attentional processes shape individuals' perceptions of the experiences they have undergone; that is, the focus of an individual's attention determines the content of their consciousness and, therefore, the experiential information that individual has available. Therefore, for people to be aware of their activities they need to be focused on them – an aspect that flow state implies. In addition, the enjoyment of an experience helps it become memorable to the individual (Flavián *et al.*, 2011; Mykletun and Rumba, 2014). Psychological studies have proposed that emotional states may affect how memories are stored in the human brain, and that these emotions might influence recall of those memories (Rolls, 1990). Therefore, the concentration and the experience of enjoyment involved in flow state mean that people who have been in flow will subsequently tend to remember the experience and be aware they were in the state. In line with these arguments, we hypothesise that:

H2. Flow state has a direct, positive effect on flow consciousness.

After making an impulse purchase, consumers may feel as though they have gotten carried away and may not have made the best decision (Hoch and Loewenstein, 1991). In this type of purchase, consumers subsequently feel that they lost their self-control. As a result of this feeling, they tend to remember and reflect on the purchase process. This leads them to be more aware of the flow they experienced, which increases their flow consciousness. Therefore, we propose that:

H3. Impulse buying has a direct, positive effect on flow consciousness.

Numerous studies have examined the impact of unplanned buying on consumers' post-purchase regret. Wood (1998) reviewed the literature on this relationship and concluded that most cases of unplanned buying lead to regret and anger. Hoch and Loewenstein (1991) found that impulse buying, caused by the consumer's low involvement in the purchasing decision, leads to a sense of post-purchase regret. In line with these conclusions, the impulse purchases examined in the present study have the characteristics of quick, spontaneous purchases. In other words, the consumer spent little time in making their decision, did not compare the product with alternatives, and conducted scant analysis of its attributes. Given this lack of involvement in the purchase, having obtained the object, the consumer may feel regret if the purchase does not turn out as expected. Thus, we hypothesise that:

H4. Impulse buying has a direct, positive effect on regret.

Little research has been carried out on the relationship between flow and regret experiences. Kuhnle and Sinclair (2011), in an educational context, examined whether the individual's decision mode affects post-purchase regret. Their study concluded that the regret felt was not reduced by flow experience. If flow is an optimal state of mind that involves an optimal experience, is it possible that it is not the flow experience itself that reduces regret, but being conscious of the experience? Few researchers have examined the regret experience in

online environments (Dhir *et al.*, 2016; Wang *et al.*, 2011). Kaur *et al.* (2016) analysed the influence of flow on the regret experience in the context of social network sites but did not obtain conclusive results. In the present study, flow experience is conceptualised through three dimensions: concentration, time distortion, and enjoyment. It has been shown that concentration leads to regret. However, the enjoyment involved in the flow experience has been shown to have no significant effect on regret, although it tended to reduce it. These results serve to reinforce the importance of answering the question posed above: what really reduces regret?

From a psychological perspective, people attempt to avoid feeling regret, and take steps to regulate the emotion when they do experience it. Moreover, when consumers become aware that a better, alternative outcome was available, they experience more regret than when they remain unaware that a better outcome was available (Tsiros and Mittal, 2000); this is important in online retailing due to the huge amount of accessible information. All human beings have a need to feel innocent. To achieve this, they try to find enough facts to relinquish personal responsibility. Given this need, the human mind tries to disassociate itself from problems and, above all, from guilt. That is, the human mind likes to separate itself from facts that have negative consequences (Zeelenberg and Pieters, 2007).

These points indicate that we interpret our own and others' behaviours. The psychological theory of attribution explains how we interpret behaviour. Attribution theory was, fundamentally, developed by Heider (1958), who defined it as a method to evaluate how people perceive their own and others' behaviours. He argued that individuals tend to attribute behaviour to two possible causes: an internal cause (personality traits, intelligence, motivation, etc.) and an external cause (luck, location, third parties). Heider termed the source of the behaviour as the "locus of control". The locus of control can be internal or external, and depends on the person and the context. An individual who attributes their failures to personal factors, to a locus of internal control – that is, blames themselves – suffers a significant decrease in self-esteem.

Therefore, as flow consciousness allows consumers to be aware of the pleasant experiences they enjoyed during their flow states and, in addition, allows them to more easily identify external factors that caused their mistakes, we propose that:

H5. Flow consciousness has a direct, negative effect on regret.

Figure 1 depicts the model with the developed hypotheses.

