International Journal of Electronic Commerce Studies
Vol.12, No.1, pp.119-142, 2021
doi: 10.7903/ijecs.1971

Exploring Consumers' Impulse Buying Behavior on Online Apparel Websites: An Empirical Investigation on Consumer Perceptions

Chao-Hsing Lee
Shangrao Normal University
jesse5501@gmail.com

Chien-Wen Chen
Feng Chia University
chencw@fcu.edu.tw

Shu-Fen Huang*
Chihlee University of Technology
Suefn2001@gmail.com

Yen-Ting Chang
Feng Chia University
alice971130@gmail.com

Serhan Demirci
Chaoyang University of Technology
sdemirci@cyut.edu.tw

ABSTRACT

In the information age, more and more people are buying products on the Internet. Impulsive buying within the online shopping research is gradually receiving more attention, as it contributes significantly to online retail profit. This study proposed a research model based on the Stimulus Organism Response (S-O-R) framework to finding the antecedents of consumer reaction and behavior, specifically to distinguish task-relevant stimuli (price attribute and convenience; i.e. TR cues) and mood-relevant stimuli (visual appeal, social influence, vendor creativity; i.e. MR cues), perceived usefulness and perceived enjoyment to explore which factors affect online impulse buying behavior. Data from 446 customers who bought apparel products online were collected to evaluate the research model.

The results indicate that convenience, visual appeal, social influence, and the vendor's creativity have a positive impact on perceived usefulness; price attribute, visual appeal, social influence, and the vendor's creativity have a positive impact on perceived enjoyment. The results also indicate that convenience and social influence are the two strongest predictors of perceived usefulness and perceived enjoyment respectively. Also, it was observed that impulse buying tendency and perceived enjoyment both significantly affect consumers' urge to buy impulsively, whereas perceived usefulness indirectly influences consumers' urge to buy impulsively through perceived enjoyment.

Keywords: Urge to buy impulsively, S-O-R framework, TR cues, MR cues, impulse buying tendency

1. INTRODUCTION

In recent years, more and more people are using online stores. Global sales in the e-retail industry will decelerate to a 16.5% growth rate in 2020 (down from 20.2% last year), a collective $3.914 trillion in ecommerce sales this year [1]. In 2020, Asia-Pacific and North America lead the regional totals for both retail and retail e-commerce sales, Asia-Pacific will account for 42.3% of retail sales worldwide, North America will capture 22.9%, and Western Europe will make up 16.2% [1]. This clearly shows that e-commerce is playing an increasingly important role in the retail industry. An interesting topic of interest in e-commerce research is impulsive buying. In the online shopping environment, online stores make shopping more convenient and provide a place for impulsive consumers to satisfy their shopping desires. Impulse buying, which is common among online shoppers, occurs when a consumer experiences a sudden, habitually powerful, and insistent urge to buy something [2, 3]. As online shopping websites are becoming more like physical shopping malls [4], all kinds of different promotional stimuli are likely to trigger impulsive buyers. Research shows that about 40% of all online expenditures are coming from impulse buying [5]. Similarly, a 2015 survey showed that 83% of online consumers expressed that they had an impulse buying experience [6]. It is clear that the online shopping environment contributes significantly to profits for the retailers; hence, it is important to understand online impulse buying phenomena. Previous research on impulse buying focused mainly focused on two different views: a shopping environment [7] and personal characteristics [8]. Eroglu et al. [9] emphasized the online shopping environment factors affecting individual internal cognitive and emotional states as a driver of impulse buying behavior.

The S-O-R (Stimulus-Organism-Response) framework proposed by Mehrabian and Russell [10] is derived from environmental psychology and illustrates the impact of external environmental stimuli on the consumers' internal perceptions and effects on the final behavior of individuals. It has been the most popular theoretic lens for studying online impulse buying behavior [7, 11, 12]. Parboteeah et al. [7] used the S-O-R framework to investigate online impulse buying, and separated website features into task factors (Task-Relevant Cues, TR Cues) that aid in the attainment of the online consumer's shopping goals, and emotional factors (Mood Relevant Cues, MR Cues) that do not directly support a particular shopping goal. However, Parboteeah et al. [7] took just navigability as a TR cue and visual appeal as an MR cue in their study. Of course, various web characteristics can be suggested as TR and MR cues, and they may vary in how they are presented to and perceived by online users [7]. Hence, various stimulus factors (including TR and MR cues) for the current information age are necessary, as described in detail in the next section.

In addition to external stimulus factors, Hsu et al. [13] also mentioned that personal traits (impulse buying tendency) cause differences in impulse buying behaviors among consumers. Therefore, when investigating impulse buying behaviors, the role of personality traits cannot be ignored. Xiang et al. [11], Huang [14] Bellini et al. [15], Chung et al. [16], Lim et al. [17], and Atulkar and Kesari [18] pointed out that the personal tendency towards impulse buying will result in increased impulse buying behavior. This study also includes the impulse buying tendency within a research framework.

This study contributes towards a better understanding of the antecedents of consumers' online impulse buying behavior, which could increase benefit to online apparel website retailers. First, this study proposed a framework based on the S-O-R model [3, 5, 10, 11, 19] to find the antecedents of consumer reaction and behavior, especially to distinguish the TR cues (price attribution and convenience) and MR cues (visual appeal, social influence, and vendor creativity) to investigate consumer's impulse buying for online apparel websites. Second, user impulsive buying tendency is also examined, as it is an important factor affecting consumers' urge to buy impulsively and the profit of enterprises; thus, customer impulsive buying tendency will be considered in this study. Finally, previous studies [20, 21, 22] indicated that gender and age are two important control variables regarding the urge to buy impulsively, which are included in this study. These three research contributions are superior to Parboteeah et al. [7] research.

The rest of this study is structured, as follows. First, we provide a complete theoretical background, followed by the development of the statistical hypotheses and a research framework. We then describe the empirical study conducted to test our statistical hypothesis. Next, and then we discuss the analytical results and their academic and implications. Finally, the research limitations and future research suggestions are presented.

2. LITERATURE REVIEW

2.1 Impulse Buying

Impulse buying is described as a sudden, compelling, and hedonic purchasing behavior that lack deliberate consideration of all available information and alternatives [7]. Sometimes it shows an irresistible and continuous manner so that even the consumers without a specific plan for shopping or purchasing specific products, they are suddenly eager to buy something immediately as they enter the shopping environment, which means impulse buying is a complex and hedonistic behavior [23]. Due to the complexity and universality of impulsive buying in different product categories or shopping environments, this behavior has become an important issue in consumer behavior research [7, 24]. Because online shopping channels allow consumers to enjoy more advantages, they became an additional option for impulsive shoppers [25]. Previous research also shows that impulse buying is common in online shopping environments [26]. Most research in the past has focused on how website interfaces affect online impulse buying behavior [7, 27, 28]. Any external factor related to shopping will lead to urge to buy impulsively, not just website interfaces. For example, factors like price attributes, visual appeal, social influence, and vendor creativity result in impulsive buying decisions [5, 11].

2.2 S-O-R Framework

The S-O-R (Stimulus-Organism-Response) framework assumes that environmental stimuli affect an individual's cognitive and affective reactions, which in turn lead to response behaviors [10]. The S-O-R framework aims to explain an individual's perceptions and behavior as a response to external stimuli. Stimuli include factors outside an individual's control, which affect the internal states of organisms when exposed to external stimuli. Organism acts as a bridge for connecting stimulus and behavior, and an organism regulates the final behavior in response to the

stimulus [29]. Response acts as a summary factor in response to results for an organism's regulation. The S-O-R approach was modified for different types of research based on different subjects [7, 30]. Today's online impulse buying research explores the relationship between environmental factors, consumer perception, emotional response, and behavioral outcomes [31]. The S-O-R approach not only provides a traditional basis for customer behavior research but also helps to identify specific environmental characteristics and overall use or shopping experience. Various researches proved that environmental features of an online store could help predict consumers' impulse buying behavior [32]. In the following section, components of the S-O-R framework are explained in detail.

