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2014

# ANTECEDENTS OF ONLINE GROUP BUYING BEHAVIOR: FROM PRICE LEVERAGE AND CROWD EFFECT PERSPECTIVES

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### Recommended Citation

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# ANTECEDENTS OF ONLINE GROUP BUYING BEHAVIOR: FROM PRICE LEVERAGE AND CROWD EFFECT PERSPECTIVES

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## Abstract

*Online group buying, as a new form of e-commerce, has offered customers a great deal of promotion and convenience in shopping. Meanwhile, there are an increasing number of OGB vendors struggling in the fierce competition and extremely turbulent business environment. During 2010 and 2011, more than 2000 OGB vendors in China have been out of business or facing with bankruptcy. Therefore, study of search and purchase behavior of potential customers in online group buying is meaningful to OGB vendors. This stream of study can offer information in relating how to maintain and improve competitiveness in the market. Present study aims to conduct an empirical research on the impact on customers' search and purchase intention in online group buying. Since little prior research has investigated the searching and purchase behavior in the context of online group buying, this research tends to fill this void by examine multiple antecedents, including products measures, vendor-related factors and individual characteristics. This paper also provides informative knowledge and contributions to both academic researchers and business practitioners.*

*Keywords: online group buying, e-commerce, purchase intention, sales and price proneness.*

# 1 INTRODUCTION

Online group buying (OGB), also known as online collaborate buying or team purchase, has been emerged and developed for almost ten years (Anand & Aron, 2003). It is a business model in which customers can recruit enough people to generate enough volume of orders to create low transaction price (Cheng & Huang, 2013; Hsu, Chang, Chu, & Lee, 2014). Similar to offline group buying auction, it offers products and services at significantly reduced prices on the condition that a minimum number of buyers would make the purchase. Based on the form of group buying auction, online group buying adopts the innovation of online market mechanisms (Anand & Aron, 2003). Recently in China, group buying has formed a thriving online shopping market (Liu, Wang, Liu, Wang, & Du, 2012). Recent investigation indicates that more than 1548 group-buying websites have been launched in 2013 and the revenue of online group-buying market in the first half of 2013 is up to RMB\$238.98 billion (Xinhuanet, 2013).

In this tremendously and explosively developing market, there are three distinctive features of online group buying. First, the shopping form of online group buying in China is not similar to group auction. When the minimum number of participants (usually this number is not very big compare to the overall participants) has been reached, new customers can purchase the product with a fixed price – like other B2C transaction. Second, the role of online group buying vendors does not equal to a distributor. Their role inclines to be a platform which can serve as bridges between the providers and potential customers. Thirdly, the products of online group buying are not restricted to physical commodity; they can be virtual products and services (e.g. hairstyle service or dinner at a restaurant).

When make decisions on group-buying website, customers do not have much information about the quality of product which is a critical factor in leveraging their price sensitivity (Diehl, Kornish, & Lynch Jr, 2003). Group buying websites do not have much similar products in one category and due to the limitation from original providers, they seldom offer the function of quality sorting which can be a strong tool in assisting customers' decision making (Cai & Xu, 2008). Considering these special characteristics of online group-buying, in current study, we propose that apart from basic product description, the final decision for customers' purchase is based on three important mechanisms – 1) Leverage on price (e.g. original price or discounting rate); 2) crowd effect (e.g. current number of participants or recommendations) and 3) trust in vendors.

As a new form of e-commerce, the focal advantage of online group buying lies in its higher discount rate and higher participation of customers. This is because the nature of online group buying which OGB vendors can negotiate for better offer of discount rate and price from product or service providers since OGB vendors have channels and abilities to gather large group of customers (Van Horn et al., 2005). Lots of study in prior research has focused on the effect of price and discount on purchase using econometric method (e.g. Chen, Chen, and Song (2007), Chen, Chen, and Song (2002) and Anand and Aron (2003)). Meanwhile, online group buying, from customers' perspective, is widely acknowledged as a form of e-commerce, therefore the attractiveness of discount rate and the volume of group (participation volume) are also built on the base of trust in vendors (Gefen, Karahanna, & Straub, 2003; Tung, Chang, & Chou, 2008). From the perspective of customers, OGB vendors seem always have the intention to manipulate their discount rate and volume of group to make their offer more attractive and "safer". Therefore, the trust in these vendors may become one of the crucial antecedents for customers to decide their purchase.

On the other hand, internet provided customers great channels to search for their goal products/services with lower price. Recent years, more and more OGB vendors suffer from fierce competition in turbulent business environment. According to people.com.cn, only 38% of the OGB vendors can update their products within one week, and more than 8% of OGB vendors are not capable of renewing their products category within one month. Moreover, during 2010 and 2011, more than 2000 OGB vendors in China have been out of business or facing with bankruptcy. Only in the September of 2011, there are more than 400 OGB vendors shutting down for shrink of their business. Therefore, it is essentially important to

investigate searching behavior of potential customers in online group buying, and this can be meaningful to OGB vendors since this stream of study can offer information in relating how to maintain and improve competitiveness in the market. Also, for little prior research has study on the searching and purchase behavior under the context of online group buying, this research has theoretical and practical contributions to both academic researchers and business practitioners. This paper aims to conduct an empirical research in answering:

*How can price leverage and crowd effect impact on customers' search and purchase intention in online group buying?*

*What are the antecedents of customers' search and purchase intention in online group buying?*

## **2 THERORETICAL BACKGROUND**

Prior research related to online group buying mainly focused on the price mechanisms provided by OGB vendors and customers price strategy, most of which are applied with econometric methods. Anand and Aron (2003) surveyed the operational online group buying markets, and study this phenomenon using analytical models. They studied the impact of production postponement by endogenizing the timing of the pricing and production decisions in a two-stage game between the monopolist and buyers. Unlike Anand and Aron, Chen et al. (2007) tend to investigate the price mechanisms from customers' perspective. They built an incomplete information dynamic game model to illustrate the bidders' bidding process. It proves that for the bidders there exists a weakly dominant strategy. Similarly, R. J. Kauffman, H. Lai, and C.-T. Ho (2010) suggested in their study that textual comments made by the participants about sellers in past auctions and existing bids affected a consumer's perceived trust in the auction initiator and the financial risk of the mechanism. And Van Horn et al. (2005) tend to investigate the impact of system efficiency and effectiveness on online group buying performance. Additionally, Shiau and Luo (2012) examined the factors that influence customers' continuous use intention on online group-buying website.

