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Why Do People Make Online Group Purchases? Risk Avoidance, Sociability, Conformity, and Perceived Playfulness

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ABSTRACT: *Group buying websites have drawn considerable attention in the business world. By improving buyers' bargaining power, these sites help consumers obtain more of the surplus created by network externality. This paper studied what makes online group buying (OGB) attractive to customers and how to strategically identify what customers need to effectively OGB. A modified Unified Theory of Acceptance and Use of Technology (UTAUT) and online group buying data from Taiwan were employed. Tests for content validity, reliability, convergent validity, discriminant validity, and model fitness show that our model, survey, and data are all valid. The author identified five reasons why people want to engage in online group buying: perceived risk avoidance, sociability, performance expectancy, effort expectancy, and social influence. The relationship between behavioral intention and use behavior, although in the positive direction, was not significant. Two moderators, gender and conformity, were tested. Females reported that they were influenced more than males in their intention to use OGB services by perceived risk avoidance, sociability, and perceived playfulness. The impact of the intention to use OGB on actual usage was stronger among those who evidenced conformity than those who did not. This study is the first instance of academic empirical research on OGB. The relationship between network externality and OGB is revealed. The moderating effect of conformity shows the importance to identify bridging persons in buying groups. The importance of role of gender is revealed.*

KEYWORDS: *Group Purchase, Sociability, Unified Theory of Acceptance and Use of Technology (UTAUT), Group Buying, Risk Avoidance, Social Network Services.*

1. Introduction

Group purchase organizations (GPOs) came into being before the advent of the Internet or Web 2.0. For example, hospitals in the US form GPOs to aggregate their buying power and negotiate with vendors for discounts. Friends can have an important effect on group purchases by creating such benefits as enhanced shopping enjoyment and information acquisition (Mangleburg, Doney & Bristol, 2004). Other benefits of GPOs for customers include increased bargaining power, feelings of empowerment and security, the opportunity to experience social interactions, and enhanced feasibility of the group purchasing process (Ramus & Nielsen, 2005).

The appearance of Internet social network services has caused group buying to take on new forms. For example, Groupon assembles local companies and offers one "Groupon" (group coupon) per day to customers in each of its local markets. If a certain number of people sign up, the deal becomes available to all. The discount can be as high as 50%. Customers do not need to know one another or belong to the same organizations; they are simply Internet users who happen to see the same discount information. Thus, collective intelligence becomes collective bargaining power. The company, which began operations in Chicago in November 2008 (Anonymous, 2011a), has recently been valued at US$11.4 billion if underwriters sell the maximum number of shares at the top of a proposed US$16-to-US$18 price range in the IPO set on November 04, 2011 (Raice & Smith, 2011).

Today, online users can engage in crowdsourcing and create new business models. Examples of these crowdsourcing models are wikis, social bookmarking, co-creation of content, collaborative map services, open innovation, and presumption, a portmanteau derived from professional consumption. Group buying goes a step further: It not only sources the crowd, it empowers the crowd.

Groupon is not the first website to offer group buying. In March 2004, a Taiwanese telnet-type BBS called Professional Technology Temple (PTT) launched its group buying department, which currently completes more than 100 group buying transactions a day. Considering that the Taiwanese population is only 24 million, this volume is huge. In 2005, China's group buying website Tuangou became popular. According to some reports, the company drove unprecedented bargains by combining the reach of the Internet with the power of the masses, and it has spread through China like "wildfire" (Anonymous, 2006). These Chinese predecessors differ from the American Groupon in the sense that they originated through online chat-rooms or indigenous BBS users rather than from firms or specific Internet platforms. People create the buying groups, become the group leaders, and target specific products. Anyone who reads the initiation notice can join a group. They do not even have to live at the same location or make purchases at the same time. In fact, the members may never meet one another. What brings them together is the grassroots power they can collectively wield to bargain with big firms.

Online group buying also benefits small and medium size sellers who cannot afford to expend large sums of money on the Internet. SMBs do not need to spend their marketing resources upfront. If they cooperate with online group buying sites and find enough interested customers, they can generate sufficient transactions to stay in business.

The aforementioned importance of online group buying motivated us to study what makes it attractive to customers. Our research is based on a modification of the Unified Theory of Acceptance and Use of Technology (UTAUT). The application of this model is

described in Section 2. Section 3 reports the methods of data collection and analysis, and conclusions are stated in Section 4.

2. Literature review and model formation

2.1 Group buying

The first problem one faces in studying group buying is the paucity of the literature. As Wei, Straub and Poddar (2011) stated, "In spite of this rapid growth, IGP (Internet Group Purchase) is nearly completely unstudied in scholarly circles, there being no academic research on how to manage IGP." For this exploratory qualitative study, Wei used collective cognition theory (Montealegre, 2002) to identify the cognitive processes that underlie group buying.

In addition to Wei, Tsvetovat and colleagues have shown how customer coalitions can become groups capable of procuring goods at a volume discount, thereby creating economies of scale among like-minded customers (Tsvetovat et al., 2000). Yamamoto and Sycara cited the benefits of buyer coalitions in e-markets, which also allow buyers to take advantage of volume discounts (Yamamoto & Sycara, 2001). These authors proposed a method that increases the number of buyers who can obtain a given item better than traditional group buying schemes can.

Kauffman and Wang (2001) explored the effects of using auctions as a group buying strategy. They specifically discussed bidding participation externalities (the number of new orders generated from an increase in the quantity of the original order) and the perceived price-drop effect (the increase in the willingness to bid when the bidder predicts that the price will suddenly drop, as opposed to when it actually drops) (Kauffman & Wang, 2001). There are two possible explanations of this effect: (1) the buying group may create more buyers, and (2) when buyers notice the price drops at previous group-buying sessions, they expect the price to drop in the next session as well; this leads them to join in the group buying.

