

Understanding the determinants of consumer impulse buying on online group buying websites in Taiwan: S-O-R approach

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Abstract

In the online shopping environment, the mode of consumption has extended from individual consumption to group buying. In Taiwan, the online group buying market grows stably yet competition among websites is fierce. Moreover, Taiwan consumers show high impulsive buying tendency in the online shopping environment, and all the advantages of online group buying increase opportunities for impulse buying. This study proposed a framework based on the S-O-R model to find the antecedents of consumer reaction and behavior, especially to distinguish task-relevant and mood-relevant stimuli. An online survey was conducted on 247 participants who had purchased products from online group buying in Taiwan, in order to empirically examine the proposed research model. Partial least squares (PLS) was employed to analyze the research model. The results show that (1) information fit-to-task, convenience, price attribute, social influence and vendor's creativity have a positive effect on perceived usefulness, (2) product attractiveness, information fit-to-task, convenience, price attribute, social influence, and the vendor's creativity have a positive impact on perceived enjoyment, (3) perceived usefulness has a positive impact on perceived enjoyment, (4) perceived enjoyment directly and positively influences consumers' impulse buying intention, whereas perceived usefulness negatively affects impulse buying intention, (5). The moderating effect of self-confidence is confirmed.

Keywords: online group buying, S-O-R model, impulse buying intention

1. Introduction

Technological progress drives the change in business models. In the online shopping market, the consumer's purchasing model is changing from individual to group buying model looking for a good bargain. Online group buying is a business model that gathers shoppers' buying power to have more discounts on product

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prices (Xiao, 2018); it refers to a social or collective shopping model where products or services are purchased at a significantly low price when a large number of buyers agree to participate in the transaction (Chen and Shen, 2015). Not only group buying allow consumers to purchase targeted products at reasonable prices, but also brings several kinds of joys; the excitement from being chosen from restricted time and quantity, or the satisfaction of discovering new products and curiosity about finding new brands. Some factors such as the low price, comprehensive product lines, convenience, and excitement of organizing group buying teams have made online group buying a new e-business model. Groupon's global annual revenue in 2019 has amounted to 2.2 billion US dollars, and the coupon portal had active customers close to 43.6 million in the fourth quarter of 2019 (Statista, 2020). Online group buying websites are widely accepted particularly in Asian countries (Hsu et al., 2015; Xiao, 2018). The commercial success of online group buying websites created a growing trend toward thousands of similar new websites and intensified competition in the industry (Xiao, 2018). New competitors are lowering the profits of the group buying market. Statistics show that dropping profit margin from 50% to 10% in the last few years (iResearch, 2016). Thus, group buying websites should focus not only on increasing the number of visitors but also drawing buying intentions in the group buying environment.

It is well known that the average visiting rate for online group buying websites is not high due to competitive online group buying environment. If we can apply external marketing factors correctly, this may enhance cross-selling and up-selling for both of new and old consumers, leading to more impulse buying for extra products (Dawson and Kim, 2010). Impulse buying can account for a large part of sales in the retail industry (Kacen et al., 2012). Impulse buying takes charge in about 40% of sales in online group buying (Verhagen and van Dolen, 2011). In shopping malls, about 50% of consumers exhibit impulse buying behavior (Nicholls et al., 2001). Research shows that consumers can change their minds even though they have prepared purchase lists or budgets (Neff, 2009). It explains that impulse buying contributes a high percentage of total sales. It leads us to finding that enhancing consumer's impulse buying may be a right way to increase sales in a highly competitive online group buying environment. Research regarding impulse buying shows that a variety of selections, price attribute, and a product's sensory attribute will affect consumer's behavior for impulse buying (Park et al., 2012). It is also found that there is a direct relationship between website quality and consumer's intention for impulse buying (Wells et al., 2011). However, research relates impulse buying behavior in online group buying context is rare to find. This study focuses on factors relates online group buying and impulse buying, and look into them with more details.

Environmental stimulation is one of the factors that catalyze impulse buying. Environmental psychology is often used to explain consumer's purchase intentions for impulse buying (Koufaris et al., 2001). Marketing researchers with an environmental psychologic view widely adopt the S-O-R model (Stimulus, Organism, and Response) proposed by Mehrabian and Russell (1974). The S-O-R model can assist investigators in controlling the consumer's emotional conditions induced by the environment and understanding the formation of individual values and behaviors induced by an emotional response (Fiore and Kim, 2007). The S-O-R model can explain online group buying behavior (Huang and Chien, 2011) and online impulse buying behavior (Parboteeah et al., 2009) altogether. Therefore, integrating the above two subjects via the S-O-R model is validated. The S-O-R model is suitable for investigating online shopping, and the relationship between environmental factors related to online group buying and impulse buying. Further, the model allows researchers to select different types of stimuli and consumer reactions based on different types of demands. As a result, our study adopts the S-O-R model as the foundation for exploring behavior regarding impulse buying. Moreover, factors associated with tasks and emotion will lead to different reactions which are related to cognition, emotion, and behavior. Therefore, our study explores the relationship between stimuli, cognition/enjoyment, and impulse buying through emotional variables.

The S-O-R model can explain both online group buying behavior (Huang and Chien, 2011) and online impulse buying behavior (Parboteeah et al., 2009). Therefore, it is suitable to integrate these two subjects via the S-O-R model. Besides, the model allows researchers to add different types of environmental stimuli to enhance the analysis of the enjoyment and the final behavior during shopping (Dennis et al., 2009; Demoulin, 2011; Manganari et al., 2011). Stimulating factors of impulse buying cover a wide range, but including them makes the analysis too complicated and lengthy. In environmental psychology, it is well known that consumer's behavioral responses to the environment depend on the individual's consumption tasks (Babin et al., 1994). Furthermore, environmental factors can be divided into task-relevant cues (TR cues) and mood relevant cues (MR cues) based on the task (Babin et al., 1994; Eroglu et al., 2001; Parboteeah et al., 2009; Xiang et al., 2016).

Within TR cues, the price attribute is one of the reasons for consumers to join online group buying (Huang and Chien, 2011). The price attribute can be used in predicting consumer's behavior for impulse buying (Dawson and Kim, 2010). In addition, group buying websites allow consumers to buy products at a lower price and allow consumers to experience new online stores or the latest products (Xiao, 2018). Maditinos and Theodoridis (2010) suggested that product availability and popularity can increase product attractiveness. The product attractiveness can affect the convenience of the functional dimension and impulse buying for a positive emotional dimension (Verhagen and van Dolen, 2011) together. The characteristics of online group buying, such as multiple payment options and rapid delivery, enhance the convenience of online group buying (Xiao, 2018). Liao et al. (2012) confirmed that convenience is one of the reasons for consumers to join online group buying. Childers et al. (2001) suggested that convenience positively affects both usefulness and joyfulness. Karbasivar and Yarahmadi (2011) also confirmed that rapid payment by credit card could increase the convenience and probability of impulse buying in online group buying. The user interface of online group buying websites can easily affect consumer's emotions for buying products (Xiao, 2018). Wells et al. (2011) mentioned that websites with higher quality (such as security, ease of navigation, visual attractiveness) stimulate consumer's impulse buying. Besides, the information fit-to-task (INFT) affects consumer's usefulness and enjoyment for online group buying websites (Parboteeah et al., 2009). Similarly, Ou and Sia (2010) pointed out that website information with higher quality improves the fluency of online group buying, leading to increased impulse buying. Taken together, factors such as product attractiveness, ease of navigation, INFT, convenience, and price attribute are investigated in this study.