In our research, we tend to combine three streams of theories to investigate the antecedents' effect of search and purchase intention in online group buying. First of all, we adopt the theories in marketing research such as 1) adaptation level (Helson, 1964); 2) assimilation contrast (Sherif, 1963) and 3) transaction utility theory (Thaler, 1985) to investigate the impact of price leverage. Then, more psychologically, we refer to the theories related to crowd in both psychology (Zimbardo, 1969) and management to investigate the crowd effect in online group buying. Thirdly, we will survey the antecedents of search intention and purchase intention from system perspective (Gefen et al., 2003; Tung et al., 2008).

### **2.1 Price Leverage**

According to the adaptation level theory, an individual's behavior represents adaptation to organic, focal and contextual cues (Helson, 1964). Focal cues are those cues to which a consumer responds directly, and contextual cues are all other stimuli within which the focal cue functions. Adaptation level theory suggests that an individual judges stimuli, such as incoming price information, in relation to an internally existing standard. That standard is the adaptation level price that can be considered the mean of previously observed market prices. Besides, assimilation–contrast theory implies that consumers have latitude of acceptance around their price beliefs (Sherif, 1963). Merchant supplied reference prices falling within the latitude are considered plausible by the individual and are thus accepted and assimilated into the internal expected price range. On the other perspectives, Thaler (1985) transaction utility theory separates the total value of a proposed purchase into two components: (1) acquisition utility — the expected pleasure from purchase and use of a product net of the cost, and (2) transaction utility, which reflects the value or merits of the deal.

Prior empirical study has proven that price and price discount predict the search and purchase intention under the moderator effect of customers' sales proneness and price conscious (Alford & Biswas, 2002; Grewal, Krishnan, Baker, & Borin, 1998). This stream of research is adopted Lichtenstein, Ridgway, and Netemeyer (1993)'s framework to design the experiment and research survey. While in present study, we also follow Lichtenstein's framework to empirically test the price leverage effect under the context of online group buying.

## **2.2 Crowd Effect**

Apart from negotiating with provider for more discount rate, the group volume in online group buying also can serve as attractiveness to customers, since the bigger volume of the participation in the purchase, the "safer" the customers may feel to purchase. This can be explained by the theories of crowd psychology. Crowd psychology suggests that ordinary people can typically gain direct power by acting collectively. Crowd behavior is heavily influenced by the loss of responsibility of individual crowd members and the impression of universality of behavior. Classical theories in crowd psychology indicate that crowds foster anonymity and sometimes generate emotion (Bon, 1896). More recently, convergence theory holds that crowd behaviors is not the crowd itself, but is carried in to the crowd by particular individual (Freud, 1955). Thus, crowd amount can be utilized to appeal other individuals to join in the group. In such reasoning, OGB vendors can take advantages of the group volume to embrace more potential customers.

Different from other forms of e-commerce, the participation volume is a unique mechanism for OGB vendors. At the same time it is one of the most important aspects OGB vendors want to show to customers – searching from the most famous online group buying vendors, we found that vendors emphasize greatly on the discount and participation volume (e.g. use bigger size and bold font or colored word to indicate the numbers). However, prior research has studied on the relationship with group volume and pricing within group auction (Anand & Aron, 2003; Chen et al., 2007) while little has investigated the impact of participation volume on customers' search and purchase intention. Current study therefore tends to fill this void by empirically examining the relations between crowd aspects and customers' intentions.

## **2.3 Technology acceptance theory**

Technology acceptance theory suggests that the effects of external variables (e.g. system characteristics, development process, training) on intention to use are mediated by perceived usefulness and perceived ease of use (Viswanath Venkatesh & Davis, 2000). TAM was first introduced in 1986, continuing to be the most influential and widely applied theoretical model in the IS field (Viswanath Venkatesh & Davis, 2000). It was first formulated with an attempt to interpret why people accept and reject information systems (Szajna, 1996). During the past few years, the information systems community considered TAM a parsimonious and powerful theory. In previous research, TAM was been employed in different technologies (e.g. e-mail, GSS, word processors, Hospital Information Systems) in diverse situations (e.g. time and culture) with different control factors (e.g., geographical information, personal information) to different subjects (e.g. knowledge workers, undergraduate students, and MBAs). Currently, researchers in the IS field regard TAM as one of the information systems own theories. In our study, we adopted perceived ease of use as antecedent DVs, including search intention and purchase Intention. We posited the PEOU of customers when they conduct transactions online have an effect on their ultimate behavior in corresponding website.

### 3 RESEARCH MODEL AND HYPOTHESES

#### 3.1 Search Intention

Researchers have revealed the correlation of price, discount and search intention (Alford & Biswas, 2002; Dutta & Biswas, 2005). Therefore, in order to investigate the online group buying behavior, apart from purchase intention; we cannot neglect customers' search intention. Search intention has been defined as buyers' intentions to search for additional information (e.g. visit other stores to check their prices) by Dhruv Grewal, Kent B Monroe, and Ramayya Krishnan (1998). In concerning the online group buying context, the customers tend to search in online vendors for, not only the price information, but also the additional quality related content (Cai & Xu, 2008). Here we adapt to Grewal's definition to view search intention as customers' intention to search in other online group buying vendors for additional product information.