In 2010, soon after the group buying business model appeared, Kauffman et al. conducted experiments that focused on three issues: risk, trust, and fairness (Kauffman, Lai & Ho, 2010; Kauffman, Lai & Lin, 2010). These issues are major concerns at the initial development stage of new business models, especially when the businesses are Internet-based (Light, 2001). When such business models become more advanced, they invent specific mechanisms to address these issues. For example, PayPal's escrow service for online auctions has reduced trust and risk problems to the point that online auction sites such as eBay can prosper. When eBay came online in 1996, there were only 250,000

auctions there (Anonymous, 2011b), but in 2010 eBay's sales reached US$9,156.3 million (Anonymous, 2011c). This enormous growth demonstrates that auctioneers do not see fairness as a problem that should cause them to avoid making transactions.

Whether the group-buying business model is yet sufficiently advanced is an open question. In any case, the rapid growth in recent years of Groupon and other group buying services may require that future research begin with strategies for the promotion of group buying. In particular, businesses want to know what makes people use online group buying so they can develop strategies to attract more users. In the next subsection, we explain how we developed the modified UTAUT model. Then we draw on the literature review to identify the key determinants of how much group buying services are used.

2.2 Research model and hypotheses

The UTAUT has been widely used in online behavioral research (Venkatesh et al., 2003). We use UTAUT for the following reasons. First, the group-buying web services we study are human-computer interfaces; HCI is the topic of TAM, which is the foundation of UTAUT (Davis, Bagozzi & Warshaw, 1989). Second, the original UTAUT covers a wide variety of platforms including corporate systems and websites. Third, many studies have demonstrated the validity of UTAUT with excellent goodness of fit (R^2) (AbuShanab, Pearson & Setterstrom, 2010; Al-Gahtani, Hubona & Wang, 2007; Chan et al., 2010; Chen, Wu & Yang, 2008; Chiu & Wang, 2008; Im, Hong & Kang, 2011; Lu, Yu & Liu, 2009; Yeow & Loo, 2009; Yuen et al., 2010). Finally, UTAUT has been applied to the study of what drives the acceptance of technologies, which corresponds to the research question: Why do people engage in online group buying?

However, there are differences between UTAUT and our model:

2.2.1 Sociability

When UTAUT was developed, most Internet sites were uni-directional: The site owners provided the content, stipulated the rules, and initiated the transactions. Today the Internet is composed of social networks. In addition to empowering buyers, the group buying sites in our study also provide for social interaction. Members are allowed to exchange ideas before, during, and after the transaction. Before the transaction they can share search results and recommend sellers, and during the transaction they can discuss what price to offer, how the product is to be delivered, and so on. After the transaction, they can post their reviews of the seller, the product, and the group leader. This social interaction gives buyers a better chance to complete the group formation. In other words, the buyers need to interact to increase their bargaining power and share information. They share a common goal, which is why it is necessary for them to unite.

Preece highlighted the importance of "understand[ing] how technology can support social interaction and design for sociability" for online communities (Preece, 2001). She previously identified three key factors that contribute to good sociability (Preece, 2000):

- **Purpose:** a community's shared focus on an interest, need, information, service, or support that provides a reason for individual members to belong to the community.
- **People:** members of the community who interact with one another and who have individual, social, and organization needs.
- **Policies:** the language and protocols that guide people's interactions and contribute to the development of folklore and rituals that bring a sense of history and accepted social norms. More formal policies may also be needed, such as registration policies, and codes of behavior for moderators. Informal and formal policies provide community governance.

While analyzing PTT, one of the largest group buying sites in Taiwan, we found these three components to be represented as follows: The purpose of the site was clearly stated at the portal, followed by the policies that users must adhere to. The website is popular and interaction takes place continually. These components created sociability for PTT, and it became our research goal to investigate whether this sociability had an effect on the use of group buying sites.

2.2.2 Conformity

Asch discovered in an experiment that one third of a team's members tended to follow the majority regardless of whether the majority decision was correct (Asch, 1951). Allen labeled such effects as "conformity" (Allen, 1965). Although online communities may not impose "public compliance," "private acceptance" is likely to occur because of "informational social influence" and "normative social influence" (Burnkrant & Cousineau, 1975; Deutsch & Gerard, 1955). Informational social influence refers to the conformity among team members that results from their belief that others' interpretations of an ambiguous situation are more accurate than their own, thereby helping them choose an appropriate course of action. Normative social influence refers to "the influence of other people that leads us to conform in order to be liked and accepted by them" (Aronson, Wilson & Akert, 2009). In the group buying situation, if a buyer follows others' interpretation or decision, and the buyer wants to belong to a certain buying group in order to enjoy steep discounts the next time, we can say that the buyer is trying to narrow the distance between the self and the group; in other words, the buyer is "conforming" to the group.

We added conformity to our model as a moderator between intention and behavior. To justify this decision, we turned to Lascu and Zinkhan's model linking conformity and consumer behavior (Lascu & Zinkhan, 1999). These authors specified three levels of conformity: compliance, identification, and internalization. Compliance is not applicable to our study because it refers to situations in which group members are monitored. Identification, on the other hand, is applicable, because it means that members follow the lead of the buying group to identify with the group so they can participate in group buying the next time. Internalization is also applicable; it means changing one's behavior after changing one's mind because of informational social influence.

