Xu, Yin; Dzever, Sam; Zhao, Guoqin

Article

Measuring the effects of pressure on consumer impulse buying intention in online group buying

International journal of enterprise information systems

International Journal of Enterprise Information Systems
Volume 19 • Issue 1

Measuring the Effects of Pressure on Consumer Impulse Buying Intention in Online Group Buying

Yin Xu, Central University of Finance and Economics, China
Sam Dzever, Institut Mines Telecom Business School, LITEM, Université Paris-Saclay, France*
Guoqin Zhao, Central University of Finance and Economics, China

ABSTRACT

Group buying organizations (GBO) have recently stepped up their well-established practice of employing super-low prices combined with limited product and service supply in a short transaction time span as a means of exerting pressure on consumers. The purpose of this research is to 1) identify and define three types of pressure that are triggered by online group-buying (OGB) promotions, 2) examine the effects of these three types of pressure on consumers' impulse buying behavior, and 3) investigate and produce knowledge about the mediating role of emotion in the relationship between pressure and impulse buying intention (IBI) of consumers. By integrating stimulus-organism-response (SOR) model and consumer impulse buying literature seen from the perspectives of marketing and enterprise information systems respectively, this research has identified three types of pressure (i.e., time pressure, quantity pressure, and price pressure) that influence the impulse buying behavior (IBB) of consumers regarding OGB. The research then examines the mediating role of emotion with reference to pleasure and arousal level. The results of a large-scale online survey combined with an analysis of a structural equation model demonstrate that the above-mentioned three types of pressure have different effects on IBI of consumers. Moreover, the research finds that this is achieved through different mediating mechanisms. Based on the results of the analysis, the authors have made some suggestions that marketers can utilize in developing effective OGB strategies. This research also provides the basis for enterprise information systems (EIS) to develop technologies that will allow organizations to better serve the needs of their OGB customers.

KEYWORDS

China, GBO, IBI, Market, Mediation, Role, OGB, Pressure, SOR

1. INTRODUCTION

Online group buying (OGB) has witnessed rapid growth since Groupon first introduced it to the global marketplace in 2008 as a business model where consumers join together as a group via the internet to seek lower prices on goods and services. For example, China's largest group buying company,

DOI: 10.4018/IJEIS.326549 *Corresponding Author

Pinduoduo, announced its gross merchandise volume (GMV) of 2,441 billion RMB in 2021 which represented an increase of 46% on the year before. And the GMV of its overseas subsidiary TEMU in Q1 2023 rapidly exceeded 1 billion RMB after opening for business in 2022. Pinduoduo's success has been attributed to its effective use of promotional tactics which include special offers at incredibly low prices with limited supply quantity in a short time span. According to Wu et al (2020) these incentives have largely been very successful in inducing consumers' pressure and urge leading to a favorable respond to group buying initiatives.

Previous studies saw OGB as a rational purchase behavior in which consumers joined together as a group with the specific purpose of securing volume discount for a product at the lowest price (Chen et al, 2002) while, at the same time, maximizing its utility (Jing & Xie, 2010). Moreover, displaying real-time, updated information with respect to the cumulative number of deals sold to other consumers contributed to lowering the uncertainty level regarding the product which, in turn, contributed to enhancing its awareness in the marketplace (Li and Wu, 2018) and signaled the value of the deal (Luo et al., 2014).

Current pressure-inducing tools in OGB have, however, the potential to lead to impulse buying intention (IBI) and the emotional aspect of OGB has not yet been well researched. A good number of studies in marketing and enterprise information systems have distinguished two information processing modes for consumers - i.e., analytical mode and emotional mode. By analytical mode, consumers focus on the costs and benefits and use more piecemeal assessments (Matias, J. B, 2021); whereas by emotional mode, consumers focus more on pleasure and arousal levels and use more holistic assessments (Epstein 1994; Kahneman & Frederick, 2002; Lee et al., 2015; Weng-Lung Shaiu, Puxi Shi, Ye Yuan, 2021). For example, according to the classical theory of reasoned action (TRA) proposed by Fishbein & Ajzen (1975), individuals form their behavioral intentions based on cognitive appraisal of the beliefs and weights of object attributes (Wen-Lung Shiau et al 2021). By contrast, the Classical Stimulus-Organism-Response (SOR) model describes individuals' perceptions of environments as a stimulus-response process by the mediation of pleasure and arousal emotions (Mehrabian & Russell, 1974; Chen Peng & Yeong Gug Kim, 2014; Kaur, S. et al, 2017; Kühn, S.W. & Petzer, D.J., 2018; Malafe, N.S.A., et al, 2023). Individuals experience disharmony when the stimuli exhibit different degrees of order and variation and consequently feel "unpleasant/pleasant", "dull/alert" (Bakker et al., 2014). The SOR model postulates that stimuli of the environment trigger emotional states and subsequently bring about behavioral responses. Two dimensions of emotion are at the center of the model, identified as: pleasure and arousal. Pleasure refers to the degree to which consumers feel "good", "joyful", "happy", "satisfied" and so on; whereas arousal refers to the degree to which consumers feel "excited", "stimulated", "alert", or "active". These two dimensions of emotional states will result in irrational approach and avoidance behavior such as, for example, impulsive buying.

Research into customer relationship management, consumer loyalty, and online buyer behavior (including impulse purchasing) and related motivational factors has been well documented in both marketing and enterprise information systems (EIS) literature (Svenson & Maule, 1993; Dhar & Nowlis, 1999; Tykocinski & Pittman, 2001; Pan, S.L., 2005; Shea, T. et al, 2006; Jain, V. et al, 2007; Kanungo, S. & Vikas Jain, 2012; Ree Ho & Doug Vogel, 2014; Mohammadhossein, N. et al, 2014; Elias, N. F., et al, 2015; Khodadadi, P. et al, 2016; Punyatoya, P. et al, 2018; King & Krishnan, 2019; Bilal, M. et al, 2020; Mosa, M. et al, 2020; Li Liu et al, 2020; Nhuong Bui et al, 2020; Weng-Lung Shiau et al, 2021; Matias, J.B.,2021; Salem, M. et al, 2022; Hwang, Y. et al, 2023).

Previous research has investigated the impact of different factors (e.g. marketing stimuli such as online merchandise attractiveness and promotion techniques, a person's impulsivity trait such as conscientiousness and action orientation, situational factors such as ease of use and communication style of a website, the influence of vendor cues (Kaur, S. et al, 2017), gender differences and education (Alam, M. S-A et al 2019), and emerging social factors such as goal commitment (Yujong Hwang et al, 2023), product recommendations and celebrities' posts, among others on IBI (Xu & Huang 2014;

Redine et al., 2023; Chen et al., 2019; Daoping Wang, Abdul Waheed, 2019 Alam, M.S. Thürmer et al., 2020; Zhao et al., 2022), the impact of advertising values (Malafe, N.S.A., et al, 2023), the effect of eWOM (electronic word of mouth), Roy, G. et al, 2021), and the more recent impact of Covid-19 and the moderating role of digital marketing (Salem, M. et al, 2022). However, context-specific marketing stimuli in OGB remains under-explored. Specifically, the effect and the influencing mechanism of the the three most frequently used promotional tools (i.e., super low price, limited quantities offered, and short transaction time span) in OGB has not been sufficiently addressed.

Although marketing strategies based on, for example, scarcity (including time scarcity and quantity scarcity) have been widely adopted in both physical and e-market places and shown to have great effects on impulse buying (Aggarwal et al., 2011; Wu et al., 2020), these three marketing tools amplified by enterprise information systems facilitated in OGB are different from the regular marketing practice in that they exceed the regulatory capacity of consumers and lead to perception of pressure, which, in turn, leads to emotional response such as urgency, eagerness, and anticipated regret. According to the SOR model, super low prices, limited quantity, and time limit in OGB can be perceived as external stimuli that induce consumers' emotions which, in turn, lead to impulse buying behavior. The mediating roles of pleasure and arousal level are yet to be sufficiently explored in the literature. For example, how do the three most frequently used promotional tools (i.e., super low price, limited quantities offered, and short transaction time span) stimulate different dimensions of emotion? and in what way does emotion affect impulse buying behavior and the possible difference between their influencing mechanisms remain largely unexplored.

To better understand the effects of these three marketing stimuli in OGB and the underlying process, this research adopts the perspective of the SOR model (widely reported in both marketing and enterprise information systems literature) focusing on the mediating effect of emotions.

In this research we take the position that by employing super-low-prices with limited product supply in short transaction time span, OGB is different from other online shopping scenarios for its three pressure-inducing characteristics (i.e., unpredictable, and uncontrollable results, competing mechanism, and perceived scarcity), all of which are very likely to stimulate emotional responses. When setting a super low price in online group buying, sellers often require minimum and maximum quantity limit. The success of traction depends on whether there are adequate buyers joining together to satisfy the minimum requirements, and this leads to uncertain results. Previous research demonstrates that unpredictable and uncontrollable outcomes are related to affective responses (Lee & Qiu, 2009) which might trigger subsequent impulse buying behavior. In addition, given the fact that the special offers available are often quickly snapped away by other buyers, this effectively leads to a situation of immediate and significant decrease in the number of available offers. This competing mechanism might trigger buyers' desire to win with high arousal level and result in impulse buying (Adam et al., 2015; Wu et al., 2020). Moreover, sellers often set a deadline for limited offers in OGB and both perceived time scarcity and product scarcity have proven to be strong drivers of emotions and sense of urgency (Zhu et al., 2015; Li et al., 2021).