2.2.1. Stimulus

The first element of the S-O-R framework is the stimulus. Stimulus refers to individuals' perceptions and then influence their response [7]. Previous environmental psychology research classified the features of websites into task-relevant stimuli (TR cues) and mood-relevant stimuli (MR cues) and regarded them as stimuli of consumers' reactions [9]. TR cues include website design, arrangement, and content to assist consumers in completing purchase goals [9]. By contrast, MR cues help to make the shopping experience more pleasurable [9, 33]. Parboteeah et al. [7] claimed that various web characteristics can be suggested as TR and MR cues; various stimulus factors (including TR and MR cues) as described in detail as follows:

In TR cues, price attribute is one of the main reasons for participating in online shopping [34], and can be used to predict consumers' impulsive purchase behavior [25]. A survey by Chinese Marketing Information Service Inc. (CMISI) [35] shows that the main reason for shoppers buying clothes online is "delivery convenience" (59.7%), followed by "purchase convenience" (57.4%). Moreover, Liao et al. (2012) confirmed that convenience is one of the reasons for consumers to join online group buying. Childers et al. [36] suggested that convenience is proportional to both usefulness and joyfulness. Karbasivar and Yarahmadi [37] also confirmed that rapid payment through credit cards could increase the convenience and probability of impulse buying in online group buying. Thus, we also included convenience in this research model.

In MR Cues, Parboteeah et al. [7] and Xiang et al. [11] have shown that users of e-commerce sites pay more attention to visual appeal and focus more on the information available on the website. More information provided by an online store brings more enjoyment to the user, increasing the visual appeal of a website, thus resulting in consumers' impulse buying behavior. Silvera et al. [38] also mentioned that social influence would increase impulse buying. Shu [39] and Shiau and Lou [40] also confirmed that social influence and purchase intention show strong associations in the online group buying environment. Besides, Dawson and Kim [25] showed that the creative use of commodities can effectively stimulate consumer impulse buying behavior. Similarly, Shiau and Luo [40] also showed that sellers' ingenuity in products or services may affect consumers' purchase intentions. In the presence of domestic online apparel brands, the innovation of apparel products has the effect of attracting customer attention and thus increasing the value of the product. This in turn stimulates impulsive buying behavior. Based on the previous studies, this study will include visual appeal, social influence, and vendor creativity.

2.2.2 Organism

The organism is an internal state of an individual which is represented by cognitive and affective states. Internal individual psychological status can be divided into cognitive reactions and affective reactions [31]. The cognitive reaction is the mental process when the consumer interacts with the stimulus, which refers to evaluation [9]. We know that TR cues focus on the execution of purchase tasks, and different types of TR cues decide website usefulness [7]; the most critical factor for evaluating cognitive reactions is perceived usefulness [36]. By contrast, affective reactions are related to an individual's emotional response when he/she is stimulated by the environment. In the model of Parboteeah et al. [7], perceived enjoyment was investigated for capturing affective reactions to the environment. Both cognitive and affective reactions will also be affected by TR cues and MR cues, and both cognitive and affective reactions will affect final impulse buying behavior [7]. Moreover, impulse buying tendency (impulsiveness) is another significant determinant of impulse buying. Liu et al. [5], Chen and Yao [19], and Chopdar and Balakrishnan [22] refer to impulsiveness as a psychological organism that directly seeks a response. Impulsiveness denotes "a consumer tendency to buy spontaneously, non-reflectively, immediately, and kinetically" [8]. Chen and Yao [19] indicate that the shoppers with impulse buying tendency are more likely to have impulse buying behaviors than others. Therefore, this study uses perceived usefulness (cognitive reaction), perceived enjoyment (affective reaction), and impulse buying tendency as organism variables to investigate the final impulse buying behavior.

2.2.3 Response

The third element of the S-O-R approach is the response. Response refers to the outcome of consumers' reactions toward the online impulse-buying stimuli and their internal evaluations [31]. In the context of impulse buying, the response has two aspects, namely, the urge to buy impulsively and the actual impulse buying behavior [11]. Previous studies adopted urge to buy impulsively rather than actual impulse purchase to do the research [7, 11, 41]; therefore, this study also adopts urge to buy impulsively to measure individuals' impulsivity rather than using impulse buying behavior. Based on Chen and Yao's [19] study, consumers' urge to buy impulsively is defined as "after receiving external stimuli in shopping scenarios, consumers exhibit a strong emotional response which prompts them to unscrupulously, irrationally, willingly, and instantly purchase products they did not plan to purchase." In this study, the focus response in the proposed model is the urge to buy impulsively of users on apparel websites.

3. PROPOSED MODEL AND DEVELOPMENT OF HYPOTHESES

As mentioned above, based on the S-O-R approach, price attribute, convenience, visual appeal, social influence, and vendor creativity will affect urge to buy impulsively through perceived enjoyment and perceived usefulness. Also, impulse buying tendency is integrated into the research model used in this study. All hypotheses from our model were developed and presented as follows:

3.1 Relationship between Price Attribute and Perceived Usefulness, Perceived Enjoyment

Lepkowska-White [42] mentioned that product discounts or promotions can attract consumers. To et al. [43] pointed out that price attribute will positively influence the utilitarian motivation of Internet shopping. Yu et al. [44] showed that consumers' perceptions of the price attribute of media tablets will positively affect customer's perceived usefulness. Zhu et al. [45] pointed out that the perceived price advantage positively influences the perceived usefulness of cross-buying. Walsh et al. [46] showed that price perceptions have a positive impact on the customer's pleasure emotions. Moreover, Park et al. [47] indicated that a price attribute on a shopping website positively influences utilitarian and hedonic web browsing for apparel products. Therefore, this study postulates the following hypotheses:

H1a: Price attribute affects perceived usefulness positively.

H1b: Price attribute affects perceived enjoyment positively.

3.2 Relationship between Convenience and Perceived Usefulness, Perceived Enjoyment

Convenience means that consumers spend less time and effort in online shopping [48, 49] mentioned that convenience is proportional to usefulness and enjoyment. Zhang et al. [50] suggested that the perceived convenience of healthcare wearable technology has a positive effect on perceived usefulness. Zhu et al. [45] pointed out that one-stop shopping convenience positively influences the perceived usefulness of cross-buying. Moreover, Kim et al. [51] also pointed out that convenience of using tour information services will increase consumer's perceived enjoyment. Therefore, this study hypothesized that:

H2a: Perceived convenience affects perceived usefulness positively.

H2b: Perceived convenience affects perceived enjoyment positively.

3.3 Relationship between Visual Appeal and Perceived Usefulness, Perceived Enjoyment

Visual appeal is a key factor in determining the degree of consumer interest in the display media richness and product information presented by shopping websites [52]. It also helps consumers evaluate whether the online store atmosphere meets their inner emotional state based on visual cues, and eventually make consumption decisions [53]. Yang et al. [54] pointed out that the visual attractiveness of wearable devices will positively affect customers' perceived enjoyment. Previous research stated visual appeal of a website can have a strong effect on the evaluation and enjoyment of them [5, 55] and usefulness [56]. Parboteeah et al. [7], Xiang et al. [11], and Zheng et al. [53] pointed out that when shoppers browse online stores; the online store's visual appeal affects consumers' perceived usefulness and arouses excitement. Thus, we propose the following hypotheses:

H3a: Visual appeal positively affects perceived usefulness.

H3b: Visual appeal positively affects perceived enjoyment.

3.4 Relationship between Social Influence and Perceived Usefulness, Perceived Enjoyment

Social influence is described as a person's perception of the social pressure put on him/her to perform or not to perform a behavior [57]. Koenig-Lewis et al. [58], Bailey et al. [59], and Zhang et al. [60] suggested that social influence can help consumers to obtain new information regarding product usefulness. Terzis et al. [61] also mentioned that individual characteristics increase perceived usefulness via social influence, leading to affect behavioral intention indirectly. Li [62] found that social influence will increase the emotional part of using a social network. Shu [39] suggested that social influence in the form of recommendations from friends, family, and colleagues will increase intention for online group buying. Park et al. [63] indicated that social influence has a positive effect on the enjoyment benefit of the user using a mobile payment service. Therefore, the following hypothesis is formulated:

H4a: Social influence affects perceived usefulness positively.

H4b: Social influence affects perceived enjoyment positively.

3.5 Relationship between Vendor Creativity and Perceived Usefulness, Perceived Enjoyment

Vendor creativity means the creation of new ideas or new products to fit consumer's requirements [40]. Hampton-Sosa [64] indicated that perceived creativity facilitation is positively related to perceived usefulness and enjoyment in the music streaming system context. Moreover, Arviansyah et al. [65] mentioned that creative vlogs will result in positive responses (perceived usefulness and enjoyment) and can leave an impression on the viewers. Therefore, it is hypothesized that:

H5a: Vendor creativity affects perceived usefulness positively.