#### 3.2 Purchase Intention

Purchase intention has widely used as a focal construct to indicate the customers' buying behavior in marketing research as well as IS research. In the prior research, purchase intention has been named differently such as buying intention (Alford & Biswas, 2002; Dhruv Grewal, R Krishnan, et al., 1998; Lichtenstein et al., 1993). After comparing the definition, we believe purchase intention can be merged with buying intention. And here we adapt Ailawadi, Neslin, and Gedenk (2001)'s definition as buyer's willingness to purchase, and define purchase intention under OGB context as customer's willingness to purchase for certain product/service in online group shopping.

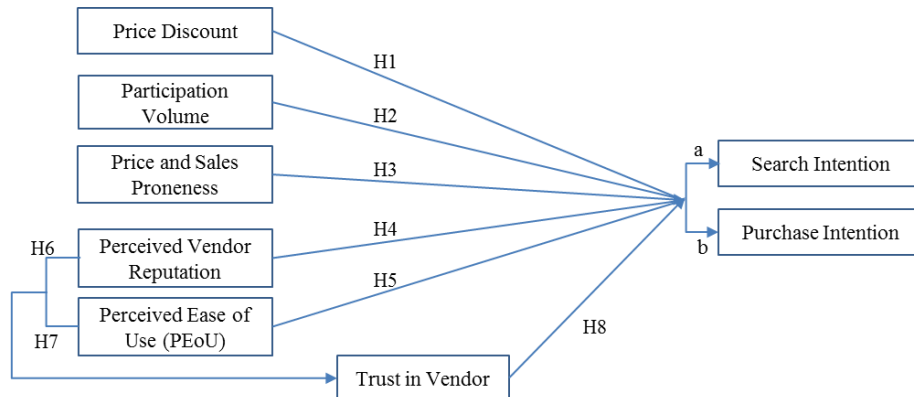


Figure 1. Research Model

#### 3.3 Price Discount

The effect of reference of price and price discount have been well developed in marketing research (Alford & Biswas, 2002; Dhruv Grewal, R Krishnan, et al., 1998). Here we adapt Alford and Biswas (2002)'s method in the context of online group buying. Also, for the nature of OGB, vendors pay much attention on their display in price discount rate as a focal attractiveness to customers. In addition, price discount is related to consumer perceptions of the product, in that the higher price discount, the more customers could save from buying this product. From the customers' perspective, discount rate is can also be viewed as the most crucial factor to decide their purchase.

Also, according to Dhruv Grewal, Kent B Monroe, et al. (1998), discount rate is also a crucial factor influencing customers' searching intention. From customers' perspective, to search for lower price and better promotion, their will compare several vendors. Online group buying provides a more convenient way for customers to search for lower price (Cai & Xu, 2008). High price discount of certain products

lead to the perception of large discount of that product. So that customers tend to search more so as to get the best price. Therefore, we can hypothesized that higher discount rate will encourage customers' search intention.

*H1a: Higher price discount will predict higher search intention in OGB.*

*H1b: Higher price discount will predict higher purchase intention in OGB.*

### **3.4 Participation Volume**

Apart from price discount rate, another essential factor for customer to consider their purchase is the participation volume. Here we define participation volume as the number of customers who have already joined in the group buying for certain product/service. Since the higher participation volume suggests a larger crowd of people have already involved in purchasing, potential customers may feel "safer" in deciding their own purchase. Besides, from crowd effect perspective, individuals gain direct power when act collectively, and their actions are reinforced and intensified by the crowd (Reicher & Ramachandran, 2000).

Also, under certain circumstances, for example the group is too small or too big, potential customers might intend to search the same product in other OGB vendors. Nevertheless, apart from comparing the price among different vendors, customers tend to compare the participation volume along the similar products. Therefore we can hypothesize that:

*H2a: Higher participation volume will result in higher search intention in OGB.*

*H2b: Higher participation volume will result in higher purchase intention in OGB.*

### **3.5 Price and Sales Proneness**

Lots from prior research have revealed the moderating effect of price and sales proneness on the relationship of price discount and search and purchase intention (Alford & Biswas, 2002; Dhruv Grewal, R Krishnan, et al., 1998; Lichtenstein et al., 1993). Past research tend to view sale proneness and price consciousness separately. Sale proneness has been defined as an increased propensity to respond to a purchase offer because the sale form in which the price is presented positively affects purchase evaluations (Lichtenstein et al., 1993), while price consciousness was defined as the degree to which the consumer focuses exclusively on paying a low price (Alford & Biswas, 2002). In this study, in order to avoid the multicollinearity among these two constructs, to consider the propensity of customers' sensitivity on price, we merge these two constructs into price and sales proneness. Under the context of online group buying, we define price and sales proneness as the propensity to respond to the discount and promotions of certain product/service.

Nevertheless, to indicate the uniqueness of online group buying, instead of using price and sales as a moderator, we tend to view it as an antecedent of customers' search and purchase intention. For the competitiveness of online group buying over other e-commerce forms is that OGB vendors can offer lower price and better promotion. Therefore, if a customer has higher price and sales proneness, he/she will have higher search and purchase intention on OGB. Therefore we can hypothesize that:

*H3a: Customer with higher price and sales proneness will have higher search intention in OGB.*

*H3b: Customer with higher price and sales proneness will have higher purchase intention in OGB.*

### **3.6 Perceived Vendor Reputation**

Yoon, Guffey, and Kijewski (1993) argue that company's reputation and its service offering determine buyer's decisions. Company's reputation helps create expectations about an offering among potential buyers. The higher reputation perceived by the customer, the better expectations formulated in customers'

mind, and therefore customers has more likely to participate in OGB website to search more products and conduct purchase on this website. Additionally, high perceived reputation also mitigates perceived uncertainties to the products provided by the vendor (Yoon et al., 1993). Therefore, it decreases customers' concern in shopping from current vendor, which in turn leads to increase in purchase intention. Accordingly, favorable reputation yields a stronger market share position (Raj, 1985). If a customer feels that current website has high position in the market, he has decreased intention to look for other websites. And current website is believed to be a better choice. Thus, we hypothesize that:

*H4a: Customers' Perceived vendor reputation is negatively associated with their search intention in OGB.*

*H4b: Customers' Perceived vendor reputation is positively associated with one's purchase intention in OGB.*

### **3.7 Perceived Ease of Use**

In IT adoption research, PEOU is employed frequently to be a factor influencing users' behavioral intention (Shen & Eder, 2009). Adapted from the Theory of Reasoned Action (TRA) model, TAM posits that PEOU have an influence on one's behavioral intention to conduct transactions on a website. A website with higher PEOU reduces the mental and physical effort to operate various functions, such as searching products and pay for selected products. Therefore, higher purchase intention will be reached.

