



## RESEARCH ARTICLE

## Driver and Barrier of Purchase Intention on Group Buying App

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ARTICLE INFO	ABSTRACT
Received: Jun 21, 2024	The global group-buying app usage rate has dramatically increased in mobile phone-based marketing. Because of its economic value and social benefits, many enterprises regard group buying apps as an essential online marketing and brand-building channel. Therefore, studying consumers' purchase intention on group buying apps has become an important topic to promote the development of online marketing. This research investigates the relationship among perceived value, customer engagement, and purchase intention by integrating the Cognition-Affection-Conation model, perceived value theory, and regulatory focus theory. Furthermore, this study studies the mediating impact of customer engagement and the moderating influence of regulatory focus. Distribute and collect 562 validated questionnaires from online Chinese millennials (born between 1981 and 1996) who had used group-buying apps in the past six months and used purpose-based sampling technology to collect data in China. Here, partial least squares and structural equation modeling (PLS-SEM) test the hypothesis through data analysis and draw the conclusion. This study's conclusions included three significant discoveries. Firstly, perceived benefit, sacrifice, and customer engagement positively impacted the purchase intention of the group-buying app. Secondly, the findings showed that the relationship between perceived values and purchase intention was mediated by customer engagement, which exhibited the most decisive influence. Thirdly, the moderation analysis revealed that promotion focus positively influenced perceived values and customer engagement.
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<p><b>Keywords</b></p> <p>Online Group Buying</p> <p>Perceived Value</p> <p>Perceived Benefit</p> <p>Perceived Sacrifice</p> <p>Customer Engagement</p> <p>Promotion-Focus</p>	
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### 1. INTRODUCTION

The consumption patterns of individuals have been significantly impacted by the COVID-19 and subsequent economic crisis. Among all the negative aspects of the pandemic, there has been a positive effect on mobile commerce adoption. Moreover, the contemporary phenomenon of social media culture plays a pivotal role in driving progress, with a significant influence already being observed. As a result, this trend encourages consumers to engage in collaborative consumption and make purchases within a group setting (Li et al., 2022). Online group buying (OGB) has emerged as a cost-saving strategy consumer resort to, while entrepreneurs are harnessing its potential as a business model and cashing-in on social media traffic (Hsu et al., 2018) to build market advantage.

Online group buying market in China has become one of the most popular industries. China is a globally developed e-commerce market, accounting for over 40% of global online orders in the retail industry by volume. Until 2025, it is expected to grow by 15 percent while remaining the largest globally (Statista, 2022). Both Pinduoduo (PDD) and Meituan Select are China's top two OGBs, they had a notable increase in downloads (Daxue Consulting, 2022). Despite OGB's promising growth, some challenges still need to be solved. Firstly, many app shoppers tend to cancel their orders before paying (S. Wang et al., 2022), one of the reasons is that OGB shoppers often associate discounts with

low quality (H. Chen et al., 2023). Secondly, an industry survey by Gartner found that up to 74% of consumers rely on social networks to guide their purchasing behaviours, influencing their trust and purchase intention in online group buying (V. M. Sharma & Klein, 2020; J. J. Zhang & Tsai, 2015). Consequently, retailers must comprehend the potential of OGB apps in enhancing customers' shopping experience and engagement. Lastly, it is hard to find literature about the factors affecting consumers' online group buying (Hossain & Rahman, 2021; W. M. Lim, 2017), like buying preferences influenced by personality traits.

Many studies regarding online group buying centered on impulsive buying (Jingjing Sun et al., 2023), and loyalty (Nina Angelovska, 2023). However, limited study can be given to purchase intention (PI) on the OGB app, it has been highlighted in Zhang et al.'s (2023) paper. Existing research on OGB has primarily centred on the positive outcomes and favourable aspects encompassing affordability and convenience. More attention should be given to the comprehensive assessment of the advantages and drawbacks of previous research (W. M. Lim, 2020). Next, our study introduces the concept of customer engagement (CE) as an essential affective attribute, CE is widely recognized as mediating the relationship with user consumption trips. To address existing problems and gaps, our study has adopted the C-A-C model (Hilgard, 1980) as a research framework. Initially, this model proposes that customers' cognitive factors, such as perceived values (PV) of products or services on OGB apps, significantly influence their PI. Lastly, few literature about the consumer factors affecting consumers' online group buying, especially the characteristics of consumers (Hossain & Rahman, 2021; W. M. Lim, 2017), like buying preferences influenced by personality traits. Here we try to utilize Regulatory Focus Theory (RFT) (Higgins, 1998, 2012) to explore the individual difference impact between PV and CE in the OGB context. We surveyed 562 experienced clients from PDD, one of the largest OGB platforms in China. PDD was selected due to its reputable business model and enough user pool, ensuring diverse opinions. Therefore, the major purpose of this study is to assess the driver and barrier of group buying app purchase intention among Chinese Millennials, and to provide appropriate marketing tactics for the group buying app seller.

The following are the questions that aim to be explored in this study.

**RQ1. Are perceived values and CE related to the OGB app's purchase intention among millennial mobile shoppers?**

**RQ2. Is there a mediating effect of CE on the PVs and purchase intention of the OGB app among millennial mobile shoppers?**

**RQ3. Does promotion-focus and prevention-focus moderate the correlation between PV and CE?**

Based on the C-A-C model, to address above mentioned problems, a thorough analysis of context-specific variables and mechanisms that influence PI on OGB apps among Chinese Millennial mobile shoppers is needed. This study deals with three research gaps that have not been identified previously.

The first gap pertains to exploring cognition factors that drive PI on the OGB app. In order to fill this gap in the literature, our research employs the concept of PV to capture consumers' holistic evaluation of purchase intention on OGB apps in terms of what they receive and given (Zeithaml, 1988). Consequently, it shows a pressing need for a comprehensive investigation into the impacts of perceived value on purchase intention in OGB. While some scholars have acknowledged the significance of multidimensional perceived value, their examination has been limited to particular benefits while ignoring the factors of sacrifice (Lv et al., 2024; N. Sharma & Fatima, 2024). Meanwhile, existing research on OGB also has primarily centered on the favorable aspects. This suggestion may be that they are more willing to accept the OGB app to increase communication, pleasure, and deals (W. M. Lim, 2020). Furthermore, it is essential to recognize that consumers will vary in their perception of risk and engagement in information gathering. More attention should be given to the comprehensive assessment of the advantages and drawbacks of previous research (W. M. Lim, 2020). This perspective can lead to a more balanced comprehension of the value creation process. Additionally, it is essential to investigate the effect of CE on PI on OGB apps (V. M. Sharma & Klein, 2020).