H5b: Vendor creativity affects perceived enjoyment positively.

3.6 Relationship between Impulse Buying Tendency and Urge to Buy Impulsively

Consumers with this impulse buying tendency are more likely than others to want to own a specific product immediately without careful assessment of consequences [19, 66]. In other words, consumers with high impulse buying tendencies belong to the irrational person group who lack cognitive control [5, 66], so they are more likely to have impulse buying than other consumers who do not have this tendency [11, 14, 15, 16, 17, 18, 23, 67, 68].Therefore, it is hypothesized that:

H6: Impulse buying tendency positively affects consumers' urge to buy impulsively.

3.7 Relationship between Perceived Usefulness and Urge to Buy Impulsively

Perceived usefulness is defined as the degree to which the online shopper believes that their shopping efficiency will be enhanced by utilizing a specific website [7]. According to Chea and Luo [69], Akram et al. [2], and Zheng et al. [53], perceived usefulness of product information available on a website is considered an

important precursor towards consumers' online buying behavior. Wu et al. [70] and Chen et al. [71] pointed out that the occurrence of impulse buying in consumers with perceived usefulness is relatively high. Thus, this study hypothesized that:

H7: Perceived usefulness has a positive impact on urge to buy impulsively.

3.8 Relationship between Perceived Usefulness and Perceived Enjoyment

Development of cognition will be induced based on individual understanding of stimulation, resulting in response for affective reactions [32]. In the context of social commerce platforms (SCP), Xiang et al. [11] mentioned that the more useful a social commerce platform is perceived to be, the more enjoyable it is to use. Zhou and Feng [72] mentioned that perceived usefulness would have a positive influence on the perceived enjoyment of video calling usage. Besides, Demirci et al. [73], Parboteeah et al. [7, 74], Terzis et al. [61], and Zheng et al. [53] also mentioned that positive cognitive reactions are capable of increasing the emotional part of impulse buying. As a result, this study hypothesized that:

H8: Perceived usefulness affects perceived enjoyment positively.

3.9 Relationship between Perceived Enjoyment and Urge to Buy Impulsively

Verhagen and van Dolen [26] showed that positive affect was the main driver of online impulse buying behavior. Park et al. [47] and Ku and Chen [55] indicated that hedonic browsing focuses on the entertaining, fun, and delightful aspects of shopping behavior, and positively influence consumers' impulse buying behavior. In the social commerce platform context, Xiang et al. [11] showed that users' perceived enjoyment of a social commerce platform positively affects their urge to buy impulsively. Moreover, Parboteeah et al. [7, 74], Shen and Khalifa [30], Chen et al. [71], and Zheng et al. [53] pointed out that when consumers browse online stores; the perceived enjoyment of customers affects consumers' urge to buy impulsively. Therefore, we propose the following hypothesis:

H9: Perceived enjoyment affects urge to buy impulsively positively.

3.10 Control variables

To examine the effectiveness of the research model, we included control variables that might affect impulse buying. Some studies have shown that female customers experience more impulse buying [71, 75, 76]. Coley and Burgess [20] indicate that female impulsive buyers tend to buy products such as jewelry and clothes that express their emotional stylistic appearance feelings while men bought items related to technology (electronics, hardware, and computer software) and sports memorabilia. Age also influences impulsive buying, with younger consumers being more likely to buy impulsively than older consumers [21, 22, 77, 78].

In conclusion, we propose the research model, as shown in Figure 1.

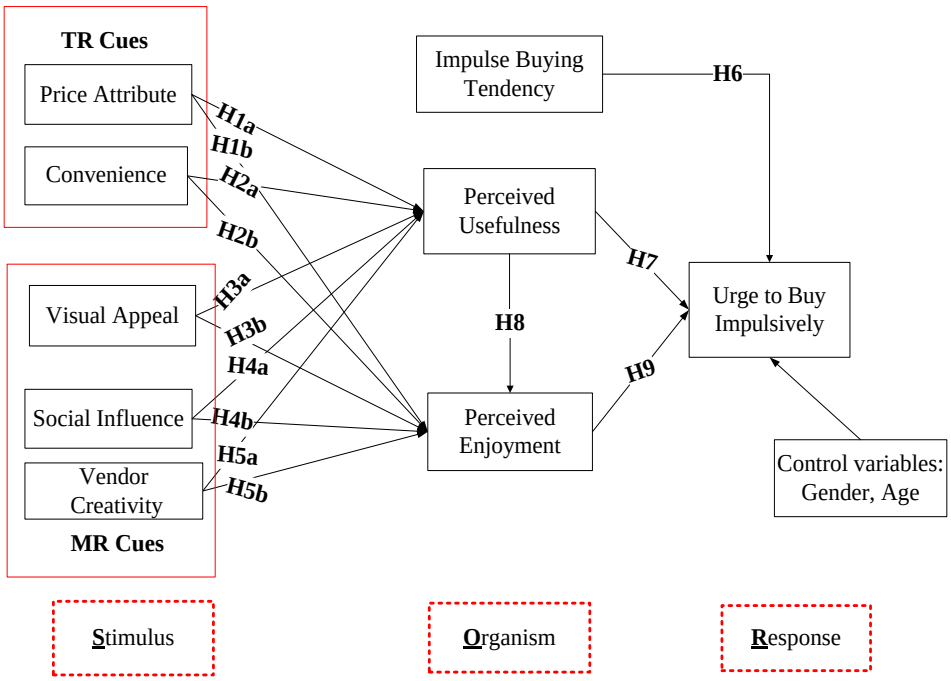

Figure 1. Research Model

4. DATA COLLECTION AND ANALYSIS

4.1. Measures

Since the objective of this study was to explore the factors that influence customers' urge to buy impulsively, we modified and adjusted the questions to fit the online apparel websites context. All the items used in our questionnaire scale were measured using a seven-point Likert-type scale ("strongly disagree" 1 to "strongly agree" 7). A pretest and a pilot test were performed to validate the questionnaire measurements. The pretest involved six participants (two professors in the e-commerce field and four online apparel consumers) who were familiar with online shopping behavior. They were asked to provide comments by eliminating redundant or unrelated measurement items. In the pilot test, we invited 45 respondents from the population of online apparel websites to confirm their reliability and validity. Some minor modifications to the content of the items were solicited before the formal survey was conducted. The appendix lists all of the questionnaire items. The study analyzed the collected data with the partial least squares (PLS). The psychometric properties of the constructs (i.e., validity and reliability) together with relationships between the constructs in the research model were examined simultaneously [79]. Compared with the covariance-based structural equation model, PLS is variance-based and suitable for predictive applications and theory building. There are two steps to test the goodness of model fit: First, the measurement model was tested using a confirmatory factor analysis (CFA) to assess the discriminant and convergent validity. Next, a structural model analysis was performed to test the significance of the path coefficients and validate the hypothesis of the research hypothesis.

4.2 Data Collection

Data collection was accomplished via an online questionnaire. We set up a questionnaire using Google Forms and distributed it on social media platforms. The questionnaire was distributed from April 5th to May 15th, 2020. A total of 512 responses were received, we obtained 446 usable responses. We had to drop 66 participants during the data selection process because some of them did not engage in any shopping activity. The sample demographics are shown in Table 1.

Among these effective samples, 63.7% of the respondents were female, 36.3% were male, and at least 43.9% were students. A total of 77.5% of the respondents were between the ages of 19 and 35, and 60.3% had earned a bachelor's degree. A total of 35.2% of the respondents spent at least one session per week visiting online apparel websites, whereas 28.7% spent at least once per month visiting online apparel websites. The ranks for spending time in visiting online apparel websites are "30 minutes ~ 1 hour" and "less than 30 minutes", accounting for 49.1% and 31.4%, respectively. The ranks for spending money on online apparel websites are "NT$ 501~800" and "NT$ 801~1200", accounting for 33.2% and 32.1%, respectively. Seven apparel shopping websites frequently visited by participants included: apparel official websites (e.g. Lative, Tokichoi, UNIQLO, OB design, etc., 50.0%), Shopee auction (23.2%), Yahoo! Shopping mall (9.6%), PChome Shopping mall (5.8%), Taobao Shopping mall (7.2%), and others (4.1%). In order to validate the representativeness of our collected sample, a comparison of the socio-demographic characteristics of our respondents with those reported in a survey of ecommerce use in Taiwan, as conducted by the Market Intelligence and Consulting Institute (MIC) [80]. MIC is one of the leading organizations in providing an abundance of professional information on Internet demographics and trends. The comparison revealed a close match between the two sample pools.