2.2.3 Perceived playfulness

The positive relationship between perceived playfulness and use of the Worldwide Web was identified by Atkinson and Kydd (1997). Following Blehar (Blehar, Lieberman & Ainsworth, 1977), they defined playfulness as "an internal personality trait [defined] as physical, social, and cognitive spontaneity; manifest joy; and a sense of humor." Moon and Kim identified playfulness as a factor influencing the acceptance of technology on the Worldwide Web (Moon & Kim, 2001). Based on Csikszentimihalyi's flow theory (Csikszentmihalyi, 2000), Moon and Kim defined three dimensions of perceived playfulness: the extent to which the individual (1) perceives that his or her attention is focused on interacting with the WWW; (2) demonstrates curiosity during the interaction; and (3) finds the interaction intrinsically enjoyable or interesting. Enjoyment has also been identified as a factor influencing users' adoption of a social network on the Internet (Hassanein & Head, 2005/2006; Lu & Wang, 2008; Klimmt, Schmid & Orthmann, 2009).

2.2.4 Perceived risk avoidance

Bauer introduced the concept of "perceived risk," which refers to the fact that consumers characteristically develop decision strategies and ways of reducing risk that enable them to act with relative confidence and ease in situations where their information is inadequate and the consequences of their actions may be drastic (Woodside & Delozier, 1976). Bauer defined two components of the level of perceived risk: (1) the amount at stake in the purchase decision, and (2) one's feeling of subjective uncertainty that one will win some or all of the amount at stake.

Virtual stores are perceived to involve greater risk than bricks-and-mortar establishments. When e-commerce was just getting started, this perceived risk prevented online stores from making money (Bhatnagar, Misra & Rao, 2000). One cause of this perceived risk may be consumers' concern about the security of transmitting credit card information over the Internet. Consumers may also be apprehensive about buying something without touching or feeling it, as well as not being able to return it if it fails to meet their approval.

It has been demonstrated that a consumer's peer groups, reference groups, and significant others can offer social support and legitimize one's purchasing decisions (Woodside, 1972). In a similar vein, online group buying may reduce the purchasing risks. First, it increases buyers' bargaining power, enabling them to avoid being "ripped off" by the seller. Second, buyers in a group buying situation have the chance to share information about the product with other group members having the same goals and stakes. They also can ask whether the group leader has a conflict of interest with the seller. Third, the privacy of the group members can be protected; although sellers can identify the group leader, they cannot identify the other members.

By adding these factors, we modified the UTAUT model as illustrated in Figure 1. The new variables are shown in bold font.

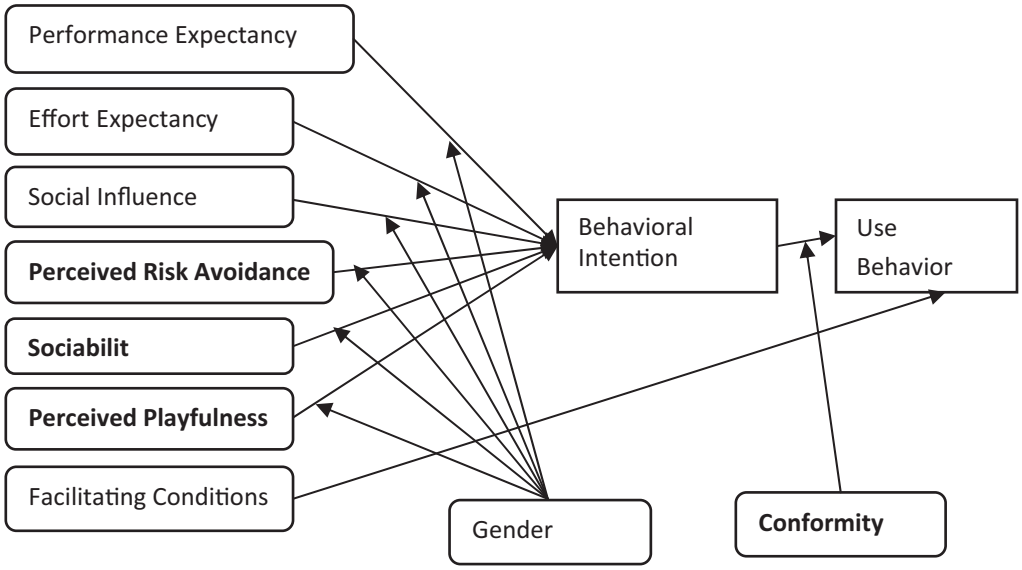

Figure 1 Group Buying Acceptance and Use Model

The model has several other noteworthy features besides the new factors. First, the original UTAUT did not emphasize social and emotional factors; perceived risk avoidance, sociability, perceived playfulness, and conformity all have emotional elements. Second, the original UTAUT includes voluntariness as a moderator. These variables are not applicable to our research, as all our survey respondents were using group buying sites voluntarily.

Based on the model, we proposed the following hypotheses (see Table 1). In the questionnaire, "group buying" means online group buying.

