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How Price Dispersion Influences Intention to Join Online Group Buying: The Role of Perceived Price Fairness

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Abstract

Base on transaction utility theory and equity theory, this study examines the effect of price dispersion on consumers' intention to join the online group buying. The mediating effect of consumers' perceived price fairness is considered. Our results reveal several important findings. Firstly, the wider the price dispersion is, the lower the consumers' perceived price fairness is. Secondly, higher the consumers' perceived price fairness contributes to higher the consumers' transaction utility. Thirdly, the consumers' transaction utility is positively related to consumers' intention to participate in the online group buying. Counter intuitively, price dispersion doesn't have direct effect on consumers' transaction utility, but through consumers' perceived price fairness as a mediator. The implications for researchers and practitioners are explored and recommendations for future research are made.

Keywords: Online group buying, Price dispersion, Perceived price fairness, Transaction utility, Reference price

1. Introduction

With the development of the E-commerce, the online group buying flourishes. As a business model of online shopping, it has appealed to increasing interest of consumers and attention of scholars (Luo et al., 2014; Wu et al., 2015). Online group buying refers to aggregating the purchasing power, forming the buyers' bargain power based on the large volume of demand, through which the consumers can obtain lower price than they would otherwise get individually. The core of this mechanism is demand aggregation and volume discounting, aiming at reducing transaction cost and transaction risk and enhancing consumers' consume utility (Anand and Aron, 2003).

Since the first B2C website Mobshop emerged in 1998, online group buying has gradually developed around the world. At the end of 1990s, some famous online group-buying websites such as Mercata, Mobshop, LetsBuyIt, Happymany etc. were in vogue. However, due to the failure of their business models in the B2C market, Mercata closed in June, 2001 and Mobshop changed its target to B2B market (Kauffmanand Wang, 2002), following which, many western online group-buying websites suffered from closing or changing their business model. Yet, online group buying had enjoyed tremendous growth in China since 2002, with lots of online group-buying websites have mushroomed, such as TaoBaoJuhuasuan (ju.taobao.com), Qijia(www.jia.com), Zhongtuan (www.teambuy.com.cn), and Campus BBS TuanGou. Many early appeared online group-buying websites in China still run actively, for example, Qijia(www.jia.com). After 2010, the Groupon model of online group-buying such as pingduoduo (www.pinduoduo.com), Meituan(www.meituan.com), Dianping (www.dianping.com), again set off a big boom in various cities in China.Online groupbuying is presenting a state of vigorous development in China and there is also great potential to achieve more in the future market. Besides, traditional Chinese culture and developing market contributes to the blossom of online groupbuying in China (Tang, 2008).

Many B2C websites suffered from closing or changing business model in a relatively short period of time due to their imperfect online group-buying model and mechanism, which lead to the consumer's low willingness to participate in the online groupbuying, insufficient demand aggregation and decreased transaction volume Song, 2007). The two main mechanisms in China are the online fixed price mechanism and the live group-buying fair. While in some online communities, there exists spontaneous groupbuying. The Groupon Model of online groupbuying, which is a kind of online fixed price mechanism, mainly sells service commodities, the consumption of which highly depends on the region.

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While the live group-buying fair is more appropriate for household building and decorate materials, which are much more valuable, thus calls for the consumer's own experience. Under the spontaneous group-buying circumstances, the goods such as the clothing, food and cosmetics, are smaller and less valuable.

Generally, consumers would search for information about products (service or goods) they want to buy before making the most favorable purchase decisions (Kotler and Keller, 2016). According to Stigler(1961), the expected savings from a given search are positively correlated with the price dispersion. Specifically, the wider price dispersion consumers faced, the stronger desire to search more discounted merchant. The mechanism of group buying can attract consumers who will not pay the full price at traditional shop but wait for the price to fall (Gottlieb, 2000). This creates the opportunity for online group buying. Therefore, for the website operators and sellers of online group buying, primary concern is the level of price discounts. But this strategy is limited to impact of consumers' intentions to join group buying. Our research questions are: (1) How the degree of price dispersion negative influences on consumers' intentions to join group buying? (2) What is the impact mechanism?

This paper will explore the effect of price dispersion on consumers' intention to join the online group buying through consumers' perceived price fairness and transaction utility. The remainder of the paper is organized as follows. In section 2, literatures are reviewed. The theoretic model and research hypotheses are proposed in section 3. After that, section 4 introduces the research methodology. Then empirical results and further discussion are shown in section 5. Finally, we make a conclusion and provide the management suggestions and the future research directions.