Customer engagement (CE) is a term used to describe the affective bond established between two parties, such as businesses and customers (Hollebeek, Srivastava, et al., 2019). The importance of mobile application-based customer engagement has been acknowledged by scholars and professionals. However, further research and experimentation are required to validate the outcomes of customer engagement in the field of mobile marketing. OGB has undergone significant growth recently; it shows great value and enormous potential. Therefore, the second research gap in this study to be more knowledge about whether CE can mediate the links between PV and PI in the context of Chinese OGB apps. Finally, the model further explores the moderating effect of individual differences between PV and CE. This document emphasizes the necessity of exploring the effect of individual differences in the application of technology (Esfahani et al., 2019). Drawing on Regulatory Focus Theory (RFT) (Higgins, 2012), the moderators of promotion-focus and prevention-focus can either amplify or diminish the relationship between PV and customer engagement in group-buying apps. Therefore, we need to explore the third gap in this study.

## 2. THEORETICAL REVIEW

The Cognitive-Affective-Conation Model introduced by Kolbe (1990) has been applied to elucidate how customers' cognition (thinking) contributes to the development of their affect (feeling) and then leads to their conation (acting) (Zhu et al., 2019). Kolbe introduced three interconnected dimensions in this model, i.e. cognitive, affective, and conative (Lavidge & Steiner, 1961; J. Park et al., 2008). The cognitive dimension pertains to the cognitive processes of thought and comprehension. Furthermore, the affective dimension delves into the emotional aspects of evaluation or judgment, and the conative dimension encapsulates the behavioural actions or decisions associated with a purchase.

This model has been widely utilized in consumer centered research to elucidate the three primary stages of the buying process (J. Park et al., 2008). The cognitive-affective-conative framework has been frequently deployed in connecting consumer cognitions, affective experiences, and subsequent behaviours in a variety of marketing contexts such as e-commerce platforms (Zhu et al., 2019), mobile AR apps (Qin et al., 2021), and social media advertising (Johnstone & Lindh, 2022). Nonetheless, this theory has yet to be applied in the context of OGB apps.

Therefore, this study extended the Cognitive-Affective-Conation Model to the OGB app setting for several reasons. Consistent with consumers' sophisticated and demanding behavior, this theory is found to be more appropriate and structured in facilitating the extraction of key factors that affect user behavior. Furthermore, OGB commerce environment differs significantly from a traditional e-commerce. The C-A-C framework allows us to capture these unique elements of OGB commerce and build a dynamic model to reflect how social interactivity influences customer engagement behavior. Third, the motivation of customers to build a harmonious and close community relationships can be examined by the C-A-C model. As argued by Wang et al. (2019), both information systems and marketing bases should be integrated to achieve optimal performance in online marketing.

Based on these arguments, Kolbe (1990) 's Cognitive-Affective-Conation Model underpinned the present study's proposition that perceived value and customer engagement are two important drivers of OGB app purchase intention. C-A-C model emphasizes that affective is the main connection between cognition and conation. This resonates well with the use of relationship management to promote positive consumer response. It is consistent with the research results of DeLone and McLean (1992), this study holds that customer engagement is an important mechanism to generate positive response when adopting technology. In addition, social media functions promote the interaction between consumers and other consumers and brands, thus promoting customer engagement (Brodie et al., 2013), it is becoming more and more important for enterprises to cultivate customer engagement behavior (Steinhoff et al., 2019). Therefore, this study holds that customer engagement is an affection response, which determines the behavior of individuals when using group-buying app.

## 3. HYPOTHESIS DEVELOPMENT

### 3.1. Drivers and barrier of purchase intention

Perceived benefits refer to a person's perception of his ability to achieve a specific behavior that will produce specific advantages (Ajzen, 1991). Sweeney & Soutar (Sweeney & Soutar, 2001) further

contribute to understanding value by introducing four key dimensions: performance, monetary value, emotional value, and social value. Consumers' attitudes will be positively influenced by the perceived benefits of specific products or services (Zeithaml, 1988).

The motivation for individuals to take action is driven by the perceived benefits derived from a transaction. In perceived value theory, perceived benefit significantly influences or predicts purchase intentions (Sweeney & Soutar, 2001). Therefore, consumers need perceived benefits to boost their confidence and reduce their fear and risk before purchasing. Within online group buying (OGB) commerce, users not only seek utilitarian values such as monetary value and perceived usefulness but also strive for hedonism, like hedonic value, and social values like connectedness with others (Hirschman et al., 1982; Rintamäki et al., 2006). Firstly, the OGB app sells exclusive products and services with monetary value that are not accessible elsewhere (Klein & Sharma, 2022; W. M. Lim, 2020); it also discovered uniformly that perceived usefulness can positively and significantly influence consumers' online shopping (Fan-Chuan Tseng, 2020). Furthermore, [Lim \(2014\)](#) suggests that the hedonic values associated with OGB deals positively impact purchase intention. Finally, a consumer's decision to buy a particular product through group purchase experience sharing and user interaction with family and friends leads to enhanced emotional and social values such as connectedness and support (Shafqat et al., 2023). We proposed that perceived benefits are a high-order construct, including PU, MV, HV, and CO (see Fig. 1).

These studies and the C-A-C framework show that cognition can influence individuals' conation. The perceived benefits of Group-Buying apps may be a driver factor for millennials' mobile shoppers; this viewpoint has been further validated by online shopping festival (W. B. Kim et al., 2023) and social media shopping (Ryu & Park, 2020). Hence, this research also posits that perceived benefit will exert a comparable beneficial influence on PI in OGB apps among Millennial shoppers. The following assumptions are made:

***H1: Perceived benefit positively relates to group-buying app purchasing intention among Millennial mobile shoppers.***

Perceived sacrifice refers to the uncertainty that consumers encounter when they are unable to predict the outcomes of their purchase decisions (C. Kim et al., 2008). Perceived sacrifice is a multidimensional construct comprising several facets (Alrawad et al., 2023), including financial risk, performance risk, time risk, physical risk, social risk, and psychological risk. Suppose the maximization of perceived benefit is the guiding principle for positive decision-making. In that case, the minimization of perceived sacrifice becomes the principle for reverse decision-making regarding purchase intention. According to OGB app features, this study summarized with previous studies, and divides the perceived sacrifice of group-buying apps into three facets: performance risk, social risk, and intrusiveness. Firstly, consumers perceive purchasing on OGB apps as a product quality and performance risk (Rather, 2021; Sohn, 2024), which hinders online shopping (Hossain et al., 2021). Additionally, social risk influences customers' purchase decisions and significantly impacts their social status within a society or social group (Featherman & Pavlou, 2003). Lastly, the intrusiveness associated with the OGB app can evoke negative emotions in consumers, as they may perceive a violation of their privacy and a loss of control (Benlian et al., 2020).