Figure 1: Conceptual model
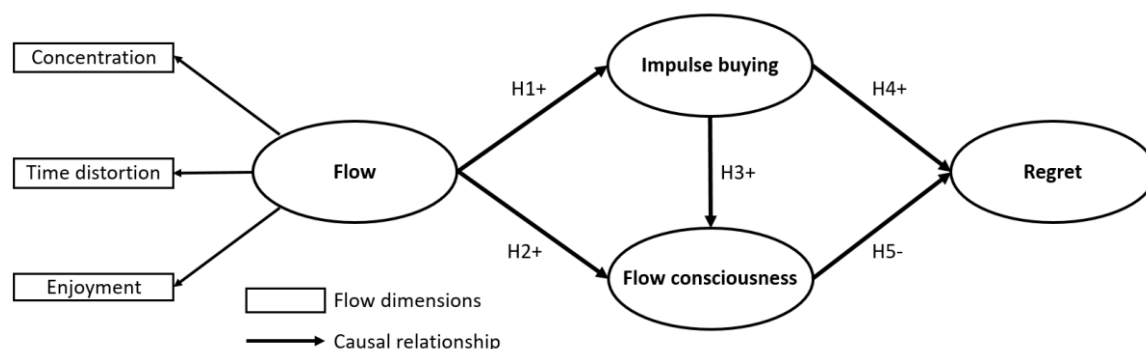
3. Methodology

This study used a mixed method. The authors conducted two focus group–based qualitative studies. Focus groups are suitable for defining important variables and for understanding the relationships between variables in the early stages of research (Van Esch and Jean Van Esch,

2013). In addition, we collected quantitative data through an online questionnaire, which was analysed through structural equation modelling (SEM) using EQS software.

3.1 Qualitative study: focus groups

Given that little research has addressed the role of flow consciousness, we conducted an exploratory study. Qualitative methodologies have been deemed appropriate in this context due to their ability to provide a deep understanding of consumers' perceptions and feelings (Hammersley, 2010). We conducted two focus groups with consumers who habitually buy online. One focus group was formed of six men, and the other of six women. Small qualitative sample sizes are considered appropriate for the investigation of emerging concepts (Van Esch and Jean Van Esch, 2013). The recruitment process started with post-graduate students over 18 years of age, and continued via snowballing. The 12 participants were aged between 18 and 36 years of age. The respondents were advised they were participating in a research project to better understand their shopping experiences. The focus group sessions lasted between 60 and 90 minutes, and were audio recorded. Prior to the data analysis, the research team checked the transcripts for accuracy.

3.2 Quantitative study

We collected the data used to carry out the quantitative study from Amazon (www.amazon.com) users' shopping experiences on the platform. Amazon is used by most of the world's population. In the United States, it was the leading online marketplace website by visit share in 2018, with 56.1% (Statista, 2019). The sample was composed of North American participants. A market research agency collected the data in January 2021 through online surveys. In terms of age and gender, the sample was representative of the sector of North American society that habitually uses e-commerce (Statista, 2020c). The questionnaires were distributed in English. For the exploratory analysis, a sample of 257 participants was used. To avoid bias, the data used for the confirmatory factor analysis were collected from 304 Amazon users who had searched for, and purchased, products on the platform (92.10% used Amazon at least twice a month). Based on a power analysis with medium effect size, this sample size can be considered sufficient (Green, 1991). The sample was young (60.86% under 35 years) and fairly gender balanced (53.62% female), and the respondents had extensive online Amazon shopping experience.

The participants were asked to remember a recent shopping experience in which they had searched for, and bought, a product on Amazon. They then answered questions about the study variables, based on that experience. To ensure content validity, we conducted a comprehensive literature review to identify the most appropriate measurement factors to use in the model; these were subsequently adapted to the context of Amazon. The scales were as follows: concentration from Ghani and Deshpande (1994), time distortion from Agarwal and Karahanna (2000) and Novak et al. (2000), enjoyment from Koufaris (2002), impulse buying from Rook (1987), flow consciousness from Sicilia et al. (2005), and regret from Bonifield and Cole (2007). Flow state was measured as a second-order reflective factor through concentration, time distortion, and enjoyment. To measure flow consciousness the participants were first given a brief explanation of flow state and then addressed the related items, as in previous studies (Herrando et al., 2018a; Sicilia et al., 2005). Appendix A sets out the complete list of items used in the questionnaire. The variables were measured using 7-point Likert-type scales, ranging from "1 = strongly disagree" to "7 = strongly agree".