In MR cues, Shu (2011) showed that consumer's purchase intention is increased based on purchase experience shared by family, friends, and others. Silvera et al. (2008) also mentioned that social influence would increase impulse buying. Shu (2011) and Shiau and Lou (2012) found that social influence and purchase intention show a strong association in the online group buying environment. Dawson and Kim (2010) pointed out that creative products can improve consumer's impulse buying effectively. Shiau and Lou (2012) proposed that service from product providers will affect consumer's intentions for online group buying. This means that the interaction among consumers will increase consumer's intention for online group buying. Furthermore, Verhagen and van Dolen (2011) found that establishing a social function, such as friendly and informative communication, will elevate consumer's intention for impulse buying. So that social influence, the vendor's creativity, and interaction are discussed in this study. In addition to external stimuli, the consumer's individual characteristics result in different impulse buying behavior (Hsu et al., 2012). Hahn and Kim (2009) suggested that self-confidence shows a significant association with consumer behavior. Hsu et al. (2012) found that self-confidence would affect the relationship between internal emotion and individual impulse buying. Thus, self-confidence would function as a factor regarding impulse buying in this study.

Our study contributes towards a better understanding of the antecedents of consumers' online impulse buying, which could benefit online group buying retailers in Taiwan. First, our research enhances our

understanding of impulse buying intention in the group buying context while complementing the findings of previous studies in impulse buying. Second, this study proposed a framework based on the S-O-R model (Mehrabian and Russell, 1974; Parboteeah et al., 2009; Liu et al., 2013; Xiang et al., 2016; Akram et al., 2018; Chen and Yao, 2018) to find the antecedents of consumer reaction and behavior, especially to distinguish task-relevant (TR cues; e.g., product attractiveness, ease of navigation, information fit-to-task, convenience and price attribute) and mood-relevant stimuli (MR cues; e.g. interaction, social influence, and vendor's creativity) to investigate consumer's impulse buying for online group buying. Finally, the study confirmed that self-confidence would affect the relationship between internal emotion and individual impulse buying intention in group buying context. The remainder of this study is organized as follows: Section 2 includes a review of online group buying, impulse buying, and S-O-R model; hypothesis development is detailed in Section 3; in Section 4 the method for examining the proposed model is introduced; and finally the research results, discussion, and implications are presented.

2. Literature review

2.1 Impulse buying

Impulse buying is described as a sudden, compelling, and hedonic purchasing behavior that lacks deliberate consideration of all available information and alternatives (Parboteeah et al., 2009). After receiving purchase stimuli, consumers show a strong desire to buy something. This behavior includes complex and joyful characteristics, and this behavior may result in emotional conflict (Chih et al., 2012; Piron, 1991; Rook, 1987). For consumers who having impulse buying, factors such as functionality and enjoyment are essential (Verhagen and van Dolen, 2011). Thus, emotional status plays a crucial role during the purchase process (Parboteeah et al., 2009). Consumers, who have impulse buying motivation, desire to acquire instant satisfaction during the purchase (Rook, 1987). The emotional reaction from consumers with impulse buying is stronger than consumers without impulse buying (Gardner and Rook, 1988).

Topics regarding impulse buying become more important in exploring consumer behavior because the complexity and popularity of impulse buying can be found from different types of product or purchase environment (Parboteeah et al., 2009; Sharma et al., 2010; Yu and Bastin, 2010). Previous studies regarding impulse buying mainly focus on entity purchase environments. There are only a few studies regarding online environments (Chih et al., 2012). As online shopping grows popular among consumers, studying online impulse buying behavior is significantly required (Dawson and Kim, 2010; Floh and Madlberger, 2013). An online shopping environment induces consumers with impulse buying often (Verhagen and van Dolen, 2011). Previous studies mostly focused on how online platforms affect consumer's behavior with impulse buying (Koufaris, 2002; Parboteeah et al., 2009; Wells et al., 2011). In fact, every factor related to purchasing is able to induce impulse buying, such as website characteristics, website stimulations, marketing strategies, and combinations (Rook and Fisher, 1995; Dawson and Kim, 2010; Park et al., 2012; Verhagen and van Dolen, 2011). A variety of external stimuli can attract new customers to visit websites and increase cross-selling and up-selling between new and existing consumers at the same time. This may result in impulse buying for other products (Dawson and Kim, 2010). It is well known that environmental factors are strong predictors for impulse buying (Rook and Fisher, 1995). Therefore, we can approach via environmental psychology's viewpoint to explain impulse buying behavior (Koufaris et al., 2001). There are various studies that have examined the factors affecting impulse buying behavior in online shopping environments. For instance, there are studies that have examined website attributes such as ease of navigation, visual design, information

richness. Such studies found that the above factors have significant effects on consumer emotions, and consequently resulting in impulse buying decisions (Verhagen and van Dolen, 2011; Parboteeah et al., 2009; Wells et al., 2011).

2.2 S-O-R model

The S-O-R (Stimulus-Organism-Response) model was proposed by Mehrabian and Russell (1974). This model describes the influence of environmental stimuli on individual terminal behavior. The S-O-R model includes three parts: the environment or stimulus which triggers behaviors and responses, the organism that responds, and the actual response (Parboteeah et al., 2009; Xiang et al., 2016; Chen and Yao, 2018). The S-O-R model aims to explain an individual's perception and behavior as a response to external stimuli. The organism acts as a bridge for connecting stimulus and behavior, and the organism regulates the final behavior in response to the stimulus (Fiore and Kim, 2007).

Donovan and Rossiter (1982) reported the first study adopting the S-O-R model in retail environments, and the study integrated several factors for the model. Eroglu et al. (2001) modified the model for investigating online purchase environments and showed that the ambiance of an online store affects the emotional and cognitive status of consumers, triggering consumer behaviors. Manganari et al. (2009) showed that the higher quality of the environment provided by an online store evokes more emotions and triggers more consumer behavior. The S-O-R model was modified for different types of research based on different subjects (Ha and Jang, 2012; Parboteeah et al., 2009; Shen and Khalifa, 2012). Various researches showed that environmental features of an online store could help predict consumers' impulse buying behavior (Kim and Lennon, 2012). In the following section, each part of the S-O-R model is explained in detail.