Table 1. Demographics

Measure	Items	Frequency	Percentage (%)
Gender	Male	162	36.3
	Female	284	63.7
Age	Under 18	15	3.4
	19-24	192	43.0
	25-35	154	34.5
	36-45	51	11.4
	Over 45	34	7.6
Education	Junior high school or less	13	2.9
	High school	19	4.3
	University	269	60.3
	Graduate school	132	29.6
	Ph. D.	13	2.9
Occupation	Full-time student	196	43.9
	Military, public service, and education	55	12.3
	Finance	11	2.5
	Communication worker	6	1.3
	Freelancer	26	5.8
	Service industry	66	14.8
	Manufacturing	27	6.1

Table 1. Demographics (cont.)

Measure	Items	Frequency	Percentage (%)
	Specialist	8	1.8
	Information industry	32	7.2
	housewife	13	2.9
	Agricultural/forestry/fishing/herding	2	0.4
	Other(retirement and unemployment)	4	0.9
Frequency of visiting apparel websites	at least once each day	52	11.7
	at least once per week	157	35.2
	at least once per month	128	28.7
	at least once per three months	58	13.0
	at least once per half-year	31	7.0
	at least once per year	20	4.5
Time for visiting apparel websites	< 30 minutes	140	31.4
	30~60 minutes	219	49.1
	1~3 hours	70	15.7
	3~6 hours	17	3.8
	More than 6 hours	0	0.0

4.3 Common Method Bias

Common method bias (CMB) was deemed a potential concern in this study, because independent and dependent data from the same source are collected [81]. This study conducted two tests to examine the common method bias. First, Harman's single-factor test is used [81]; un-roasted exploratory factor analysis indicated that the largest factor explained 38.55% of the overall variance (< 50%). The total variance explained was 74.46% in un-rotated factor analysis; therefore, common method bias in this study is not a significant problem. Second, another common method factor that was linked to all single-indicator constructs was included in the Smart PLS model; this was recommended by Liang et al. [82]. The results demonstrated that the loadings of the principal variables were all significant ($p < 0.001$), and none of the common method factor loadings was significant. These results further indicated that common method bias was unlikely to be a serious concern in this study.

5. ANALYSIS AND RESULTS

5.1 Assessment of The Measurement Model

The first step in the analysis was to evaluate the measurement model based on four criteria: First, reliability was evaluated in terms of internal consistency of items. Here, Cronbach's α and composite reliability were used. In Table 2, the Cronbach's of all constructs were above 0.7, and exceeded the threshold values suggested by Fornell and Larcker [83] and Hair et al. [84]; furthermore, the composite reliability ranged from 0.891 to 0.953, exceeding the threshold value of 0.7 [84], indicating that the research model measures possess sufficient construct reliability.

In addition, Table 2 shows that the standardized factor loadings for different measurement items were above 0.70 and the average variance extracted (AVE) for all constructs were above 0.50 (range from 0.671 to 0.808); these suggest that the proposed model possess sufficient convergent validity [85]. To address discriminant validity, we first compare average variance extracted (AVE) and Shared Variance between variables as suggested by Fornell and Larcker [83]. The square root of the average variable explained of any given construct was greater than the corresponding inter-measure correlation. Table 3 represents the related results where all of the square root of the AVE (highlighted in bold) are greater than the correlations between a variable that confirms the discriminant validity of the constructs.

Table 2. Reliability and Validity

Constructs	Factor Loading	Cronbach's Alpha	Average Variance Extracted (AVE)	Composition Reliability
Convenience	0.792~0.846	0.884	0.684	0.915
Impulse Buying Tendency	0.806~0.875	0.897	0.708	0.924
Price Attribute	0.873~0.926	0.882	0.808	0.927
Perceived Enjoyment	0.876~0.917	0.939	0.803	0.953
Perceived Usefulness	0.841~0.878	0.913	0.741	0.935
Social Influence	0.730~0.915	0.814	0.734	0.891
Urge to Buy Impulsively	0.781~0.924	0.917	0.753	0.938
Visual Appeal	0.751~0.877	0.877	0.671	0.911
Vendor Creativity	0.787~0.898	0.879	0.734	0.917

Table 3. Discriminant Validity

	CV	IBT	PA	PE	PU	SI	UBI	VA	VC
Convenience	**0.827**								
Impulse Buying Tendency	0.225	**0.841**							
Price Attribute	0.540	0.261	**0.899**						
Perceived Enjoyment	0.499	0.576	0.444	**0.896**					
Perceived Usefulness	0.637	0.352	0.439	0.651	**0.861**				
Social Influence	0.176	0.571	0.280	0.488	0.356	**0.857**			
Urge to Buy Impulsively	0.204	0.687	0.291	0.539	0.343	0.497	**0.868**		
Visual Appeal	0.612	0.367	0.540	0.599	0.543	0.332	0.37	**0.819**	
Vendor Creativity	0.471	0.372	0.453	0.534	0.534	0.445	0.33	0.601	**0.857**

Note: *Diagonal elements (in bold) are the square root values of the average variance extracted (AVE). Off-diagonal elements are the correlations among constructs; CV = Convenience; IBT = Impulse Buying Tendency; PA = Price Attribute; PE = Perceived Enjoyment; PU = Perceived Usefulness; SI = Social Influence; UBI = Urge to Buy Impulsively; VA = Visual Appeal; VC = Vendor Creativity.

5.2 Analysis of Structural Model

Following the validation and reliability verification, we applied bootstrapping analysis with 5000 re-samples to the whole sample to examine the structural validity of the model (hypotheses testing). As our study is based on a strong theoretical foundation of the S-O-R framework, high factor loadings, and involves a fairly high sample size (n= 446), Smart PLS is an appropriate statistical analysis tool [53, 86]. The results of the structural path analysis are presented in Table 4 and Figure 2. The structural model suggests that convenience ($\beta = 0.459$, $p < 0.001$) strongly correlated with perceived usefulness. Other statistically significant correlating independent variables were vendor creativity ($\beta = 0.187$, $p < 0.001$), social influence ($\beta = 0.158$, $p < 0.001$), and visual appeal ($\beta = 0.089$, $p < 0.01$). In comparison to this, price attribute ($\beta = 0.014$, $p = 0.856$) did not correlate with perceived usefulness. Similarly, visual appeal ($\beta = 0.235$, $p < 0.001$) strongly correlated with perceived enjoyment. Other statistically significant correlating independent variables were social influence ($\beta = 0.233$, $p < 0.001$), vendor creativity ($\beta = 0.050$, $p < 0.01$), and price attribute ($\beta = 0.047$, $p < 0.01$). In comparison to this, convenience ($\beta = 0.016$, $p = 0.866$) did not correlate with perceived enjoyment. The study findings support hypotheses H1b, H2a, H4a, H4b, H5a, and H5b, but not H1a, and H2b (see Table 4 and Figure 2). Besides, impulse buying tendency ($\beta= 0.728$, $p < 0.001$) was positively related to a consumer's urge to buy impulsively, thus supporting H6. Furthermore, perceived usefulness directly and positively influences consumers' perceived enjoyment ($\beta = 0.372$, $p < 0.001$) (H8 is supported), whereas perceived usefulness indirectly influences consumers' urge to buy impulsively through perceived enjoyment ($\beta = 0.007$; $p = 0.895$) (H7 is not supported). Perceived enjoyment directly and positively influences consumers' urge to buy impulsively ($\beta = 0.110$, $p < 0.001$) (H9 is supported). Also, the control variable, age, had a significant positive effect on consumers' urge to buy impulsively, while gender didn't have an effect on consumers' urge to buy impulsively.

The R^2 value refers to the value of the exogenous variables that explain the variation in the endogenous variables, which is used as an indicator of the overall predictive power of the model. Chen et al. [21] recommended that the value of R^2 for exogenous variables should be more than 0.20 to be statistically viable. As shown in Figure 2, the explained variance is 50.3% for perceived usefulness, 56.4% for perceived enjoyment, and 65.3% for urge to buy impulsively. All of the R^2 values exceed the minimum criteria of 0.20, except for return intention [21].