SEM, based on covariance (EQS), was used to test the hypotheses. This is appropriate for developing a consolidated theory (Anderson and Gerbing, 1988).

3.3 Measurement model

The scales were validated in two steps, through an exploratory factor analysis (Hair et al., 1998) and a confirmatory factor analysis (Fornell and Larcker, 1981). First, we carried out an analysis

of reliability and dimensionality (Hair *et al*., 1998) using SPSS statistical software (see Table I). Second, to confirm the dimensional structure of the scales, a confirmatory factor analysis was conducted through SEM, using EQS statistical software.

A confirmatory factor analysis corroborated the initial factor structure. We planned to successively eliminate indicators that did not meet the criteria proposed by Jöreskog and Sörbom (1993). Based on these criteria, in the present study it was not necessary to eliminate any item. Thereafter, convergent validity was evaluated through the average variance extracted (AVE) indicator (see Table II): this exceeded the recommended threshold of 0.50 (Fornell and Larcker, 1981). Finally, we assessed the model's discriminant validity by verifying that the inter-construct correlations were lower than the square roots of the AVEs of each variable (Fornell and Larcker, 1981). Table II shows these values. As all pairs of constructs met this criterion, it can be concluded that the model has an acceptable level of discriminant validity. This supports the proposal that flow is a reflective construct, with its dimensions serving as indicators. Flow exists at a different level from its dimensions and, thus, it is not a profile construct (Guo and Poole, 2009). Moreover, researchers have recognised that when measuring psychological constructs that describe attitudes or behaviours it is better to use reflective indicators because they are the origin of the observed variable, and their effects are reflected in the variable (Agarwal and Karahanna, 2000; Reychav and Wu, 2015; Siekpe, 2005). The results also showed satisfactory values for the structural model: (χ^2 = 320.788, 174 df, p value< 0.01; NFI = 0.936; NNFI = 0.968; CFI = 0.973; and RMSEA = 0.047).

Table I: Exploratory analysis

Variable	Mean	SD	CA
Concentration	4.87	1.498	0.940
Time distortion	4.507	1.765	0.917
Enjoyment	4.634	1.489	0.947
Impulse buying	3.280	1.477	0.806
Flow consciousness	3.419	1.154	0.760
Regret	3.474	1.731	0.864

SD = Standard deviation; CA = Cronbach's α.

Table II: Latent variable reliability

Variable	CR	AVE	(1)	(2)	(3)	(4)	(5)	(6)
(1) CONC	0.955	0.842	**0.918**					
(2) DIST	0.936	0.829	0.402	**0.910**				
(3) ENJ	0.923	0.751	0.428	0.298	**0.866**			
(4) IMP	0.929	0.766	0.190	0.242	0.166	**0.875**		
(5) FLOW CONS	0.823	0.699	0.422	0.414	0.432	0.213	**0.836**	
(6) REG	0.961	0.861	0.013	0.111	-0.083	0.457	-0.072	**0.927**