The effects of the above-mentioned three characteristics of OGB as enablers of emotional response on consumers' purchase decisions are significant and therefore worthy of further research.

To gain a more comprehensive understanding of how sellers influence OGB, and also gain a better insight into the underlying psychological mechanisms, this research empirically explores the impact of pressure triggered by three most frequently used promotional tools in OGB (i.e., super-low-price, limited supply, and short transaction time on impulse buying) and highlights the mediating effect of emotion. This research contributes to enhancing our understanding of the mechanisms of IBI for consumers with respect to OGB. Moreover, it enriches the theory of impulse buying and provides practical tools for marketers to use in OGB.

In view of the preceding discussion, therefore, the objectives of this research have been outlined as follows:

1) To identify and define three types of pressure which are triggered by OGB promotions.
2) To examine the effects of these three types of pressure on consumers' impulse buying behavior;
3) To investigate and produce knowledge about the mediating role of emotion in the relationship between pressure and IBI of consumers.

The above-outlined three research objectives, in turn, constitute the basis for hypotheses development for our work which are presented later in the paper.

2. BACKGROUND

2.1. Impulse Buying in Online Group Buying

Stern (1962) defines impulse buying as any purchase with neither plan nor a lot of reflection. XU & Huang (2014) posit that it is a sudden and immediate purchase after the shopper experiences an urge to buy. The impact of online consumer impulse buying has also been studied regarding vendor cues (Kaur, S. et al, 2017); gender differences and level of education (Waheed, A. et al, 2019); and advertising values (Malafe, N.S.A., et al, 2023).

According to the Consumption Impulse Formation Enactment (CIFE) model (Dholakia, 2000), there are three types of antecedents to form a consumption impulse which the author identifies as: marketing stimuli (or external impulse trigger cues), a person's impulsivity trait, and situational factors. Chan et al. (2017) maintain that there are two types of stimuli for online impulse buying behavior which the authors identify as external and internal. The external stimuli are specific to a website while marketing and situational stimuli are internal to it and relate particularly to the characteristics of the consumer.

With the rapid development of online shopping scholarly research has turned to online impulse buying. Donthu & Gilliland (1996) suggest that consumers generally tend to purchase on the basis of impulse when it comes to online buying compared to buying in a physical marketplace. Research by Koski et al. (2004) finds that there are six types of factors that induce impulse buying behavior in online buying environment. These have been identified as: anonymity, availability, abundance of goods and services, promotional activities, direct marketing, and credit card applications. Earlier research on the subject tended to focus more on marketing stimuli-related factors such as promotion (Peck & Childers, 2006), price and advertising (Dholakia, 2000); personal factors such as impulsiveness, instant gratification, and normative evaluation (Liu et al., 2013); and situation factors such as facilitating function and the communication mode of the website (Verhagen & Dolen, 2011). By contrast more recent research has paid more attention to social factors such as product recommendations (Chen et al., 2019); celebrities' posts (Zafar et al., 2021); and social interactions (Xu et al., 2020).

As a new business model of e-commerce, OGB websites are employing novel marketing stimuli. In a typical group buying, marketers either set a short valid transaction time span (e.g. "only for today deals") or limited supply quantity (e.g. "only limited to 5000 products") for the super-low-price products. In such a situation the websites will post the valid transaction time and the number of available products in real time. These strategies are generally known to increase consumers' pressure and accelerate their purchase decisions. Research by Cheng & Huang (2013) has demonstrated that the promotional characteristics of OGB are more likely to induce consumers' impulse buying behavior. Zhao et al. (2022) summarize the factors affecting IBI in OGB as follows:

- Marketing characteristics (discount price, promotion price),
- Situational characteristics (website visual appeal, ease of use, display format, reputation of the website,), and
- Consumer characteristics (impulsive traits, consumer attitudes, etc.).

From a theoretical viewpoint, all the influencing factors in online buying may have an effect in OGB but these do not include pressure and also ignore its origins and influencing mechanism. The unique features of OGB practice are still to be explored, especially with respect to pressure and stress experienced by consumers because of limited offers with significant discount in a short decision time span.

2.2. Consumer Pressure

Consumer pressure is the perception and adaptive response where environmental demand exceeds their regulatory capacity and is mainly generated by unpredictable and uncontrollable outcomes (Koolkaas et al., 2011). With limited time in enterprise information systems facilitated OGB, it is easy for consumers to watch the end time of group buying approaching, but they can do anything about it. In addition, limited quantities with both minimum and maximum requirements make it hard for consumers to predict how many people might join and whether this group buying would be successful or not. Also, buyers are not able to determine with certainty whether they might be able to secure the product in the end due to the competing mechanism of OGB. Moreover, super low prices beyond consumers' expectation are rare and hard to predict.

According to the SOR model (Mehrabian & Russell 1974, Cheng Peng & Yeong Gug Kim, 2014; Kaur, S. et al, 2017; Kühn, S.W. & D.J. Petzer, 2018; Roy, G. et al, 2021; Minh Duy Vo & Si Van Nguyen, 2022; Chakraborty, U. & Biswal, S.K., 2022), individuals react emotionally based on internal or external stimuli and form behavioral intentions. Seen from the perspective of OGB, pressure perception of the three marketing tools (super low price, limited offers, and short valid transaction time) will generate emotional reactions, and finally result in impulse purchase. In this process, perception of the environment is captured by pressure which is regarded as a self-adaptive reaction to external circumstances. Such reaction leads participants to behave in a manner that deviates from their normal, everyday, behavior seen from both a physiological and psychological perspective (Luthans et al., 2006).

Based on the preceding discussion this research posits that consumer pressure is one of the most important perceptions of external stimuli associated with OGB. Moreover, we classify consumers' pressure into three categories which we have identified as: time pressure, quantity pressure, and price pressure. These three categories of pressure all directly stimulate corresponding emotional response.

3. HYPOTHESES DEVELOPMENT AND THEORETICAL MODEL

3.1. Time Pressure and Emotion

According to Svenson & Maule (1993), time pressure is the adaptive response to the awareness of limited decision time. Payne et al. (1996) posit that time pressure is an important factor that influences decision-making since this is generally a time-consuming process. With ample time a decision-maker

Table 1. Difference between three types of pressure

Marketing Stimuli	Pressure Perception	Characteristics
Limited time	Time pressure	Uncontrollable Resource scarcity
Limited quantity	Quantity pressure	Uncontrollable Unpredictable Product scarcity competing mechanism
Super low price	Price pressure	unpredictable

might try different ways of finding a solution to a problem. However, faced with an insufficient time a decision-maker may feel pressure and rapidly pivot to a fast and heuristic decision-making mode which, in turn, helps reduce decision complexity, save on the cost of search, and shorten decision time (Chandon et al., 2000). Consequently, consumers might develop a "buy-it-now" enthusiasm and feel happy. Rai, Lin & Jiraporn (2021) also demonstrate the role of enjoyment in a time-limited promotion. Hamilton et al. (2019) distinguish between product scarcity and resource scarcity. Product scarcity is primarily the scarcity of ends, whereas resource scarcity is primarily the scarcity of means. Product scarcity often enhances consumers' valuations of goods, whereas resource scarcity tends to attenuate the effects of contextual cures on product evaluations. Limited time in OGB is regarded as a resource scarcity which helps to reduce the negative emotions derived from an unsuccessful group buying.

Moreover, short valid transaction time span in OGB leads to a sense of urgency which, in turn, triggers anxiety among consumers. In such circumstances consumers generally feel obliged to make a rapid decision thinking that should they not do so the opportunity of a "good buy" may no longer be there. This situation induces "buy-it-now" enthusiasm among consumers which is often accompanied by a high arousal emotion. Similarly, the higher the amount of time pressure the greater the sense of regret consumers feel about not taking advantage of a "good buy" opportunity. Zhu et al. (2018) have demonstrated a 'mere urgency effect' by which the limited time in an urgent task is a salient restriction eliciting attention and encouraging emotion to play a role.

In view of the preceding discussion the following hypotheses have been developed for our research:

H1a: In OGB the greater the time pressure the higher the amount of emotional pleasure derived from the purchase.
H1b: In OGB the greater the time pressure the higher the level of emotional arousal derived from the purchase.

3.2. Quantity Pressure and Emotion

Quantity pressure refers to the adaptive response to the awareness of the limited quantity of supply (Svenson & Maule, 1993). Limited quantity of supply is a sign of product scarcity which can be amplified by EIS facilitated OGB context (Zhao et al., 2022) and depicts the feeling that 'not everyone is able to get the product even if they pay for it'. As a result, consumers are very concerned about losing the opportunity of a good purchase and generally tend to feel anticipated regret which contributes to their sense of pressure. Unlike time pressure, quantity pressure is partially out of the control of consumers which means that they are uncertain about whether they will eventually be able to obtain the offers. Every time a competitive buyer purchases a unit of a product the remaining available number of the same product decreases. According to Aggarwal et al. (2011) this competitive mechanism induces consumers' concern about losing the opportunity of a purchase which results in anticipated regret. In addition, sellers often set a minimum threshold for OGB. The success of the transaction is uncertain and very dependent on the number of buyers. This uncertainty among consumers regarding whether they are able to obtain the product at the right time and quantity leads to a heightened worry about the unpredictable results. This, according to Kukar-Kinney et al. (2012), leads to uncomfortable and unpleasant emotions. Furthermore, the limited supply of quantity makes consumers feel nervous and highly alarmed about the products with high arousal emotion (Hsu et al., 2015).