Table 4. Tests of Hypothesized Relationships

Hypothesis	Path Coefficient	t-value	Decision
H1a：Price Attribute→ Perceived Usefulness	0.014	1.063	Non-supported
H1b：Price Attribute→ Perceived Enjoyment	0.047	2.790(**)	Supported
H2a： Convenience → Perceived Usefulness	0.459	26.480(***)	Supported
H2b：Convenience → Perceived Enjoyment	0.016	1.1087	Non-supported
H3a：Visual Appeal→ Perceived Usefulness	0.089	4.030(***)	Supported
H3b：Visual Appeal→ Perceived Enjoyment	0.235	11.433(***)	Supported
H4a：Social Influence →Perceived Usefulness	0.158	10.732(***)	Supported
H4b：Social Influence →Perceived Enjoyment	0.233	13.435(***)	Supported
H5a：Vendor Creativity→ Perceived Usefulness	0.187	8.300(***)	Supported
H5b：Vendor Creativity →Perceived	0.050	2.233(**)	Supported

Enjoyment			

Table 4. Tests of Hypothesized Relationships (cont.)

Hypothesis	Path Coefficient	t-value	Decision
H6：Impulse Buying Tendency→ Urge to Buy Impulsively	0.728	55.083(***)	Supported
H7：Perceived Usefulness→ Urge to Buy Impulsively	0.016	1.255	Non-supported
H8：Perceived Usefulness→ Perceived Enjoyment	0.372	16.567(***)	Supported
H9：Perceived Enjoyment→ Urge to Buy Impulsively	0.110	5.254(***)	Supported

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

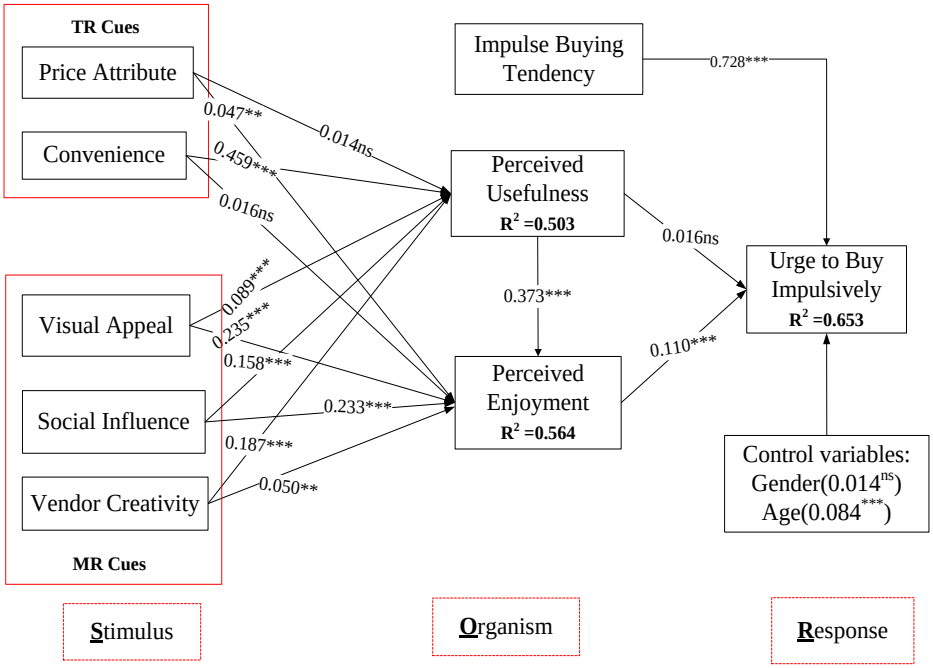

Figure 2. The results for the hypothesis test.

(*** P＜0.001, ** P＜0.01, * P＜0.05)

6. CONCLUSION AND DISCUSSION

6.1. Research Findings

This study aimed to explore consumers' impulse buying for online apparel websites based on the S-O-R framework modified from Parboteeah et al. [7]. Our research findings are described as follows:

1. For TR cues, our findings show that price attribute has no significant effect on perceived usefulness, but price attribute has a positive impact on perceived enjoyment; we found that when consumers browse the apparel website, the

preferential prices and promotional activities provided by online apparel websites can make consumers feel more valued when browsing apparel products. Besides, convenience positively and significantly affects perceived usefulness; while convenience shows no effect on consumer perceived enjoyment. This means that online apparel websites should provide a convenient purchasing process, without any spatial or time limitations; the more convenient the online apparel website is, the higher the value of the consumer's perceived usefulness, leading to increased intention to consumer's urge to buy impulsively.

2. For MR cues, our findings show that visual appeal has a positive impact on perceived usefulness and perceived enjoyment. This finding was analogous to the view proposed by Zheng et al. [53] and Parboteeah et al. [7]. Unlike previous studies, this study considered two factors (perceived usefulness and perceived enjoyment) at the same time, because the web pages and layout of the apparel websites can not only help consumers feel entertained, but also reduce the difficulty of consumers' shopping efforts. Also, social influence had a significant impact on both perceived usefulness and perceived enjoyment; it means that apparel website websites can share some experiences with famous people or celebrities [87, 88] to increase consumer's feeling or emotion (usefulness and enjoyment as the organism factors in this study). Third, vendor creativity positively affects perceived usefulness and perceived enjoyment, which means that the more consumers browse apparel websites, the more the new products and sales activities will stimulate consumers' feelings.
3. Impulse buying tendency has a positive impact on the urge to buy impulsively. It indicate that when a consumer have impulsive trait and would like to have an apparel product immediately, the more impulse buying they will have, as it is more difficult for highly impulsive consumers to maintain self-control, so it is easy for them to generate their urge to buy impulsively. This result is consistent with several previous studies [5, 11, 17, 19, 41].
4. Our results show that perceived usefulness has a significant positive significant effect on perceived enjoyment. Apparel websites should emphasize the strength of their products and their promotional activities. Thus, consumers will believe that purchasing through apparel websites is a useful and correct decision, and then promote their joyful and pleasurable experiences because of their urge to buy impulsively. Most importantly, we found that perceived usefulness has no direct effect on the consumer's urge to buy impulsively, but perceived enjoyment has a positive impact on the urge to buy impulsively. This result is consistent with Wu et al. [70] and Zheng et al. [53] studies.
5. Finally, the control variable, age, had a significant positive effect on consumers' urge to buy impulsively; this result is consistent with Chen et al.'s [21] study. Age also influences impulsive buying, with younger consumers between the ages of 19 and 35 being more likely to buy impulsively.

6.2 Research contribution

6.2.1 Academic contribution

First, in this study, using the S–O–R approach as a theoretical framework, a model of impulse buying in the context of online apparel purchases was proposed and tested. Features that were deemed pertinent for apparel websites and include TR cues (price attribution and convenience), MR cues (visual appeal, social influence, and vendor creativity) were used as stimulus. The results of this study confirm that these

features are important in the context of online apparel product purchases, given that the reliability coefficients which were above 0.80. These results provide support for the initial work by Parboteeah et al. [7, 74]. Further, these results provide evidence that the impulsive sales of apparel products can be increased through the manipulation of these features on the apparel's websites [5, 47, 74].

Second, impulse buying tendency has the greatest influencial effects on consumers' urge to buy impulsively. We also found that the explained variance is 64.4% for urge to buy impulsively is higher than Parboteeah et al.'s [7] research with explaining 39.3% of the variance in the urge to buy impulsively construct. These results provide support for the impulse buying tendency that cannot be ignored. This is the second academic contribution to our study.

Third, according to the results, in comparison to perceived usefulness, perceived enjoyment had a strong and positive effect on consumers' urge to buy impulsively, which was consistent with a previous study [53]. This study further revealed that perceived usefulness had an indirect influence on the urge to buy impulsively via affecting reaction (perceived enjoyment); perceived enjoyment played an important role in consumers' behavior intention on online apparel websites.