2. Theoretical Background

2.1 Online Group Buying

There are two main streams in the extant literature on group buying. One focuses on the mechanism of online groupbuying, while the other one focuses on demand aggregation of online group buying. The former stream mainly concerns the model of online group-buying and dynamic pricing mechanism. Kauffman and Wang (2001,2002) qualitatively research the operation model and profit model of online group-buying and find that online group-buying has the following three characteristics:(1)demand-side network externality: the number of existing orders has a significant positive effect on new orders placed during each three-hour period. (2)price threshold effect: people are more willing to join the online group-buying, when the number of orders approaches the next price drop level and the price level for transacting will fall in the near future. (3)ending effect: more orders are expected to be placed during the last three-hour period of the auction cycles. Anand and Aron(2003) discuss the price-discovery mechanism from the perspective of quantity discount, and build models to theoretically compare the posted price and online group-buying price under different conditions. They pointout that group-buying pricing outperform posted pricing under demand heterogeneity and production postponement in combination with scale economies. Jing andXie(2011) conclude that group buying dominates traditional selling strategies when the information gap between expert and novice consumer is moderate and the information exchange is efficient among consumers, after comparing the online group-buying model with other marketing models and popular social interaction schemes. Under the circumstances of group-buying auction, Chen et al.(2002, 2007, 2009) made a comparison of online group-buying auction and fixed price auction. They build a theoretic model based on game theory between buyers and sellers, relied on which consumers' game strategy and sellers' optimal price curve are given. Under the same circumstances, Lai and Zhuang(2004) explore the specific process and business model of online group buying.

The later steam of online group-buying literature focuses on how to attract potential participants and transform them into real participants (Marchand, 2014; Zhang andGu, 2015). Kauffmanet al.(2010) analyze the effect of consumers' perceived price fairness and procedure fairness on consumers' price satisfaction and intention to participate in online group-buying auction. From social exchange theory perspective, Shiau and Luo(2012) investigate factors that affect consumer continuous use intention toward online group buying and the degree that reciprocity and reputation of social exchange, trust, and vendor creativity affect consumer satisfaction and intention toward online purchasing. Based on theory of planned behavior, Chen and Huang (2013) study the antecedents of intention to join online groupbuying, and its relationship with behavior. They find that factors that affect potential consumers and current consumers are different, with the former being experiential electronic word-of-mouth, relational embeddedness and service quality attitude, while the latter being structural and relational embeddedness and system quality attitude. Zhouet al.(2013) explore the information diffusion process of fixed-price groupbuying based on large scale data base. Their findings show that mass media communication and interpersonal communication have positive effects on sales on the initial stage, while negative ending stage. Furthermore, Luoet al.(2014) discuss the deal popularity in online group-buying and Wu et al.(2015) find the threshold effects in online group buying.

2.2 Price Dispersion

Generally speaking, the extent of consumers' information search is negatively correlated with the cost of information search, which means that the consumers' behavior of information search will affect the sellers' pricing strategy, thus leading to the price dispersion in the same market (Stigler, 1961; Thaler, 1985). Stigler (1961) points out that price dispersion is the price gap of the same kind of good in the same region in information economics. Stigler (1961) mentions four reasons of the price dispersion, namely, search cost, aging of knowledge, identification change of buyers and sellers and economies of scale. As for the other reasons of price dispersion, scholars propose that it can arise from heterogeneity in consumer loyalty(Shilony,1977; Varian,1980; Lach,2002), heterogeneity in consumer preference for retailers (Chen and Hitt, 2001), service heterogeneity (Pan et al., 2002), and heterogeneity in capacity of competing retailers (Li et al.,2013). The blossom of online shopping contributes to price dispersion (Pan et al., 2004). Ancarani and Shankar (2004) compare among pure-play Internet, bricks-and-mortar (traditional), and bricks-and-clicks (multichannel) retailers, finding that when shipping costs included, pure-play e-retailers have the highest range of prices. However, Overby and Forman (2015) find that buyers used electronic commerce to shift their demand geographically to exploit price differences, which reduced geographic price dispersion. Wu et al. (2015) summarize the studies on the sources of online price dispersion.

Consumers' expected savings are positively related to price dispersion, indicating that when faced with wider price dispersion, they will have a stronger willingness to search for cheaper merchant (Hall, 1983; Kotler and Keller,2016). From the perspective of information economics and transaction utility, Lai et al.(2006) research that how the market price dispersion affects the consumers' intention to participate into the online groupbuying by comparing consumers' internal reference price and expected final group-buying price. They find that the internal reference price and the predicted final price and transaction utility of groupbuying generated by the customer are lower with wide price dispersion than in one with narrow price dispersion. Meanwhile, higher consumers' perceived transaction utilities of groupbuying would lead to higher intention to join groupbuying.

2.3 Perceived Price Fairness

To make a decision whether to join the online groupbuying, consumers are very likely to search information, such as, online prices, offline shops' prices, group-buying prices, as well as the prices oneself or others have got in the past. Consumers' price acceptability will be affected by perceived price fairness (Martins and Monroe,1994; Lastner et al., 2019).