When the perceived sacrifice exceeds the customer's tolerance level for acquiring a product or service, it diminishes the perceived value of said product or service, consequently affecting their purchase intention (H.-W. Kim et al., 2007; Zeithaml, 1988). This perspective has also been substantiated through researches related with PS conducted in mobile payments (Verkijika & Neneh, 2021), and autonomous retailing (Sohn, 2024). Therefore, this study hypothesizes that Millennial mobile users are discouraged from purchasing on OGB due to the potential perceived sacrifice on OGB apps. Assumptions are as follows:

***H2: Perceived sacrifice is negatively related to group-buying app purchasing intention among Millennial mobile shoppers.***

Customer engagement refers to a continuous exchange between a firm and its customers, which aims to foster mutually beneficial transactional and non-transactional outcomes. Previous scholarly investigations have demonstrated a direct and positive association between customer engagement

and customer purchase behavior (A. Sharma et al., 2022; Zheng et al., 2022). CE is the degree to which a customer interacts and participates in a company or brand's goods or services (Vivek et al., 2014). This approach allows consumers to establish effective communication channels with the seller, gain deeper insights into the product, and cultivate a mutually beneficial relationship. It is worth noting that offering assistance through social interaction can enhance outcomes such as perceived value, consumer trust, satisfaction, and commitment in customer engagement (Y. Chen et al., 2019; Hajli, 2014; Liang et al., 2011). As a result, CE will lead to an increased intention to purchase. Effective CE management is crucial for online vendors throughout the transaction process. This is because highly engaged customers have a perception of pricing as more fair and reasonable compared to those who are disengaged or less engaged (Denktaş-Şakar & Sürücü, 2020).

CAC Model shows that "affective" positively influences "conation" behavior. This perspective has also been substantiated through research on living streams (Zheng et al., 2022) and online communities (Prentice et al., 2019). Therefore, this study also believes CE positively influences PI on the OGB app among Millennial shoppers. Millennial mobile shoppers are highly committed to group-buying apps may buy on this application. Therefore, we make the following assumptions:

***H3: Customer engagement positively relates to group-buying app purchasing intention among Millennial mobile shoppers.***

### **3.2 Perceived value and customer engagement:**

This study defines PV as consumers' subjective product assessment, considering what is received and given (Zeithaml, 1988). Extensive empirical research has consistently shown a strong positive correlation between consumers' perception of value and their level of engagement (Itani et al., 2020; X.-J. Lim et al., 2019). At first, perceived benefits are the cornerstone of the relationship between customers and companies; high value is the main reason for good consumer perception, evaluation, and purchase decision (Holbrook, 1999). On the contrary, perceived sacrifice pertains to what is given up or contributed to obtaining a product (Zeithaml, 1988). It can be classified as monetary and non-monetary spending. When enterprises reduce the perceived sacrifice of products or services, consumers' perceived benefits will be higher (Shirazi et al., 2022). Moreover, the perception of value influences customers' behavior in engaging with a brand or company (Klein & Sharma, 2022). A study conducted by Itani et al. (2019) revealed that perceived value has a positive impact on customer engagement within the restaurant industry. Therefore, OGB apps should promote perceived benefits and reduce perceived risk through CE (Klein & Sharma, 2022).

Based on this evidence, the behavioral model proposes that cognition plays a significant role in fostering affection (Hilgard, 1980), and perceived values are crucial in building CE with customers in OGB apps. The PV impacts CE, facilitating communication between customers and merchants and exerting excellent or harmful effects on product purchases. This perspective has also been substantiated through research on loyalty programs (Meyer-Waarden et al., 2023), and restaurant (Itani et al., 2019). Therefore, this study also believes that perceived benefits and perceived sacrifice will positively or negatively impact CE on the OGB app among Millennial shoppers. With the support of the C-A-C model, this study posits that perceived value in the group-buying apps will positively or negatively impact customer engagement (i.e., affection). Assumptions are as follows:

***H4: Perceived benefit positively relates to customer engagement among Millennial mobile shoppers.***

***H5: Perceived sacrifice negatively affects customer engagement among Millennial mobile shoppers.***

### **3.3 Mediating role of customer engagement:**

Interactions between customers and companies can lead to a psychological state called CE (Brodie et al., 2013). Customer engagement is a multidimensional concept encompassing various aspects of customers' shopping experience. It involves conscious attention, enthusiastic participation, and social connection (Vivek et al., 2014). Studies have shown that engagement mediates online, influencing different theoretical relationships (Hollebeek et al., 2014; Luo et al., 2024). CE is a mediating variable in many marketing studies, significantly affecting consumer and business

relationships. When customer engagement increases, individuals are more likely to invest in cognitive, emotional, behavioral, and social resources (Hollebeek et al., 2014; Hollebeek, Hollebeek, et al., 2019). For instance, earlier research revealed a positive association between online environmental cues, engagement, and purchase decisions. This is supported by customers with better processing capabilities for product-related information and engaging in more substantial social interactions. In this model, customer engagement is regarded as a mechanism that mediates the nexus between the seven cognitive factors (i.e., monetary value, perceived usefulness, hedonic value, connectedness, perceived performance, intrusiveness, and social risk) and the conative factor (i.e., purchase intention). Additionally, perceived values have been found to facilitate consumers' cognitive processes, where they perceive themselves as potentially taking actions within the online shopping environment (OGB).