The preceding analysis leads us to formulate the following additional hypotheses for this research:

H2a: In group buying the greater the quantity pressure the lower the level of pleasure emotion attained.
H2b: In group buying the greater the quantity pressure the higher the level of arousal emotion attained.

3.3. Price Pressure and Emotion

Price pressure refers to the adaptive response to the awareness of a super low price. Price promotion has mainly been considered to encourage consumers' rational decision making, increase utility and purchase intention; whereas in OGB context, super low price exceeding consumers' expectations is unpredictable and thus has the potential to discourage deliberation and instead intensify the impact of affective response (Aydinli et al., 2014). According to Buck & Dodd (1991) the perceived difference between product value and cost generally leads consumers to think that if they don't buy, they will bear the loss. Zhou et al. (2013) find that in OGB deep discounts leads to the anticipation of economic benefit by consumers which, in turn, enhances their level of pleasure and satisfaction.

Normally, price is perceived as a loss and price discount is perceived as a gain (Johnson et al., 1999). A super low price offered in a special marketing event (such as OGB) is perceived as an unexpected gain which will induce consumers' surprise and high arousal level (Kim & Tanford, 2020). Moreover, Zhou et al. (2013) find that in group buying if the price discounts provided by sellers are favorable enough consumers will anticipate economic benefit which leads to an enhancement of their level of excitement and satisfaction.

Based on the above postulations we have formulated the following additional hypotheses for our research:

H3a: In group buying the greater the price pressure the higher the level of pleasure emotion attained.
H3b: In group buying the greater the price pressure the higher the level of arousal emotion attained.

3.4. The Relationship Between Emotion and Impulse Buying Intention

According to the SOR model (Mehrabian & Russell, 1974), pleasure and arousal level are two important dimensions of emotion. The authors define pleasure as a certain degree of pleasure, happiness, fun and satisfaction; while arousal level is defined as the feeling of irritation, vigor, and excitement.

Rook et al. (1987) posit that impulse buying is often formed from pleasure and entertainment factors. The reasons why one cannot control themselves in impulse buying are that consumers are pleasant, satisfied, and often in a state of excitement. The sense of pleasure will induce consumers to purchase unplanned goods or cause excessive consumption, i.e., pleasure emotion will encourage consumers to buy impulsively. Chebat & Michon (2003) find that pleasure emotion (such as happiness, satisfaction, etc.) encourages buyers to stay longer in a shop, interact more with the staff, simplify the decision-making process, establish a good impression of the goods, and enhance the volume of the transaction. This effectively promotes consumers' desire for impulse buying. Wang et al. (2014) maintain that in OGB pleasure emotion has a positive effect on impulse buying intention.

Rook & Gardner (1993) investigate the influencing mechanism of arousal emotion on impulse buying. The authors find that high arousal emotion makes consumers concentrate more on the products which contributes to an impulse buying behavior. On the other hand low arousal emotion helps consumers control their own behavior and reduces the occurrence of impulse buying.

Based on the above analysis the following final hypotheses have been formulated for our research:

H4a: In group buying the greater the pleasure emotion the higher the level of impulse buying intention.
H4b: In group buying the greater the arousal emotion the higher the level of impulse buying intention.

3.5. Theoretical Model

Based on the SOR model our research postulates that fixed time limit, limited product quantity, and low price leads consumers to first form cognitive evaluation of time pressure, quantity pressure, and price pressure, which generates double-dimension emotional reactions and ultimately leads to

an impulse buying intention. This research is structured in accordance with the theoretical model in Figure 1 developed by the authors.

Our theoretical model suggests that in OGB time pressure, quantity pressure, and price pressure will affect two dimensions of consumers' emotion (identified as: pleasure emotion and arousal emotion) leading to impulse buying intention.

4. METHODOLOGY

This research utilizes quantitative methodology both in terms of its design as well as the methods of empirical data collection and data analysis.

4.1. Questionnaire Design

The scale of measures in this research is developed in accordance with the established norms and has been adapted to fit the study setting. Apart from the questions related to demographic variables, all items employ a 5-point Likert scale. "Time pressure" is measured with 5 items as proposed by Svenson & Maule (1993), Dhar & Nowlis (1999), and Tykocinski & Pittman (2001); "Quantity pressure" is measured with 5 items as proposed by Svenson & Maule (1993), Dittmar & Beattie (1995), and Rook & Fisher (1995); "Price pressure" is measured with 5 items as proposed by Zhou et al. (2013); "Pleasure emotion" is measured with 4 items and "arousal emotion" is measured with 5 items consistent with the classical scales developed by Mehrabian & Russell(1974); "Impulse buying intention" is measured with 6 items as proposed by Jones et al (2003), and Youn & Faber (2000). The definitions and measurements are depicted in Table 2.

We conducted a pre-test analysis to verify the reliability of the questions in the survey. Items of low reliability (i.e., coefficient between item and factor below 0.5) were excluded from the scale. To increase validity of the measurement some reversal items were included in the data collection instrument (survey questionnaire).

Figure 1. Theoretical model

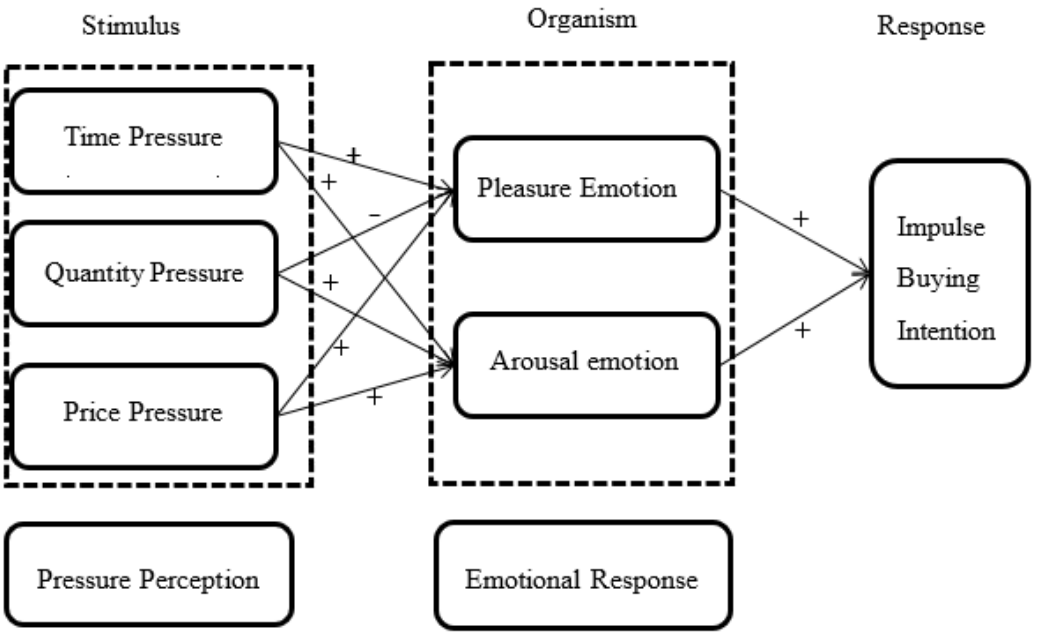

Table 2. Variable definition and measurement

Variable		Definition	Specific Questions in the Empirical Data Collection Instrument (Questionnaire)	Source
Time pressure		Time pressure refers to adaptive responses of feeling pressed for time or having too many things within a limited time frame.	T1. I think that the indicated time limit is very short in this group buying.	Svenson & Maule (1993), Dhar & Nowlis (1999), Tykocinski & Pittman (2001)
			T2. I think that the indicated time limit is very tight, and I probably won't be able to buy it.	
			T3. When making buying decisions the indicated time limit makes me feel sick.	
			T4. I feel that I do not have enough time for proper consideration.	
			T5. I think that if I don't buy immediately, I will regret it later.	
Quantity pressure		Quantity pressure refers to the adaptive response to the awareness of limited supply quantity.	Q1. In this group buying I am concerned about the available quantity of the products.	Svenson & Maule (1993), Dittmar & Beattie (1995), Rook & Fisher (1995)
			Q2. I think that if I don't rush to buy the product it will be sold out soon.	
			Q3. I think that the amount of available products will not be able to satisfy demand.	
			Q4. I think that the amount of products available in this group buying is insufficient.	
			Q5. I feel that I must make a decision before the products are sold out	
Price pressure		Price pressure is the adaptive response to the awareness of a super low price.	P1. The price discount gives me a sense of urgency.	Aydinli et al. (2014), Zhou et al. (2013)
			P2. The discount provided in this group buying is a very valuable opportunity. If I do not buy this time I will never have the opportunity later.	
			P3. This promotion has a huge impact on my purchasing plan and the discount is very attractive.	
			P4. If I give up this chance, I will feel a self-inflicted loss.	
			P5. Faced with discounted products I always want to buy without much thought.	
Emotion	**Pleasure emotion**	Pleasure emotion refers to a certain degree of pleasure, happiness, fun and satisfaction.	PE1. A glimpse of product-related information makes me feel happy.	Mehrabian & Russell(1974)
			PE2. When I find relevant information on this group buying, I feel very satisfied.	
			PE3. When I find relevant information on this group buying, I feel very happy.	
			PE4. When I find relevant information on this group buying, I feel very joyful.	
	Arousal emotion	Arousal emotion refers to the feeling of irritation, vigor, and excitement.	AE1. When I find relevant information on this group buying, I feel excited.	Mehrabian & Russell (1974)
			AE2. When I find relevant information on this group buying, I feel stimulated.	
			AE3. When I find relevant information on this group buying, I feel vigorous.	
			AE4. When I find relevant information on this group buying, I feel surprised.	
			AE5. In this group buying I feel very calm (reverse).	