Table 1 Research Hypotheses

H1	Users' performance expectancy with regard to group buying leads to their intention to engage in group buying.
H2	Users' low expectancy of effort in group buying leads to their intention to engage in group buying.
H3	Social influence leads to users' intention to engage in group buying.
H4	Users' perceived risk avoidance with regard to group buying leads to their intention to engage in group buying.
H5	Sociability on the group-buying site leads to users' intention to engage in group buying.
H6	Users' perceived playfulness with regard to group buying leads to their intention to engage in group buying.
H7	Facilitating features of the group buying site lead to users' intention to engage in group buying.
H8	Users' intention to engage in group buying leads to their use of group buying.
H1a	The influence of performance expectancy on intention to use group buying is moderated by gender, such that the effect is stronger for women.
H2a	The influence of effort expectancy on the intention to use group buying is moderated by gender, such that the effect is stronger for women.
H3a	Social influence on the intention to use group buying is moderated by gender, such that the effect is stronger for women.
H4a	The influence of perceived risk avoidance on the intention to use group buying is moderated by gender, such that the effect is stronger for women.
H5a	The influence of sociability on the intention to use group buying is moderated by gender, such that the effect is stronger for women.
H6a	The influence of perceived playfulness on the intention to use group buying is moderated by gender, such that the effect is stronger for women.
H8a	The influence of behavioral intention on the use of group buying is moderated by conformity, such that the effect is stronger for users showing the greatest conformity.

2.3 The survey

The design of the questionnaire and the preliminary selection of items was guided by the literature review. The items are shown in Table 2. The new variables described in Section 2.2, as well as the measures of performance expectancy, effort expectancy, and social influence, were adapted from several sources (Davis et al., 1989; Moore & Benbasat, 1991; Thompson, Higgins & Howell, 1991; Venkatesh et al., 2003). The measures of facilitating conditions and behavioral intention were adapted from these sources as well as from Ajzen (1991) and Ajzen and Fishbein (1975).

Table 2 Measures

Label	Measure
Performance Expectancy	
PE01	I think online group buying can improve buying performance.
PE02	I think online group buying can make buying more efficient.
PE03	I think online group buying makes buying easier.
PE04	I think online group buying makes for a higher quality buying experience.
PE05	Overall, I think online group buying helps my buying activity.
Effort Expectancy	
EE01	Online group buying is easy to learn.
EE01	It is easy to engage in buying activities using online group buying.
EE03	It takes time to do online group buying.
EE04	Online group buying is complicated and hard to understand.
Social Influence	
SI01	My family members and good friends have influenced my use of online group buying.
SI02	Online group buying is common in my society.
SI03	People think those who use online group buying are cool.
SI04	Those who use online group buying easily get the attention of other people.
Perceived Risk Avoidance	
RA01	Online group buying may reduce risks.
RA02	I may avoid some losses when I do online group buying.
RA03	Online group buying is safe.
Sociability	
SO01	I can socialize with other people during online group buying.
SO02	I feel a sense of amiability when I do online group buying.
SO03	I like the feeling of interacting with other people when doing online group buying.
Perceived Playfulness	
PP01	I feel immersed when I do online group buying.
PP02	I do not feel that other things interfere with me when I do online group buying.
PP03	When I do online group buying, I tend to ignore other things.
PP04	I feel online group buying is interesting.
PP05	I feel online group buying is inspiring.
Conformity	
CO01	I follow the group leader's ideas for online group buying.
CO02	It bothers me if I cannot keep up with the other members of an online purchase group.

Table 2 Measures (continued)

Label	Measure
CO03	I am concerned about how other people react to what I say and do in an online purchase group.
CO04	I change my thinking to avoid other people's negative comments in an online purchase group.
CO05	I insist on my ideas when they are different from the group leader's.
Facilitating Conditions	
FC01	An online group buying site can help me with buying even if I have no prior experience with it.
FC02	I feel puzzled because online group buying sites have different interfaces.
FC03	I like the interfaces of online group buying sites.
Behavioral Intention	
BI01	Online group buying is a good idea.
BI02	I like to buy things using online group buying.
BI03	I recommend that other people use online group buying.
UB	The popularity of online group buying increases every year.

3. Data collection and analysis

3.1 Pre-test

The questionnaire has three parts. The first part is a general survey on group buying that we used to screen inappropriate respondents from the test sample. Those who did not have online group buying experience were excluded. The second part of the questionnaire is shown in Table 2. The third part consists of demographic items, the data from which were used for F-tests to check the effects of demographic differences.

The first step in the pre-test was to invite ten scholars with domain knowledge and extensive experience with online group buying to examine the above preliminary version of the questionnaire. Two MIS professors checked the internal validity of the questions, and three Ph.D. candidates helped them evaluate the questionnaire further. Five professionals were invited to check for ecological validity; i.e., whether the questions are really important for online group buying. All ten judges agreed that the questionnaire "can measure what it is supposed to measure" and that "all dimensions are essential to the evaluation of SNS and SNS games." Thus, face validity and content validity were achieved.

We then put the questionnaire on Google Docs for the pre-test. Through personal connections with sites such as MSN, Skype, BBS, personal blogs, and Facebook, we

recruited 82 respondents, 14 of whom submitted invalid questionnaires. The reasons for disqualifying the questionnaires were: (1) the same answer was given to each item; (2) at least one question and its reverse-worded counterpart had contradictory answers, and (3) more than one questionnaire was submitted (as inferred from the same IP address). The sampling period was March 15 through March 20, 2010.

Cronbach's α was used to assess the reliability of the scales composing the questionnaire. Because reliability for all the scales met this criterion (see Table 3, $\alpha > 0.7$), all the items were retained in the final questionnaire (Guilford, 1965).

Table 3 Reliabilities of the Preliminary Scales

Scale	Cronbach's α	# of Items
Performance Expectancy	0.819	4
Effort Expectancy	0.847	4
Social Influence	0.827	3
Perceived Risk Avoidance	0.879	3
Sociability	0.879	3
Perceived Playfulness	0.850	4
Conformity	0.873	4
Facilitating Conditions	0.878	3
Behavioral Intention	0.826	3

3.2 Main test

The survey was then posted on Google Docs where it remained for 12 days, from April 23 through May 3, 2010. The link was provided on several popular Taiwanese online group buying websites, and sites affiliated with university BBSs. All respondents had an equal chance to win the provided lottery rewards. The total number of questionnaires received was 402, but 85 were discarded due to invalid responses, leaving a final sample size of 317. The reasons for disqualifying these questionnaires were the same as in the pre-test.