The C-A-C model proposes that affective factors serve as the transitional stage between cognition and behavior. The level of customer engagement in group buying depends mainly on the services provided by the OGB seller. Utilizing this mechanism can strengthen the relationship between customers and retailers. This perspective has also been substantiated through research on retailing platforms (Roy et al., 2023), branded mobile media (X.-J. Lim, Cheah, Ng, Kamal Basha, et al., 2021), and luxury brands (Rahman et al., 2023). Thus, the suggested model proposes that CE mediates the relationships between perceived value (i.e., perceived benefits and perceived sacrifice) and subsequent PI Assumptions as follows:

***H6: Customer engagement mediates the relationship between perceived benefit and group-buying app purchasing intention among Millennial mobile shoppers.***

***H7: Customer engagement mediates the relationship between perceived sacrifice and group-buying app purchasing intention among Millennial mobile shoppers.***

### **3.4 Moderating role of regulatory focus**

According to the regulatory focus theory proposed by Higgins (1998), an individual's future behavior patterns are determined by their regulatory focus. People adjust their promotion-centered or prevention-centered way of thinking by interacting with others. The theory also argues that the evaluations and decisions made by consumers are influenced by their motivational focus, whether it is prevention or promotion. Users' cognition, needs, and behavioral intentions may differ depending on their motivational mindsets. Researches on regulatory focus theory indicates that an individual's focus can lead to different attitudes, preferences, and behaviors regarding a specific issue (Lin et al., 2018; Maduku, 2024; Sit et al., 2022). For instance, promotion-focused users prioritize enjoyment, while prevention-focused users emphasize practical utility. Whereas, prevention-focused individuals in order to ensure safety and prevent errors, it is advisable to employ conservative strategies (X. Wang et al., 2022). Similarly, impact of perceived benefits and perceived sacrifice on customer engagement is less critical for millennial mobile shoppers because these connections may be affected by individual differences. Therefore, it is reasonable to assume that promotion-focused users, driven by perceived values, are more inclined to increase consumer engagement than those with prevention-focused group-buying apps.

Based on this regulatory focus theory, we propose a mechanism that links the stimulation of group-buying apps to participate in customer engagement. This perspective has also been substantiated through research on sustainable consumption (Maduku, 2024) and the virtue travel community (Xie et al., 2023). Thus, the suggested model proposes that RFT moderate the relationships between perceived value (i.e., perceived benefits and perceived sacrifice) and CE. Therefore, the regulatory assumptions of this study are as follows:

***H8: Promotion focus significantly moderates the relationship between perceived benefit and perceived sacrifice among Millennial mobile shoppers, where the relationship is more robust when promotion focus is high.***

***H9: Prevention focus significantly moderates the relationship between perceived benefit and perceived sacrifice among Millennial mobile shoppers, where the relationship is weaker when prevention focus is high.***

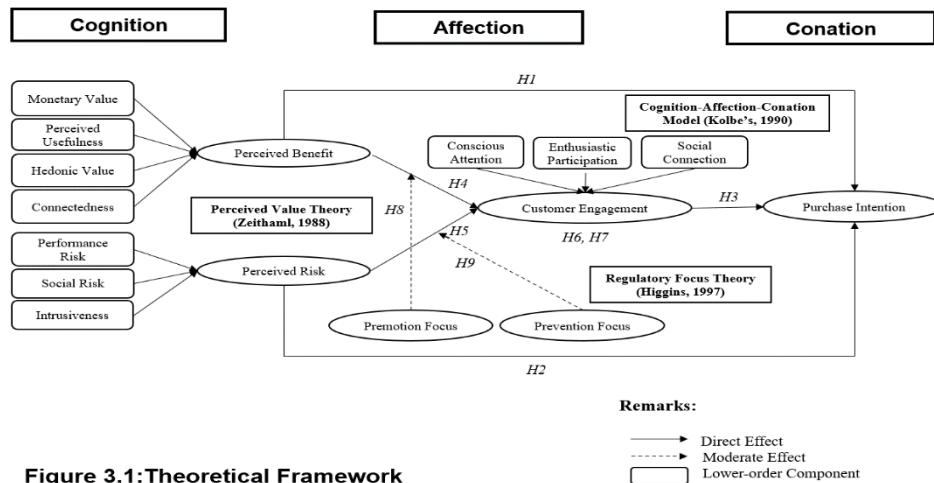


Figure 3.1: Theoretical Framework

## 4. METHOD

### 4.1 Survey development and sampling

The study recruited Chinese millennials (born between 1981 and 1996) as participants. They were chosen based on their association with high-tech and extensive experience with online purchasing (Sohaib & Han, 2023). The research focused explicitly on PinDuoDuo (PDD) users who had utilized the platform within the past six months. To ensure accurate and concise results, the survey only collected data from users who had already undergone pre-screening from a large sample size. Data collection was facilitated through a popular Chinese survey platform called Wenjuanxing. The survey hyperlink was disseminated to participants via prominent Chinese social media applications: WeChat and QQ. Respondents could complete the survey using their preferred devices; the research object and estimated length were explained to respondents before beginning the survey. Between August and September of 2023, 1,133 responses were collected. After removing 571 unqualified responses, 562 responses remained for analysis. According to a post-hoc power analysis conducted by F Faul et al. (2007), this sample size of 562 participants was deemed sufficient to meet the minimum requirement. The analysis made certain assumptions, such as an effect size of 0.15 and a power level of 80%; the results indicate that most respondents were female (64.06%) and had completed a master's degree (40.21%), about 25.09% of participants reported earning between US\$822 and US\$1233 monthly. Additionally, approximately 39.32% of participants had used the PDD application for their purchases for over three years (see Table 1).

Demographic Variable	Category	Frequency (n=420)	(%)
<i>Gender</i>	Male	202	35.94
	Female	360	64.06
<i>Education level</i>	Compulsory education	27	4.8
	Diploma	46	8.19
	Degree	191	33.99
	Master	226	40.21
	PhD	72	12.81
<i>Monthly income (US\$)</i>	Below 411	137	24.38
	411-822	141	25.09
	822-1233	126	22.42
	1233-1644	80	14.23
	1644-2055	25	4.45
	Over 2055	53	9.43

<i>PDD use time</i>	Below six months	60	10.68
	Between 7-12 months	57	10.14
	Between 13-24 months	116	20.64
	Between 25-36 months	108	19.22
	Over 3 Years	221	39.32
<i>PDD use frequency</i>	Daily	25	4.45
	Weekly	155	27.58
	Monthly	187	33.27
	Quarterly	108	19.22
	Half a year	48	8.54
	Annual or less	39	6.94

**4.2 Measures**

This study evaluated most constructs, including PB, PS, and CE, as higher-order constructs comprising underlying lower-order dimensions (see Table 2). Mainly, PB consisted of four dimensions: perceived usefulness (J. Yu et al., 2017), monetary value, hedonic value, and connectedness (Sweeney & Soutar, 2001). PS was measured with three dimensions, namely, performance risk (Jacoby & Kaplan, 1972), social risk (Jacoby & Kaplan, 1972), and intrusiveness (Hérault & Belvaux, 2014). Additionally, Vivek et al. (2014) examined conscious attention, enthusiasm engagement, and social connection. The promotion and prevention-focus constructs from Lockwood et al. (2002) were incorporated, and purchase intention was assessed using the scale developed by (S. Kim & Park, 2013). The specific items employed for these constructs can be found in Table 2.