6.2.2 Practical Contributions

This study offers practical implications for apparel website managers by offering insight into ways to improve their impact on consumers' urge to buy impulsively and offering management strategies; apparel proprietors on the internet must increase both external stimulus (TR cues and MR cues) for impulse consumers, which will promote apparel websites to have more profit. Several managerial implications are further obtained from this research, as follows:

First, in an online apparel shopping context, convenience is a significant driving factor in consumers' perceived usefulness, eventually discouraging perceived enjoyment of the apparel websites. In other words, consumers spend less time and effort in the online apparel websites are more likely to increase consumers' perceived usefulness (i.e., gathering information, without going out for shopping); apparel websites should provide accurate purchase information to make consumers find products rapidly without restricting time, location or mobile devices. This finding implies that convenience can be a marketing stimulus for consumers' perceived usefulness to engage in rational informational processing during online apparel products shopping context [47].

Second, visual appeal has a significant effect on the perceived enjoyment of apparel products; that is, the visual appeal of an apparel product has a direct effect on the perceived enjoyment of apparel. This finding supports the notion that visual appeal is a marketing stimulus to promote consumers' enjoyment [7, 11]. Therefore, online apparel website managers can use product virtualization technology, e.g., 3D virtual reality technology [89], to provide the apparel product information on the website and convert first-time visitors or web browsers into impulse buyers while shopping online.

Third, social influence increases the consumer's usefulness and enjoyment of online apparel products. Apparel website managers can utilize eWOM from celebrities on social media, friends, or family to help consumers to obtain new product information and increase online market share for apparel products. This may

increase a consumer's perceived usefulness and enjoyment, as well as increase their sequential impulse buying behavior.

Fourth, according to the analytical results, perceived enjoyment had a strong and positive effect on consumers' urge to buy impulsively than perceived usefulness. On the online apparel websites, consumers who browsed to have fun and disregard the outcomes inclined to have affective reactions would eventually have impulse buying behavior. Therefore, apparel websites can provide a variety of apparel products and promotion activities to promote consumers' positive emotional responses (perceived enjoyment).

Finally, people with impulsive traits are more likely to spend more money on apparel products without carefully considering the consequences of impulsive buying [17, 66]. Therefore, the online apparel website managers could offer additional shopping functions and reduce barriers to impulse buying; this can encourage impulsive consumers could to spend more money and time on apparel products. For example, the apparel product recommendation system should be incorporated with the online shopping websites to assist consumers in finding suitable clothing that facilitates their impulsive buying behavior [86].

6.3 Research Limitations and Future Suggestions

Based on the research results, several new possibilities are revealed for future exploration:

First, we can explore the usage of apparel website services based on different locations or countries in future suggestions. Next, some significant variables can be integrated into this model to increase the explanation of this model to urge to buy impulsively, such as positive and negative affect [15, 19, 23, 26], hedonic value and utilitarian value [47, 17, 53], para-social interaction [11, 15, 19, 23, 26, 87, 88], pleasure and arousal [19, 90, 91]; flow experience [70, 87], consumers' attitudes toward the brand [88], and website quality and other related quality variables (e.g. trust, satisfaction, and commitment) [70, 92].

7. REFERENCES

[1] eMarketer (2020). Global commerce 2020，Ecommerce Decelerates amid Global Retail Contraction but Remains a Bright Spot, https://www.emarketer.com/content/global-ecommerce-2020 . Accessed 18 Oct 2020.

[2] U. Akram, P. Hui, M. K. Khan, S. K. Saduzai, Z. Akram and M. H. Bhati, "The plight of humanity: Online impulse shopping in China," Human Systems Management, 36(1), pp.73-90, 2017.

[3] U. Akram, P. Hui, M. K. Khan, Y. Tanveer, K. Mehmood and Ahmad, W. "How website quality affects online impulse buying," Asia Pacific Journal of Marketing and Logistics, 30(1), pp.235-256, 2018.

[4] S. H. Liao, P. H. Chu, Y. J. Chen and C. C.Chang, "Mining customer knowledge for exploring online group buying behavior," Expert Systems with Applications, 39(3), pp.3708-3716, 2012.

[5] Y. Liu, H. Li and F. Hu, "Website attributes in urging online impulse purchase: An empirical investigation on consumer perceptions," Decision Support Systems, 55(3), pp.829-837, 2013.

[6] eMarketer, "Millennials admit to impulse shopping: More than 80% of millennials have made an impulse purchase," 2015. https://www.emarketer.com/Article/Millennials-Admit-Impulse-Shopping/1011834
[7] D. V. Parboteeah, J. S. Valacich and J. D. Wells, "The influence of website characteristics on a consumer's urge to buy impulsively," Information Systems Research, 20(1), pp.60-78, 2009.
[8] D. W. Rook and R. J. Fisher, "Normative influences on impulsive buying behavior. Journal of Consumer Research," 22(3), pp.305-313, 1995.
[9] S. A. Eroglu, K. A. Machleit and L. M. Davis, "Atmospheric qualities of online retailing: A conceptual model and implications," Journal of Business Research, 54(2), pp.177-184, 2001.
[10] A. Mehrabian and J. A. Russell, "An approach to environmental psychology," the MIT Press, 1974.
[11] L. Xiang, X. Zheng, M. K.Lee and D. Zhao, "Exploring consumers' impulse buying behavior on social commerce platform: The role of parasocial interaction," International Journal of Information Management, 36(3), pp.333-347, 2016.
[12] H. Xu, , K. Z. Zhang and S. J. Zhao, "A dual systems model of online impulse buying," Industrial Management & Data Systems, 120(5), pp.845-861, 2020.
[13] C. L. Hsu, K. C. Chang and M. C. Chen, "Flow Experience and Internet Shopping Behavior: Investigating the Moderating Effect of Consumer Characteristics," Systems Research and Behavioral Science, 29(3), pp.317-332, 2012.
[14] L. T. Huang, "Flow and social capital theory in online impulse buying," Journal of Business Research, 69(6), pp.2277-2283, 2016.
[15] S. Bellini, M. G. Cardinali and B. Grandi, "A structural equation model of impulse buying behaviour in grocery retailing," Journal of Retailing and Consumer Services, 36, pp.164-171, 2017 .
[16] N. Chung, H. G. Song and H. Lee, "Consumers' impulsive buying behavior of restaurant products in social commerce," International Journal of Contemporary Hospitality Management, 29(2), pp.709-731, 2017.
[17] S. H. Lim, S. Lee and D. J. Kim, "Is online consumers' impulsive buying beneficial for E-commerce companies? An empirical investigation of online consumers' past impulsive buying behaviors," Information Systems Management, 34(1), pp.85-100, 2017,.
[18] S. Zheng and B. Kesari, "Role of consumer traits and situational factors on impulse buying: does gender matter?," International Journal of Retail & Distribution Management, 46(4), pp.386-405, 2018.
[19] C. C. Chen and J. Y. Yao, "What drives impulse buying behaviors in a mobile auction? The perspective of the Stimulus-Organism-Response model," Telematics and Informatics, 35, pp.1249-1262, 2018.
[20] A. Coley, and B. Burgess, "Gender differences in cognitive and affective impulse buying," Journal of Fashion Marketing and Management: An International Journal, 7(3), pp.282-295, 2003.
[21] Y. Chen, Y. Lu, B. Wang and Z. Pan, "How do product recommendations affect impulse buying? An empirical study on WeChat social commerce," Information & Management, 56(2), pp.236-248, 2019.
[22] P. K. Chopdar and J. Balakrishnan, "Consumers response towards mobile commerce applications: SOR approach," International Journal of Information