Fairness refers to the extent to which outcomes are deemed reasonable and just (Bolton et al.,2003). There are two main basic theories explaining the effect fairness on consumer behavior in extant researches. Firstly, Kahneman et al.(1986) propose dual entitlement theories, which mean that firms' pricing strategy can directly affect consumers' perceived fairness. Specifically, consumers will not have much negative emotions if the prices increase because of increasing cost, while they will think it unfair if the firms raise the price to chase more profit. Secondly, equity theory proposed by Adams (1965) addresses settings in which an individual compares his evaluation of a process or an outcome against the sentiments of others about these things in order to establish his or her perception of fairness. Equity theory includes various comparative others that may influence the perceived fairness of an exchange relationship (Namkung and Jang, 2010). A reference other may be another person, a class of people, an organization, or the individual himself relative to his experiences from an earlier point in time. For price fairness, the results that consumers can compare are a variety of prices. Consumers' price fairness perceptions can be explained by referring to the equity theory (Konuk, 2019).

Based on the transaction utility theory and equity theory, Darkeand Dahl (2003) test different scenarios in which subjects received different size of discounts to explore the relationship between discount, perceived fairness and satisfaction. Their research shows that discount increase purchase satisfaction due to the nonfinancial rewards that are associated with perceptions of fairness. After conceptually integrating the theoretical foundations of fairness perceptions, Xia et al.(2004) build a new model to explain the generalization process of the consumers' price fairness. They assert that consumers' perceived fairness is a process of comparison. Therefore, different comparison context can result into diverse outcome. Four factors may influence unfairness price perception: (1) the context of the comparative transaction; (2) the cost-profit distribution and attributions for the inequality; (3) buyer-seller relationship and trust; (4) knowledge, beliefs, and social norm. In addition, they consider that the consumers' perceived price fairness include both the affective and cognitive aspects, which have influence on the perceived value of products. Lim (2020) presents a purchase equity model for online group buying to examine the antecedents and consequences of online group buying behavior.

2.4 Transaction Utility and Reference Price

According to the economic theory and consumer behavior theory, consumers always maximize their utility through the consumption choice.

Tsvetovat et al.(2000)believe that consumers choose to join groupbuying due to the lower price or higher transaction utility. Start with the mental coding of combinations of gains and losses using prospect theory, Thaler(1985) develops the new transaction utility theory, and applies it into the marketing and consumer behavior research. He holds the belief that consumers consider not only the price and value of a product, but also the psychology perception. The perceived gains and losses of a transaction are calculated by reference points. Thaler (1985) defines the total utility as the sum of acquisition utility and transaction utility. The former depends on the value of the good (or service, experience) received compared to the outlay, while the latter depends solely on the perceived merits of the "deal", i.e. the price the individual pays compared with certain reference prices. Grewalet al.(1998)'s research provides evidence supporting the assertion that advertised selling and reference prices would affect the consumer's transaction value and acquisition value, which will in turn affect the consumer's intention to purchase. Here, the transaction value means the transaction utility. Aggarwal and Vaidyanathan (2016) use acquisition-transaction utility perspective to identify key differences in mechanisms invoked by the larger font size of the Regular Price vs. that of the Sale Price.

A reference price can be defined as any price in relation to which other prices are seen(Biswas and Blair,1991; Lowe and Alpert, 2010;Sinha and Adhikari, 2017).Reference price contains the external reference price and the internal reference price (Monroe, 1990). External reference prices can be provided to the consumer through channels such as advertising, catalog listings, and consumer price guides (Weisstein et al., 2019). Internal reference prices are those stored in the consumer's memory (Kumar et al.1998).Adaptation level theory (Helson, 1964) and assimilation-contrast theory (Sherif and Hovland, 1961) are always adopted to explain reference price effect. A model interpreting the effect of reference price on consumer's decision was proposed by Urbanyet al.(1988). It turns out that an exaggerated reference price has generally the same positive effects on perception as a plausible price. If the reference price the consumer is told is above their lowest expected price, the consumer will get a positive transaction utility by making a comparison of external reference price and internal reference price, which would facilitate higher likelihood to purchase (Compeauet al., 2005).

As for high value products, such as home building materials, wedding supplies and electric appliance, consumers will be much more cautious about making purchasing decision. They might spend plenty of time and energy searching prices of both online and offline, leading to much higher consumer involvement. Moreover, on some site of live group buying, sellers will distribute brochures about the group-buying product prices, the discounts and other external reference prices, which can inform consumers of price level and price dispersion of the group-buying product. By comparing all of these external prices mentioned above, the consumers can generalize their internal reference price, which can contributes to consumers making the most favorable purchase decision.