2.2.1 Stimulus

To find out effective factors from environmental characteristics, we start from the consumer's viewpoints. Consumer's responses to environmental stimuli depend on consumer's purchase tasks (Babin et al., 1994). Based on the level of consuming tasks, the environmental characteristics can be divided into high task-relevant cues (TR cues) and low task-relevant or mood relevant cues (MR cues) (Eroglu et al., 2001; Richard, 2005). Task-relevant factors include website design, arrangement, and content to assist consumers in completing purchase goals (Eroglu et al., 2001). By contrast, emotional factors do not show a direct connection to purchase tasks. The primary function of emotional factors is to build up the enjoyment of purchase environment and joyful memory that affects consumer's purchase behavior via alteration of consumer's emotion (Babin et al., 1994; Eroglu et al., 2001). Product attractiveness, the convenience of website viewing, connection between information and task, convenience, and price characteristics can be categorized as task-related factors. Interactivity, social influence, and product provider's creativity are categorized as emotional factors.

2.2.2 Organism

Internal individual psychological status can be divided into cognitive reactions and affective reactions. Cognitive reaction means the status of the internal mind that deals with information (Eroglu et al., 2001). We know that TR cues focus on the execution of purchase tasks, and different types of TR cues decide website usefulness (Parboteeah et al., 2009). Furthermore, the most critical factor for evaluating cognitive reactions is perceived usefulness (Childers et al., 2001). Perceived usefulness refers to the extent to which an individual believes that trading on group buying websites would enhance the effectiveness of his/her shopping (Xiao, 2018), so the integration of perceived usefulness in this study is suitable (Parboteeah et al., 2009). Affective

reactions mean feelings and emotion induced by the internal process after interaction between individuals and environments (Éthier et al., 2006). Perceived enjoyment is an essential marker for handling individual emotional reactions (Childers et al., 2001). So integrating perceived enjoyment into this study is suitable. In addition to cognitive reactions, TR affects affective reactions as well. Therefore, both cognitive and affective reactions will also be affected by MR cues, and both cognitive and affective reactions will affect the final impulse buying behavior (Kim et al., 2012; Parboteeah et al., 2009).

The connection between cognitive and affective reactions has been discussed extensively (Parboteeah et al., 2009). Several studies mentioned that understanding stimuli develop individual cognitive reactions, and this will decide affective reactions responsible for stimuli, affecting final behavior (Hausman and Siekpe, 2009; Kim et al., 2012; Parboteeah et al., 2009). In the researches regarding impulse buying, this action is classified as unreasonable, joyful, and inconsiderable behaviors. This does not mean that a purchase decision is entirely out of cognitive procedures (Shen and Khalifa, 2012). Positive cognitive reactions are capable of increasing positive affective reactions during impulse buying behavior (Parboteeah et al., 2009). Previous research shows that emotional status plays an essential role in determining impulse buying behavior (Parboteeah et al., 2009; Park et al., 2012; Shen and Khalifa, 2012). Therefore, active reactions acting as a primary driving force is more suitable for exploring impulse buying in this study.

2.2.3 Response

The third element of the S-O-R framework is the response. Response refers to the consumers' reaction to online impulse purchase behavior stimuli and organisms (Chan et al., 2017). In the context of impulse buying, the response has two aspects; the urge to buy impulsively and the actual impulse buying behavior (Rook, 1987; Xiang et al., 2016). Specifically, the urge to buy impulsively is examined as the only individual response in Parboteeah et al. (2009). Based on Xiang et al. (2016) and Chen and Yao's (2018) study, consumers' impulse buying intention is defined as "a strong emotional response that consumers exhibit after receiving external stimuli in shopping scenarios, which prompts them to unscrupulously, irrationally, willingly, and instantly purchase products they did not plan to purchase." In this study, the response we focused on the proposed model is the impulse buying intention of users on group buying websites.

3. Hypothesis development

According to previous studies, the use of the S-O-R model can naturally distinguish stimulation factors related to TR and MR cues (Parboteeah et al., 2009). Although this structure acts as research fundamental in this study, Parboteeah et al. (2009) did not point out the effectiveness of cognitive reactions and impulse buying behaviors. We know that cognitive reactions may reduce the possibility of impulse buying behavior (Park et al., 2012). Thus, this study hypothesized that perceived usefulness affected impulse buying intention negatively. Furthermore, different individual characteristics result in different impulse buying behavior. So individual characteristics play essential roles in discussing impulse buying behavior (Hsu et al., 2012). Hahn and Kim (2009) pointed out that self-confidence plays a vital role in consumer behavior. This means that self-confidence can profoundly explain performance and purchase behavior (Parfitt and Pates, 1999; Hahn and Kim, 2009). In addition, Hsu et al. (2012) mentioned that self-confidence could affect the relationship between internal emotion and impulse buying behavior. Thus, in this study, self-confidence serves as a moderator in exploring impulse buying behavior in order to investigate impulse buying behavior induced by online group buying entirely.

3.1 Hypotheses of the TR cues

3.1.1 Product attractiveness

Product attractiveness is defined as the perception of product's popularity, the number of exciting offers, an assortment of variations, and whether products are aligned with customer's interest (Verhagen and van Dolen, 2011). Attractive products cause impulse buying if they are innovative, original, and distinctive and bring enjoyment to customers (Dholakia, 2000). Chen and Zhang (2015) found that recommended or popular products create impulse buying emotion. Product attractiveness affects not only functional convenience but also creates enjoyment which increases the impulse to buying behavior (Liao et al., 2012; Verhagen and van Dolen, 2011). Besides, Miranda (2009) suggested that product attractiveness increases purchase enjoyment. Taken together, we hypothesized that:

H1a: Product attractiveness positively affects perceived usefulness.

H1b: Product attractiveness positively affects perceived enjoyment.

3.1.2 Ease of navigation

Research shows that the design elements of a website drive impulse purchase behavior (Chan et al., 2017). Xiao (2018) listed elements like the ease of navigation, competitive prices, availability of products, and availability of time for shopping to promote an unplanned purchase. Navigability refers to the degree to which an individual believes that a website exhibits adequate navigational functionality. Easier navigation allows individuals to obtain the information needed from the website with minimal effort (Davis, 1989). Navigability is a standard functional variable, which is a task-relevant cue, whereas visual appeal is related to mood-relevant cues. Research shows that both navigability and visual appeal have a significant effect on the urge to buy impulsively (Parboteeah et al., 2009). Similarly, Floh and Madlberger (2013) found that navigation of websites atmospheric cues positively influenced impulse buying behavior through shopping enjoyment. Wells et al. (2011) suggested that impulse buying behavior is easily developed in consumers with higher impulse buying behavior when these consumers view websites with higher quality (such as safety, ease of navigation, and visual attractiveness). Lin and Lo (2016) found that ease of navigation significantly influences consumer's emotional responses, creating enjoyment and arousal which leads to the urge to buying impulsively. Factors like a well-defined list of products, highlighted recommendations, and aesthetic layout were found to have a significant effect on impulse buying (Chen and Zhang, 2015). Thus, this study hypothesized that:

H2a: Ease of navigation positively affects perceived usefulness.