3.3 Demographic variables

Table 4 gives the demographic data.

We then conducted a series of one-way ANOVAs to test for possible significant relations between the demographic and psychological variables. As shown in Table 5, the only demographic factor that affected the results was gender, a moderator variable in our model.

Table 4 Demographic Variables

Variable	Category	#	%	Accumulated %
Gender	Female	221	69.7	70.7
	Male	96	30.3	100.0
Age	< 18	2	0.6	0.6
	18 - 23	198	62.5	63.1
	24 - 30	103	32.5	95.6
	31 - 35	9	2.8	98.4
	36 - 40	1	0.3	98.7
	41 - 45	2	0.6	99.4
	46 - 50	2	0.6	100.0
Online time each day	< 1 hr	5	1.6	1.6
	1hr - 3hr	55	17.4	18.9
	3hr - 5hr	106	33.4	52.4
	5hr - 7hr	83	26.2	78.5
	7hr - 9hr	37	11.7	90.2
	9hr - 11hr	13	4.1	94.3
	> 11hr	18	5.7	100.0
Average monthly income (in NT$, US$1 = NT$30)	< 1,000	24	7.6	7.6
	1,000 - 5,000	69	21.8	29.3
	5,000 - 10,000	125	39.4	68.6
	10,000 - 20,000	30	9.5	78.2
	20,000 - 30,000	29	9.1	87.4
	30,000 - 40,000	21	6.6	94
	> 40,000	19	6.0	100.0
Membership status	Leader	24	7.6	7.6
	Follower	293	92.4	100.0
Type of buyer	Professional	6	1.9	1.9
	Regular	311	98.1	100.0
Experience (time elapsed since first buy)	< 0.5 year	80	25.2	25.2
	0.5 - 1 year	79	24.9	50.2
	1 - 1.5 years	50	15.8	65.9
	1.5 - 2 years	32	10.1	76
	> 2 years	76	24	100.0

Table 4 Demographic Variables (continued)

Variable	Category	#	%	Accumulated %
Frequency of buying each year	1	13	4.1	4.1
	2 - 4	121	38.2	42.3
	5 - 9	96	30.3	72.6
	10 - 13	28	8.8	81.4
	14 - 17	6	1.9	83.3
	18 - 20	3	0.9	84.2
	> 20	50	15.8	100.0

Table 5 Scores on the Psychological Dimensions as a Function of Demographic Variables

	Gender		Age		Experience	
	F	**p**	***F***	**p**	***F***	**p**
Performance Expectancy	1.318	0.112	0.719	0.885	1.022	0.439
Effort Expectancy	1.634	0.015**	1.005	0.466	1.169	0.240
Social Influence	0.996	0.480	1.095	0.332	1.164	0.246
Perceived Risk Avoidance	1.835	0.034*	1.046	0.402	0.706	0.898
Sociability	1.783	0.038*	0.912	0.612	0.838	0.734
Perceived Playfulness	1.535	0.030*	1.603	0.146	1.088	0.342
Facilitating Conditions	1.018	0.445	1.112	0.309	0.966	0.529
Behavioral Intention	0.927	0.593	1.298	0.125	1.116	0.304

* $p < 0.05$. ** $p < 0.025$. *** $p < 0.01$.

3.4 Reliability and validity tests

All the measures continued to show good reliability in the main test (see Table 6).

To test the validity of the dimensions, we began by applying the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to determine if the scales were suitable for factor analysis (Kaiser, 1974). A KMO value greater than 0.8 means that the items have low partial correlations with the total scale of which they are a part; the obtained value was 0.83. We also applied Bartlett's sphericity test, which yielded $p < 0.05$. Thus, the scales are factorable by both criteria.

The factor analysis yielded 9 factors corresponding to the 9 psychological dimensions in Table 7. This means that the constructs are valid.

Table 6 Scale Reliabilities for the Main Test

Dimension	Cronbach's α	# of Questions
Performance Expectancy	0.793	4
Effort Expectancy	0.872	4
Social Influence	0.718	3
Perceived Risk Avoidance	0.800	3
Sociability	0.797	3
Perceived Playfulness	0.714	4
Conformity	0.706	4
Facilitating Conditions	0.700	3
Behavioral Intention	0.897	3

We next conducted tests for convergent and discriminant validity. Convergent validity is achieved when the following three conditions are met: (1) all the standardized factor loadings exceed 0.5, (2) the composite reliability (CR) is greater than 0.7, and (3) the average variance extracted (AVE) exceeds 0.5 (Fornell & Larcker, 1981). Table 8 shows that convergent validity was achieved based on these criteria.

Discriminant validity is achieved when the square root of the AVE of a construct is greater than the correlation between that construct and another construct (Fornell & Larcker, 1981). Table 9 shows that discriminant validity was achieved by this criterion.

3.5 Model fit

We next sought to determine whether our model is the best of the available choices. The three kinds of model fit (absolute fit, incremental fit, and parsimonious fit) for the data are presented in Table 10. As shown in Table 10, the results meet the minimally acceptable levels by all three model fitting criteria.

3.6 Hypothesis testing

Finally, we used maximum likelihood estimation to test the hypotheses listed in Section 2.2. Table 11 shows the structural equation model for the path analysis and the results of the hypothesis tests.