**5. DATA ANALYSIS**

To evaluate the proposed model, Partial Least Squares Structural Equation Modeling (PLS-SEM) was used, a causal-predictive methodology widely utilized in various social science fields, including marketing (Sarstedt & Cheah, 2019). PLS-SEM employs a causal-predictive methodology that enables researchers to optimize their ability to explain and predict phenomena. According to Hair et al. (2019), the SmartPLS software was employed for the evaluation, consisting of two distinct stages: measurement and structural models.

**5.1 Common method variance**

Harman's single-factor analysis determined that a single component accounted for only 27.10% of the variance, below the established threshold of 50%, as Podsakoff et al. (2012) suggested. Furthermore, a comprehensive collinearity test revealed that the variance inflation factor (VIF) values for all components ranged from 1.113 to 3.020, which were below the threshold of 3.33 (Table 2), as proposed by Kock & Lynn (2012). These results indicate that CMB, as measured by the VIF, did not pose a significant issue in this study.

**5.2 Measurement model assessment**

Validated questionnaires were utilized in the measurement model assessment, with responses scored on a 5-point Likert scale ranging from 1 to 5. The composite reliability ratings were examined to ensure they exceeded the threshold of 0.70, as recommended by Hair, et al. (2019).

Construct	Item	Loading	CR	AVE	FC	
Perceived Benefit (PB)						
Monetary Value (Sweeney & Soutar, 2001)	MV1. The prices of the products in this OGB app are fair.	0.781	0.900	0.692	1.895	
	MV2. The OGB app offers reasonably priced goods.	0.864				



	MV3. When I purchase anything through this OGB app, I get value for my money.	0.832				
	MV4. Using this OGB app for purchasing is cost-effective.	0.849				
Perceived Usefulness (J. Yu et al., 2017)	PU1.I can shop efficiently using this OGB app at anytime and anywhere.	0.820	0.929	0.766	2.122	
	PU2.I can find products using this OGB app at anytime and anywhere.	0.863				
	PU3.It is convenient to shop with this OGB app.	0.911				
	PU4.Shopping on this OGB app is useful to my daily life.	0.903				
Hedonic Value (Sweeney & Soutar, 2001)	HV1.Using this OGB app for shopping is one that I would enjoy.	0.900	0.946	0.813	2.798	
	HV2.Using this OGB app for shopping would make me feel good.	0.917				
	HV3.Using this OGB app for shopping is interesting.	0.893				
	HV4.In the post-pandemic era, I would enjoy using this OGB app for shopping.	0.895				
Connectedness (Sweeney & Soutar, 2001)	CO1.This OGB app helps me to feel accepted by others.	0.883	0.940	0.796	1.633	
	CO2.This OGB app makes a good impression on me and other people.	0.909				
	CO3.The OGB app gives me social approval.	0.904				
	CO4.The OGB app makes me feel close to the community.	0.872				
Perceived sacrifice (PS)						
Intrusiveness (Hérault & Belvaux, 2014)	IN1.The marketing method of this OGB app is intrusive.	0.848	0.941	0.761	1.588	
	IN2.The marketing method of this OGB app is irritating.	0.912				
	IN3.The marketing activity of this OGB app is indiscreet.	0.842				
	IN4.The marketing activity of this OGB app is disturbing.	0.850				
	IN5. I prefer something other than the marketing method of this OGB app.	0.907				
Performance Risk (Jacoby & Kaplan, 1972)	PR1. I am afraid of getting defective products via this OGB app.	0.933	0.886	0.663	1.415	
	PR2. Through this OGB app, I might get products others are happy with, but I need more.	0.873				
	PR3. The instructions for products purchased via this OGB app could be clearer, so I cannot understand all the functions.	0.715				
	PR4. After receiving a product via this OGB app, I might discover it is fine. been better <sup>14</sup>					
Social Risk (Jacoby & Kaplan, 1972)	SR1. I fear others will see me negatively if I join this OGB app.	0.926	0.905	0.705	1.295	
	SR2. I am afraid that this OGB app I joined is an act of fraud, so I will not get a sense of identification with my friends.	0.846				

	SR3. I am afraid that my friends will not get a sense of identification with me for buying products that they consider inferior by this OGB app.	0.738				
	SR4. I do not dare to tell others that I join this OGB app.	0.839				
Customer Engagement (CE)						
Conscious Attention (Vivek et al., 2014)	CA1.I would like to know more about this OGB app.	0.820	0.942	0.731	2.187	
	CA2.I like the events that are related to this OGB app.	0.858				
	CA3.I want to learn more about this OGB app.	0.871				
	CA4. Pay much attention to anything about this OGB app.	0.887				
	CA5.I keep up with things related to this OGB app.	0.876				
	CA6.Anything related to this OGB app grabs my attention.	0.816				
Enthusied Participation (Vivek et al., 2014)	EP1.I spend a lot of my discretionary time visiting this OGB app.	0.841	0.917	0.735	3.020	
	EP2.I am heavily into this OGB app.	0.882				
	EP3.Browse this OGB app, which is part of my schedule.	0.871				
	EP4.My days would be the same with this OGB app.	0.835				
Social Connection (Vivek et al., 2014)	SC1.I spend a lot of my discretionary time considering this OGB app.	0.833	0.941	0.763	2.398	
	SC2.I love talking about this OGB app with my friends.	0.854				
	SC3.I enjoy visiting this OGB app more when I am with my friends.	0.900				
	SC4.Visiting this OGB app with my friends is fun.	0.924				
	SC5.Overall, I felt positive when I engaged with this OGB app.	0.853				
Promotion-focus (Lockwood et al., 2002)	PRO1.I frequently imagine how I will achieve my hopes and aspirations.	0.823	0.886	0.660	1.240	
	PRO2.I often imagine myself experiencing good things that I hope will happen to me.	0.821				
	PRO3.I am more oriented toward achieving success than preventing failure.	0.809				
Prevention-focus (Lockwood et al., 2002)	PRE1. I am likely to purchase products/services on this OGB app.	0.826	0.906	0.706	1.351	
	PRE2.Given the opportunity, I intend to purchase products on this OGB app.	0.839				
	PRE3.Given the opportunity, I would consider purchasing products on this OGB app shortly.	0.881				
Purchase Intention (S. Kim & Park, 2013)	PI1. I am likely purchasing products/services on this OGB app.	0.891	0.946	0.816	1.113	
	PI2.Given the opportunity, I intend to purchase products on this OGB app.	0.897				
	PI3.Given the opportunity, I would consider purchasing products on this OGB app shortly.	0.930				