H2b: Ease of navigation positively affects perceived enjoyment.

3.1.3 Information fit-to-task (INFT)

Information fit-to-task refers to the extent to which information presented on a website is accurate and appropriate for the task at hand (Loiacono et al., 2007). Parboteeah et al. (2009) mentioned that INFT would increase cognition and enjoyment, resulting in the induction of consumer's impulse buying intention indirectly. Ou and Sia (2010) reported that information with higher quality is capable of increasing consumer's understanding of purchase activities, and it will elevate the consumer's purchase intention. Kim et al. (2012) illustrated that diversity and immediateness of information show a positive effect on practical and playful values. Examining the influence of social relationship factors on impulse buying behavior, Xiang

et al. (2016) showed that INFT had a significant effect on both perceived usefulness and perceived enjoyment. As a result, this study hypothesized that:

H3a: INFT positively affects perceived usefulness.

H3b: INFT positively affects perceived enjoyment.

3.1.4 Convenience

Convenience refers to consumers' time and effort perceptions related to online shopping or using services (Xiao, 2018). Childers et al. (2001) mentioned that convenience is proportional to usefulness and enjoyment. Zhang et al. (2017) also suggested that access convenience of the healthcare wearable device will increase consumer's perceived usefulness. In addition, one-to-one service increases consumer's joyful purchase. Huang and Chien (2011) also suggested that purchase convenience will increase consumer's intention for online group buying, and convenience of payment also elevates the probability for impulse buying (Karbasivar and Yarahmadi, 2011). Therefore, this study hypothesized that:

H4a: Convenience positively affects perceived usefulness.

H4b: Convenience positively affects perceived enjoyment.

3.1.5 Price attribute

Lepkowska-White (2004) mentioned that a product discount or promotion could attract consumers. According to Madhavaram and Laverie (2004) buying decisions driven by a discounted price is a type of impulse buying, and such kind of conduct is called a planned impulse buying behavior. Park et al. (2012) pointed out that price attribute such as a low-price strategy increases the probability for impulse buying. Dawson and Kim (2010) showed that product promotion could serve as a predictor for evaluating consumer behavior for impulse buying. Similarly, Chen and Yao (2018) and Zhu et al. (2018) showed that the discounted price is a strong precursor for impulse buying. Besides, Özer and Zheng (2016) showed that discount prices could make consumers feel pleased, satisfied, and positive. Thus, this study hypothesized that:

H5a: Price attribute positively affects perceived usefulness.

H5b: Price attribute positively affects perceived enjoyment.

3.2 Hypotheses of the MR cues

3.2.1 Interactivity

Interactivity can be described as the obtainment and efficiency of website support tools (Srinivasan et al., 2002). Interactivity also covers communication between websites and consumers. Previous research showed that increased interactivity leads to more positive website evaluations, leading to favorable attitudes toward purchase intention (Cho and Leckenby, 1999; Jee and Lee, 2002; Yoo and Stout, 2001). Cyr et al. (2009) confirmed that interactivity between a website and consumer would affect the website's practical and enjoy values. Besides, Baleghi-Zadeh et al. (2017) and Lee and Lee (2019) showed that website interactivity functions as a heuristic cue that prompts users' perceived usefulness. Kim et al. (2012) illustrated that response speed and response capability can affect practical and enjoy values of purchase. Verhagen and van

Dolen (2011) and Yang et al. (2018) pointed out that websites should establish friendly and informative communications, leading to increasing website social and cognitive functions as well as purchase enjoyment and impulse buying behavior. Besides, feedback mechanisms, response capability, and social functions can assist website members to exchange information, leading to increasing capability for price negotiation and intention for group buying (Shiau and Luo, 2012; Shu, 2011). Thus, this study hypothesized that:

H6a: Interactivity positively affects perceived usefulness.

H6b: Interactivity positively affects perceived enjoyment.

3.2.2 Social influence

Shu (2011) suggested that recommendations from friends, family, and colleagues will increase intention for online group buying. Besides, consumers feel that online purchase is joyful and convenient. Chen and Zhang (2015) found that other consumer's recommendations have a positive effect on impulse buying. Similarly, Chen and Lu (2015) indicated that social factors like online comments, media, and personal recommendations, positively affect social influence and online group-buying intention. Terzis et al. (2012) stated that individual characteristics increase perceived usefulness via social influence, leading to affect behavioral intention indirectly. Park et al. (2019) indicated that social influence has a positive effect on the enjoyment benefit of users utilizing mobile payment services. Harmancioglu et al. (2009) also suggested that a word of mouth and social influence can help consumers to obtain new information regarding products, leading to impulse buying behavior. Overall, this study hypothesized that:

H7a: Social influence positively affects perceived usefulness.

H7b: Social influence positively affects perceived enjoyment.

3.2.3 Vendor's creativity

Vendor's creativity means the creation of new ideas or new products that fit consumer's requirements (Shiau and Luo, 2012). Arnold and Reynold (2003) found that an idea is one of the motivations for the induction of consumer's enjoyment. Shiau and Lou (2012) confirmed that the vendor's creativity for products or services would affect the consumer's behavioral intention. Ou and Sia (2010) stated that customized products or services provided by vendors would increase consumer's cognition. Xiao (2018) found that the motivation to search for and secure the right product to fit one's demands as in the form of choice optimization affects perceived usefulness within online group buying behavior. Dawson and Kim (2010) also pointed out that creativity for products or services can stimulate consumer's intention for impulse buying effectively. Therefore, this study hypothesized that:

H8a: Vendor's creativity positively affects perceived usefulness.

H8b: Vendor's creativity positively affects perceived enjoyment.

3.3 Relationship between perceived usefulness and perceived enjoyment

The development of cognition will be induced based on the individual understanding of stimulation, resulting in response to affective reactions (Hausman and Siekpe, 2009; Kim et al., 2012). Xiang et al. (2016) showed that individual cognition positively affects consumer's intention for staying at the store through

purchase enjoyment. Terzis et al. (2012) also mentioned that perceived usefulness positively affects behavioral intention via perceived enjoyment. Besides, Parboteeah et al. (2009) suggested that positive cognitive reactions can increase the emotional part of impulse buying. As a result, this study hypothesized that:

H9: Perceived usefulness positively affects perceived enjoyment.

3.4 Relationship between perceived enjoyment and impulse buying intention

The intention for impulse buying means the level of consumer's desire for purchase. A higher level of impulse buying intention results in a higher probability of impulse buying (Beatty and Ferrell, 1998). Evidence showed that affective reactions show a positive correlation with impulse buying intention in traditional retail environments (Beatty and Ferrell, 1998). In online buying environments, emotion or emotional status plays a vital role in determining purchase behavior (Hausman and Siekpe, 2009). Previous studies also reported that elevation of emotion or enjoyment increases impulse buying intention (Adelaar et al., 2003; Parboteeah et al., 2009; Park et al., 2012; Shen and Khalifa, 2012; Xiang et al., 2016; Zheng et al., 2019). As above mentioned, this study hypothesized that:

H10: Perceived enjoyment positively affects impulse buying intention.