Management, 53, pp.102106, 2020. https://doi.org/10.1016/j.ijinfomgt.2020.102106
[23] W. H. Chih, C. H. J. Wu and H. J. Li, "The antecedents of consumer online buying impulsiveness on a travel website: individual Internal factor perspectives," Journal of Travel & Tourism Marketing, 29(5), pp.430-443, 2012.
[24] P. Sharma, B. Sivakumaran and R. Marshall, "Impulse buying and variety seeking: a trait-correlates perspective," Journal of Business Research, 63(3), pp.276–283, 2010.
[25] S. Dawson and M. Kim, "Cues on apparel web sites that trigger impulse purchases," Journal of Fashion Marketing and Management, 14(2), pp.230- 246, 2010.
[26] T. Verhagen and W. V. Dolen, "The influence of online store beliefs on consumer online impulse buying: A model and empirical application," Information & Management, 48(8), pp.320-327, 2011.
[27] M. Koufaris, "Applying the technology acceptance model and flow theory to online consumer behavior," Information Systems Research, 13(2), pp.205-223, 2002.
[28] J. D. Wells, V. Parboteeah and J. S. Valacich, "Online impulse buying: understanding the interplay between consumer impulsiveness and website quality," Journal of the Association for Information Systems, 12(1), pp.32-56, 2011.
[29] A. M. Fiore and J. Kim, "An integrative framework capturing experiential and utilitarian shopping experience," International Journal of Retail & Distribution Management, 35(6), pp.421-442, 2007.
[30] K. N. Shen and M. Khalifa, "System design effects on online impulse buying," Internet Research, 22(4), pp.396-425, 2012.
[31] T. K. Chan, C. M. Cheung and Z. W. Lee, "The state of online impulse-buying research: A literature analysis," Information & Management, 54(2), pp.204-217, 2017.
[32] J. H. Kim and S. Lennon, "Music and amount of information: do they matter in an online apparel setting? The International Review of Retail," Distribution and Consumer Research, 22(1), pp.55-82, 2012.
[33] B. J.Babin, W. R. Darden and M. Griffin, "Work and/or fun: measuring hedonic and utilitarian shopping value," Journal of Consumer Research, 20 (4), pp.644-656, 1994.
[34] W. Huang and C. Chien, "Consumer behavior analysis with fruit group-buying," International Journal of Intelligent Technologies and Applied Statistics, 4(1), pp.95-107, 2011.
[35] CMISI Chinese Marketing Information Service Inc, "A survey for apparel brand preference and purchase intention," 2016. http://www.cmisi.com.tw/industry-tracking.
[36] T. L. Childers, C. L. Carr, J. Peck and S. Carson, "Hedonic and utilitarian motivations for online retail shopping behavior," Journal of Retailing, 77(4), pp.511-535, 2001.
[37] A. Karbasivar and H. Yarahmadi, "Evaluating effective factors on consumer impulse buying behavior," Asian Journal of Business Management Studies, 2(4), pp.174-181, 2011.
[38] D. H. Silvera, A. M. Lavack and F. Kropp, "Impulse buying: the role of affect, social influence, and subjective wellbeing," Journal of Consumer Marketing, 25(1), pp.23- 33, 2008.

[39] W. Shu, "Why do people make online group purchases? risk avoidance, sociability, conformity, and perceived playfulness," MIS Review, 17(1), pp.63-88, 2011.
[40] W. L.Shiau and M. M. Luo, "Factors affecting online group buying intention and satisfaction: a social exchange theory perspective," Computers in Human Behavior, 28(6), pp.2431-2444, 2012.
[41] S. W. Lin and Louis Y. S. Lo, "Evoking online consumer impulse buying through virtual layout schemes," Behaviour & Information Technology, 35(1), pp.38-56, 2016.
[42] E. Lepkowska-White, "Online store perceptions: how to turn browsers into buyers?," Journal of Marketing Theory and Practice, 12(3), pp.36-47, 2004.
[43] P. L. To, C. Liao and T. H. Lin, "Shopping motivations on Internet: A study based on utilitarian and hedonic value," Technovation, 27(12), pp.774-787, 2007 ,.
[44] J. Yu, H. Lee, I. Ha and H. Zo, "User acceptance of media tablets: An empirical examination of perceived value," Telematics and Informatics, 34(4), pp.206-223, 2017.
[45] D. H. Zhu, Y. W. Wang and Y. P. Chang, "The influence of online cross-recommendation on consumers' instant cross-buying intention," Internet Research, 28(3), pp.604-622, 2018.
[46] G. Walsh, E. Shiu, L. M. Hassan, N. Michaelidou and S. E. Beatty, "Emotions, store-environmental cues, store-choice criteria, and marketing outcomes," Journal of Business Research, 64(7), pp.737–744, 2011.
[47] E. J. Park, E. Y. Kim, V. M. Funches and W. Foxx, "Apparel product attributes, web browsing, and e-impulse buying on shopping websites," Journal of Business Research, 65(11), pp.1583-1589, 2012.
[48] K. H. Chung and J. I. Shin, "The antecedents and consequents of relationship quality in internet shopping," Asia Pacific Journal of Marketing and Logistics, 22(4), pp.473-491, 2010.
[49] S. Gupta and H. W. Kim, "Value-driven Internet shopping: the mental accounting theory perspective," Psychology & Marketing, 27(1), pp.13–35, 2010.
[50] M. Zhang, M. Luo, R. Nie and Y. Zhang, "Technical attributes, health attribute, consumer attributes, and their roles in adoption intention of healthcare wearable technology," International Journal of Medical Informatics, 108, pp.97-109, 2017.
[51] J. Kim, K. Ahn and N. Chung, "Examining the factors affecting perceived enjoyment and usage intention of ubiquitous tour information services: A service quality perspective," Asia Pacific Journal of Tourism Research, 18(6), pp.598-617, 2013.
[52] H. Zhang, Y. Lu, B. Wang and S. Wu, "The impacts of technological environments and co-creation experiences on customer participation," Information & Management, 52(4), pp.468-482, 2015 .
[53] X. Zheng, J. Men, F. Yang and X. Gong, "Understanding impulse buying in mobile commerce: An investigation into hedonic and utilitarian browsing," International Journal of Information Management, 48, pp.151-160, 2019.
[54] H. Yang, J. Yu, H. Zo and M. Choi, "User acceptance of wearable devices: An extended perspective of perceived value," Telematics and Informatics, 33(2), pp.256-269, 2016.
[55] E. C. S. Ku and C. D. Chen, "Flying on the clouds: how mobile applications enhance impulsive buying of low cost carriers," Service Business, 14, pp.23–45, 2020.

[56] S. F. Pengnate and R. Sarathy, "An experimental investigation of the influence of website emotional design features on trust in unfamiliar online vendors," Computers in Human Behavior, 67, pp.49-60, 2017.
[57] I.Ajzen and M. Fishbein, "Understanding attitudes and predicting social behavior. Englewood Cliffs," NJ: Prentice-Hall, 1980.
[58] N. Koenig-Lewis, M. Marquet, A. Palmer and A. L. Zhao, "Enjoyment and social influence: predicting mobile payment adoption," The Service Industries Journal, 35(10), pp.537-554, 2015.
[59] A. A. Bailey, C. M. Bonifield and A. Arias, "Social media use by young Latin American consumers: An exploration," Journal of Retailing and Consumer Services, 43, pp.10-19, 2018.
[60] T. Zhang, D. Tao, X. Qu, X. Zhang, J. Zeng, H. Zhu and H. Zhu, "Automated vehicle acceptance in China: Social influence and initial trust are key determinants," Transportation research part C: emerging technologies, 112, pp.220-233, 2020.
[61] V. Terzis, C.N. Moridis and A. A. Economides, "How student's personality traits affect computer-based assessment acceptance: Integrating BFI with CBAAM," Computers in Human Behavior, 28(5), pp.1985-1996, 2012.
[62] D. C. Li, "Online social network acceptance: a social perspective," Internet Research. 21(5), pp.62-580, 2011.
[63] J. Park, J. Ahn, T. Thavisay and T. Ren, "Examining the role of anxiety and social influence in multi-benefits of mobile payment service," Journal of Retailing and Consumer Services, 47, pp.140–149, 2019.
[64] W. Hampton-Sosa, "The impact of creativity and community facilitation on music streaming adoption and digital piracy," Computers in Human Behavior, 69, pp.444–453, 2017.
[65] Arviansyah, A. P. Dhaneswara, A. N. Hidayanto and Y. Q. Zhu, " Vlogging: Trigger to Impulse Buying Behaviors," In Pacific Asia Conference on Information Systems Conference, 2018.
[66] Y. Chang, "The influence of media multitasking on the impulse to buy: A moderated mediation model," Computers in Human Behavior, 70, pp.60-66, 2017.
[67] A. J. Badgaiyan and A. Verma, "Intrinsic factors affecting impulsive buying behavior- Evidence from India," Journal of Retailing and Consumer Services, 21(4), pp.537-549, 2014.
[68] L. Y. Leong, N. I. Jaafar and A. Sulaiman, "Understanding impulse purchase in Facebook commerce: does Big Five matter?," Internet Research, 27(4), pp.786-818, 2017.
[69] S. Chea and M. M. Luo, "Post-adoption behaviors of e-service customers: The interplay of cognition and emotion," International Journal of Electronic Commerce, 12(3), pp.29-56, 2008.
[70] L. Wu, K. W.Chen and M. L. Chiu, "Defining key drivers of online impulse purchasing: A perspective of both impulse shoppers and system users," International Journal of Information Management, 36(3), pp.284-296, 2016.
[71] T. Y. Chen, T. L. Yeh and W. C. Lo, "Impacts on Online Impulse Purchase through Perceived Cognition," Journal of International Consumer Marketing, 29(5), pp.319-330, 2017.
[72] R. Zhou and C. Feng, "Difference between leisure and work contexts: The roles of perceived enjoyment and perceived usefulness in predicting mobile video