3.7 Moderating effects

To test the moderating effects of conformity, we used the following multiple regression formula:

$$UB = \alpha_0 + \alpha_1 BI + \alpha_2 BIxCO$$

The notation is the same as in Table 2. The results are presented in Table 12.

Table 7 Factor Loadings for the Psychological Scales

	Factor								
	1	2	3	4	5	6	7	8	9
EE01	**0.871**	0.209	0.095	0.055	0.103	0.032	0.018	-0.025	0.104
EE02	**0.841**	0.206	0.068	0.091	0.066	-0.012	0.160	0.083	0.162
EE03	**0.718**	0.162	0.035	0.259	0.027	-0.045	0.202	0.146	0.086
EE04	**0.727**	0.178	-0.052	0.059	-0.012	-0.066	-0.022	-0.029	0.335
BI01	0.289	**0.757**	0.051	0.175	0.099	-0.046	0.094	0.144	0.181
BI02	0.289	**0.777**	0.120	0.205	0.100	0.033	0.041	0.143	0.051
BI03	0.204	**0.771**	0.089	0.188	0.151	0.059	0.124	0.129	0.113
SO01	0.114	0.076	**0.737**	0.047	0.019	0.053	0.159	0.238	0.027
SO02	0.033	0.020	**0.874**	0.097	0.042	-0.014	0.080	0.091	0.094
SO03	-0.020	0.050	**0.818**	-0.050	0.017	-0.019	0.035	0.081	0.099
PE01	0.221	0.406	-0.098	**0.527**	0.198	-0.074	0.176	0.040	0.012
PE02	0.063	0.097	0.146	**0.824**	0.057	-0.055	0.008	0.048	0.113
PE03	0.130	0.206	-0.012	**0.780**	0.153	0.074	0.164	0.064	0.043
PE04	0.201	0.446	-0.010	**0.528**	0.117	0.039	0.126	0.025	0.147
CO01	0.023	-0.175	0.108	0.267	**0.522**	0.012	0.122	0.149	-0.194
CO02	0.020	0.318	-0.041	0.095	**0.707**	0.135	-0.035	0.079	0.055
CO03	0.067	0.299	-0.002	0.085	**0.764**	-0.001	0.001	0.174	0.073
CO04	0.089	-0.021	0.054	0.031	**0.784**	0.020	0.088	-0.052	-0.074
RA01	0.008	0.006	0.008	0.108	0.049	**0.827**	0.051	-0.059	0.053
RA02	-0.025	-0.066	0.003	-0.030	0.024	**0.843**	-0.022	0.025	0.075
RA03	-0.047	0.059	-0.005	-0.089	0.050	**0.844**	0.054	0.044	0.125
PP01	0.138	0.242	0.333	0.134	0.129	0.018	**0.598**	0.238	0.180
PP02	0.135	0.132	0.116	0.051	-0.048	0.084	**0.743**	-0.148	-0.055
PP03	0.117	0.307	0.043	-0.056	0.190	0.124	**0.681**	0.123	0.235
PP04	-0.002	-0.160	0.021	0.235	0.025	0.028	**0.669**	0.105	0.099
SI01	0.044	-0.032	0.176	0.070	0.061	0.001	-0.053	**0.829**	-0.115
SI02	0.117	0.266	0.021	0.025	0.190	0.038	-0.126	**0.706**	0.150
SI03	-0.028	0.202	0.293	0.058	0.029	0.145	0.095	**0.677**	-0.010
FC01	0.197	0.035	0.178	0.127	0.035	0.034	0.108	-0.108	**0.763**
FC02	0.271	0.105	0.044	-0.007	-0.077	0.093	0.056	-0.008	**0.762**
FC03	0.140	0.302	0.085	0.205	0.095	0.062	-0.201	0.230	**0.570**

Table 8 Measures of Convergent Validity

Dimension	Factor Loading	CR	AVE
Performance Expectancy	0.527 - 0.824	0.786	0.58
Effort Expectancy	0.718 - 0.871	0.877	0.64
Social Influence	0.677 - 0.829	0.714	0.56
Perceived Risk Avoidance	0.827 - 0.844	0.784	0.55
Sociability	0.737 - 0.874	0.770	0.53
Perceived Playfulness	0.598 - 0.743	0.668	0.54
Facilitating Conditions	0.570 - 0.763	0.735	0.58
Behavioral Intention	0.757 - 0.777	0.898	0.75
Use Behavior	0.808 - 0.817	0.608	0.54

Table 9 Correlation Matrix of the Scales

Dimension	PE	EE	SI	RA	SO	PP	FC	BI	UB
Performance Expectancy	**(0.76)**								
Effort Expectancy	0.49	**(0.80)**							
Social Influence	0.32	0.29	**(0.74)**						
Perceived Risk Avoidance	-0.02	-0.07	-0.10	**(0.74)**					
Sociability	0.31	0.33	0.56	-0.06	**(0.73)**				
Perceived Playfulness	0.51	0.43	0.46	-0.01	0.45	**(0.73)**			
Facilitating Conditions	0.45	0.58	0.30	-0.18	0.44	0.55	**(0.76)**		
Behavioral Intention	0.66	0.57	0.50	-0.03	0.56	0.49	0.53	**(0.86)**	
Use Behavior	0.19	0.11	0.24	-0.05	0.15	0.13	0.28	0.22	**(0.73)**

Note: Numbers on the diagonal are the square roots of AVE.

The α_2 coefficient shows that conformity had the predicted moderating effect. This means that the positive effect of the intention to use group buying on actual use was greater if the users conformed to their group.