3.5 The connection between perceived usefulness and impulse buying intention

Davis (1989) proposed that perceived usefulness serves as an essential marker for determining usage behavior. Sun and Wu (2011) pointed out that the occurrence of impulse buying in consumers with self-understanding is relatively low. Park et al. (2012) stated that practical value would decrease the probability of impulse buying. Yoon (2013) suggested that consumer's experience of using products shows a negative correlation with impulse buying. Thus, this study hypothesized that:

H11: Perceived usefulness negatively affects impulse buying intention.

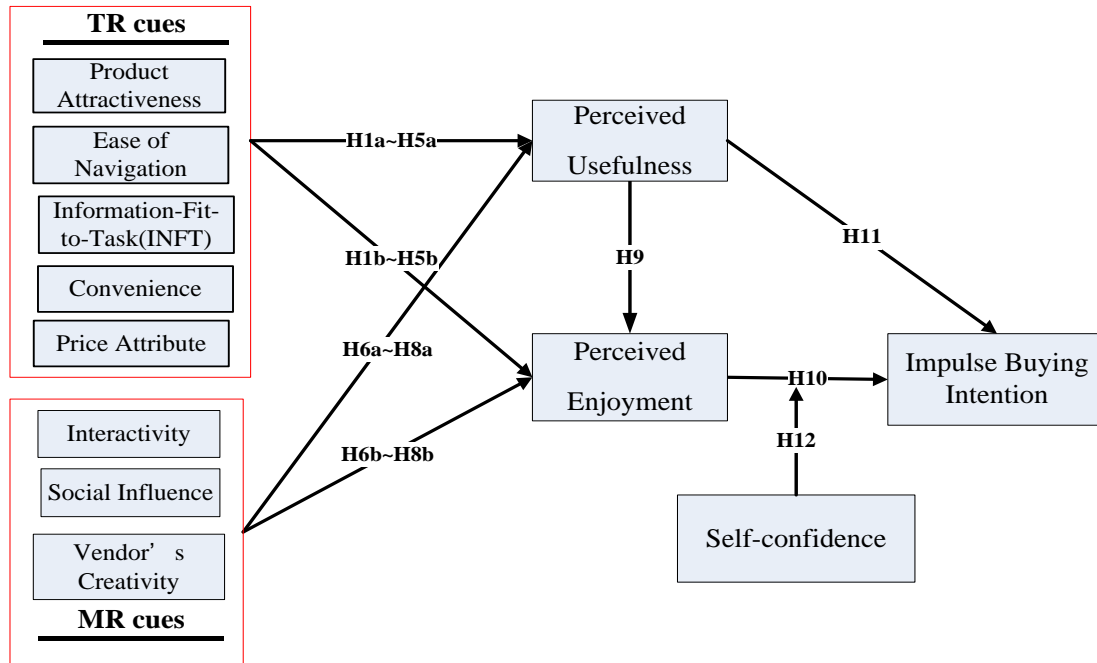
3.6 The moderating impact of self-confidence

Self-confidence means the confirmation level for an individual purchase decision (Bearden et al., 2001). In the research regarding online shopping, different levels of self-confidence resulted in different cognition for shopping risk, affecting shopping behavior and decision time for purchase (Smith and Sivakumar, 2004). In purchase behavior for the wines, different levels of self-confidence affect the capability for selection of wines with good quality, resulting in the trail of new brand wines and shopping enjoyment (Olsen et al., 2003). Chen et al. (2004) stated that self-efficiency and self-respect affect individual emotional status and performance. Hsu et al. (2012) mentioned that different levels of self-confidence affect personal internal emotion for purchase behavior. As a result, this study hypothesized that:

H12: Different levels of self-confidence affect the relationship between impulse buying intention and perceived enjoyment.

This study integrated external factors such as product attractiveness, ease of navigation, INFT, convenience, price attribute, interactivity, social influence and vendor's creativity, and moderator self-confidence as well as the S-O-R model to test the hypotheses. The research structure is shown in Figure 1.

Figure 1. Research structure and hypothesis.



4. Research method and analysis

4.1 Data collection

A web-based questionnaire was sent to respondents with actual experience in online group buying, and 247 valid questionnaires were collected for further analysis. The demographics of the valid respondents are as follows: male consumers were 26.7%, and female consumers were 73.3%. The majority of respondents have a bachelor's degree (69.2%), followed by a graduate school degree (27.5%). Among these respondents, 64.0% were in the age group of 19-24 whereas, 25-35 years old accounted for and 32.4%. This shows that for online group buying, the young population is the primary segment. 64.8% of valid respondents were students, with 69.2% having a college degree, and 27.5% have a master degree. For monthly income, 32.8% of users stated a monthly income below US\$170, and 23.5% of users stated monthly income with US\$170-340. Monthly income analysis is consistent as the majority of respondents being students. The demographics of the valid respondents can be seen in Table 1.

Among valid respondents, 40.9% stated that they visit group buying websites once a day. On the while, 21.1% stated that they visit once a week. Of the responses, 51% of the respondents spent 30-60 minutes a day, whereas 27.9% spent less than 30 minutes a day. The average expenditure for online group buying consumers was in the order of NT\$ 201-500 (49.0%) and NT\$ 501-800 (31.6%). In order to assess the representativeness of the sample, this study collects and compares the socio-demographic characteristics of

the respondents with those reported in a survey of electronic commerce use in Taiwan, as conducted by the Market Intelligence and Consulting Institute (MIC) (2019), which is one of the leading organizations that provide abundant and professional information on Internet demographics and trends. The comparison revealed a close match between the two samples.