Continued on following page

Table 2. Continued

Variable	Definition	Specific Questions in the Empirical Data Collection Instrument (Questionnaire)	Source
Impulse buying intention	Impulse Buying Intention refers to the urge to buy the specific product which tends to be spontaneous and without a lot of thought.	BI1. The moment I see the product I immediately want to buy it.	Jones et al. (2003), Youn & Faber (2000)
		BI2. I feel a strong desire to buy these products	
		BI3. The moment I see the products in the group buying I hope to buy it.	
		BI4. Although I do not have a purchasing plan for the product, I still want to buy it.	
		BI5. In this group buying I have no desire to buy a product that is outside my plan (reverse).	
		BI6. I do not give too much thought before making the purchase decision.	

In the questionnaire a 5-point Likert scale was used to measure the variables which included: demographics, three types of pressure, pleasure and arousal emotion, and impulse buying intention.

4.2. Empirical Data Collection

The questionnaire was distributed in both paper and electronic versions in China from the beginning of March to end of May 2019. By convenient sampling, the first two hundred (200) copies of the paper version were distributed to college students in Beijing. To ensure that respondents had enough experience with OGB, two hundred (200) copies of the electronic version of the questionnaire were subsequently distributed to company employees randomly through an online survey website (www.sojump.com). Respondents were required to report their prior experience of OGB, and those without any experience were discarded. Of the four hundred (400) copies of the questionnaire distributed, 229 responses were received within one month, which represents a response rate of 57.3%. Of these 21 responses were considered invalid and therefore discarded. A total of 208 responses were considered valid and as such retained for the testing of the model. This represented a recovery rate of 52%. In terms of the online survey of the 208 valid samples, 135 were from college students and 73 samples were from company employees.

5. FINDINGS OF THE RESEARCH

5.1. Descriptive Analysis

As can be discerned from Table 3 the proportion of female respondents was slightly higher than that of their male counterpart (53.37%:46.63%). In terms of age distribution respondents aged 20 to 29 accounted for more than half the population, while respondents aged 30 to 39 accounted for nearly 26 percent of the population. The other two age groups accounted for a relatively small percentage. For the distribution of educational background most respondents had a Bachelor's degree followed by a Master's degree. In addition, respondents with a monthly spend of 501-2000Yuan (RMB) accounted for more than 90% of the sample population which is consistent with the average monthly spend of the general population in China. Finally, we investigated respondents' frequency of group buying and found that 71.15% had a repeat group buying experience of more than 10 times; and that 31.73% was over a period of four years or more. This clearly indicates that the respondent samples were very experienced in group buying.

We also tested the difference between the samples of college students and those of company employees. There was a significant difference in age; a slight difference in monthly spending, and

Table 3. Basic sample analysis

Item	Category	Frequency	Proportion
Gender	Male	97	46.63%
	Female	111	53.37%
Age	20 and below	3	1.44%
	21-30	132	63.46%
	31-40	53	25.48%
	40 and above	20	9.62%
Educational background	Senior high school and below	0	0.00%
	College(bachelor)	0	0.00%
	University	129	62.02%
	Master and above	79	37.98%
Monthly spending	500 and less	3	1.44%
	501-1000yuan	75	36.06%
	1001-2000yuan	119	57.21%
	2001-2999yuan	9	4.33%
	3000 and more	2	0.96%
Group buying experience	Have	208	100.00%
	never	0	0.00%
Total frequency of group buying	1-5times	23	11.06%
	6-10times	37	17.79%
	More than 10 times	148	71.15%
Time of group buying	Under half year	1	0.48%
	Half to one year	3	1.44%
	1-2 years	24	11.54%
	2-3 years	46	22.12%
	3-4 years	68	32.69%
	More than 4 years	66	31.73%

no difference in education and group buying experiences. This may have resulted from the fact that college students were very active groups in emerging e-commerce purchase, and that most of the offers in group buying websites had low prices thus affordable to college students.

5.2. Reliability and Validity Test

$Cronbach's\ \alpha$ was utilized to test the reliability of the measurement and the results show that the majority of $Cronbach's$ coefficients are above 0.80 (with quantity pressure and pleasure emotion a little under 0.80) which demonstrates a good level of reliability.

Confirmative factor analysis (CFA) was adopted to test the validity of the measurement. The Results indicate that the fit index of CFA is above 0.80, χ^2 / df =3.166<4,RMSEA<0.08 thus demonstrating that there is good validity.

Table 4. Reliability test result

Variable	Item	$Cronbach's\ \alpha$ Coefficient
Time pressure	T1,T2,T3,T4,T5	0.867
Quantity pressure	Q1,Q2,Q3,Q4,Q5	0.783
Price pressure	P1,P2,P3,P4,P5	0.913
Pleasure emotion	PE1,PE2,PE3,PE4	0.761
Arousal emotion	AE1,AE2,AE3,AE4,AE5	0.83
Impulse buying intention	BI1,BI2,BI4,BI5	0.835

Table 5. CFA test result

Fit Index	χ^2 / df	RMSEA	GFI	AGFI	NNFI	NFI	CFI
Parameters	3.166	0.0073	0.892	0.863	0.822	0.913	0.812

5.3. Structural Equation Model Analysis

From the above-indicated analysis of reliability and validity the research presented in this work is found to be both reliable and valid thus warranting further analysis.

The use of structural equation modeling (SEM) as a basis for research in both marketing and enterprise information systems is widespread (Urbach, N. & Ahlemann, F., 2010; Thaw, Y.Y. et al, 2012; Ram, J. et al, 2013; Khodadadi, P. et al, 2016; Akrong, G. B. et al, 2021).

In this study we use structural equation modeling (widely reported in both marketing enterprise information systems literature) with maximum likelihood estimation using AMOS7.0 statistical software to test the research hypotheses. This method is explicitly recommended for models including reflective measures exhibiting low multi-collinearity with relatively large samples (normally more than 200 samples) (Gefen et al., 2011) which is the case in this research. The model, using a sample of 208 respondents for this research, is formulated by means of variables with reflective measures and variance inflation factor (VIF) for each variable which is below 3 – i.e., lower than the common cut-off threshold of 5.

We begin the analysis by establishing the structural chart to show the relationship between the latent variables and indicators. The overall structural equation model M1 is as shown in Figure 2.

SEM test indicates a good fit between the model M1 and the data. Table 6 shows the model fit index.

Table 6 shows that $\chi^2 / df = 1.359 < 4$ which confirms that the degree of fitness is consistent with the stated requirements. *RMSEA* is less than 0.08 which also meets the requirements. The other five indicators are all above 0.8, among which CFI and IFI exceeds 0.9, clearly demonstrating that the required level has been achieved. Consequently, each fit index satisfies the requirements thus demonstrating acceptability of the structural equation model.

The critical ratio and test value are outlined in Table 7.

From table 7 it can be easily discerned that time pressure has a significant impact on arousal emotion which has a coefficient of 0.151 ($p = 0.013$). Quantity pressure has a weak impact on pleasure emotion, with a coefficient of -0.180 ($p = 0.093$). Price pressure has a significant impact on pleasure emotion, with a coefficient of 1.036($P<0.001$); it also has a significant impact on arousal emotion, with a coefficient of 0.223($P=0.0033$). Pleasure emotion has a significant impact on impulse buying