	PI4.Likely, I will purchase products on this OGB app shortly.	0.894				
Notes: C.R.: composite reliability; AVE: average variance extracted; FC: full collinearity						

According to Hair et al. (2019), the results presented in Table 3 demonstrated that the convergent validity was achieved when the average variance extracted was more significant than 0.50. The recommendation by Hair et al. (2017), outer loadings exceeding 0.708 are better than a construct that can account for at least 50 percent of the variance in the indicators. On the other hand, outer loadings below 0.4 (Bagozzi et al., 1991; Hair Jr et al., 2017) should be excluded unless the construct achieves a score of 0.5 or higher than the AVE score (Hulland, 1999; Ramayah et al., 2016).

**Table 3: Discriminant validity**

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13
Conscious Attention													
Connectedness	0.475												
Hedonic Value	0.487	0.617											
Intrusiveness	0.151	0.109	0.218										
Monetary Value	0.300	0.410	0.672	0.071									
Enthusied Participation	0.716	0.461	0.649	0.229	0.394								
Performance Risk	0.080	0.038	0.089	0.578	0.080	0.184							
Purchase Intention	0.500	0.412	0.661	0.099	0.518	0.662	0.050						
Prevention-focus	0.343	0.262	0.190	0.238	0.191	0.366	0.179	0.338					
Promotion-focus	0.346	0.204	0.205	0.122	0.264	0.253	0.226	0.407	0.353				
Perceived Usefulness	0.393	0.511	0.732	0.071	0.755	0.448	0.064	0.589	0.165	0.304			
Social Connection	0.699	0.423	0.493	0.166	0.235	0.845	0.157	0.541	0.419	0.278	0.290		
Social Risk	0.148	0.048	0.155	0.399	0.073	0.071	0.310	0.103	0.283	0.215	0.060	0.117	
Notes: HTMT < 0.85 (Henseler et al., 2015)													

Table 3 demonstrates that the discriminant validity is acceptable if each latent construct's HTMT score is less than 0.85 (Hair, Risher, et al., 2019).

### 5.3 Higher-order construct assessment

Three constructs, namely PB, PS, and CE, were considered reflective-formative higher-order constructs (HOCs). HOC was assessed with a two-stage approach (Sarstedt et al., 2019). The convergent validity of the HOCs was measured by utilizing a single global item, recommended by Cheah et al. (2018). The redundancy analysis revealed that the path coefficients of the global item measure for PB, PS, and CE were 0.753, 0.753, and 0.812, respectively. The results of this study indicate that the sub-dimensions played a significant role in explaining over 50% of the variation in the criterion construct, as shown in Table 4. Furthermore, it is noteworthy that the collinearity issue

did not pose a significant problem for the higher-order constructs (HOCs), as supported by the VIF values within 3.33, ranging from 1.134 to 2.652 (Becker et al., 2015).

**Table 4: Higher-order construct**

Higher-order construct	Lower-order construct	Convergent validity	Weight	VIF	SE	t-value	p-value
Perceived Benefits	Monetary Value	0.753	0.033	1.943	0.070	0.467	0.640
	Perceived Usefulness		0.196	2.271	0.071	2.762	0.006
	Hedonic Value		0.729	2.318	0.072	10.097	0.000
Perceived sacrifices	Connectedness		0.167	1.502	0.065	2.562	0.010
	Performance Risk	0.753	0.345	1.346	0.223	1.546	0.122
	Social Risk		-0.728	1.134	0.307	2.374	0.018
Customer Engagement	Intrusiveness		0.754	1.455	0.274	2.754	0.006
	Conscious Attention	0.812	0.311	1.908	0.099	3.148	0.002
	Enthusied Participation		0.624	2.652	0.083	7.477	0.000
	Social Connection		0.172	2.605	0.089	1.930	0.054

At last, the result of outer weights and significance of three out of four PB LOCs (i.e., perceived usefulness = 0.196, hedonic value = 0.729; connectedness = 0.167) had a significant effect ( $p < 0.05$ ), except monetary value = 0.033. On the other hand, three PS LOCs (i.e., performance risk = 0.345; social risk = -0.728; intrusiveness = 0.754) showed a significant impact ( $p < 0.05$ ). Furthermore, the sub-dimensions of CE (CA = 0.311; EP = 0.624; SC = 0.172) are also all significant. Therefore, similar to previous studies, this study found several LOCs formed the three HOCs.

### 5.5. Robustness checks

The present study additionally uses coefficient of determination ( $R^2$ ), effect size ( $f^2$ ), and predictive relevance ( $Q^2$ ) as tools for evaluating the robustness of the structural model. Primarily, the model exhibits significant explanatory power; PB, PS, and CE explained 50% of the variance in purchase intention, while PB and PS explained 51% of the variance in CE (Table 5). Next, the significance of each path was evaluated by calculating the effect size ( $f^2$ ), as stated by Hair et al. (2019), to ensure accuracy. As Cohen et al. (2003) suggested, CE ( $f^2 = 0.207$ ) and PB ( $f^2 = 0.191$ ) have medium effect sizes on purchase intention, and PS has a negligible effect size ( $f^2 = 0.041$ ). It is worth noting that PB ( $f^2 = 0.493$ ) showed a significant value, but PS ( $f^2 = 0.140$ ) only had a small effect size on CE. Additionally, the predictive relevance of the model was evaluated using Stone-Geisser's  $Q^2$  statistic (Geisser, 1974; Stone, 1974) The  $Q^2$  values for CE (0.386) and PI (0.405) were found to be statistically significant, indicating the model's predictive relevance (Hair, Risher, et al., 2019).