Table 1. Demographics (number of subjects = 247)

Measure	Items	Frequency	Percentage
Gender	Male	66	26.7
	Female	181	73.3
Age	Under 18	6	2.4
	19-24	158	64.0
	25-35	80	32.4
	36-45	1	0.4
	Over 45	2	0.8
Education	Junior high school or less	0	0
	High school	8	3.2
	University	171	69.2
	Graduate school	68	27.5
Occupation	Full-time student	160	64.8
	Military, public service, education	19	7.7
	Finance	4	1.6
	Media/Culture	3	1.2
	Freelancer	3	1.2
	Service industry	25	10.1
	Manufacturing	11	4.5
	Specialist (doctors, lawyers, engineer)	7	2.8
	Information industry	7	2.8
	Construction industry	2	0.8
	Housewife	4	1.6
	Other	2	0.8
Frequency of visit	at least once a day	101	40.9
	at least once a week	52	21.1
	at least once a month	48	19.4
	at least once every three months	25	10.1
	at least once every six months	12	4.9
	at least once a year	9	3.6
Viewing time	less than 30 minutes	69	27.9
	30 ~1 hour	126	51.0
	1 ~ 3 hours	49	19.8
	3 ~ 6 hours	3	1.2
	more than 6 hours	0	0

4.2 Analysis of measurement model

Data analysis adopted the partial least squares (PLS) method, which allows researchers to specify the relationships among the factors of conceptual interest and the measures underlying each construct (Wold, 1989; Pavlou and Fygenson, 2006). The PLS approach allows researchers to simultaneously assess measurement model parameters and structural path coefficients (Chin, 1998). According to the prediction requirements for this study, the PLS is an appropriate statistical analysis tool (Chen and Cheng, 2009; Lin et al., 2018; Park et al., 2012). The respondents are requested to rate each item on a seven-point Likert scale, where 1 implies strongly disagree and 7 implies strongly agree. To evaluate construct reliability, this study assesses the Cronbach' α and composite reliabilities (CR) of all constructs. As shown in Table 2, all variables have both Cronbach' α and composite reliability values ranging from 0.86 to 0.95, which are greater than the reliability criterion of 0.7, as suggested by previous studies (Fornell and Larcker, 1981; Hair et al., 2010) and all the average variance extracted (AVE) values (0.60~ 0.82) are greater than the minimum level of 0.50 (Bagozzi and Yi, 1988), as recommended by the previous studies (Fornell and Larcker, 1981; Hair et al., 2010). Since the values of reliability are above the recommended thresholds, the scales for evaluating the constructs are deemed to exhibit convergence reliability. Moreover, we examined discriminant validity via the correlation estimation between the constructs by using the variance extraction measure (Fornell and Larcker, 1981). Table 2 indicates that the variances extracted by the constructs are greater than any squared correlation among the constructs; thereby, demonstrating that each construct is statistically different from the others. The foregoing analysis shows that the measurement model tests, including convergent and discriminant validity measures, are satisfactory.

Table 2. AVE and correlation coefficient matrix

	Cronbach's α	AVE	CR	PA	EN	INFT	Con	Price	INT	SI	VC	PU	PE	IBI	C
PA	0.77	0.60	0.86	0.775											
EN	0.88	0.67	0.91	0.557	0.819										
INFT	0.82	0.74	0.90	0.596	0.712	0.860									
Con	0.83	0.67	0.89	0.462	0.552	0.500	0.819								
Price	0.90	0.72	0.93	0.588	0.483	0.545	0.534	0.849							
INT	0.81	0.64	0.88	0.523	0.449	0.565	0.454	0.575	0.800						
SI	0.83	0.66	0.89	0.328	0.291	0.348	0.387	0.368	0.435	0.812					
VC	0.82	0.64	0.88	0.477	0.486	0.500	0.477	0.492	0.499	0.555	0.800				
PU	0.84	0.69	0.90	0.461	0.427	0.495	0.547	0.543	0.486	0.433	0.515	0.831			
PE	0.93	0.82	0.95	0.578	0.479	0.546	0.543	0.594	0.509	0.477	0.549	0.585	0.906		
IBI	0.94	0.74	0.95	0.102	0.071	0.070	0.154	0.071	0.152	0.320	0.243	0.093	0.361	0.860	
C	0.76	0.67	0.86	0.399	0.360	0.454	0.352	0.401	0.452	0.384	0.477	0.386	0.456	0.122	0.819

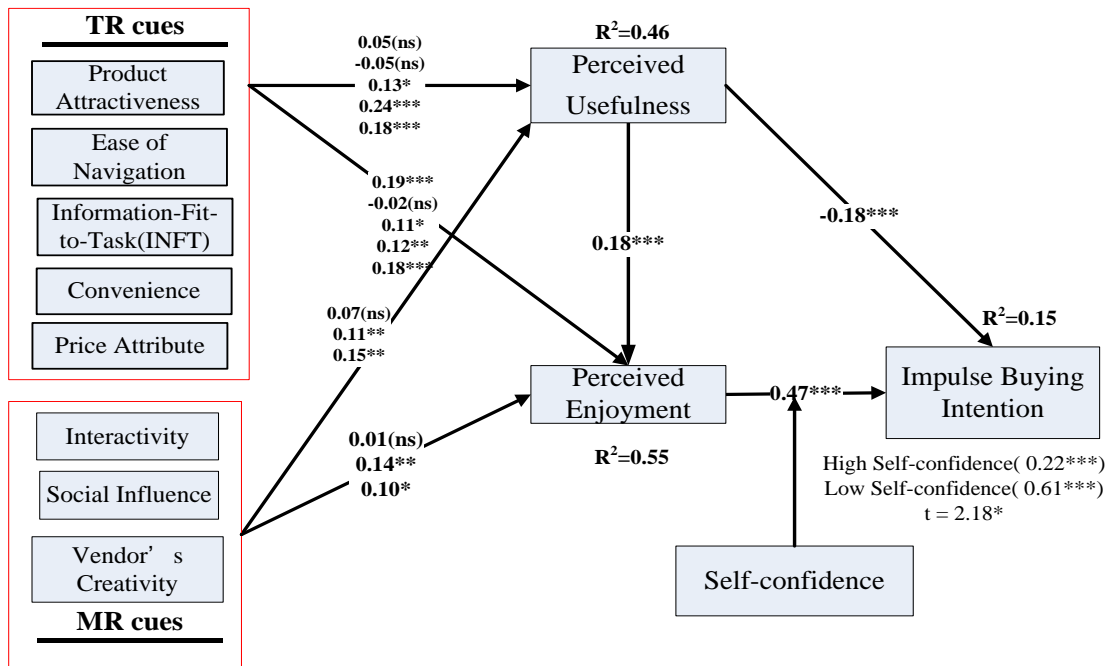
*Numbers with color mean AVE. The others are the correlation coefficient for dimension. CR = composition reliability

**PA, product attractiveness; EN, ease of navigation; INFT, information fit-to-task; Con, convenience; Price, price attribute; INT, interactivity; SI, social influence; VC, vendor's creativity; PU, perceived usefulness; PE, perceived enjoyment; IBI, impulse buying intention; C, self-confidence.

4.3 Structural model analysis and results

The results of the hypotheses analysis are summarized in Figure 2 and Table 3.

Figure 2. The results for hypothesis test (***) $P < 0.001$, ** $P < 0.01$, * $P < 0.05$



As shown in Table 3, factors including INFT, convenience, price attribute, social influence, and vendor's creativity affected perceived usefulness significantly. Factors including product attractiveness, INFT, convenience, price attribute, social influence, and the vendor's creativity affected perceived enjoyment significantly. Also, self-confidence significantly moderated the connection between perceived enjoyment and impulse buying intention. The R^2 values of the endogenous constructs can be explained through the explanatory power of the proposed model. The explained variance is 46% for perceived usefulness, 55% for perceived enjoyment, and 15% for impulse buying intention. All of the R^2 values were greater than the minimum criteria of 0.10 (Falk and Miller, 1992).