3. Conceptual Framework and Hypotheses

3.1 Conceptual Framework

Base on transaction utility theory and equity theory, this paper will research the effect ofprice dispersion on consumers' intention to join the online group buying, which is mediated by consumers' perceived price fairness, under the circumstances of one-price mechanism. Our overarching conceptual framework guiding this research is shown in Figure1.The price dispersion comprises not only the online shop provided prices, but also the offline shop provided prices, as consumers always search for price information of both online and offline shops before they decide whether to join the groupbuying. Wu et al.(2013) propose that the buyers' expected utility changes as the patterns of price dispersion for a fixed amount of purchase uncertainty. Furthermore, the information searched, together with the online group-buyingprice form the external reference price, can help consumers generate internal reference price. Thaler (1985) maintains that transaction utility depends on the individual paid compared to internal reference price, which is produced based on the external reference prices. The consumers' transaction utility will finally affect their intention to join groupbuying. Meanwhile, consumers will perceive the price fairness of the online groupbuying, on the account of the comparison of various market prices and group-buying price. Extant researches have proved that perceived price unfairness will decrease the consumers' satisfaction, intention to purchase and contribute to consumers' complain(Campbell,1999; Huppertzet al.,1978; Martins,1995).

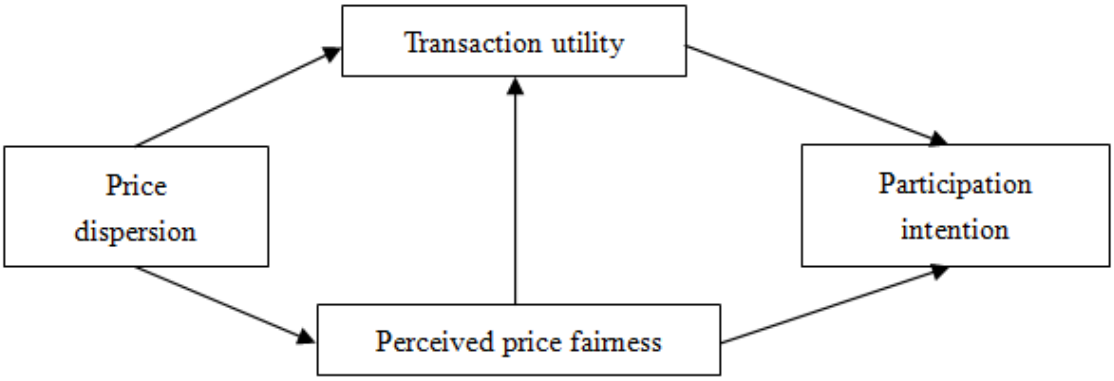


Figure1: Conceptual Framework

3.2 Research Hypotheses

Stigler (1961) points out that when faced with wider price dispersion, the consumer may have stronger willingness to look for a shop that provides a lower price. Both Urbany et al.(1988) and BiswasandBlair(1991) believe that the external reference prices faced by the consumer can affect his internal reference price and exposure to an external reference price can also change their previous price beliefs. The consumer willjudge the believability of the price information using their own initial price expectation (Jensen et al., 2003). Lai et al.(2006) also show that the internal reference prices generated by customers are lower in an e-market with wide price dispersion than in one with narrow price dispersion. Moreover, the discounts in the online groupbuying can also be seen as the external prices for the consumer. To some extent, larger discount means wider price dispersion in the market, which would also affect the consumer's internal reference price. Based on the analysis above, we believe that the consumers will adjust their own internal reference price to a low level according to the wider price dispersion. Thaler(1985) points out that the transaction utility depends on difference of the price the individual paid and his internal reference price. The consumer perceived fair price is one kind of his internal reference prices, so it will be affected by the price dispersion in the market. In the context of this research, the final price paid by the consumer is a determined price in advance. Thus, the effect of price dispersion on the consumer perceived fair price could be seen as that on the consumer's transaction utility. Based on the economics of information theory and transaction utility theory, we propose our hypothesis 1.

H1: *Compare to the narrow price dispersion, wide price dispersion leads to the lower consumers' transaction utility.*

Based on the dual entitlement theory of Kahneman et al.(1986) and the equity theory of Adams(1965), an individual would compare his evaluation of a process or an outcome against the sentiments of others about these things in order to establish his or her perception of fairness. As for price fairness, the outcomes that are comparative are various kinds of prices. Furthermore, pricing tactics and price cues can affect consumer perception of price fairness (Grewal et al., 2004). Hamilton and Chernev(2013) study the price image in retail management and point out that the degree of retailer's price dispersion can impact consumers' perceived price fairness through price image. The consumer who wants to participate into the online groupbuying will get to know the extent of the price dispersion in the market through different channels. By comparing the prices of different shops and the online group-buying price, the consumer will establish the perceived price fairness in their mind, which would finally help to generate their own perceived price fairness of the online group-buying price. According to the dual entitlement theory, we hold the belief that the wider the price dispersion is, the lower the consumer perceived production cost of the firm is. In that case, the consumer will consider that the seller raise the good prices in order to get more profit rather than due to the increase of the cost. Then their perceived price fairness will decrease. This leads us to state our hypothesis 2.