Furthermore, high PEOU induce customers' willingness to accept current website (Davis, 1989) so they are less inclined to look for additional information from other website or OGB vendor, and to compare products in different websites. Hence, we hypothesize:

*H5a: Customers' perceived ease of use of the vendor is negatively associated with their search intention in OGB.*

*H5b: Customers' perceived ease of use of the vendor is positively associated with their purchase intention in OGB.*

### **3.8 Trust in Vendor**

Customers tend to trust vendors which have a reputation of being trustworthy (Cosmides & Tooby, 1992). Furthermore, Koufaris and Hampton-Sosa (2002) argue customer believe that vendor with a high reputation is less likely to jeopardize their reputation assets by acting opportunistically, since for the untrustworthy behavior of a vendor with high reputation, its cost is perceived to be much higher than a vendor with low reputation. Therefore, vendors tend to produce high-quality items and provide decent services rather than risk jeopardizing their repute. Hence, we hypothesize that:

*H6: Customers' perceived vendor reputation is positively associated with trust in vendor in OGB.*

Wang and Benbasat (2005) have argued that the perceived ease of use increase trust. PEOU demonstrates that the vendor have devoted extra energy and extended effort in designing the website, which means then vendor care about customers' feelings. Conversely, customer may perceive difficult-to-use website as less considerable and less capable, and therefore, they may lower their trust to the vendor. In addition, as indicated in the book of Blau (1964), people usually subconsciously look for cues as to whether they can trust the other party when they engage with another person, including cues in behavior and appearance. Extending this to the realm of e-commerce, an website having quality of PEOU tend to create more trust in customers mind (Gefen et al., 2003). Moreover, a defined and clear website and an easy-operating process are recipe for creating trust in this process. Although PEOU is not the solo determinant of trust, we posit it contribute to trust. Hence, we hypothesize that.

*H7: Customers' perceived ease of use of an OGB website is positively related to one's trust in the vendor.*



Reichheld and Schefter (2000) indicated that trust is an important antecedent to participation in e-commerce website. Trust is a prerequisite of social behavior (Edelman, 2011), such as purchase a product. Customers are more likely to participate in browsing, searching as well as purchasing on the website on which they place more trust. Trust in vendor, a subjective feeling, can help customers to rule out some websites and vendors they dislike at first, also including undesirable yet possible behaviors of the OGB vendor. Therefore, trust reduce the social complexity faced by OGB customers (Gefen et al., 2003). Hence, trust contributes to the purchasing activities of OGB customers. On the other hand, trust in the vendor makes customers comfortable when browsing products on this website, so that they are less likely to switch to other websites. Based on above arguments, we hypothesize that:

*H8a: Customers' trust in vendor has a negative effect on one's search intention in OGB.*

*H8b: Customers' trust in vendor has a positive effect on one's purchase intention in OGB.*

## 4 RESEARCH METHODOLOGY

We conducted an empirical reach in order to test the proposed antecedents of search intention and purchase intention. A pretest was conducted before the survey to identify levels of price discount and participation volume among respondents. All the participants involved in the survey would be assigned to a group out of four, different group have different levels of price discount and participation volume. All the other constructs in the model will be measured by items in the survey.

### 4.1 Operationalization of Construct

In developing the measurement instrument we adopted tested questions from previous research so as to improve validity. Besides referring to items of construct from reliable sources such as top journal articles (Stone & Stone Eugene, 1978), we carried out further modifications to these items to enable them to perfectly suit our research context. In total, twenty-seven items were generated. Participants were asked to answer there 27 questions based on a seven-point Liker scale, in which 1 represents "strongly disagree" and 7 indicates "strongly agree". Furthermore, they were asked to provide some demographic information, including gender, monthly-income, age, length of surfing the Internet, group buying experience as well as the city they live in.

### 4.2 Conceptual Validation

Since some of the items are directed adopted from prior research in top journals in IS, and minor changes have been made to these items to fit into our research context, label sorting was conducted before the survey, in which four students from the behavioral track of the information systems department from a local university were involved. These items were further refined and revised according to their feedback and the result of label sorting. Final 27 items are listed in Table 1 below:

Construct	Item	Measures	Source
Perceived Vendor Reputation	Rep1	The vendor is a leader in its field	Adapted from Yoon et al. (1993)
	Rep2	The vendor provides help in solving customer' problems	
	Rep3	The vendor provides consistently high-quality service	
	Rep4	The vendor offers a broad array of products and services	
	Rep5	The vendor has national wide capabilities and resources	
Perceived Ease of Use	PEoU1	My interaction with this OGB vendor would be clear and understandable	Adapted from V. Venkatesh and Davis (1996)
	PEoU2	Interacting with this OGB vendor would not require a lot of my mental effort	
	PEoU3	I find this OGB website would be easy to use	