Moreover, we suggested a hypothesis that self-confidence is moderating the relationship between perceived enjoyment and impulse buying. Self-confidence is the moderating variable. On the while, perceived enjoyment is the corresponding exogenous variable, and impulse buying intention is the endogenous variable. We aim to explore the effect of perceived enjoyment on impulse buying under different levels of self-confidence. Within interference analysis, Loh (2002) mentioned that when the sample data is skewed, and the sample average is exploited as the basis for grouping, populations will be highly uneven. To solve this problem, the median should be adopted as the basis for grouping. We also adopted the median as

the grouping basis in this study. We divided the sample into two groups: high personal self-confidence group and low personal self-confidence group according to the different levels of personal self-confidence. After

Table 3. Tests of hypothesized relationships.

Hypothesis	Relationship	Coefficient	t value	Result	
H1a: Product attractiveness → Perceived usefulness	+	0.05	1.06	Not support	
H1b: Product attractiveness → Perceived enjoyment	+	0.19	4.24(***)	Support	
H2a: Ease of navigation → Perceived usefulness	+	-0.05	1.01	Not support	
H2b: Ease of navigation → Perceived enjoyment	+	-0.02	0.27	Not support	
H3a: INFT → Perceived usefulness	+	0.13	2.29(*)	Support	
H3b: INFT → Perceived enjoyment	+	0.11	2.08(*)	Support	
H4a: Convenience → Perceived usefulness	+	0.24	5.02(***)	Support	
H4b: Convenience → Perceived enjoyment	+	0.12	2.51(*)	Support	
H5a: Price attribute → Perceived usefulness	+	0.18	3.48(***)	Support	
H5b: Price attribute → Perceived enjoyment	+	0.17	2.94(**)	Support	
H6a: Interactivity → Perceived usefulness	+	0.07	1.49	Not support	
H6b: Interactivity → Perceived enjoyment	+	0.01	0.26	Not support	
H7a: Social influence → Perceived usefulness	+	0.11	2.98(**)	Support	
H7b: Social influence → Perceived enjoyment	+	0.14	2.87(**)	Support	
H8a: Vendor's creativity → Perceived usefulness	+	0.15	2.71(**)	Support	
H8b: Vendor's creativity → Perceived enjoyment	+	0.10	2.13(*)	Support	
H9: Perceived usefulness → Perceived enjoyment	+	0.18	4.42(***)	Support	
H10: Perceived enjoyment → Impulse buying intention	+	0.47	9.26(***)	Support	
H11: Perceived usefulness → Impulse buying intention	-	-0.18	3.41(***)	Support	
H12: Moderator: self-confidence	+	low	0.61	2.18(*)	Support
		high	0.22		

Note. *** P < 0.001, ** P < 0.01, * P < 0.05.

excluding the mediation group from the study, we examined the t-test for the estimated values generated by the Smart PLS to calculate the significance of the interference effect. This study refers to the t-test method proposed by Keil et al. (2000) to verify statistical significance. The test results are shown in Table 4.

The effects of different self-confidence levels are significantly different so that H12 is significantly supported. In the high self-confidence group, the self-confidence level interferes the effect of perceived enjoyment on impulse purchase intention. The direct effect before adding the interference variable was 0.47. However, the effect decreased significantly lower to 0.22 after adding moderator variables. In the low self-confidence group, self-confidence level also influenced to the effect of perceived enjoyment on impulse buying intention. The effect rose to 0.61 after adding the moderator variables, and the effect of perceived

enjoyment on the impulse buying intention was enhanced significantly. Therefore, the effect of self-confidence on perceived enjoyment on impulse buying intention is significant. We can interpret that users with low personal self-confidence are more affected by online group purchases than those with higher self-confidence.

Table 4. Statistical comparison of paths for high and low self-confidence groups.

Self-confidence	Sample size	Perceived enjoyment → Impulse buying intention			t-value for comparison
		Standard deviation	Path coefficient	t-value	
Low	109	0.03	0.61	19.11***	2.18*
High	101	0.05	0.22	4.89***	

Notes: *** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$.

5. Conclusion and suggestions

5.1 Conclusion

This study aimed to explore consumer's impulse buying for online group buying based on the S-O-R model modified by Parboteeah et al. (2009). We integrated 5 TR cues and 3 MR cues and adopted self-confidence as a moderator in this model. Our research findings are as follows.

For TR cues, our findings show that product attractiveness positively affects perceived enjoyment. Group buying websites should provide products with high satisfaction, high quality, and high market demand. For example, specific product combinations accompanying with holidays or products with the promotion can increase product attractiveness and consumer's enjoyment for purchase. However, our study results do not show a significant relationship between product attractiveness and perceived usefulness. One explanation of this result might be related to the launching timing and speed of new product on group buying websites. To et al. (2007) mentioned that the timing for retail websites to launch new products is behind the timing for consumers to change their purchase behavior. Consumers consider that product categories and product combinations are limited and feel that group buying websites are not different from other types of websites. Therefore, group buying websites should focus on responding to consumer's demands and provide more flexible options. Second, ease of navigation shows no effect neither on usefulness nor enjoyment. Verhagen and van Dolen (2011) suggested that consumers treat ease of navigation as an essential factor during an online purchase, not a factor for the encouragement of impulse buying. It means that ease of navigation does not affect consumer's impulse buying behavior. Group buying websites should emphasize the website's advantages and strengths, assuring the easiness of website user interface. Third, our results show INFT positively and significantly affects perceived usefulness and perceived enjoyment. This illustrates that group buying websites should increase information quality. Information content should be professional and sufficient. Moreover, experience from social members can also be added, leading to an increase in the reliability of the information. It allows consumers to understand products and group buying activities clearly. Also, convenience positively and significantly affects perceived usefulness and perceived enjoyment. It means that group buying websites should provide a convenient purchasing process, without any spatial or time limitations. The more convenient the group buying website is, the higher the evaluation for consumer's perceived usefulness and perceived enjoyment, leading to increased intention to consumer's group buying behavior. Finally, the price attribute affects perceived usefulness and perceived enjoyment positively

significant. Low price is the most attractive factor in group buying websites, so website managers should keep holding this factor. The price of the products should be reasonable so that consumers buy more products at economic prices. Providing price comparison between group buying websites is also an excellent strategy to increase consumer's perceived usefulness and perceived enjoyment.