H2: *Compare to the narrow price dispersion, wide price dispersion leads to the lower consumers' perceived price fairness.*

Thaler(1985) argues that the transaction utility of an individual depends on difference of his outlay and his internal reference price. The consumer's perceived price fairness is also affected by the consumer's perceived production cost of the firm. Moreover, Xia et al.(2004) establish a theoretic model about the price fairness and argue that the consumer's perceived price fairness consists of the cognitive aspect and the affective aspect. Both the cognitive aspect and the affective aspect of the perceived price fairness could affect the consumer's perceived value. Martins and Monroe (1994) also show that the consumer's perceived price unfairness could lower perceived value. The consumer's perceived price fairness would affect his internal fair price, which would in turn affect the consumer's transaction utility. This leads us to propose our hypothesis 3.

H3:*The consumers' transaction utility will be higher when the consumers' perceived price fairness is higher.*

Previous researches has shown that unfair price perceptions can lower customer satisfaction, purchase intentions, and result in complain (Campbell, 1999; Huppertz et al.,1978; Martins,1995). Xia et al.(2004) also hold the belief that when buyers believe that inequality in an exchange is unacceptable, upsetting or disappointing. They may choose to complain, ask for a refund, spread negative word of mouth, and/or leave the relationship, depending on their assessment of which action is most likely to restore equity with the least cost. Huppertz et al.(1978) argue that when the consumers' perceive certain factors in a relationship as inequitable, they seek inequity reduction. In the dynamic pricing mechanism, Lai and Zhuang (2004) examine the effect of the consumer's perceived price fairness and process fairness on their intention to purchase under in the online group buying with different incentive mechanisms. Lim (2020) verifies that the higher consumers perceive the purchase equity of online groupbuying, the more likely consumers will make an online group purchase. Thus, we get hypothesis 4.

H4:*The consumers' intention to join the online groupbuying will be higher when the consumers' perceived price fairness is higher.*

Urbany et al.(1988) propose a model of consumption decision and argue that the probability of purchase will increase when consumer's perceived transaction utility is improved. Biswas and Blair (1991) think that through comparison the good price, the maximum good price and the average good price the consumer would have a feeling of saving, which would in turn affect the intention to purchase. Lai et al.(2006)also find that in the online groupbuying with a dynamic pricing mechanism, a higher consumer's perceived transaction utilities of groupbuying will lead to a higher intention to join groupbuying. The analysis above leads us to state our hypothesis 5.

H5: *The consumers' intention to join the online groupbuying will be higher when the consumers' transaction utility is higher.*

4. Methodology

4.1 Method

This study tested different effects of perceived price fairness and transaction utility, established under narrow or wide price dispersion, on intention to participate the group buying. Respondents were assigned at random to one of two conditions of one factor (price dispersion: wide vs. narrow) between-subjects design. We adopted one-price mechanism of group buying, and a digital camera was carefully chosen as our stimuli. Respondents were required to search for price information before making the decision of whether to join the online groupbuying. Respondents were faced with a context as followed. First, a virtual brand camera was presented, along with its basic information, such as basic parameters, camera lens parameters, screen parameters and exposure control parameters. The camera is standardized configured. Virtual brand and standardized configuration are adopted not only to control brand's effect on consumer's perception, but also to let subjects concern more about price, rather than configuration. Next, respondents were faced with information of an online groupbuying of the same camera, with price and introductions. Then prices of both traditional and online shops were provided. After exposure to information mentioned above, respondents were asked to fulfill scales of perceived price dispersion (PPD), perceived price fairness (PPF), transaction utility (TU), and participation intention (PI).

4.2 Measurements

A series of rating scales were adopted to measure PPD, PPF, TU, and PI, with three seven-point items for each construct (1= strongly disagree; 7= strongly agree).Perceived price fairness (PPF) was measured by averaging responses to three items developed by Joshi (1989) and Vaidyanathan and Aggarwal (2003) ("compared with prices in the market, I think the price of group-buying is fair/reasonable/acceptable"). Transaction utility (TU) was also measured by three items developed by Grewal (1998) , from aspects like whether they feel good/ have a sense of saving/gain pleasure from this group buying experience. Participation intention (PI) was also measured by three items developed by Gupta *et al.* (2004) and Spears and Singh (2004) ("I intend to/am very likely/am interested in participate/participating this online group-buying").