CR = Composite reliability; AVE = Average variance extracted. CONC = Concentration; DIST = Time distortion; ENJ = Enjoyment; IMP = Impulse buying; FLOW CONS = Flow consciousness; REG = Regret.
The diagonal elements (in bold) are the square roots of the AVEs (variance shared between the constructs and their measures). Off-diagonal elements are the inter-construct correlations.
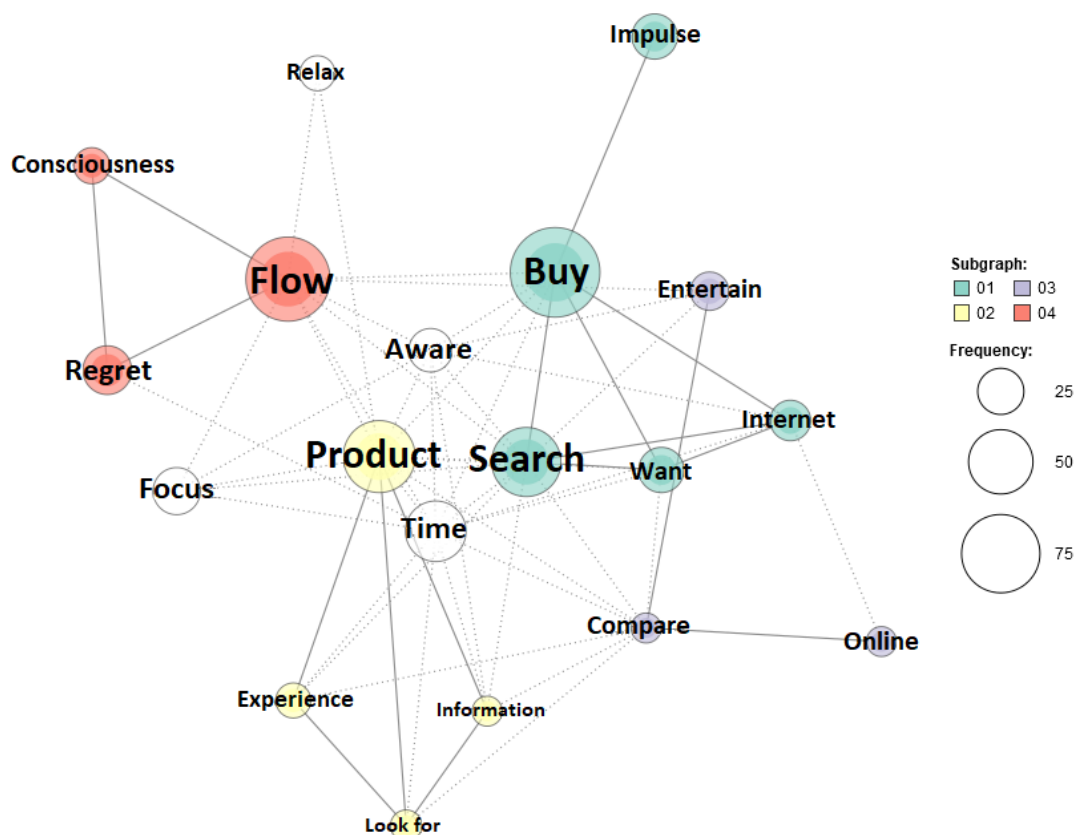
4. Results

4.1 Focus groups

Figure 2 shows the relationships established by the KH Coder algorithm from the data collected in the focus groups. These findings show that the main concepts discussed in this study (flow, regret, and flow consciousness) are closely related. There is also a clear relationship between flow and buying, which extends to purchase type – for example, impulse purchases (see Figure 2). In addition, the main results obtained from analysis of data from the two focus groups show that it is indeed possible to make a distinction between flow state and flow consciousness (Table III).

Thus, flow state and flow consciousness are two different concepts. Consequently, individuals can be in flow but not aware of it, both while they are absorbed and afterwards. The data also revealed that loss of awareness is common during flow state. In this state, people perform activities without thinking much, and feel very confident and able to make good decisions, which has been shown to elicit actions such as impulse buying (Jeffrey and Hodge, 2007). Nonetheless, the focus group results showed that most people become aware they were in flow at some point after making a purchase. However, there are also cases where individuals have claimed they were conscious of being in a state of flow while they were actually in the state of flow. Finally, the results demonstrate a relationship between flow consciousness and regret; that is, when consumers become aware that they were in a state of flow this reduces any regret they feel for having bought something they did not need or will not use much in the future. Recalling flow state as a relaxing, pleasant, and comfortable experience helps reduce negative thoughts.

Figure 2: Interrelated concepts

Notes: Solid lines represent strong co-occurrences; dotted lines represent weak co-occurrences.

Table III: Focus group results

Concept	Description	Example of participants' statements
Flow consciousness	Flow state is associated with a loss of consciousness. When an individual is in a flow state, nothing matters beyond the activity in which they are engaged. The person is in an intrinsic state, totally involved, not thinking about anything not related to the task being performed.	*"It usually happens to me when I shop online, I start looking for a jacket at 4 o'clock and at 7 o'clock I realize how much time has passed. The truth is that I get totally involved. Afterwards, I think, did I really spend three hours looking for this?"* (Participant 3, F1, female) *"When some time passes, you are aware of what you have done and you say: well, maybe there were other options that would have been useful, but I think not. I have been looking at a lot of options. In that moment of flow, I think you are focused on only one thing and you do not think about anything else, only what you are looking for."* (Participant 8, F2, male)
Moment of flow consciousness	Most people become aware they were in flow at some point after they make the purchase. However, there are also cases where individuals claim to be conscious of being in a flow state at the time they are in it.	*"I think that most of the time when I search for products on the Internet I am aware that I am in flow. In searches that I do simply for leisure, to get information, I am aware of it."* (Participant 9, F2, male) *"I became aware later, when I saw that two hours had passed to buy the product. While I was shopping I was paying attention, I was interested in it and I did not realize it."* (Participant 11, F2, male) *"While I am shopping or searching, I don't realise that I am in flow. I am only aware if I look at the clock on my mobile phone. Although there are times when you are so focused that you do not even care to look at the watch and do not look at it."* (Participant 5, F1, female)
Relation between regret and flow consciousness	Flow state is a pleasant experience for consumers. If they are aware of being in the state, they will have a better recall of the purchase. This will alleviate negative thoughts such as regret.	*"I think that in the short term it does reduce that regret. I think I had a good time, I have informed myself. After all, I have learned something."* (Participant 10, F2, male) *"I value the fact that I have been in flow. When I buy a product online, I also like to learn things, you know different products... When I realise how much I have learned in that time, I think it has been worth it, even if I am not completely happy with the product I have bought."* (Participant 12, F2, male) *"The truth is that you realise that you have spent a lot of time searching, but you don't mind because you are relaxed and you are getting information on a subject that, if you are not in flow, you might not look at in depth."* (Participant 2, F1, female)