	<b>PEoU4</b>	I would find it easy to get the website to do what I want it to do	
<b>Trust in Vendor</b>	<b>Trust1</b>	The OGB vendor is trustworthy	Adapted from Jarvenpaa, Tractinsky, and Saarinen (1999)
	<b>Trust2</b>	The OGB vendor wants to be known as one who keeps promises and commitments	
	<b>Trust3</b>	I trust this store keeps my best interests in mind	
	<b>Trust4</b>	I find it necessary to be cautious with this OGB vendor	
	<b>Trust5</b>	This retailer has more to lose than to gain by not delivering on their promises	
<b>Price and Sales Proneness</b>	<b>Pron1</b>	I am willing to go to extra to find lower prices	Adapted from Alford and Biswas (2002)
	<b>Pron2</b>	The money saved by finding lower prices is usually worth the time and effort	
	<b>Pron3</b>	The time it takes to find lower prices is usually worth the effort	
	<b>Pron4</b>	When I buy coupons from OGB website, I feel I am getting a good deal	
	<b>Pron5</b>	I pay much attention on the price discounts offered by OGB vendor	
<b>Search Intention</b>	<b>SI1</b>	Before making a purchase decision, I would visit other stores for a lower price	Adapted from D. Grewal, K.B. Monroe, and R. Krishnan (1998)
	<b>SI2</b>	Before making a purchase decision, I would need to search for more information about prices of alternative[product]	
	<b>SI3</b>	Before making a purchase decision, I would visit other websites that sell this [product] to check their prices	
<b>Purchase Intention</b>	<b>PI1</b>	I would purchase [product] or service from this OGB website	Adapted from Dhruv Grewal, R Krishnan, et al. (1998), Gupta, Su, and Walter (2004) and R. J. Kauffman, H. Lai, and C. T. Ho (2010)
	<b>PI2</b>	Suppose you need to buy this product in the next month, how willing would you be to buy it from OGB website/other online vendor?	
	<b>PI3</b>	I am willing to participate in this OGB	
	<b>PI4</b>	I will probably participate in this OGB	
	<b>PI5</b>	I am interested in participating in OGB	

Table 1. Survey Questions

### 4.3 Research Context

In this project, we study how various factors including properties of products and values of vendor as well as some individuals' characteristics can influence customers searching and purchasing behaviors on an OGB website. Factors involving vendors include price discount and participation volume. Elements in this project related to individual characteristics contain perceived vendor reputation and perceived ease of use as well as trust in vendor. For the lack of prior research on customers' search intention and purchase intention under the context of online group buying, we extend existing research to online group buying website. Online group buying (OGB) or team purchase, is a form of selling that a crowd of people gathered together to purchase an item, in which everyone could share a certain discount. We looked into prior research in online shopping. On top of the study, we drive our model and survey questions.

### 4.4 Pretest

The pretest subjects (n = 40) were provided with a description of a casual buffet dinner with friend (which is quite popular among Chinese college students) and asked to indicate the highest and average discount rate as well as participation volume estimates for the service in online group buying. The estimated mean highest and lowest discount rates were 72.98% and 22.65% off; respectively the estimated mean highest

and lowest participation volumes were 419.59 and 65.06. Based on the pretest results, the high level discount rate was set at 73% off and low discount rate was set at 23% off. Similarly, the high participation volume was set at 420 persons, while low participation volume was set as 65 persons.

#### 4.5 Research Design

A 2 (two levels of discount rates)  $\times$  2 (two levels of participation volume) between-subjects experimental design was used for the study. Discount rate and participation volume were manipulated by the results from pretest. In order to test our hypotheses and answer the research question, we design a two stage study to gather data. In the first stage of our study, the respondents were given one famous OGB vendors in China and asked to fill out a survey about the reputation of the vendor, their trust issues in vendor, their price and sales proneness and their demographic information. At the second stage, these respondents (the same group of people) were divided into four groups (40 respondents for each group) and shown different webpages of a same buffet restaurant service. The webpages for the four groups are quite similar (even have the same price after discount: 50RMB) except for they are showing different discount rates and participation volumes. Then the respondents were asked to finish the second survey about their search intention and purchase intention. The survey questions are shown in Table 1. Most our respondents are college students in China. According to their demographic information, most of them are young people and have online shopping experience and OGB experience, therefore we can view them as potential OGB vendor.

## 5 DATA ANALYSIS AND RESULT

In this section, before we test our research model and conduct data analysis, we first conduct test analysis for reliability and validity, which may serve as a direction of our data issue. For test reliability and validity, we conduct Exploratory Factor Analysis (EFA) to check the quality of constructs and Confirmatory Factor Analysis (CFA) to test the accuracy of item-factor matching and prepare for factor-factor relationship analysis. Then, before we leap to ANOVA, we will test for the normality, linearity and multicollinearity issues of the data, which serves as the basic assumption of ANOVA.

### 5.1 EFA and CFA

To ensure the reliability of data, Exploratory Factor Analysis (EFA) was conducted to the collected data, setting the extraction method to Principal Component Analysis and rotation method to Varimax rotation in SPSS. After the first round EFA, six factors emerged from these items and they combined to account for 67.813% of the total variance. By checking item-intended factor correlations (should be  $> 0.5$ ) and item-unintended factor correlations (should be  $< 0.4$ ), we dropped items that do not conform to convergent validity and discriminant validity. In this round, *trust4*, *trust5*, *pron4* and *pron5* were dropped. After dropping these four items, we conduct second round EFA to remaining items, six factors emerge from these items, *rep4* and *rep5* disobey discriminant validity and convergent validity, since item-intended factor loading is less than 0.5 and item-unintended loading is larger than 0.4. Although *rep1* and *PEoU4* exhibit 0.401 and 0.407 loadings (a little larger than the threshold 0.4) to Component 1 respectively, they illustrate a perfect convergent validity. Therefore, in the second round, we only drop *rep4* and *rep5*. In this third round of EFA, six factors emerge from these items and the rotated component matrix indicates a decent convergent validity and discriminant validity, except for *rep3*. For the item *rep3*, its loading to Component 2 is 0.404, a little larger than 0.4. Since its item-intended loading fits well and the combined model account for 76.974% of the total variance. We decide not to drop this item.