For MR cues, previous research shows that interactivity affected neither perceived usefulness nor perceived enjoyment. Compared to an offline store, consumers usually do not interact with website staff during purchase. This may be due to the technical restriction of virtual purchase environments (To et al., 2007). Allowing more interactivity between website staff and consumers can overcome this restriction. For instance, responses to consumer's inquiries should be practical, and not just official statements. Second, social influence affected perceived usefulness and perceived enjoyment positively significant. Consumers make decisions about whether to join a group buying activity after evaluating other consumer's experiences. Group buying websites can share such experiences with famous people or bloggers to draw the consumer's attention to products or group buying activities. Experiences from other people will increase the usefulness of group buying websites, and the strength of group buying websites will spread via consumer or social networks. Third, the vendor's creativity affected perceived usefulness and perceived enjoyment positively significant. Not only adding creative new products but also group buying websites can introduce novel marketing strategies. For example, providing discounts for holiday products or promoting special advertisement/marketing events may increase group buying creativity. In doing so, the consumer's impulse buying intention could be induced.

Moreover, our results show that perceived usefulness has a positive significant effect on perceived enjoyment. Group buying websites should emphasize the strength of products and group buying activities. By doing so, consumers can believe that purchasing through group buying websites is a useful and correct decision. Once consumers think that group buying via websites is useful, this will bring consumers joyful and pleasurable experiences for online group buying. Most importantly, we found that both perceived enjoyment and perceived usefulness affects impulse buying intention positively significant. Perceived enjoyment plays a central role in impulse buying. Group buying websites should emphasize the joyful part of the group buying by exploiting discount campaigns, exclusive products, or creative marketing ideas, which will bring consumers surprises. On the other hand, usefulness increases impulse buying. Group buying websites should shorten consumer's consideration time for purchase. Providing sufficient and diverse information that helps consumers acknowledge the usefulness and advantage of products can reduce consumer's consideration time and increase the probability of group buying behavior.

Lastly, our results show that self-confidence significantly affects the relationship between perceived enjoyment and impulse buying intention. Consumers with low self-confidence are prone to emphasize the enjoyment of group buying activities, resulting in reducing judgment. For such consumers, it is easier to induce impulse buying behavior than those who are not. (Mossman and Ziller, 1968). Group buying websites should provide joyful activities to increase impulse buying intention for consumers with lower self-confidence. On the other hand, group buying websites should provide a whole new group buying activities to attract consumers with high self-confidence. It can increase perceived enjoyment for such consumers, leading to elevate impulse buying intention.

5.2 Research contribution

5.2.1 Academic contribution

Our study adopted the S-O-R model as a basic structure and integrated several factors to explore the relationship between such factors and impulse buying intention. We summarize our conclusions resulted from the survey data as follows.

First, in comparison to the S-O-R model proposed by Parboteeah et al. (2009) and by ours, we discussed online group buying intention via multi-elemental factors. We found more explanatory power for perceived usefulness and perceived enjoyment, resulting in a more complete investigation of impulse buying behavior. In this study, we found that the effect of perceived usefulness and perceived enjoyment on impulse buying intention is consistent with results from Parboteeah et al. (2009). Therefore, we suggest that several mediators or internal reactions can be integrated into our model with more explanatory power for exploring impulse buying behavior.

Second, the difference in the model between Parboteeah et al.'s (2009) and ours is lied on how to connect perceived usefulness and impulse buying intention. We can find that the relationship between perceived usefulness and impulse buying intention is contrary. This part of the result is also consistent with the previous study (Park et al., 2012).

Finally, Parboteeah et al. (2009) did not integrate individual characteristics into the S-O-R model. They employed self-confidence as a moderator. We believe that a discussion of impulse buying intention for online group buying would be complete only if individual characteristics were integrated into an examination. Research results are consistent with the previous study (Hsu et al., 2012).

5.2.2 Clinical contributions

Due to the competition of online group buying websites, the ratio of new visitors is higher than the current visitors in most of the group buying websites. Since the cost of attracting new visitors is higher than the maintenance cost for the current visitors, increasing consumer's impulse buying behavior is important for website managers to balance the cost of attracting new consumers. We hope that our study may serve as references for group buying website managers to develop adequate managerial strategies to run businesses. We provide some practical suggestions as followings:

First, group buying websites should provide accurate purchase information. This will make consumers to find products rapidly. For example, consumers think that group buying websites serve as gatekeepers by providing price comparison. In addition, social influence will increase consumer's trust for online group buying products via online word-of-mouth(eWOM) from celebrities, friends or family. On the other hand, increasing interaction between consumers and group buying activities also elevates consumer's intention for impulse buying. This will make consumers enjoy their purchase without restricting time, location or mobile devices. Furthermore, group buying websites should increase creativities to increase consumer's perceived usefulness. For instance, new products, new marketing strategies, or new product combinations will stimulate consumer's perceived usefulness, leading to increased consumer's impulse buying intention.

Second, group buying websites should notice whether online products fit consumer's demands. If the sales are different from what it was expected, the reasons should be found immediately. Products or brands with consumer's expectation and confirmation of a combination between products and prices play crucial roles in increasing consumer's perceived enjoyment.

Third, group buying websites should emphasize enjoyment. It can increase consumer's perceived enjoyment and sequential impulse buying behavior. On the other hand, group buying websites should provide the comparison results immediately, leading to reduce the time for consumer's reasonable thinking.

Finally, group buying websites should provide some purchase activities with more challenges. This will attract consumers with high self-confidence. For consumers with low self-confidence, external environments will increase their impulse buying behavior, such as joyful purchase activities.

5.3 Research limitations and future suggestions

Based on the research results, we propose topics for further research as follows.

First, factors, such as different stimuli, purchase experiences, positive and negative affect, can be considered for future work (Bellini et al., 2017; Mohan et al., 2013), and hedonic value and utilitarian value (Lim et al., 2017).

Second, self-efficacy received increasing attention as another important individual difference variable (Wang et al., 2013). Self-efficacy is the individuals' belief that they have the capability to perform a particular behavior (Bandura (1986)). Many previous studies adopted self-efficacy to predict behavioral intentions in the Internet context (e.g., Chang et al., 2017; Kim et al., 2009; Li et al., 2018; Peña-García et al., 2020; Thakur, 2018; Wang et al., 2013). Self-efficacy in online stores is defined as the belief of consumers in their capacity to successfully use the Internet to search for information and purchase products through online stores (Li et al., 2018); consumers with higher self-efficacy in online stores are expected to show greater online purchase intention. Hence, self-efficacy is a good choice as an individual difference variable. It is worth considering in future research.

Third, though we try to recruit users with representation on group buying websites, our data was biased toward the young, highly educated, female population (more than seventy percent of subjects) in Taiwan. Data from a more balanced background, i.e., age, education, and gender, would be preferred for better generalization. We suggest exploring online group buying behavior on different locations or countries as comparative analyses in the future.

Finally, we can integrate some significant variables into our model to explain more about impulse buying intention, such as word-of-mouth (WOM), relationship variables (e.g., trust and perceived value) (Kim, 2011; Shahin Sharifi and Rahim Esfidani, 2014), regulatory focus theory (Lin et al., 2018), consumers' attitudes toward websites' marketing (Wilkins et al., 2016), and product return intention (Powers and Jack, 2013, 2015; Lim et al., 2017; Workman and Lee, 2019; Chen et al., 2020).

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