F1=Focus group 1; F2=Focus group 2.

4.2 Flow state dimensionality

The first step in carrying out the analysis of the quantitative results was to confirm the multidimensional structure of flow state; we propose that it is formed by concentration, time distortion, and enjoyment. Therefore, we also verified, using a second-order model, whether the flow state dimensions converged towards a single factor. First, we conducted an exploratory factor analysis of the three factors (concentration, time distortion, and enjoyment) to identify the dimensions of flow. This was done using the principal axis factoring method and varimax

rotation (Hair *et al.*, 1998; Kaiser and Rice, 1974). Each item loaded onto its factor (see Table IV); this supports the three-factor structure hypothesised. The Kaiser–Meyer–Olkin value was 0.862, which is greater than the 0.70 threshold (Kaiser and Rice, 1974), and was significant (p = 0.000). These three factors explained 81.06% of the total variance; the Cronbach's alpha (α = 0.897) was greater than 0.70 (Nunnally, 1978). In this step, we also analysed the normality of the variables. The Kolmogorov–Smirnov–Lilliefors and Shapiro–Wilk statistics were calculated, resulting in p-values <0.001. These findings thus supported the alternative hypothesis of non-normality. For this reason, we subsequently conducted a robust maximum likelihood estimation (Bentler, 1995).

Table IV: Rotated component matrix

Items	Factor 1 (λ)	Factor 2 (λ)	Factor 3 (λ)
CONC1	0.837		
CONC2	0.909		
CONC3	0.901		
CONC4	0.871		
DIST1		0.873	
DIST2		0.871	
DIST3		0.916	
ENJ1			0.813
ENJ2			0.883
ENJ3			0.822
ENJ4			0.840

CONC = Concentration; DIST = Time distortion; ENJ = Enjoyment

Second, to depurate the scales we applied the strong convergence criterion, which involves eliminating insubstantial indicators with standardised coefficients lower than 0.5 (Jöreskog and Sörbom, 1993). No items were removed. Subsequently, we analysed the reliability and validity of the dimensions. All Cronbach's alpha values were greater than 0.70 (Nunnally, 1978). The composite reliability indexes exceeded the recommended value of 0.70 (Jöreskog, 1971), and the AVE values were higher than 0.50 (Fornell and Larcker, 1981). Finally, discriminant validity was assessed by verifying that the inter-construct correlations were lower than the square roots of the AVEs of each variable (Fornell and Larcker, 1981).

After corroborating the validity of the scales, we used the model rival technique proposed by Anderson and Gerbing (1988) to test whether the multidimensional model was appropriate. The first alternative established a unidimensional model in which all items were gathered into a single factor. The second option was based on the three dimensions discussed in the previous analyses. The third option considered concentration, time distortion, and enjoyment as three independent factors – that is, factors unrelated to flow. Table V depicts the empirical results. The multidimensional model has better goodness of fit indexes than the unidimensional model and the three independent factors model. This supports the proposal that flow is multidimensional and is measured through concentration, time distortion, and enjoyment, as found in previous research (Herrando *et al.*, 2018b; Siekpe, 2005).

4.3 Structural model
Following the verification of the measurement scales, the hypotheses were tested. Most of the hypotheses were supported; only H3 was rejected. The structural model fit showed good values: (χ^2 = 118.945, 59 df, p value< 0.01; NFI = 0.937; NNFI = 0.963; CFI= 0.972; and RMSEA = 0.049).
The findings showed that flow state had significant positive effects on impulse buying (β = 0.321; p<0.001), supporting H1, and flow consciousness (β = 0.677; p<0.001), supporting H2.