calling use acceptance," 2017, Frontiers in psychology, 8, 350. DOI: 10.3389/fpsyg.2017.00350
[73] S. Demirci, C. W. Chen and J. Y. Liao, "Understanding the determinants of consumer impulse buying on online group buying websites in Taiwan: S-O-R approach," Asian Journal of Information and Communications, 12(1), pp.18-43, 2020.
[74] D. V. Parboteeah, D. C. Taylor and N. A. Barber, "Exploring impulse purchasing of wine in the online environment," Journal of Wine Research, 27(4), pp.322-339, 2016.
[75] M. A. H. Saleh, "An investigation of the relationship between unplanned buying and post-purchase regret," International Journal of Marketing Studies, 4(4), pp.106-120, 2012.
[76] F. Imam, "Gender differences in impulsive buying behavior and post-purchasing dissonance under incentive conditions," Journal of Business Strategies, 7(1), pp.23-29, 2013.
[77] S. Aral and D. Walker, "Identifying influential and susceptible members of social networks," Science, 337(6092), pp.337-341, 2012.
[78] X. Hu, X. Chen and R. M. Davison, "Social support, source credibility, social influence, and impulsive purchase behavior in social commerce," International Journal of Electronic Commerce, 23(3), pp.297-327. 2019,
[79] W. W. Chin, "Issues and opinion on structural equation modeling," MIS Quarterly, 22(1), pp.7-16, 1998.
[80] Market Intelligence and Consulting Institute (MIC), "The survey of online shopping behavior in Taiwan in 2019," 2019. http://mic.iii.org.tw/index.asp. accessed 25 Jul 2020.
[81] P. M. Podsakoff, S. B. MacKenzie J. Y. Lee and N. P. Podsakoff, "Common method biases in behavioral research: a critical review of the literature and recommended remedies," Journal of applied psychology, 88(5), pp.879-903, 2003.
[82] H. Liang, N. Saraf, Q. Hu and Y. Xue, "Assimilation of enterprise systems: the effect of institutional pressures and the mediating role of top management," MIS Quarterly, 31(1), pp.59-87, 2007.
[83] C. Fornell and D. F. Larcker, "Evaluating Structural Equation Models with Unobservable and Measurement Error," Journal of Marketing, 18(1), pp.39-50, 1981.
[84] J. F. Hair, B. Black, B. Babin and R. E. Anderson, "Multivariate data analysis: A global perspective (7th ed.)," 2010 Prentice-Hall, 2010.
[85] J. F. Hair, C. M. Ringle and M. Sarstedt, "Partial least squares structural equation modeling: Rigorous applications, better results, and higher acceptance," Long Range Planning, 46(1-2), pp.1-12, 2013.
[86] C. T. Lin, C. W. Chen, S. J. Wang and C. C. Lin, "The influence of impulse buying toward consumer loyalty in online shopping: a regulatory focus theory perspective," Journal of Ambient Intelligence and Humanized Computing, pp.1-11, 2018.
DOI: https://doi.org/10.1007/s12652-018-0935-8
[87] C. L. Hsu, "How vloggers embrace their viewers: Focusing on the roles of para-social interactions and flow experience," Telematics and Informatics, 49, pp.101364, 2020.
https://doi.org/10.1016/j.tele.2020.101364

[88] Y. Q. Zhu, D. Amelina and D. C. Yen, "Celebrity endorsement and impulsive buying intentions in social commerce-The case of Instagram in Indonesia: Celebrity Endorsement," Journal of Electronic Commerce in Organizations, 18(1), pp.1-17, 2020. DOI: 10.4018/JECO.2020010101

[89] H. J. Kang, J. H. Shin and K. Ponto, "How 3D Virtual Reality Stores Can Shape Consumer Purchase Decisions: The Roles of Informativeness and Playfulness," Journal of Interactive Marketing, 49, pp.70-85, 2020.

[90] Y. Liu, Q. Li, T. Edu, L. Jozsa and I. C. Negricea, "Mobile shopping platform characteristics as consumer behavior determinants," Asia Pacific Journal of Marketing and Logistics, 2019. DOI 10.1108/APJML-05-2019-0308

[91] K. Yang, H. M. Kim and J. Zimmerman, "Emotional branding on fashion brand websites: harnessing the Pleasure-Arousal-Dominance (PAD) model," Journal of Fashion Marketing and Management: An International Journal, 2020. DOI 10.1108/JFMM-03-2019-0055.

[92] T. P. Liang, Y. T. Ho, Y. W. Li and E. Turban, "What drives social commerce? The role of social support and relationship quality," International Journal of Electronic Commerce, 16(2), pp.69-90, 2011.

Appendix. Measurement scales

Construct		Measure	Adapted source
Convenience	CV1	This apparel website provides ease procedures for ordering	[48][50]
	CV2	A first-time buyer can purchase from this apparel website without much help.	
	CV3	The apparel website is very convenient to use.	
	CV4	The apparel website allows me to make a purchase whenever I want.	
	CV5	The apparel website allows me to make shopping without going out.	
Impulse Buying Tendency	IBT1	I often buy things spontaneously.	[5][11][19]
	IBT2	If I see something new on the apparel website, I want to buy it.	
	IBT3	Sometimes I cannot resist the temptation to buy something.	
	IBT4	I often want to buy things when I see something nice.	
	IBT5	"Buy now, think about it later" describes me.	
Price Attribute	PA1	The apparel website carries products with reasonable prices.	[43][45][47]
	PA2	Discounted prices are very cheap on the apparel website.	
	PA3	The price of products on the apparel website is economical.	
Perceived Enjoyment	PE1	Shopping with apparel website was exciting.	[7][11][74]
	PE2	Shopping with apparel website is enjoyable.	
	PE3	Shopping with apparel website is interesting.	
	PE4	I found my visit to apparel website is fun.	

Construct		Measure	Adapted source
	PE5	Shopping with apparel website is fun for its own sake.	
Perceived Usefulness	PU1	Using apparel websites can save shopping time in searching and buying products.	[7][11][60][74]
	PU2	Apparel websites are helpful in buying what I want online.	
	PU3	Using the apparel website can increase my shopping productivity in searching and buying products.	
	PU4	Using the apparel website can enable me to have a better search and purchase of products than using other websites.	
	PU5	Using the apparel website can increase my shopping effectiveness.	
Social Influence	SI1	Using the apparel website is common in my society.	[58][59][60][63]
	SI2	My family members and good friends have influenced my use of the apparel website.	
	SI3	People think those who use the apparel website are cool.	
	SI4	Those who use the apparel website easily get the attention of other people.	
Urge to Buy Impulsively	UBI1	Browsing apparel websites, I had a desire to buy items that did not pertain to my specific shopping goal.	[5][11][19]
	UBI2	I experienced several sudden urges to buy things when doing shopping on apparel websites.	
	UBI3	While browsing apparel websites, I inclined to purchase items outside my specific shopping goal.	
	UBI4	When I do the shopping on apparel websites, I felt a sudden urge to buy something	
	UBI5	I ended up spending more money than I originally set out to spend.	
Visual Appeal	VA1	The layout of the mobile web site is appropriate.	[11][52][53]
	VA2	This website is visually pleasing.	
	VA3	The home page is attractive and makes me want to visit.	
	VA4	The apparel website shows me plenty of visually appealing pictures.	
	VA5	The apparel website is visually cheerful.	
Vendor Creativity	VC1	The apparel website vendor suggests new product ideas.	[40][64]
	VC2	The apparel website vendor often has new ideas about how to promote products.	
	VC3	The apparel website vendor often has a new approach to sale products.	
	VC4	The apparel website vendor develops new ways to meet consumer demands.	

*SI1 was dropped due to low factor loading.