We then tested the moderating effects of gender on all the dimensions except facilitating conditions, which has no support in the literature. The regression formula was:

$$BI = \beta_0 + \beta_{i1} X_i + \beta_{i2} G,$$

where X_i is the score for dimension we and G is a dummy variable for gender (male = 0, female = 1). β_{i2} is the coefficient representing the moderating effect of gender on dimension i.

Table 10 Measures of Model Fit

Statistic	Value	Threshold	Result
Absolute fit			
$\chi 2/df$	2.03	< 3	Good
GFI	0.87	> 0.8	Good
AGFI	0.83	> 0.8	Good
RMSEA	0.057	< 0.1	Good
Incremental fit			
IFI	0.96	> 0.9	Good
CFI	0.96	> 0.9	Good
Parsimonious fit			
PGFI	0.69	> 0.5	Good
PNFI	0.79	> 0.5	Good

Table 11 Results of Hypothesis Tests

	Path	Coefficient	t	p	Supported
H1	Performance Expectancy → Behavioral Intention	0.42	6.41***	< 0.001	Yes
H2	Effort Expectancy → Behavioral Intention	0.24	4.19***	< 0.001	Yes
H3	Social Influence → Behavioral Intention	0.14	2.05**	0.025	Yes
H4	Perceived Risk Avoidance → Behavioral Intention	0.12	2.50***	0.009	Yes
H5	Sociability → Behavioral Intention	0.29	4.19***	< 0.001	Yes
H6	Perceived Playfulness → Behavioral Intention	0.02	0.22	0.492	No
H7	Facilitating Conditions → Use Behavior	0.18	1.70	0.429	No
H8	Behavioral Intention → Use Behavior	0.13	1.42	0.078	No

* $p < 0.05$. ** $p < 0.025$. *** $p < 0.01$.

Table 12 Moderating Effect of Conformity

	Coefficient	t	p
α_0	0.374	1.620	0.053
α_1	0.316	1.517	0.035
α_2	0.229	1.794	0.037*

* $p < 0.05$. ** $p < 0.025$. *** $p < 0.01$.

As can be seen in Table 13, gender had significant effect on perceived risk avoidance, sociability, and perceived playfulness. This means that when females (1) perceived that group buying can help avoid risk, (2) were sociable, and (3) perceived group buying to be playful, they tended to use group buying more than males did.

Table 13 Results of Testing the Moderating Effects of Gender

Dimension	β_{i0}	Coefficient	t	p
Performance Expectancy	β_{10}	-0.3221	-1.8353	0.034*
Effort Expectancy	β_{20}	-0.2378	-1.9032	0.029*
Social Influence	β_{30}	-0.9623	-1.8238	0.035*
Perceived Risk Avoidance	β_{40}	-0.2353	-1.0328	0.151
Sociability	β_{50}	-0.8623	-0.9822	0.164
Perceived Playfulness	β_{60}	-0.0932	-0.2018	0.420
Dimension	**β_{i1}**	**Coefficient**	**t**	**p**
Performance Expectancy	β_{11}	0.9662	5.9587	< 0.001***
Effort Expectancy	β_{21}	0.9352	4.8136	< 0.001***
Social Influence	β_{31}	0.9111	2.0138	0.023**
Perceived Risk Avoidance	β_{41}	0.9047	2.4338	0.007***
Sociability	β_{51}	0.9133	4.0234	< 0.001***
Perceived Playfulness	β_{61}	0.9148	0.2013	0.420
Dimension	**β_{i2}**	**Coefficient**	**t**	**p**
Performance Expectancy	β_{12}	0.0234	1.1430	0.1271
Effort Expectancy	β_{22}	0.2383	1.0931	0.1377
Social Influence	β_{32}	0.0983	1.0902	0.1383
Perceived Risk Avoidance	β_{42}	0.0931	1.8381	0.0336*
Sociability	β_{52}	0.1026	1.7779	0.0383*
Perceived Playfulness	β_{62}	0.0517	1.7909	0.0372*

* $p < 0.05$. ** $p < 0.025$. *** $p < 0.01$.

4. Discussions and conclusions

It takes only 3 years for group buying businesses to grow from the situation where "the number of accumulated orders sometimes is small" (Kauffman et al., 2010) to billion-dollar enterprises. As the industry evolves, new challenges await. Whereas the problem two years ago was too few auction startups, the problem today is how to strategically identify what customers need to effectively use group buying. The results show that

perceived risk avoidance and sociability, in addition to the factors previously identified by UTAUT (performance expectancy, effort expectancy, and social influence), have a significant impact on the use of online group auctions. However, in contrast to the results of most studies employing UTAUT, the relationship between behavioral intention and use behavior, although in the positive direction, was not significant in the present study.

The present study also revealed the role of gender as a moderator. Females reported that they were influenced more than males in their intention to use online group buying (OGB) services by perceived risk avoidance, sociability, and perceived playfulness. Conformity was the other moderator: The impact of the intention to use OGB on actual usage was stronger for those who evidenced conformity than those who did not.

Our literature search indicated that our study is the first instance of academic empirical research on OGB. Although being first is not always a positive contribution, we believe in this case it is. We noted in Section 1 that studying OGB is important because Internet companies, regardless of whether they are sellers or social network services, take advantage of the Internet to grow. Will OGB sites and consumers start to take advantage of the same Internet features? How will network externality, which has created many large Internet firms, affect the growth of OGB services? Will the result be to create another set of giant companies by exploiting the power of collective buyers, as happened when large sellers and social networks were created by exploiting ubiquity and user bases?