Figure 2. Structural equation model M1

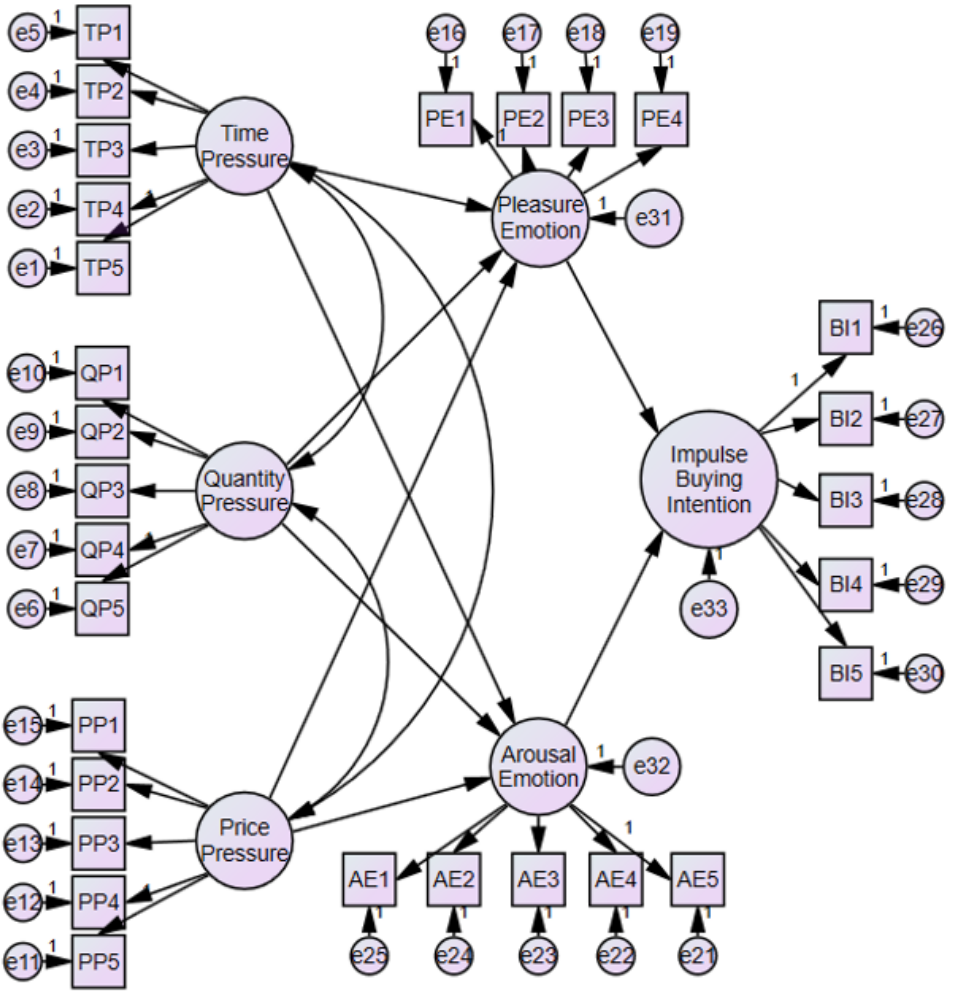

Table 6. Model fit index of M1

Fit Index	χ^2 / df	RMSEA	GFI	AGFI	NNFI	IFI	CFI
Estimate of parameters	1.359	0.042	0.883	0.850	0.873	0.924	0.923

intention, with a coefficient of 0.460(P<0.0013). Arousal emotion also has a significant impact on IBI with a coefficient of 1.498(P<0.001).

Our research finds that the impact of time pressure on pleasure emotion and quantity pressure on arousal emotion are not significant. Specifically, the coefficient between time pressure and pleasure emotion is 0.088 (P = 0.492). We argue that the reason might be attributed to the fact that when consumers perceive high time pressure, they worry that they might not be able to get the group buying task done successfully and therefore have a sense of mistrust and anxiety both of which induce unpleasant emotions. The influence coefficient between quantity pressure and arousal emotional is

Table 7. Test results of the structural equation model M1

Path Relation	Estimate of Parameters	S.E.	C.R.	P
Time pressure→ Pleasure emotion	.088	.128	.687	.492
Time pressure→ Arousal emotion	.151	.061	2.492	.013
Quantity pressure→ Pleasure emotion	-.180	.107	-1.681	.093
Quantity pressure→ Arousal emotion	.045	.040	1.138	.255
Price pressure→ Pleasure emotion	1.036	.197	5.261	***
Price pressure→ Arousal emotion	.223	.076	2.949	.003
Pleasure emotion→ Impulse buying intention	.460	.076	6.063	***
Arousal emotion→ Impulse buying intention	1.498	.371	4.037	***

0.045 (P = 0.255) which indicates that consumers may not be sensitive to quantity information. For example, "only 5000 products are still available" might not make much sense to consumers. As a result, quantity pressure has little impact on arousal emotion.

These results of the analysis show that our research hypotheses are broadly supported which indicates that the overall structural equation model M1 is acceptable. These positive results not withstanding we acknowledge that the insignificant paths need to be eliminated, and that the modified model needs to be re-estimated.

In view of the results outlined in Table 7 the structural equation model is modified to exclude the statistically insignificant paths. This leads to the structural equation model M2 which is outlined in Figure 3. The equation is then re-tested after adjustment. The fit index of M2 is shown in Table 8, while the critical ratio and the test value are shown in Table 9.

Table 8 shows that $\chi^2 / df = 1.407 < 4$ which demonstrates that the fitting degree meets the stated requirements. *RMSEA* is less than 0.08 which also meets the requirements. The other five indicators are all above 0.7, among which AGFI exceeds 0.8; GFI,NNFI,CFI,IFI exceed 0.9 thus achieving the required level. Accordingly, each fit index basically satisfies the requirements and demonstrates that the structural equation model M2 is acceptable.

From Table 9 it can be easily discerned that quantity pressure has a significant impact on pleasure emotion, with a coefficient of -0.201 (p=0.061). This means that the higher the quantity pressure the lower the pleasure emotion. Price pressure also has a significant impact on pleasure emotion with a coefficient of 1.115 (P<0.001), indicating that the higher the price pressure the larger the price discount and the higher the pleasure emotion.

By comparing the absolute value of coefficients of quantity pressure and price pressure it can be seen that price pressure has a higher impact on pleasure emotion than does quantity pressure. Little research has to date been carried out to compare the effect of size between the different driving factors. Time pressure has a significant impact on arousal emotion with a coefficient of 0.151 (P=0.028) which indicates that the stronger the time pressure the higher the arousal emotion. Price pressure also has a significant impact on arousal emotion with a coefficient of 0.188 (P=0.017). This shows that the stronger the price pressure the higher the arousal emotion. By comparing the absolute value of

Table 8. Model fits index of M2

Fit Index	χ^2 / df	RMSEA	GFI	AGFI	NNFI	IFI	CFI
Estimate of parameters	1.407	0.044	0.901	0.870	0.889	0.964	0.965

Figure 3. Structural equation model M2

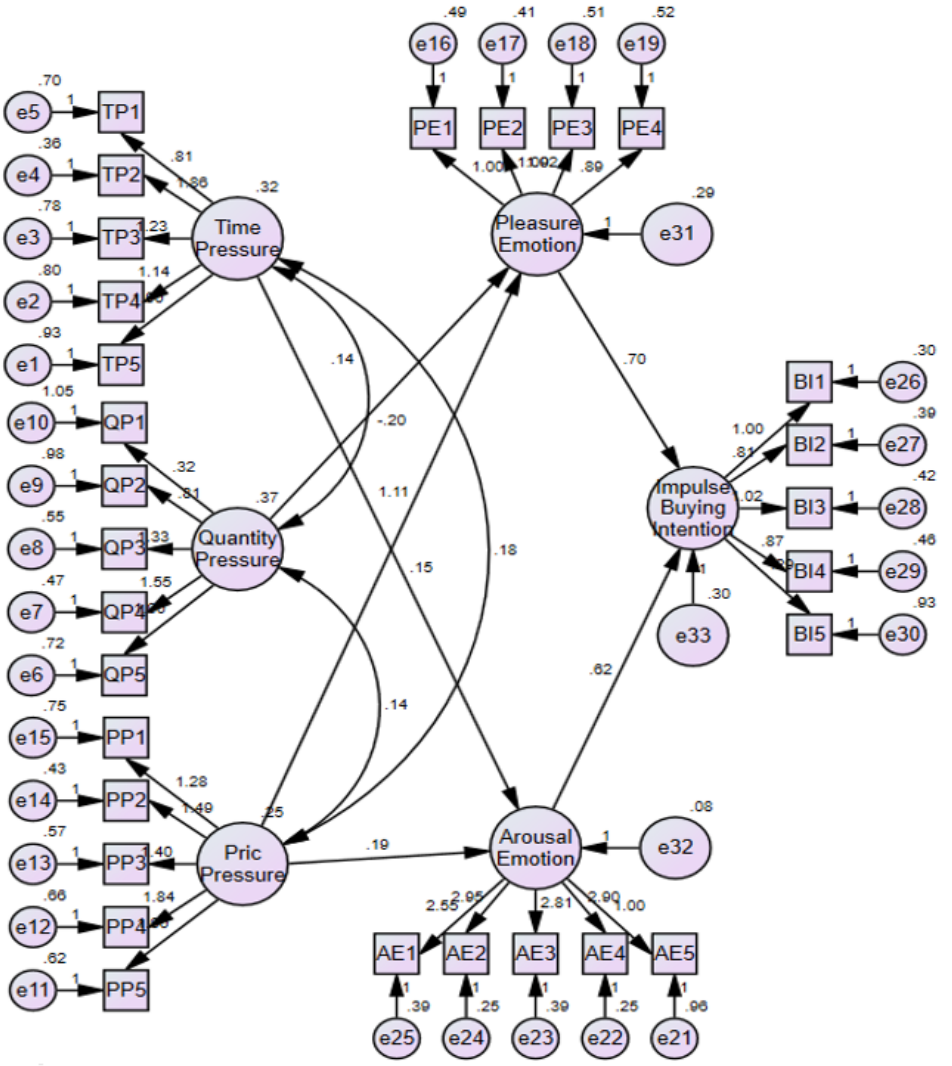

Table 9. Test results of overall structural equation model M2

Path Relation	Estimate of Parameters	S.E.	C.R.	P
Time pressure→ Arousal emotion	.151	.069	2.199	.028
Quantity pressure→ Pleasure emotion	-.201	.107	-1.876	.061
Price pressure→ Pleasure emotion	1.115	.192	5.805	***
Price pressure→ Arousal emotion	.188	.079	2.389	.017
Pleasure emotion→ Impulse buying intention	.696	.092	7.525	***
Arousal emotion→ Impulse buying intention	.619	.217	2.858	.004

the coefficients of time pressure and price pressure it is found that price pressure has a higher impact on pleasure emotion than time pressure does.