Impulse buying was shown to have no effect on flow consciousness (β = -0.004; p>0.05), leading to rejection of H3. However, impulse buying affected consumer regret (β = 0.495; p<0.001), supporting H4. Finally, flow consciousness had a negative effect on regret (β = -0.176; p<0.001), supporting H5. These relationships partially explain the endogenous variables used in the model: impulse buying (R^2 = 0.103), flow consciousness (R^2 = 0.456), and regret (R^2 = 0.238). R^2 values (coefficient of determination) of 0.20 and above are considered high in the consumer behaviour discipline (Hair *et al*., 2016). In this sense, the two most important concepts analysed in the research – flow consciousness and regret – satisfy the requirements of the index. The results are shown in Table VI and Figure 3.

Table V: Goodness-of-fit indexes in the unidimensional, multidimensional, and three independent–factor models

Goodness-of-fit indexes	Unidimensional model	Multidimensional model	Three independent–factor model
Chi-square	1762.634	135.117	256.396
Degrees of freedom	44	38	44
P	0.00000	0.00085	0.00000
Bentler–Bonnet normed fit index (BNFI)	0.571	0.976	0.922
Bentler–Bonnet non-normed fit index (BNNFI)	0.472	0.984	0.920
Comparative fit index (CFI)	0.578	0.989	0.936
Root mean square error of approximation (RMSEA)	0.291	0.051	0.114

Table VI: Results of hypothesis tests

Relation	Beta Standardized	T-statistic	P-value	Result
H1: Flow → Impulse buying	0.321	4.069	<0.001	Supported
H2: Flow → Flow consciousness	0.677	6.564	<0.001	Supported
H3: Impulse buying → Flow consciousness	-0.004	0.059	>0.05	Not supported
H4: Impulse buying → Regret	0.495	8.457	<0.001	Supported
H5: Flow consciousness → Regret	-0.176	2.975	<0.001	Supported

Figure 3: Structural model
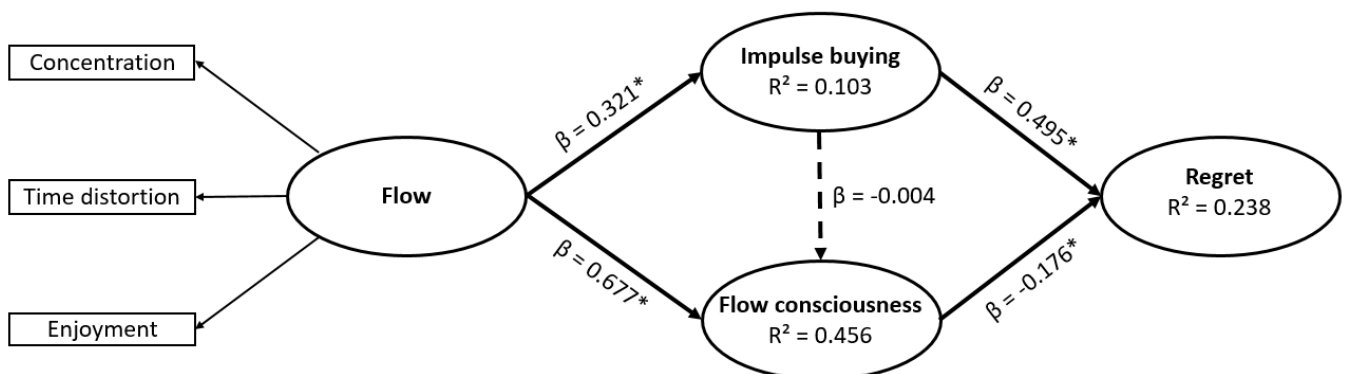
Notes: * Coefficients are significant at 0.001 level

5. Discussion

This research shows the direct influence that flow state has on impulse buying. The impacts that flow has on the shopping experience do not end there, however; they are also affected by flow consciousness. While research has extensively analysed flow, it has focused less on the impact that flow consciousness has on consumers. The present study has shown that flow consciousness has positive effects not only for companies but also for consumers, as it reduces any regret they feel after making impulse purchases. Thus, flow consciousness can help to maintain, or increase, consumers' feelings of well-being after making an impulse purchase. The findings from the focus groups showed that, when searching online, consumers may maintain a higher state of consciousness if they have defined purchase objectives than if they are searching for information merely to stay informed. This is in line with findings of online environment–based research in other contexts showing that users' goals affect their experiences and behaviours (Flavián and Gurrea, 2006).