**Table 5: Results of the structural model**

Path Relationship	Std beta	Std error	t-value	p-value	95% Bca CI LB UB	VIF	$f^2$	$R^2$	$Q^2$
H1: Perceived Benefit→PI	0.389	0.057	6.779	0.000	(0.294, 0.482)	1.594	0.191	0.500	0.405
H2: Perceived sacrifice→PI	0.151	0.065	2.317	0.021	(0.047, 0.209)	1.122	0.041		
H3: CE→PI	0.424	0.054	7.783	0.000	(0.330, 0.509)	1.745	0.207		
H4: Perceived Benefit→CE	0.507	0.036	14.246	0.000	(0.450, 0.567)	1.082	0.493	0.512	0.386
H5: Perceived sacrifice→CE	-0.263	0.086	3.044	0.002	(-0.315, -0.187)	1.020	0.140		

H6: Perceived Benefit→CE→PI	0.215	0.030	7.250	0.000	(0.167, 0.265)				
H7: Perceived sacrifice→CE→PI	-0.111	0.040	2.804	0.005	(-0.145, -0.069)				
H8: Promotion-focus x Perceived Benefit→CE	0.097	0.035	2.765	0.006	(0.030, 0.146)	1.027	0.027		
H9: Prevention-focus x Perceived sacrifice→CE	-0.038	0.036	1.055	0.292	(-0.089, 0.028)	1.037	0.004		

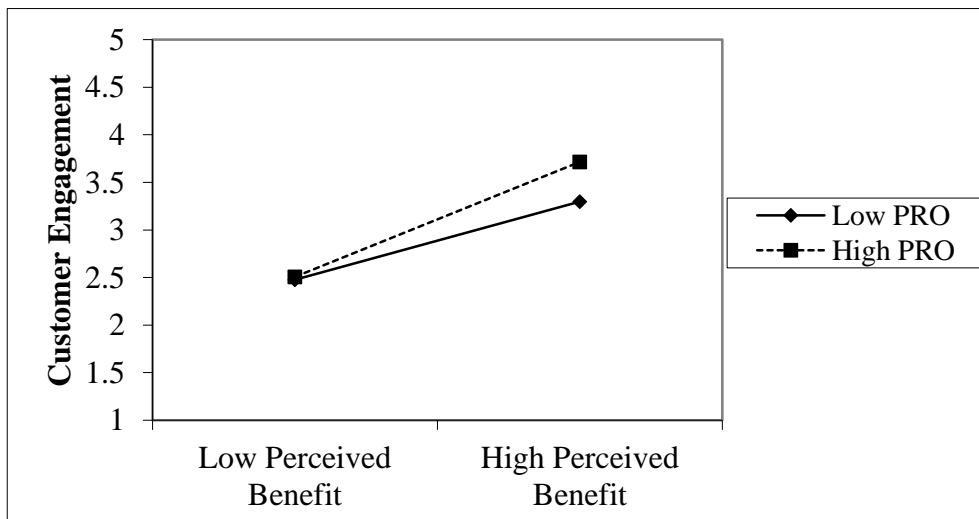
Notes: CE: customer engagement; PI: purchase intention

	Q2_predict	PLS RMSE	MAE	LM RMSE	MAE	PLS-LM RMSE	MAE	Predict Power
PI1	0.343	0.700	0.538	0.679	0.516	0.021	0.022	Medium
PI2	0.342	0.740	0.562	0.737	0.562	0.003	0.000	
PI3	0.362	0.739	0.577	0.742	0.577	-0.003	0.000	
PI4	0.353	0.797	0.610	0.799	0.615	-0.002	-0.005	

The prediction results in Table 6 showed that purchase intention items had a medium prediction power, except for PI1 and PI2. This suggests that Millennials, connected to various technologies and digital platforms, have more sophisticated behaviors. The importance of customer perceived value theory by Zeithaml (1988) was highlighted in examining OGB app purchase intention. Therefore, PB, PS, and CE are critical purchasing intention variables.

**5.6. Moderating effect**

The study also examined the moderating effect using bootstrapping. Promotion-focus moderated the correlation ( $\beta=0.097$ ;  $p\text{-value}=0.006$ ) between perceived benefit and CE, supporting H8. However, prevention focus has insignificantly impacted between PS and CE ( $\beta=0.038$ ;  $p\text{-value} < 0.292$ ), so H9 is not validated.



Because the moderate effect ( $\beta=0.097$ ) is positive, so the plot (see Fig.3) display that the slope of high promotion-focus (dotted line) is steeper compared to low promotion-focus (solid line). Therefore, the relationship between perceived benefit and CE was more robust with a high promotion focus than a low prevention focus.

## 6. DISCUSSIONS, THEORETICAL AND PRACTICAL CONTRIBUTION

### 6.1 Discussion of finding

#### 6.1.1 The relationships between perceived values, customer engagement, and purchase intention

Drawing on the C-A-C Model, cognition based upon the theory of perceived value (H.-W. Kim et al., 2007), we proposed PB and PS as the determinants influencing purchase intention. The results demonstrate a significant relationship between the hypothesized PVs on the PI of the OGB App; it may be noted that earlier, that PV plays a significant role in consumers' evaluation of new technology. The study found that the four first-order benefit dimensions are more crucial in determining perceived value than perceived sacrifice, which is consistent with previous research (S. Kim et al., 2009). Hedonic value in perceived benefit emerges as the most influential factor among them. The findings validate our initial hypothesis that many individuals who engage in online shopping exhibit a proclivity for sensation-seeking behavior and a desire to attain and sustain a particular level of arousal (Arnold & Reynolds, 2003). Therefore, to enhance perceived value, improving the degree of perceived benefit and maintaining perceived sacrifice is adequate. Only monetary value is insignificant; it may indicate that sometimes, deriving hedonic value from perceptions of bargains extends beyond mere monetary value or transactional utility, as Babin et al. (1994) stated. On the other hand, the results show CE also has a significant relationship and ranked top among three (PB, PS, and CE) on the PI of the OGB App, consistent with the assertion of engagement's role in leading to more robust PI (V. M. Sharma & Klein, 2020). Therefore, the first objective is fulfilled.

Subsequently, the investigation reveals a noteworthy impact of PVs on CE. The above research results exhibit a discernible correlation between customers' PB and PS directly impacting CE. Firstly, this study identifies conscious attention, enthusiastic participation, and social connection as essential components of CE. These findings support the theoretical framework conceptualizing CE as a reflective second-order construct. Previous studies have also indicated the importance of customer engagement in connecting customers, brands, and fellow customers (Yang et al., 2022). Secondly, our results prove that CE is positively affected by PV, offering us an actionable way to enhance OGB's business performance. The product can be oriented to improving customers' CE so that their intention to purchase on the OGB app can be effectively motivated. It aligns with previous research; the results presented in this study support earlier conclusions about the positive impact of PVs on CE (Itani et al., 2019). Furthermore, as proposed, the research results demonstrated that CE mediates between PVs (perceived benefit and perceived sacrifice) and PI on the OGB app. Apart from monetary value, all the related constructs were significant drivers of behavioral intention. It partially attributed that Millennials who shop on the OGB app place more on hedonism (Arnold & Reynolds, 2003). Therefore, incorporating hedonic components in OGB significantly enhances CE beyond perceived usefulness and connectedness concerns. This study's results align with previous research, which reported the mediating effect of customer engagement on purchase intention in the context of the OGB app (Klein & Sharma, 2022). These findings confirmed that CE can mediate the relationship between PVs and PI in the OGB context, so the second objective was also reached.