After EFA, we have already dropped *trust4*, *trust5*, *rep4*, *rep5*, *pron4* and *pron5*, and then Confirmatory Factor Analysis (CFA) was conducted in LISREL. Results for CFA indicate the measurement model with standardized loading path diagram. The model fit of measurement model is shown in Table 2 below.

From the table we can conclude that for our goodness of fit index and standardized RMR are slightly beyond the threshold, we can view our measurement model as a reasonable model.

	Relative chi-square	RMR	GFI	NFI	IFI	CFI	RFI	SRMR	RMSEA
Threshold	<3	<0.5	>=0.9	>=0.9	>=0.9	>=0.9	>=0.9	<0.05	
Statistics	1.55	0.11	<b>0.87</b>	0.93	0.98	0.98	0.92	<b>0.051</b>	0.053 Reasonable

Table 2. Measurement Model Fit

For convergent validity, as indicated in Table 3, the t-values of factor loadings are significant (>1.96). According to the rule of thumb in convergent validity, we check standard loading (>0.7), average variance extract (AVE>0.5), Cronbach's alpha (>0.7) as well as Composite factor reliability (CR>0.7) from Table 3. All the requirements are satisfied.

For discriminant validity, according to the rule of thumb, factor correlation should be less than 0.6, item-factor correlation need to be larger than item-unintended factor correlation, and the root of AVE of a factor should be larger than factor-factor correlation. Therefore, referring Table 4, we can see the factor correlations of Trust and Reputation, Trust and PEOU, and Reputation and PEOU are above 0.6, which can be problematic issues in concerning discriminant validity.

		T Value	Standard Loading	AVE	CR	Cronbach's $\alpha$
Trust	trust1	13.51	0.88	0.723	0.887	0.886
	trust2	13.19	0.86			
	trust3	11.94	0.81			
Reputation	rep1	6.46	0.51	0.554	0.779	0.757
	rep2	10.32	0.75			
	rep3	13.49	0.92			
PEoU	PEoU1	12.64	0.94	0.667	0.889	0.887
	PEoU2	12.29	0.82			
	PEoU3	13.19	0.86			
	PEoU4	10.56	0.74			
Proneness	pron1	12.41	0.83	0.729	0.890	0.888
	pron2	13.64	0.89			
	pron3	12.53	0.84			
SI	SI1	13.55	0.97	0.796	0.919	0.918
	SI2	13.65	0.88			
	SI3	14.78	0.92			
PI	PI1	7.86	0.59	0.872	0.872	0.871
	PI2	8.10	0.60			
	PI3	11.98	0.81			
	PI4	13.26	0.86			
	PI5	14.23	0.90			

Table 3. Convergent Validity

	Trust	Reputation	PEoU	Proneness	SI	PI
Trust	0.851					
Reputation	<b>0.684</b>	0.744				
PEoU	<b>0.701</b>	<b>0.665</b>	0.817			
Proneness	0.304	0.290	0.225	0.854		
SI	0.229	0.172	0.179	0.472	0.889	
PI	0.286	0.268	0.446	0.266	0.327	0.764

Table 4. Factor Correlation Table

## 5.2 Normality, linearity and multicollinearity

To test the normality and linearity, histogram, plot of regression standard residual and scatterplot are of two dependent variables are generated in SPSS. The histogram diagrams indicate that the standard residual fit in normal distribution very well, and plot of regression standard residual indicate that these plot follow the line decently. Also, the scatter plot illustrates the points are symmetrically distributed around the line. To sum up, the data can fulfil the normality and linearity. In order to test the multicollinearity, we use SPSS to check for Variance Inflation Factor (VIF) and Condition Index. Tables were formulated respectively when DV is SI and PI. The result shows that VIF satisfy the requirement (when  $VIF > 3.3$ , it may suggest the existence of multicollinearity). Also condition indexes satisfy the rule of thumb (when condition index  $> 30$  it may suggest the existence of multicollinearity), and there are no two IVs that are loaded highly on one small factor ( $> 0.9$ ). By observing both VIF and condition index, we can conclude that our constructs are not suffer from multicollinearity.

## 5.3 ANOVA

After fulfill the assumption of normality, linearity and multicollinearity, as there are in total four groups in the survey, every group has 40 respondents involved. To test whether or not the means of these four groups are all equal, we adopted ANOVA to test the differences. The result of Box Test indicates the null hypothesis is not supported, and therefore, the observed covariance matrices are not equal across groups. Then, detail analysis was conducted to different dependent variables.

After knowing that there is significant difference existing among the four groups, we conduct ANOVA to find where the differences lying in. First, set SI as dependent variable, and the result indicates difference exists between groups in relating to search intention. To be specific, the group with high discount and high participation and the group with high discount and low participation have different impacts on SI. This illustrates that different participation levels have different effects on SI. Similarly, we can also reach the conclusion that different discount levels do not have different effects on SI. It is also indicated that the group with high discount and low participation and group with low discount and high participation have different effects on SI. In this situation, we cannot reach the conclusion whether it is the effect of discount or participation. From comparing the mean value among the groups, H1a is rejected since group with high discount rate has small mean of SI, and H2a is supported since group with high participation volume has larger mean of SI. Similarly to search intention as dependent variable, under the circumstance of PI as dependent variable, the result indicates that there is no difference between these groups. Therefore, H1b and H2b are rejected.

## 5.4 SEM and hypotheses test

To test the hypotheses 3 – 8, we use structural equation modeling (SEM) with LISREL in order to assess the two dependent variables (DVs) simultaneously. We tested the relationship between the independent variables (IVs) and the DVs as well as the mediation effect. The results were summarized in Table 5. From the values of R-square, we can learn that search intention can be explained at 23% while purchase intention can be explained at 24% by the independent variables. As indicated in Table 5, although

perceived vendor reputation and perceived ease of use are significantly correlated with trust, trust in vendor are not significantly related to search intention and purchase intention, we can conclude that the mediating effect does not exist. The model fit parameter indicates the structural model in this research is reasonably fit.