To date very little research has been carried out comparing the effect of size on the different types of pressure. Aggarwal et al. (2011) find that quantity scarcity is more effective than time scarcity in affecting consumers' impulsive purchase intentions offline. It is worth noting, however, that the research did not address the issue of emotion directly. Wu et al. (2020) find that quantity scarcity is more powerful in inducing arousal level than time scarcity. The results of our research are different from those of previous studies partly due to differences in measurement and methodology. The Wu et al (2020) study adopts an experimental design approach in order to manipulate quantity scarcity and time scarcity. By contrast, in a survey study it is easier for respondents to imagine limited decision time than limited offer without any targeted categories or brands. That may be the reason why quantity scarcity is less powerful in a survey study than in an experiment one.

The results reported in Table 9 also show that pleasure emotion has a significant impact on impulse buying intention with a coefficient of 0.696 ($P<0.001$). Arousal emotion also has a significant impact on impulse buying intention with a coefficient of 0.619($P=0.004$). Pleasure emotion is found to be slightly stronger than arousal emotion in affecting impulse buying. It is suggested that pleasure motivates impulse buying, and that arousal mobilizes the process (Rook & Gardner, 1993). The different roles of pleasure and arousal emotions and their interaction in affecting impulse buying are still to be sufficiently explored in scholarly research.

The above results demonstrate that 6 of our 8 of our research hypotheses are significantly supported, and this indicates that the overall structural equation model M2 is accepted.

Based on the above analysis our research verifies all of the assumptions as outlined in Table 10.

6. DISCUSSION AND FUTURE RESEARCH

Although this research contributes to enhancing our understanding of impulse buying in OGB, we believe there are five remaining areas that need to be further explored in future research to strengthen our better understanding of the issue.

Table 10. Results of hypotheses testing

Serial Number	Hypotheses	Supported / Not Supported
H1a	In group buying the greater the time pressure the higher the amount of emotional pleasure derived from the purchase.	Not Supported
H1b	In OGB the greater the time pressure the higher the level of emotional arousal derived from the purchase.	Supported
H2a	In OGB the greater the quantity pressure the lower the level of pleasure emotion attained.	Supported
H2b	In OGB the greater the quantity pressure the higher the level of arousal emotion attained.	Not Supported
H3a	In OGB the greater the price pressure the higher the level of pleasure emotion attained.	Supported
H3b	In OGB the greater the price pressure the higher the level of arousal emotion attained.	Supported
H4a	In OGB the greater the pleasure emotion the higher the level of impulse buying intention.	Supported
H4b	In OGB the greater the arousal emotion the higher the level of impulse buying intention.	Supported

First, although this research focuses on the mediation mechanism of emotion in OGB, the rational decision-making process still plays an important role (Jing & Xie 2010). The question of how rational and emotional processes interact is one which we plan to fully explore in the next phase of our research.

Second, the present research investigates the effects of three promotional tools including super low price, limited quantity, and short transaction time span in online OGB, it does not consider other influencing factors such as, for example, web design, the nature of product studied, specific market segments, etc. The next phase of our research shall address these issues as well.

Third, 65% of our respondents were college students. As OGB is becoming more popular across different age groups, it is worth examining it in a more diverse sample settings (for example, experienced versus first time OGB). A comparative study of this nature, we believe, will enable us to have a broader understanding of the imperative of OGB and its effect on marketing strategy.

Fourth, our empirical data was collected from a self-reported questionnaire which may have social desirability bias. For some respondents, attending OGB for super low price and behaving impulsively are not things to be proud of. As such they might underreport the frequency of attending OGB and the level of impulsive buying intention. However, as OGB increases in popularity, presumably some of the factors we have indicated here related to bias may no longer be relevant. However, going forward we intend to integrate these into our sample in order to test their evolution.

Fifth, maximum likelihood SEM estimation is adopted in this study. Although this method is appropriate for our data, alternative methods such as, for example, Partial Least Squares Structural Equation Modeling (PLS-SEM) may be worth considering going forward given that our data is not a perfect normal distribution (Ringle et al., 2012).

7. CONCLUSION

The focus of this research has been to investigate and produce knowledge about the underlying influencing mechanisms of three consumer pressure factors (i.e., time pressure, quantity pressure, and price pressure) in OGB. It empirically verifies the effects of the three factors on impulse buying intention through the mediation of emotion. The results show that time pressure, quantity pressure, and price pressure have different effects on consumer emotion and therefore play different roles in impulse buying intentions. These conclusions help us further understand impulse buying and its antecedents in OGB seen from the perspective of emotion. Specifically, price pressure has been shown to bring pleasure and excitement to consumers. Quantity pressure leads to low pleasure emotion but does not necessarily affect arousal emotion. Time pressure has a positive impact on arousal emotion but its effect on pleasure emotion is not significant.

Analysis of the empirical data demonstrates that in OGB both pleasure emotion and arousal emotion of consumers have positive effects on impulse buying. In comparison, pleasure emotions significantly impact IBI more than arousal emotion. Among the three types of pressure, price pressure appears to have the greatest impact on both arousal emotion and pleasure emotion. These conclusions suggest that in OGB, marketers should attempt to provide more attractive prices to exert pressure on consumers. This will lead to a more effective promotion of consumer impulse buying which, in turn, will increase sales volumes and thus bring about higher economic gains.

As OGB rapidly increases in popularity across many parts of the global marketplace we believe our research has significant implications not just for marketing managers but for organizations generally who, faced with increasing competition and dynamism of the marketplace, need to constantly re-calibrate their strategies to remain competitive in the marketplace. We have seen this phenomenon already taking place in markets such as China and the U.S. – the world's leading economies.

This research also contributes to the field of EIS in that it provides a basis for organizations to innovate in the development of technologies that enhance better coordination of their business processes. More specifically, given the fast-changing pace of consumer behavior due to eMarketing generally and specifically the emerging phenomenon of OGB, the fundamentals of customer

relationship management, customer experience management, and enhanced supply chain integration and management need to be reappraised to reflect the changing dynamics of consumer buyer behavior in the marketplace. Organizations need to better streamline their customer relationship and experience management activities as well as their supply chains to better satisfy the demands of their OGB customers. In this regard it can be said that EIS are uniquely placed to provide organizations with the necessary technology to better manage their relationships and experience with OGB customers. Moreover, EIS can also provide organizations with the necessary technology to restructure their supply chain management activities with a view to better satisfying the specific needs of their OGB customers.

In conclusion it can be said that the findings of this research have contributed towards reflecting on just what kinds of technology platforms can be developed by EIS with a view to enabling organizations to better satisfy the needs of their OGB customers.

ACKNOWLEDGMENT

This research was supported by the National Natural Science Foundation of China [grant number 71972196]; and the Chinese Ministry of Education Project of Humanities and Social Sciences [grant number 18YJA630051].

REFERENCES

Adam, M. T., Krämer, J., & Müller, M. B. (2015). Auction fever! How time pressure and social competition affect bidders' arousal and bids in retail auctions. *Journal of Retailing*, *91*(3), 468–485. doi:10.1016/j.jretai.2015.01.003

Aggrawal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages-A consumer competition perspective. *Journal of Advertising*, *40*(3), 19–30.

Akrong, G. B., Shao, Y., & Owusu, E. (2021). Assessing the Impact of System Quality, Information Quality, and Service Quality on Enterprise Resource Planning (ERP) Systems. *International Journal of Enterprise Information Systems*, *17*(4), 69–84. doi:10.4018/IJEIS.2021100104

Alam, M. D. S.-A., Wang, D., & Waheed, A. (2019). Impact of Digital Marketing on Consumers' Impulse Online Buying Tendencies With Intervening Effect of Gender and Education: B2C Emerging Promotional Tools. *International Journal of Enterprise Information Systems*, *15*(3), 44–59. doi:10.4018/IJEIS.2019070103

Aydinli, A., Bertini, M., & Lambrecht, A. (2014). Price promotion for emotional impact. *Journal of Marketing*, *78*(4), 80–96. doi:10.1509/jm.12.0338

Bakke, I., Voordt, T. V. D., Vink, P., & Boon, J. D. (2014). Pleasure, arousal, dominance: Meherabian and Russell revisited. *Current Psychology (New Brunswick, N.J.)*, *33*(3), 405–421. doi:10.1007/s12144-014-9219-4

Bilal, M., Jianqiu, Z., Akram, U., Tanveer, Y., Sohaib, M., Ahsan, M., & Raza, A. (2020). The Role of Motivational Factors for Determining Attitude Towards eWOM in Social Media Context. *International Journal of Enterprise Information Systems*, *16*(2), 73–91. doi:10.4018/IJEIS.2020040105

Buck, L., & Dodd, P. (1991). *Relative values, or What's art worth?* BBC Books.