The research model demonstrated that flow state has a positive effect on impulse buying and flow consciousness, and that these two concepts have different impacts on post-purchase regret. A mechanism to explain regret can be identified based on these two concepts. On the one hand, making an impulse purchase generates regret. On the other hand, flow consciousness makes it possible to reduce the regret experienced. However, no relationship has been found between impulse buying and flow consciousness. Sometimes, having made an impulse purchase, consumers do not think about it afterwards. They have bought the item and do not subsequently ponder the underlying reasons that caused them to make the purchase. This could explain the lack of a relationship between the variables.

This study makes several contributions. First, it makes theoretical contributions to both flow theory and regret theory. The findings highlight the importance of being conscious of having been in a flow state, which reduces the regret one feels after making an impulse purchase. The study also contributes to the understanding of flow theory in terms of conceptualisation of the construct. Previous studies have examined whether flow state is a formative or reflective construct, and its dimensionality (Siekpe, 2005); that is, they have analysed whether it is a unidimensional or a multidimensional model (Herrando *et al*., 2018a). In this study, we also considered whether the concentration, enjoyment, and temporal distortion constructs are unrelated. In addition, our results add knowledge to regret theory, as flow consciousness, hitherto unconsidered in this context, was shown to alleviate the consumer's feelings of regret. While studies, in several contexts, have attempted to identify whether flow reduces regret (Kaur *et al*., 2016; Kuhnle and Sinclair, 2011), we found that regret may be reduced if the consumer is aware of having experienced flow. Thus, this research sheds new light onto regret theory, and expands current knowledge by examining the relationship between regret and flow consciousness.

Second, the findings also allow us to propose valuable managerial recommendations. The online channel is still used less than the offline for impulse purchases. Geoblink (2019) reported that only 22% of consumers questioned claim to have made impulse purchases through the online channel. This is in line with previous research which indicated that the offline channel is used slightly more often for impulse buying than is the online channel (Aragoncillo and Orús, 2018). Studies have found that flow experiences increase impulse purchases. Web features encourage information-channel use (Flavián and Gurrea, 2008) and, although flow state arises from intrinsic motivation, can help induce flow state. Thus, online retailers should provide elements that induce flow states; for instance, interactive content might help consumers enter flow. Specifically, for example, product-related games could be introduced to increase the consumer's enjoyment. Likewise, displaying videos, 360° photos of products, and/or virtual trials using augmented reality might increase the consumer's enjoyment of the shopping experience. These aspects can provide a more interactive shopping experience, in which the consumer is more involved, which can result in the creation of flow states; when consumers enter flow, this

strengthens, in particular, the enjoyment dimension. Providers should also avoid presenting the consumer with non-relevant information that might distract them from their purchase; this will also increase the consumer's concentration, allowing them to reach flow state, which is essential, particularly in mobile-device-based consumer experiences (Barta *et al.*, 2021). Time distortion is also facilitated when a clock is not displayed on device screens. In addition, virtual assistants that quickly resolve doubts contribute to time distortion, as consumers perceive that they have carried out a greater number of actions (e.g., answering questions about delivery time, compatibility of the product with other products, guarantees) in a shorter period.

A further managerial contribution of this study relates to the effects of flow consciousness. Previous research has argued that understanding the online regret experience can enable developers and professionals to better design user interfaces and tools that will help users avoid carrying out actions in the online space that they will later come to regret (Wang *et al.*, 2011). Consumers' post-purchase regret experiences can have significant negative implications for companies, so it is very important that they develop mechanisms to reduce these feelings. Online retailers should introduce messages into their online environments post-purchase that make it easier for consumers to realise and remember what a great shopping experience they had. These messages should be introduced more frequently for low-cost and hedonic products, as these are more associated with impulse purchases (Muruganantham and Bhakat, 2013). This could lead the consumer to experience more positive post-purchase feelings, which may influence future behaviour.

The findings about flow consciousness could also be very important for product reviews. When online retailers contact consumers after they have bought a product to ask them to rate their purchase experience, they might also pose questions about how they feel about the experience at this subsequent time of contact. This could lead to better product evaluations, especially among consumers who regret their purchases.

Promoting impulse buying can generate benefits for e-commerce retailers. However, the ethical aspects of encouraging impulse buying should be taken into account. Although this study suggests a strategy to reduce consumer regret, encouraging impulse buying without some controls might cause major problems in the long term, and reduce the consumer's purchase intentions for the online retailer. Therefore, while retailers might use the results of this study to increase impulse buying, they should frame their actions to take account of the consumer's welfare.