SEM	IV	DV	Co-efficient	t-value	Hypotheses Test
To test the main effect	price and sales proneness	search intention	0.46	5.17	H3a is supported
		purchase intention	0.20	2.34	H3b is supported
	percieved vendor reputation	search intention	-0.075	-0.57	H4a is not supported
		purchase intention	-0.08	-0.6	H4b is not supported
	percieved ease of use	search inention	0.073	0.56	H5a is not supported
		purchase intention	0.50	3.47	H5b is supported
To test the mediation effect	percieved vendor reputation	trust in vendor	0.40	3.97	H6 is supported
	perceived ease of use	trust in vendor	0.44	4.40	H7 is supported
	trust in vendor	search intention	0.094	0.70	H8a is notsupported
		purchase intention	-0.071	-0.51	H8b is not supported

Table 5. Results of Hypothesis Testing

## 6 DISCUSSION AND IMPLICATION

From the data analysis, we found discount rate is not correlated with search intention or purchase intention which is contradictory to prior marketing research. And more interest thing is that price and proneness is positively correlated to search and purchase intention. It might because, customer already got the impression of online group buying as a channel of get discount and promotion. Therefore, in deciding their purchase, they tend to weight more on product/quality offered by OGB vendor. On the other hand, participate volume has shown a positive relationship with search intention, which suggest customers tend to compare the group volume among different OGB vendors to decide their purchase. While this is shown in the analysis, we would like to highlight a few key points which could be the source of the counter intuitive result. First of all, during the test for normality, linearity and multicollinearity, the several outliers have been spotted which may affect the results. However, we did not manage to drop them since we need to main an exactly same size for each group. If we gathered more data in the data collection phase, we might have tried to replace several outliers with the extra data. Secondly, as the result of pre-test, it shows that in labeling the levels of participation rates, there is a huge standard deviation which might indicate that among different groups of customers, their sense of higher level of participation can be greatly different. Some people tend to join in the group with 1,000 participations while other feel reasonable and acceptable to join in a smaller group such like 20-50 persons. Therefore, the accuracy of the hypotheses testing related to participation volume can be undermined.

### 6.1 Theoretical and Practical Contributions

Since little prior research has study on the antecedents of search and purchase intention under the context of online group buying, this research shed lights on concerning the mechanisms of group buying to indicate the shopping behavior of customers. For the nature of online group buying, price and discount are positively associated by the customers price and sales proneness which indicates that customers have already view online group buying as an effective channel to searching for lower price and better promotion. This paper provided an effective method to associate the characteristics of online group buying from three aspects: 1) price leverage; 2) crowd effect and 3) system acceptance.

For practitioners, this paper can also serve as a mirror to understand the customers' buying behavior in online group buying. From the result of this paper, we can know that when shopping in the online group

website, the perceived ease of use can affect the trust of OGB vendors. Therefore, OGB vendors should pay attention to their direction to users and webpage design to better serve the customer. On the other hand, from this research we can see that customers tend to compare the participation volume before deciding their purchase. Therefore, OGB vendors should focus on control the participation volume of products to form better strategy to attract customers and form competitiveness.

## 6.2 Limitation and Future Work

There are some limitations of our study. One limitation is that the survey was conducted respondents who use Chinese group buying website and the product type is limited to coupon for cuisine. Hence the generalizability might be weak. Future studies can perform such analysis to examine whether these relationships are the same across different group buying websites, such as “BIGDEAL”, a Singapore group buying website, and across different products. Another limitation is that the study is cross-sectional. Every respondent involved in the survey is asked to see a picture about a website before answering these questions. The picture is static. However, websites are dynamic in their developments. Further studies can be conducted to examine the impacts of these same factors over time. A longitudinal study with measures at different times will be helpful to answer these questions. Similarly, in this paper, we only consider the effect of discount rate as a leverage of price. Nevertheless, this leverage effect can be associated with price. Therefore, in the future study, it can be designed as a  $2 \times 2 \times 2$  experiments to indicate the leverage effect of discount rate in different levels of price.

## REFERENCES

- Ailawadi, K. L., Neslin, S. A., & Gedenk, K. (2001). Pursuing the value-conscious consumer: store brands versus national brand promotions. *Journal of Marketing*, 65(1), 71-89.
- Alford, B. L., & Biswas, A. (2002). The effects of discount level, price consciousness and sale proneness on consumers' price perception and behavioral intention. *Journal of Business research*, 55(9), 775-783.
- Anand, K. S., & Aron, R. (2003). Group buying on the web: A comparison of price-discovery mechanisms. *Management Science*, 49(11), 1546-1562.
- Blau, P. M. (1964). *Exchange and power in social life*: Transaction Publishers.
- Bon, G. L. (1896). *The crowd: A study of the popular mind*.
- Cai, S., & Xu, Y. (2008). Designing product lists for e-commerce: The effects of sorting on consumer decision making. *Intl. Journal of Human-Computer Interaction*, 24(7), 700-721.
- Chen, J., Chen, X., & Song, X. (2002). Bidder's strategy under group-buying auction on the Internet. *Systems, Man and Cybernetics, Part A: Systems and Humans*, IEEE Transactions on, 32(6), 680-690.
- Chen, J., Chen, X., & Song, X. (2007). Comparison of the group-buying auction and the fixed pricing mechanism. *Decision Support Systems*, 43(2), 445-459.
- Cheng, H.-H., & Huang, S.-W. (2013). Exploring antecedents and consequence of online group-buying intention: An extended perspective on theory of planned behavior. *International Journal of Information Management*, 33(1), 185-198.
- Cosmides, L., & Tooby, J. (1992). Cognitive adaptations for social exchange. *The adapted mind*, 163-228.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.
- Diehl, K., Kornish, L. J., & Lynch Jr, J. G. (2003). Smart agents: When lower search costs for quality information increase price sensitivity. *Journal of Consumer Research*, 30(1), 56-71.
- Dutta, S., & Biswas, A. (2005). Effects of low price guarantees on consumer post-purchase search intention: The moderating roles of value consciousness and penalty level. *Journal of Retailing*, 81(4), 283-291.
- Edelman, B. (2011). Adverse selection in online “trust” certifications and search results. *Electronic Commerce Research and Applications*, 10(1), 17-25.