Bui, N., Pham, L., Williamson, S., Mohebbi, C., & Le, H. (2020). Intention to Use Mobile Commerce: Evidence From Emerging Economies. *International Journal of Enterprise Information Systems*, *16*(1), 1–30. doi:10.4018/IJEIS.2020010101

Chakraborty, U., & Biswal, S. K. (2022, October). Are online reviews credible? The effects of online reviews for the adoption of MOOCs for E-learning. *Journal of Decision Systems*, 1–22. Advance online publication. doi:10.1080/12460125.2022.2133370

Chan, T. K., Cheung, C. M., & Lee, Z. W. (2017). The state of online impulse-buying research: A literature analysis. *Information & Management*, *54*(2), 204–217. doi:10.1016/j.im.2016.06.001

Chandon, P., Wansink, B., & Laurent, G. (2000). A benefit congruency framework of sales promotion effectiveness. *Journal of Marketing*, *64*(4), 65–81. doi:10.1509/jmkg.64.4.65.18071

Chebat, J. C., & Michon, R. (2003). Impact of ambient odors on mall shoppers' emotions, cognition, and spending: A test of competitive causal theories. *Journal of Business Research*, *56*(7), 529–539. doi:10.1016/S0148-2963(01)00247-8

Chen, Y., Lu, Y., Wang, B., & Pan, Z. (2019). How do product recommendations affect impulse buying? An empirical study on WeChat social commerce. *Information & Management*, *56*(2), 236–248. doi:10.1016/j.im.2018.09.002

Cheng, H. H., & Huang, S. W. (2013). Exploring antecedents and consequences of online group-buying intention: An extended perspective on theory of planned behavior. *International Journal of Information Management*, *33*(1), 185–198. doi:10.1016/j.ijinfomgt.2012.09.003

Dhar, R., & Nowlis, S. M. (1999). The effect of time pressure on consumer choice deferral. *The Journal of Consumer Research*, *25*(4), 369–384. doi:10.1086/209545

Dholakia, U. M. (2000). Temptation and resistance: An integrated model of consumption impulse formation and enactment. *Psychology and Marketing*, *17*(11), 955–982. doi:10.1002/1520-6793(200011)17:11<955::AID-MAR3>3.0.CO;2-J

Dittmar, H., Beattie, J., & Friese, S. (1995). Gender identity and material symbols: Objects and decision considerations in impulse purchases. *Journal of Economic Psychology*, *16*(3), 491–511. doi:10.1016/0167-4870(95)00023-H

Donthu, N., & Gilliland, D. (1996). The infomercial shopper (observations). *Journal of Advertising Research*, *36*(2), 69–76.

Elias, N-F., Mohamed, H., & Arridha, R.R. (2015). A study on the factors affecting customer satisfaction in online airline services. *International Journal of Business Information Systems*, *20*(3), 274-288.

Eptein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *The American Psychologist*, *49*(8), 709–724. doi:10.1037/0003-066X.49.8.709 PMID:8092614

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior*. Addison-Wesley.

Gefen, D., Rigdon, E. E., & Straub, D. (2011). Editor's comments: An update and extension to SEM guidelines for administrative and social science research. *Management Information Systems Quarterly*, *35*(2), iii–xiv. doi:10.2307/23044042

Hamilton, R., Thompson, D., Bone, S., Chaplin, L. N., Griskevicius, V., Goldsmith, K., & Zhu, M. (2019). The effects of scarcity on consumer decision journeys. *Journal of the Academy of Marketing Science*, *47*(3), 532–550. doi:10.1007/s11747-018-0604-7

Ho, R., & Vogel, D. (2014). The impact of social networking functionalities on online shopping: An examination of the web's relative advantage. *International Journal of Business Information Systems*, *16*(1), 25–41. doi:10.1504/IJBIS.2014.060834

Hsu, M. H., Chang, C. M., & Chuang, L. W. (2015). Understanding the determinants of online repeat purchase intention and moderating role of habit: The case of online group-buying in Taiwan. *International Journal of Information Management*, *35*(1), 45–56. doi:10.1016/j.ijinfomgt.2014.09.002

Hwang, Y., Lin, H., & Shin, D. (2023). An Empirical Study on the Information Formality Motivation, Social Influence, and Goal Commitment of Knowledge Workers. *International Journal of Enterprise Information Systems*, *19*(1), 1–17. doi:10.4018/ijeis.320766

Jain, V., Wadhwa, S., & Deshmukh, S. G. (2007). A Negotiation-to-Coordinate (N2C) Mechanism for Modeling Buyer-Supplier Relationship in Dynamic Environment. *International Journal of Enterprise Information Systems*, *3*(2), 1–22. doi:10.4018/jeis.2007040101

Jing, X., & Xie, J. (2011). Group buying: A new mechanism for selling through social interactions. *Management Science*, *57*(8), 1354–1372. doi:10.1287/mnsc.1110.1366

Johnson, M. D., Herrmann, A., & Bauer, H. H. (1999). The effects of price bundling on consumer evaluations of product offerings. *International Journal of Research in Marketing*, *16*(2), 129–142. doi:10.1016/S0167-8116(99)00004-X

Jones, M. A., Reynolds, K. E., Weun, S., & Beatty, S. E. (2003). The product-specific nature of impulse buying tendency. *Journal of Business Research*, *56*(7), 505–511. doi:10.1016/S0148-2963(01)00250-8

Kahneman, D., & Frederick, S. (2002). Representativeness revisited: attitude substitution in intuitive judgment. In Heuristic and Biases: The psychology of intuitive judgment. New York: Cambridge University Press.

Kanungo, S., & Jain, V. (2012). Online shopping behavior: Moderating role of gender and product category. *International Journal of Business Information Systems*, *10*(2), 197–221. doi:10.1504/IJBIS.2012.047147

Kaur, S., Lal, A. K., & Bedi, S. S. (2017). Do Vendor Cues Influence Purchase Intention of Online Shoppers? An empirical study using S-O-R framework. *Journal of Internet Commerce*, *16*(4), 343–363.

Khodadadi, P., Abdi, F., & Khalili-Damghani, K. (2016). An integrated model of customer experience, perceived value, satisfaction, and loyalty in electronic stores. *International Journal of Enterprise Information Systems*, *12*(4), 31–46. doi:10.4018/IJEIS.2016100103

Kim, E. L., & Tanford, S. (2021). Turning discounts into profits: Factors influencing online purchasing decisions for hotel add-on Items. *Cornell Hospitality Quarterly*, *62*(4), 438–454. doi:10.1177/1938965520935397

Kocher, M. G., Pahlke, J., & Trautmann, S. T. (2013). Tempus fugit: Time pressure in risky decisions. *Management Science*, *59*(10), 2380–2391. doi:10.1287/mnsc.2013.1711

Koolhaas, J. M., Bartolomucci, A., Buwalda, B., de Boer, S. F., Flügge, G., Korte, S. M., Meerlo, P., Murison, R., Olivier, B., Palanza, P., Richter-Levin, G., Sgoifo, A., Steimer, T., Stiedl, O., van Dijk, G., Wöhr, M., & Fuchs, E. (2011). Stress revisited: A critical evaluation of the stress concept. *Neuroscience and Biobehavioral Reviews*, *35*(5), 1291–1301. doi:10.1016/j.neubiorev.2011.02.003 PMID:21316391

Koski, N., & Mesiranta, N. (2005). Impulse buying on the internet: encouraging and discouraging factors. In *Frontiers of e-Business Research (FeBR) 2004* (pp. 23–35). Tampere University of Technology and University of Tampere.

Kühn, S. W., & Petzer, D. J. (2018). Fostering purchase intentions toward online retailer websites in an emerging market: S-O-R perspective. *Journal of Internet Commerce*, *17*(3), 255–282. doi:10.1080/15332861.2018.1463799

Kukar-Kinney, M., Ridgway, N. M., & Monroe, K. B. (2012). The role of price in the behavior and purchase decisions of compulsive buyers. *Journal of Retailing*, *88*(1), 63–71. doi:10.1016/j.jretai.2011.02.004

Lee, L., Lee, M. P., Bertini, M., Zquberman, G., & Arie, D. (2015). Money, time and the stability of consumer preferences. *JMR, Journal of Marketing Research*, *53*(2), 184–199. doi:10.1509/jmr.10.0386

Lee, Y. H., & Qiu, C. (2009). When uncertainty brings pleasure: The role of prospect imageability and mental imagery. *The Journal of Consumer Research*, *36*(4), 624–633. doi:10.1086/599766

Li, C., Wang, Y., Lv, X., & Li, H. (2021). To buy or not to buy? The effect of time scarcity and travel experience on tourists' impulse buying. *Annals of Tourism Research*, *86*, 103083. doi:10.1016/j.annals.2020.103083

Liu, L., Su, X., Akram, U., & Abrar, M. (2020). The user acceptance behavior to mobile digital libraries. *International Journal of Enterprise Information Systems*, *16*(2), 38–53. doi:10.4018/IJEIS.2020040103

Liu, Y., Li, H., & Hu, F. (2013). Website attributes in urging online impulse purchase: An empirical investigation on consumer perceptions. *Decision Support Systems*, *55*(3), 829–837. doi:10.1016/j.dss.2013.04.001

Luthans, F., Avey, J. B., Avolio, B. J., Norman, S. M., & Combs, G. M. (2006). Psychological capital development: Toward a micro-intervention. *Journal of Organizational Behavior*, *27*(3), 387–393. doi:10.1002/job.373

Malafe, N. S. A., Fereydoni, S. G., & Chashmi, S. A. N. (2023). The impact of advertising values on impulsive and compulsive buying. *Journal of Internet Commerce*, *22*(3), 349–394. doi:10.1080/15332861.2022.2057122

Matias, J. B. (2021). Understanding intention and behavior toward online purchase of agriculture and fisheries products using extended technology acceptance model. *International Journal of Enterprise Information Systems*, *17*(4), 118–137. doi:10.4018/IJEIS.2021100107

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology.* The MIT Press.