But will the effect of these Internet features on the fast growth of big Internet companies be the same for OGB? The answer is not clear, because there are many differences between OGB and the models exemplified by eBay and Facebook. First, there is always the question of how the increase in utility created by network externality is distributed between suppliers and consumers. In the past, users of companies such as eBay enjoyed the convenience, and they arguably did not care much about the lack of significant monetary benefits. To the contrary, buyers on OGB sites enjoy discounts and do want to get higher utility created by the network externality.

The second possible difference between OGB websites and other websites with respect to network externality is that the effect of the network is weaker in the OGB case (Sundararajan, 2007). As long as the buying group is big enough or powerful enough to get its members a steep discount, there is no need for a larger network. Thus, unlike big companies that take advantage of the network externality of the entire Internet, is it possible for OGBs to have multiple archipelagos, each serving a single city or an industry? Or is the network effect so small that there is no need for large OGB sites?

Third, many network effects are word of mouth. As Galeotti noted, an increase in word-of-mouth communication enables a greater spread of information, thereby increasing

sales and profits. However, in the case of OGB, negative adoption externality carries more weight: An increase in the number of neighbors makes it harder to satisfy the requirement that everybody buy the product (Galeotti & Goyal, 2009). This creates a dilemma: Increasing the number of buyers can reduce prices, but it can also increase the difficulty of forming buying groups.

Fourth, the findings from the present study show that conformity is an important moderator of the effect of behavioral intention on use behavior. Although there was a positive relationship between the two, it is not significant. When conformity was added, however, the combined effect of conformity and behavioral intention on usage becomes significantly positive. This result implies that it is necessary that the group have a strong leader whom the other buyers can follow. As Galeotti noted, "The interaction may involve word of mouth communication about product quality and prices. In this case, the presence of a single informed neighbor leads to product awareness and possibly purchase." (Galeotti & Goyal, 2009) This concept is similar to that of a "gatekeeper," or bridging person (Fleming & Marx, 2006). Consistent with Fleming, we define a gatekeeper as a person who maintains personal connections with different types of people, someone who knows the products and services and can provide unbiased advice. Thus, the gatekeeper is someone who buyers can follow in deciding whether to participate in a group purchase. Companies such as Groupon have already established relationships with local vendors (Anonymous, 2011a; Weiss, 2010). However, OGB sites probably also need to identify gatekeepers to lead the group buying. This may limit their opportunity to take advantage of the network externality enjoyed by other types of Internet companies.

Fifth, the network externality of social network services (SNS) such as Facebook may have to be local; users may want to acquire offline friends online, and they may not need to connect with the whole Internet. Nonetheless, they can still take advantage of ubiquity: Everything a user posts on her own page can be viewed by anyone in the world, which matters if users want their posts to have social impact. In the case of OGB, we have not observed that social influence matters much. What OGB participants cared about is there being enough buyers to get discounts or share information. The implications of this lack of ubiquity are two-fold. First, OGB companies can learn lessons from sites such as Craig's List (http://www.craigslist.com/), which features not only mass collaboration, but also localization. Second, Internet ubiquity may not be significant for OGB businesses, and global companies can face local competition.

If any of the above questions are worth asking, studies similar to ours are necessary. It may not be obvious that being the first mover of the OGB market has advantages with respect to factors such as ubiquity and network externality. First movers will not always be as successful as Facebook, which took advantage of the 6-degree separation phenomenon

and then just waited to reap the benefits of network externality. To keep their customers, OGB companies must also have good strategies. The present results demonstrate that a productive strategy that any OGB company can benefit from is to convince customers that group purchases can help them avoid risk, allow them to socialize, and show them how to select and follow good group leaders.

However, this list of suggestions is far from exhaustive. For example, we did not include "affinity" as a dimension. According to our informal interviews, many Taiwanese and Chinese like group purchasing because it offers them affinity. Females, especially, love this sense of belongingness.

Another limitation of this study is the unit of analysis. We analyzed only buyers, but it may be valuable to analyze vendors as well. OGB has some of the characteristics of a two-sided market (Eisenmann, Parker & Van Alstyne, 2006; Parker & Van Alstyne, 2005) in that OBG sites such as Groupon function as platforms; the site is a meeting ground for buyers and sellers. Buyers form their own network, but so do sellers. The utility of being a network member is determined by the size of the other network. The key to success for a two-sided market is to form one side and allow the other side to grow symbiotically. In the case of OGB, it is unclear which side should start first. In Taiwan, sites that emerged from the formation of buyer networks have not generated significant business. On the other hand, in the US, Groupon started with sellers and now enjoys strong capitalization. Research similar to ours, but applied to sellers, should provide a different perspective on online group buying.

All this raises other questions. What results would we get if we studied buyers in the US rather than Taiwan? Are there any factors other than starting with buyers that explain why Taiwan's OBG companies did not become giants? If they start by forming seller networks, would they become another Groupon? These questions are complicated. First, the Chinese prefer to act collectively (see Benvenisti, 2008; Earley, 1989). It follows that it is natural for Taiwanese companies to start with buyers, because in Chinese culture buyers form groups with common goals. Second, the fact that starting by organizing vendors was successful for sites such as Groupon does not mean, at least in theory, that it was necessarily a mistake for Taiwanese sites to start by organizing buyers. Internet social network services create personal profiles and classify customers according to common personal characteristics. This is sometimes called "hypertargeting" (Shih, 2009). The classifications can be in any combination and in any number of parameters. Every group of individuals with the same set of characteristics is potentially a buying group for a specific product. Then, online social network sites such as Facebook can take advantage of hypertargeting to sell products to idiosyncratic buying groups.

To conclude, the above report and discussion of this pioneering empirical study not only provide managerial insights but also raises many questions for future studies. We hope it will stimulate a comprehensive body of research on online group buying.

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