6. Limitations and Future Research

This study has some limitations that can open avenues to future research. We analysed the impact that flow consciousness has on the consumer's post-purchase feelings of regret. The study could be replicated in other contexts, such as social networks and video games; this could help generalise the results. Regret not only arises because of the monetary losses that occur after product purchase but also because of the time the user devoted to the process. Research in these contexts could further analyse the effects of flow consciousness on user regret. When people play video games, they can be in flow states. The players may find themselves at certain levels they cannot complete, but continue to play because they believe they will, eventually, complete them. In this situation, users are aware of the time they are spending trying to complete the level, which may cause them to later feel regret about devoting such time to the effort. Social networks are sometimes used for pure entertainment, and at other times to relax, and users may thus use them to take a break from tasks. In this context, it is possible that watching a video may generate the desire to watch another video because of recommendations triggered by the first video, and the individual may then spend much longer than planned using the social media platform. Although the user is concentrating on and enjoying the videos, they may become aware that they are in flow. Therefore, the effect of this variable on regret in these contexts should be analysed.

Future studies in the retail context could also take a step further and examine whether flow consciousness leads to subsequent purchases from the same retailer, despite the consumer having experienced feelings of regret based on a previous purchase from that retailer. Future research could analyse this, and other effects, to find out more about the importance of flow consciousness in consumer behaviour.

In addition, future studies might examine the impact of the individual buyer's characteristics, or purchase characteristics, on flow consciousness. During the focus groups it was noted that, in general, when participants undertook searches for entertainment purposes, they were more likely to be aware of flow afterwards. Therefore, aspects such as hedonic purchase orientation should be investigated.

The empirical results did not support the hypothesis that impulse buying had a direct impact on flow consciousness. However, the data collected from the focus groups did support the existence of a relationship between the concepts. Future studies might investigate the causes of these results. For example, research could analyse whether, in addition to its impact on regret, flow consciousness has a moderating effect on the relationship between impulse buying and regret.

This study focused on one type of regret that arises after the purchase of a product; future studies might analyse the role flow consciousness plays in regret felt during the purchase process; that is, as the consumer evaluates their alternatives and/or choices. In this way, it may become clear whether the awareness of having enjoyed a pleasant experience lessens this second type of regret.

A further limitation of the study lies in the fact that individuals sometimes, for various reasons, fail to provide accurate information when questioned for research (due, e.g., to social desirability, failure to recognise the error, etc.). Therefore, it may be that the effect of impulse buying on regret is, in reality, even greater. To address this limitation, future works might combine information collected through questionnaires with information gathered from participants' biometric responses.

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Appendix A. Scale items

Concentration
CONC1. I was absorbed intensely in the activity.
CONC2. My attention was focused on the activity.
CONC3. I concentrated fully on the activity.
CONC4. I was deeply engrossed in the activity.
Time distortion
DIST1. Time seemed to go by very quickly.
DIST2. I tended to lose track of time.
DIST3. Time flew while I was surfing the website.
Enjoyment
ENJ1. The shopping experience was interesting.
ENJ2. The shopping experience was enjoyable.
ENJ3. The shopping experience was exciting.
ENJ4. The shopping experience was fun.
Impulse buying
IMP1. I bought a product that I had never intended to buy.
IMP2. I bought a product based on how I felt at the moment.
IMP3. "I see it, I buy it" describes my buying behaviour in that experience.
IMP4. I bought the product spontaneously.
Flow consciousness
The word "flow" is used to describe a state of mind sometimes experienced by people who are deeply involved in some activity. An example of flow is where a professional athlete is playing exceptionally well and has achieved a state of mind where nothing else matters outside of the game; the athlete is completely and totally immersed in it. This experience is not exclusive to athletics – many people report this state of mind when playing games, engaging in hobbies, working, or surfing the Internet. Activities that lead to flow completely captivate a person for a period. When one is in flow, time may seem to stand still and nothing else seems to matter. The flow state may not last long on any particular occasion, and it may come and go over time. Flow has been described as an intrinsically enjoyable experience. Now, based on the shopping experience that you have remembered, indicate your level of agreement with the following statements, from 1 "strongly disagree" to 7 "strongly agree".
FLO1. I experienced flow.
FLO2. It was a very intense sensation.
Regret
REG1. I regretted buying this product.
REG2. I should have chosen an alternative product.
REG3. After receiving this product, I felt bad about ordering it.
REG4. In retrospect, I felt that I could have made a better choice by choosing a different product.