- Freud, S. (1955). Group psychology and the analysis of the ego The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume XVIII (1920-1922): Beyond the Pleasure Principle, Group Psychology and Other Works (pp. 65-144).
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: an integrated model. *MIS quarterly*, 27(1), 51-90.
- Grewal, D., Krishnan, R., Baker, J., & Borin, N. (1998). The effect of store name, brand name and price discounts on consumers' evaluations and purchase intentions. *Journal of Retailing*, 74(3), 331-352.
- Grewal, D., Monroe, K. B., & Krishnan, R. (1998). The effects of price-comparison advertising on buyers' perceptions of acquisition value, transaction value, and behavioral intentions. *Journal of Marketing*, 62(2).
- Grewal, D., Monroe, K. B., & Krishnan, R. (1998). The effects of price-comparison advertising on buyers' perceptions of acquisition value, transaction value, and behavioral intentions. *The Journal of Marketing*, 46-59.
- Gupta, A., Su, B. C., & Walter, Z. (2004). An empirical study of consumer switching from traditional to electronic channels: A purchase-decision process perspective. *International Journal of Electronic Commerce*, 8(3), 131-161.
- Helson, H. (1964). Adaptation-level theory.
- Hsu, M.-H., Chang, C.-M., Chu, K.-K., & Lee, Y.-J. (2014). Determinants of repurchase intention in online group-buying: The perspectives of DeLone & McLean IS success model and trust. *Computers in Human Behavior*, 36, 234-245.
- Jarvenpaa, S. L., Tractinsky, N., & Saarinen, L. (1999). Consumer Trust in an Internet Store: A Cross - Cultural Validation. *Journal of Computer - Mediated Communication*, 5(2), 0-0.
- Kauffman, R. J., Lai, H., & Ho, C.-T. (2010). Incentive mechanisms, fairness and participation in online group-buying auctions. *Electronic Commerce Research and Applications*, 9(3), 249-262.
- Kauffman, R. J., Lai, H., & Ho, C. T. (2010). Incentive mechanisms, fairness and participation in online group-buying auctions. *Electronic Commerce Research and Applications*, 9(3), 249-262.
- Koufaris, M., & Hampton-Sosa, W. (2002). Customer trust online: examining the role of the experience with the Web-site. *Information Systems Journal*, 5, 1-22.
- Lichtenstein, D. R., Ridgway, N. M., & Netemeyer, R. G. (1993). Price perceptions and consumer shopping behavior: a field study. *Journal of Marketing Research*, 234-245.
- Liu, H., Wang, W., Liu, D., Wang, H., & Du, N. (2012). HappyGo: A field trial of local group buying. Paper presented at the Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work.
- Raj, S. (1985). Striking a Balance between Brand'Popularity'and Brand Loyalty. *Journal of Marketing*, 49(1).
- Reicher, S., & Ramachandran, V. (2000). Crowd psychology. *Encyclopedia of human behaviour* (2nd edn)(Oxford, Elsevier).
- Reichheld, F. F., & Schefter, P. (2000). E-loyalty. *Harvard business review*, 78(4), 105-113.
- Shen, J., & Eder, L. B. (2009). Intentions to Use Virtual Worlds for Education. *Journal of Information Systems Education*, 20(2).
- Sherif, C. W. (1963). Social categorization as a function of latitude of acceptance and series range. *The Journal of Abnormal and Social Psychology*, 67(2), 148.
- Shiau, W.-L., & Luo, M. M. (2012). Factors affecting online group buying intention and satisfaction: A social exchange theory perspective. *Computers in Human Behavior*, 28(6), 2431-2444.
- Stone, E. F., & Stone Eugene, F. (1978). *Research methods in organizational behavior*: Goodyear Publishing Company Santa Monica.
- Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. *Management Science*, 42(1), 85-92.
- Thaler, R. (1985). Mental accounting and consumer choice. *Marketing science*, 4(3), 199-214.



- Tung, F. C., Chang, S. C., & Chou, C. M. (2008). An extension of trust and TAM model with IDT in the adoption of the electronic logistics information system in HIS in the medical industry. *International journal of medical informatics*, 77(5), 324.
- Van Horn, T., Engman, J. C., Halbert, R. V., Gustafsson, N., Woodford, D. A., Pache, J. P., & Dean, G. C. (2005). System and method for extension of group buying throughout the internet: Google Patents.
- Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test\*. *Decision sciences*, 27(3), 451-481.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science*, 46(2), 186-204.
- Wang, W., & Benbasat, I. (2005). Trust in and Adoption of Online Recommendation Agents. *Journal of the Association for Information Systems*, 6(3).
- Xinhuanet. (2013). The revenue of online group-buying market in the first half of 2013 has reached RMB&238.98 billion, from [http://big5.xinhuanet.com/gate/big5/news.xinhuanet.com/info/2013-08/29/c\\_132673924.htm](http://big5.xinhuanet.com/gate/big5/news.xinhuanet.com/info/2013-08/29/c_132673924.htm)
- Yoon, E., Guffey, H. J., & Kijewski, V. (1993). The effects of information and company reputation on intentions to buy a business service. *Journal of Business research*, 27(3), 215-228.
- Zimbardo, P. G. (1969). The human choice: Individuation, reason, and order versus deindividuation, impulse, and chaos. Paper presented at the Nebraska symposium on motivation.