Mohammadhossein, N., Ahmed, M. N., Zakaria, N. H., & Goudarzi, S. (2014). A study towards the relation of customer relationship management, customer benefits, and customer satisfaction. *International Journal of Enterprise Information Systems*, *10*(1), 11–31. doi:10.4018/ijeis.2014010102

Mosa, M., Agami, N., Elkhayat, G., & Kholief, M. (2020). A Literature Review of Data Mining Techniques for Enhancing Digital Customer Engagement. *International Journal of Enterprise Information Systems*, *16*(4), 80–100. doi:10.4018/IJEIS.2020100105

Ordóñez, L. D., Benson, L. III, & Beach, L. R. (1999). Testing the compatibility test: How instructions, accountability, and anticipated regret affect prechoice screening of options. *Organizational Behavior and Human Decision Processes*, *78*(1), 63–80. doi:10.1006/obhd.1999.2823 PMID:10092471

Pan, S. L. (2005). Customer perspective of CRM systems: A focus group study. *International Journal of Enterprise Information Systems*, *1*(1), 65–88. doi:10.4018/jeis.2005010105

Payne, J. W., Bettman, J. R., & Luce, M. F. (1996). When time is money: Decision behavior under opportunity-cost time pressure. *Organizational Behavior and Human Decision Processes*, *66*(2), 131–152. doi:10.1006/obhd.1996.0044

Peck, J., & Childers, T. L. (2006). If I touch it I have to have it: Individual and environmental influences on impulse purchasing. *Journal of Business Research*, *59*(6), 765–769. doi:10.1016/j.jbusres.2006.01.014

Peng, C., & Kim, Y. G. (2014). Application of the Stimuli-Organism-Response (S-O-R) Framework to online shopping behavior. *Journal of Internet Commerce*, *13*(3-4), 159–176. doi:10.1080/15332861.2014.944437

Punyatoya, P., Satpathy, A., & Agrawal, A. (2018). Factors driving consumer loyalty intention towards e-tailers: An integrated model. *International Journal of Business Information Systems*, *27*(4), 466–492. doi:10.1504/IJBIS.2018.090288

Rai, D., Lin, C. W. W., & Jiraporn, N. (2021). The impact of scheduling styles on time-limited promotions: The moderating role of redemption frames. *Journal of Business Research*, *135*, 774–786. doi:10.1016/j.jbusres.2021.06.056

Ram, J., Corkindale, D., & Wu, M. L. (2013). Enterprise resource planning adoption: Structural equation modeling analysis of antecedents. *Journal of Computer Information Systems*, *54*(1), 53–65. doi:10.1080/08874417.2013.11645671

Redine, A., Deshpande, S., Jebarajakirthy, C., & Surachartkumtonkun, J. (2023). Impulse buying: A systematic literature review and future research directions. *International Journal of Consumer Studies*, *47*(1), 3–41. doi:10.1111/ijcs.12862

Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). Editor's comments: A critical look at the use of PLS-SEM in" MIS Quarterly. *Management Information Systems Quarterly*, *36*(1), iii–xiv. doi:10.2307/41410402

Rook, D. W. (1987). The buying impulse. *The Journal of Consumer Research*, *14*(2), 189–199. doi:10.1086/209105

Rook, D. W., & Fisher, R. J. (1995). Normative influences on impulsive buying behavior. *The Journal of Consumer Research*, *22*(3), 305–313. doi:10.1086/209452

Rook, D. W., & Gardner, M. P. (1993). In the mood: Impulse buying's affective antecedents. *Research in Consumer Behavior, 6*(7), 1-28.

Roy, G., Datta, B., Mukherjee, S., & Basu, R. (2021). Effect of eWOM stimuli and eWOM response on perceived service quality and online recommendation. *Tourism Recreation Research*, *46*(4), 457–472. doi:10.1080/02508281.2020.1809822

Salem, M., Baidoun, S., Sharekh, N. A., Sammour, N., Alnajar, G., Alasttal, F., Anguini, I., & Sager, H. (2023). Factors affecting Arab consumers' attitudes toward online shopping in light of COVID-19: The moderating role of digital marketing. *Journal of Enterprise Information Management*, *36*(2), 480–504.

Shea, T., Brown, A., White, S., Curran-Kelly, C., & Griffin, M. (2006). Customer relationship management (CRM) metrics: What's the holdup? *International Journal of Enterprise Information Systems*, *2*(3), 1–9. doi:10.4018/jeis.2006070101

Shiau, W.-L., Shi, P., & Yuan, Y. (2021). A meta-analysis of emotion and cognition in information system. *International Journal of Enterprise Information Systems*, *17*(1), 125–143. doi:10.4018/IJEIS.2021010107

Sohn, H. K., & Lee, T. J. (2017). Tourists' impulse buying behavior at duty-free shops: The moderating effects of time pressure and shopping involvement. *Journal of Travel & Tourism Marketing*, *34*(3), 341–356. doi:10.1080/10548408.2016.1170650

Stern, H. (1962). The significance of impulse buying today. *Journal of Marketing*, *26*(2), 59–62. doi:10.1177/002224296202600212

Svenson, O., & Maule, A. J. (Eds.). (1993). *Time pressure and stress in human judgment and decision making*. Springer Science & Business Media. doi:10.1007/978-1-4757-6846-6

Thaw, Y. Y., Dominic, P. D. D., & Mahmood, A. K. (2012). A structural equation modelling approach for Malaysian consumers' perspectives on e-commerce B2C transactions. *International Journal of Business Information Systems*, *10*(2), 178–196. doi:10.1504/IJBIS.2012.047146

Thürmer, J. L., Bieleke, M., Wieber, F., & Gollwitzer, P. M. (2020). If-then plans help regulate automatic peer influence on impulse buying. *European Journal of Marketing*, *54*(9), 2079–2105. doi:10.1108/EJM-05-2018-0341

Tykocinski, O. E., & Pittman, T. S. (2001). Product aversion following a missed opportunity: Price contrast or avoidance of anticipated regret? *Basic and Applied Social Psychology*, *23*(3), 149–156. doi:10.1207/S15324834BASP2303_1

Urbach, N., & Alhemann, F. (2010). Structural equation modeling in information systems research using partial least squares. *Journal of Information Technology Theory and Application*, *11*(2), 5–40.

Verhagen, T., & Van Dolen, W. (2011). The influence of online store beliefs on consumer online impulse buying: A model and empirical application. *Information & Management*, *48*(8), 320–327. doi:10.1016/j.im.2011.08.001

Vo, M. D., & Nguyen, S. V. (2022, November). Enhancing store brand equity through relationship quality in the retailing industry: Evidence from Vietnam. *Cogent Business & Management*, *9*(1), 2149150. Advance online publication. doi:10.1080/23311975.2022.2149150

Wang, Q., Yao, Q., & Ye, Y. (2014). The influence of price discount and sales volume on impulse purchase intention of online group-buying. *Journal of Industrial Engineering and Engineering Management*, *28*(4), 37–47.

Wu, Y., Xin, L., Li, D., Yu, J., & Guo, J. (2021). How does scarcity promotion lead to impulse purchase in the online market? A field experiment. *Information & Management*, *58*(1), 103283. doi:10.1016/j.im.2020.103283

Xu, H., Zhang, K. Z., & Zhao, S. J. (2020). A dual systems model of online impulse buying. *Industrial Management & Data Systems*, *120*(5), 845–861. doi:10.1108/IMDS-04-2019-0214

Xu, Y., & Huang, J. S. (2014). Effects of price discounts and bonus packs on online impulse buying. *Social Behavior and Personality*, *42*(8), 1293–1302. doi:10.2224/sbp.2014.42.8.1293

Xu, Y., & Huang, J. S. (2015). Factors influencing cart abandonment in the online shopping process. *Social Behavior and Personality*, *43*(10), 1617–1627. doi:10.2224/sbp.2015.43.10.1617

Youn, S., & Faber, R. J. (2000). Impulse buying: Its relation to personality traits and cues. *Advances in Consumer Research. Association for Consumer Research (U. S.)*, *27*, 179–185.

Zafar, A. U., Qiu, J., Li, Y., Wang, J., & Shahzad, M. (2019). The impact of social media celebrities' posts and contextual interactions on impulse buying in social commerce. *Computers in Human Behavior*, *115*, 106178. doi:10.1016/j.chb.2019.106178

Zhao, Y., Li, Y. X., Wang, N., Zhou, R. X., & Luo, X. (2022). A meta-analysis of online impulsive buying and the moderating effect of economic development level. *Information Systems Frontiers*, *24*(5), 1667–1688. doi:10.1007/s10796-021-10170-4 PMID:34393617

Zhou, G., Xu, K., & Liao, S. S. (2013). Do starting and ending effects in fixed-price group-buying differ? *Electronic Commerce Research and Applications*, *12*(2), 78–89. doi:10.1016/j.elerap.2012.11.006

Zhu, M., Yang, Y., & Hsee, C. K. (2018). The mere urgency effect. *The Journal of Consumer Research*, *45*(3), 673–690.

Yin Xu is working as an associate professor of Marketing at the School of Business, Central University of Finance & Economics (CUFE). She obtained her Ph.D. of Management from Tsinghua University, Beijing, China. She is also the supervisor of Finance and Big Data Marketing Research Center. Her current areas of interest include eWOM, big data marketing and consumer behavior.

Sam Dzever is Professor of Management at the Institut Mines-Telecom Business School, LITEM, Université Paris-Saclay, Evry, France.

Guoqin Zhao is Associate Professor of Economics at the Institute of Finance & Economics, Central University of Finance & Economics (CUFE), Beijing, China.