4.3 Procedure

The experiment was implemented by manipulating the degree of price dispersion (wide vs. narrow) in the market. Generally, the price of the digital camera chosen as our experiment product was about 2000 RMB. Through the pretest, we knew that the normal price dispersion of the digital camera in the market was about 200-300 RMB. Thus, we set the narrow price dispersion at 100RMB and the wide price dispersion at 500RMB. To ensure the fairness and rationality of the markets under different price dispersion, we set the average prices of the digital camera in both markets as 2000RMB. The prices in the market with a narrow price dispersion ranged from

1950-2050RMB and the prices in the market with a wide price dispersion ranged from 1750-2250RMB. In each market with different price dispersion, 19 shops (both online and offline shops) that sold the experimental digital camera and an online group-buying website were chosen to provide the external reference price to the respondents. To ensure the comparability of the two experimental groups, we set the same online group-buying price of each group.

Table1: Sample Demographics

Demographic variables	Category	Frequency (percentage)
Gender	Male	54 (35.5%)
	Female	98 (64.5%)
Grade	Undergraduate	53 (34.9%)
	Graduate	92 (60.5%)
	Others	7 (4.6%)
Age	<=18	4 (2.7%)
	19~24	135 (88.7%)
	>=25	13 (8.6%)
Online Shopping	Has participated	146 (96.1%)
	Has not participated	6 (3.9%)
Times of online shopping in the last six months	1-6	55 (49.39%)
	>6	71 (46.70%)
Online Group-buying	Has participated	68 (44.7%)
	Has not participated	84 (55.3%)
Times of online group-buying in the last six months	1-6	62 (40.76%)
	>6	6 (3.93%)

169 university students participated in the study. 17 responses were deleted because of incompleteness, leaving 152 valid responses, including 69 ones in wide price dispersion group and 83 ones in narrow price dispersion group. Table 1 shows the demographics of the respondents. In the experimental samples, there are 54 males (35.5%) and 98 females(64.5%). To avoid the effect of the gender on the results of the experiment, we did the *T*-test to compare the two groups by gender and found that the difference between the two groups was not significant.

5. Empirical results

The partial least-squares (PLS) approach, a structure equation modeling technique, is employed to analyze the relationship involving price dispersion, perceived price fairness, transaction utility and participation intention. PLS is chosen as it is suited to estimate a complex structural equation model especially in situations: (1) when the model incorporates both formative and reflective indicators; (2) when assumptions of multivariate normality and interval scaled data cannot be satisfied; and (3) when the primary concern of the study is the prediction of dependent endogenous variables. PLS models are typically evaluated based upon: (1) the reliability and validity of measures; (2) size and significance of the path coefficients, and (3) ability of the model to predict the outcome variables (Cheung2010). Moreover, PLS involves no assumptions about the population or scale of measurement (Fornell and Bookstein, 1982). Its sample size requirement is either 10 times the largest measurement number within the same construct or 10 times the largest construct number affecting the same construct (Chin and Newsted, 1999).

5.1 Reliability and Validity

To validate the instruments, internal consistency, convergent validity and discriminate validity were examined. Firstly, composite reliability was adopted to evaluate internal consistency. It relies on actual loadings to compute the factor scores, which is a better indicator of internal consistency than Cronbach's alpha in PLS (Ranganathan et al., 2004). As described in Table 2, the composite reliability values for the constructs in the model were all above the suggested threshold of 0.7 (Chin, 1998; Straub, 1989), thus supporting the reliability of the measures.

Table 2: Psychometric Table of Measurements

Construct	Item	Loading	St. Error	T-Statistic
Perceived price fairness (CR= 0.9345; AVE=0.8097)	Compared to other prices in the market, the price of online groupbuying is fair. (PPF1)	0.8917***	0.0288	30.9796
	Compared to other prices in the market, the price of online groupbuying is reasonable. (PPF2)	0.9184***	0.0173	53.0255
	Compared with other prices in the market, the price of online groupbuying is acceptable. (PPF3)	0.8890***	0.0267	33.3324
Transaction utility (CR=0.9624; AVE=0.8952)	Taking advantage of an online group-buying price-deal like this makes me feel good. (TU1)	0.9177***	0.0177	51.7573
	I would get a lot of pleasure knowing that I would save money at this reduced online group buying price. (TU2)	0.9304***	0.0138	67.2632
	Beyond the money I save, taking advantage of this online group-buying price deal will give me a sense of joy. (TU3)	0.8780***	0.0298	29.4777
Participation intention (CR=0.9345; AVE=0.8262)	I am willing to participate in the online groupbuying. (PI1)	0.9532***	0.0109	87.1974
	I will probably to participate in the online groupbuying. (PI2)	0.9333***	0.0147	63.4475
	I am interested in participating in the online groupbuying. (PI3)	0.9518***	0.0103	92.3766

Note：CR: Composite Reliability
AVE: Average Variance Extracted
***p<0.01

As for convergent validity, which indicates the extent to which the items of a scale that are theoretically related are related in reality, two tests were conducted to examine it. One is factor loading on the construct. As shown in Table 2, all the items had a loading above the suggested 0.55 (Falk and Miller, 1992) and all of them were significant at the 0.01 level. The other one is the construct's average variance extracted (AVE). As shown in Table 2, the AVE values for all constructs were above the limit of 0.50 advised by Fornell and Larcker (1981).In summary, convergent validity was supported.