Finally, the last objective investigates the moderator of individual differences, specifically prevention-focus, and promotion-focus, in influencing the effects of perceived values on customer engagement. Promotion-focused customers incline to resort to emotions for assessing and judging information, as evidenced by previous research indicating their greater concern for gains over losses (Higgins, 1998; Jin et al., 2024). As predicted, the PB to CE path is more robust among consumers with a higher promotion focus; they tend to respond to positive information about the wanted product and show higher openness and tendencies toward CE. It infers that PB plays a significant role in enhancing engagement among high promotion-focused consumers; this discovery supports the

idea that RFT can significantly affect customer engagement in marketing (Sheng et al., 2020; L. Yu & Mishra, 2020). Again, this finding supports the research conducted by Arnold and Reynolds, (2009), which found that promotion-focused individuals are more concerned about gains than losses. However, contrary to expectations, prevention-focused customers showed no significant effect on perceived sacrifice and customer engagement. This finding contradicts previous research by Park et al. (2018). The answer for the result is that perceived benefits motivate consumers voluntarily share their experiences, leading them to overlook the importance of perceived sacrifice. The study also found a moderate association between perceived value and customer engagement, fulfilling the third objective of the study.

## 6.2 Theoretical implications

The current investigation explored how customers of Online Group Buying (OGB) assess their engagement and develop decision-making patterns. Firstly, the theoretical framework proposed in the study suggests that cognitive factors play a significant role in eliciting conation reactions among consumers. The analysis focuses on the concept of Perceived Interactivity (PI) on the OGB app through the utilization of the C-A-C model (Hilgard, 1980). Previous research has explored the individual impacts of environmental factors and customer-perceived value on shaping consumer decision-making processes. This research introduces a holistic value framework (Babin et al., 1994; Holbrook, 1999) that incorporates two cognitive factors: perceived benefit and perceived sacrifice. By concurrently investigating perceived benefit and perceived sacrifice, which are identified as the main drivers of consumer perceived value on the OGB app, the study enhances theoretical understanding through the examination of these constructs as formative second-order variables composed of their respective components. This includes exploring the emotional reactions that play a key role in transforming cognitive elements into behavioral outcomes, understanding PV's effect of customers' PI on the OGB should be multifaceted by CE, which, in turn, can be delivered to PI enhancement. Although PVs have a distinct effect, the most crucial variable in OGB when explaining consumer PI is CE. Meanwhile, the findings show that the OGB apps' use of CE to promote customers' purchase intention is successful. This improves past research examining the direct correlation between PV and PI. PVs and CE did have a significant role in understanding consumers' PI on OGB, thus adding value to existing knowledge.

Moreover, this study aims to enhance the comprehension of CE as a mediator by examining the relationship between PV and PI, thereby expanding the definition of the CE concept as a three-dimensional higher-order construct. Therefore, PVs include perceived benefits and perceived sacrifices based on cognition and affection states; they thoroughly comprehend the process that encourages purchasing on OGB apps. The evidence presented in this study highlights the urgent necessity for relationship management in online environments. These findings align with earlier assertions that the dynamics of user-retailer relationships have evolved beyond simple transactions, becoming more intricate and complex (X.-J. Lim et al., 2021). Consequently, our research extends the existing body of knowledge by comprehensively understanding the mechanisms that enhance purchase intention in online shopping. By employing engagement theory and focusing on engaging Millennial users, this study contributes to understanding engagement and relationship management.

Finally, the results of our study suggest that an individual's regulatory focus influences the impact of PV on CE. Previous research has often assumed that user behavior is consistent across the link between app features and engagement without considering how consumer differences may affect this relationship. In this study, we build upon this study utilizes Higgins (1998)Regulatory Focus Theory framework to examine the moderating effect of customer differences within the context of the OGB app. Our findings reveal that customer with promotion focus moderates the relationship between perceived benefits and customer engagement, while prevention focus does not. This suggests that highly promotion-focused consumers utilize perceived benefits to enhance their engagement.

### 6.3 Practical implications

This study presents valuable insights for stakeholders regarding user expectations of a specific OGB app, emphasizing the importance of engaging consumers through PV aspects related to OGB. Retailers and marketers can enhance service delivery by focusing on customer engagement and product advantages to attract Millennial mobile shoppers. Strategies such as offering personalized discounts, prompt customer service, and user-generated content can help tap into this lucrative market. Providing more information about products and transactions on OGB apps can reduce user uncertainty. App developers are encouraged to incorporate personalized benefits and engaging mechanisms to create a compelling value proposition. Understanding customer engagement with different features can help tailor content to users' preferences. Emphasizing growth and acquisition for promotion-focused users and stability and security for prevention-focused users can enhance user engagement. The perceived security of OGB apps in handling sensitive information can increase users' perceived benefits. Collaboration between managers and retailers to provide various services like product guarantees and secure online environments can further support the move towards OGB.

## 7. LIMITATIONS, AND FUTURE RESEARCH

This study has limitations similar to previous research. Due to a small sample size focusing only on Chinese Millennials using the OGB app, the generalizability of the findings may be restricted. Future studies should use samples that better represent specific regions or global markets through comparative analysis or alternative methods. The study identified specific values impacting purchase intent on the OGB app, suggesting a need for further research to explore different perspectives comprehensively. While the study mainly looked at individual differences in customer engagement affecting purchase intent, future research could incorporate additional factors to enhance understanding of group purchase behavior in retail markets, which would benefit stakeholders.

**Data availability:** The datasets generated and/or analyzed during this study are not publicly available due to general data protection regulations, but are available from the corresponding authors on reasonable request.

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**Competing interests:** The authors declare no competing interests.

**Ethical approval:** This research was approved by the Jawatankuasa Etika Universiti Untuk Penyelidikan Melibatkan Manusia, Universiti Putra Malaysia (No. JKEUPM-2023-682). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

**Informed consent:** Written informed consent was obtained from all participants in this study before commencing the survey.

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