Discriminate validity was examined at the construct level. Table 3 presented the loading and cross-loading of all measures in our model. The item loadings in their corresponding columns were all higher than the loadings of the items used to measure the other constructs. Meanwhile, the item loadings were higher for their corresponding constructs than for others. Therefore, according to the criteria for discriminate validity suggested by Chin (1998), discriminate validity of our measurements was supported.

Table 3: Loadings and Cross-Loadings for Reflective Measures

	PPF	TU	PI
PPF 1	**0.8917**	0.6566	0.5539
PPF 2	**0.9184**	0.694	0.6034
PPF 3	**0.8890**	0.7406	0.6606
TU 1	0.7782	**0.9177**	0.7216
TU 2	0.735	**0.9304**	0.7495
TU 3	0.5907	**0.8780**	0.6689
PI 1	0.6503	0.7293	**0.9532**
PI 2	0.6202	0.7413	**0.9333**
PI 3	0.6494	0.7604	**0.9518**

Furthermore, Multi-collinearity was tested, with two indicators of tolerance and variation inflation factor (VIF). Tolerance, which is the amount of variability of the selected independent variables not explained by other independent variables, is measured by $1\text{-}R^2_i$. While VIF, which measures how much the variance of the estimated regression coefficients are inflated as a result of being related to the other independent variables, is measured by the formula of $1/1\text{-}R^2_i$ (Neter et al.,1990).The threshold of tolerance is above 0.10 and that of VIF is less than 5–10.The results showed that the overall independent variables' tolerance is between 0.371 and0.396, while their VIF is between 1 and 2.478, which suggested that there was no potential problem with multi-collinearity.

5.2 Manipulation Test of Price Dispersion

In the experiment, we manipulated the extent of price dispersion, which turned out to be narrow or wide. We used ANOVA to test whether the manipulation was successful. Table 4 reported the results of SPSS 18.0. The results suggested that the perceived price dispersion of the respondents in different groups was significantly different at the 0.05 level ($F(1,150)=20.154$, $p=0.00$), which supported the successful manipulation.

Table4: Manipulation Test

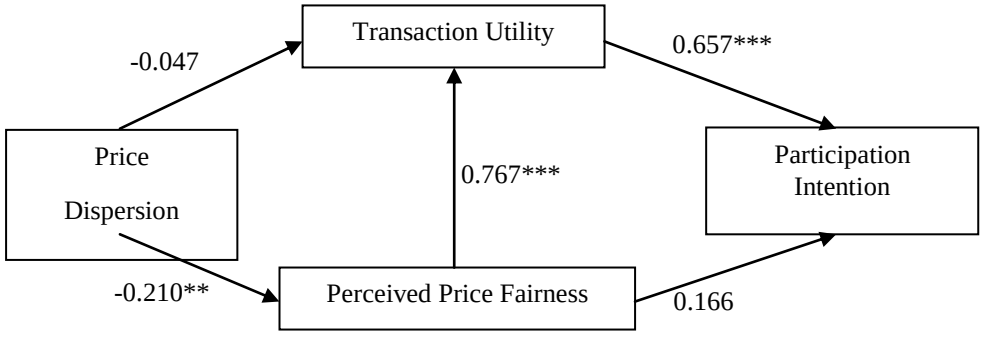
	Sum of Squares	*DF*	Mean Squared Error	*F*-value	*p*-value
Between Groups	37.875	1	37.875	20.154	.000***
Within Groups	281.888	150	1.879		
Total	319.763	151			

Note: * $p<0.1$, ** $p<0.05$, *** $p<0.01$

5.3 Hypotheses Test

Results of our model were shown in Figure 2 and Table 5. As indicated by path loadings, the price dispersion had significant negative effects on the consumer's perceived price fairness (β= -0.210,$p<0.05$). Specifically, the wider the price dispersion was, the lower the consumer's perceived price fairness was.H2 was strongly supported. The results also showed that the consumer's perceived price fairness had a significant positive effect on the consumer's transaction utility ($\beta=0.767$, $p<0.01$), which in turn had a significant positive effect on the consumer's intention to participate in the online groupbuying ($\beta=0.657$, $p<0.01$). Therefore,H3 and H5 were both supported. While, neither the effect of the price dispersion on the consumer's transaction utility($\beta=-0.047$, $p>0.1$) nor the effect of the consumer's perceived price fairness on the consumer's intention to participate in the online groupbuying ($\beta=0.166$, $p>0.1$)were not significant at the 0.1 level, thus H1 and H4 were not supported. All the results above indicate that the consumer's perceived price fairness is a full mediator, through which the price dispersion in the market can affect the consumer's transaction utility, which in turn would affect the consumer's intention to participate in the online groupbuying. Furthermore, from the perspective of Herzberg (1966)'s two-factor theory, fairness is a hygiene factor in group-buying transactions, which verifies that fairness is one of essential characteristics of market.

Figure 2: Path Coefficient



* $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table5: Path Coefficient

	T-Statistics	Path Coefficient
PD–> TU	0.7565	-0.047
PD –> PPF	2.2989	-0.210**
PPF –> TU	18.3971	0.767***
PPF –> PI	1.2850	0.166
TU –> PI	6.0477	0.657***

Note：* p<0.1, ** p<0.05, ***p<0.01.

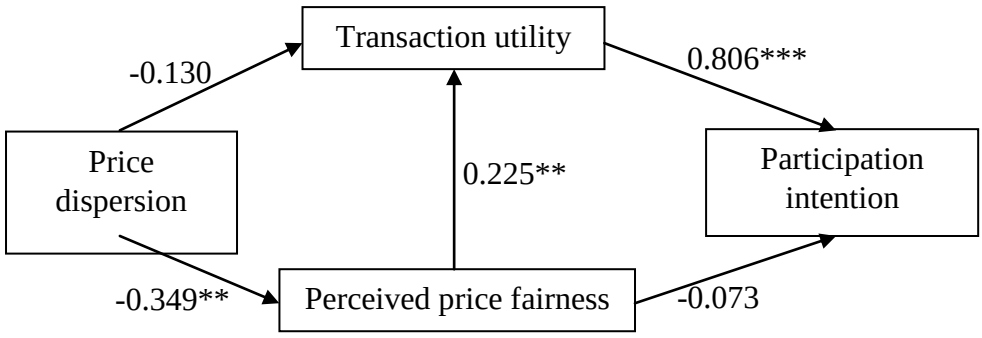
5.4 Further Discussion

The consumers' perceived fair price is affected by the production cost perceived by them. The consumer's perceived fair price is a specific price value that the consumer thinks the firm should offer. Yet, the perceived price fairness is the perception of the consumer after he or she has made a comparison of different prices of many firms and it consists of both the cognitive aspect and the affective aspect. Thus, the perceived fair price can be seen as another indicator of the perceived price fairness. The higher consumers' perceived price fairness, the closer the consumers' perceived fair price is to the average price of the digital camera (i.e. 2000RMB). Based on the consumer's perceived fair price tested in the experiment, we made an ANOVA analysis.

Under the assumption of homogeneity of variance, the results showed that there was a significant difference (F(1,150)= 20.796, p=0.00) between perceived fair prices of the wide and narrow price dispersion groups. In the context of wide price dispersion, the consumer's average perceived fair price (1819.45RMB) is significantly lower than that (1920.33RMB) in the context of narrow price dispersion. When compared with 2000RMB, the gap of former is larger than that of the latter one, which provides further evidence to support H2.

As mentioned above, the consumer's perceived fair price can be seen as another indicator of the consumer's price fairness. The consumer's perceived price fairness was replaced in the initial theoretic model by the consumer's perceived fair price to further verify our conclusions. As shown in Figure 3 and Table 6, the price dispersionhada significant negative effects on the consumer's perceived fair price (β=-0.349,p<0.05), which in turn had a significant positive effect on the consumer's transaction utility(β=0.225,p<0.01). Moreover, the results showed that the consumer's transaction utility (β=0.806,p<0.01) had a significant positive effect on the consumer's intention to participate in the online groupbuying. The results are consistent with previous conclusions.

Figure3: Path Coefficient in Further Discussion



* p<0.1, ** p<0.05, ***p<0.01.

Table6: Path Coefficient

	T-Statistics	Path Coefficient
PD –> TU	1.2307	-0.130
PD –> PFP	3.2977	-0.349***
PFP –> TU	2.6153	0.225***
PFP –>PI	0.6548	-0.073
TU –> PI	17.1317	0.806***

Note：* p<0.1, ** p<0.05, ***p<0.01.

6. Conclusion

6.1 Findings

This paper focuses on the effect of price dispersion on consumers' intention to participate in online groupbuying under the circumstances of one-price mechanism. The main findings of this study are as follows. Firstly, the wider the price dispersion is, the lower the consumers'perceived price fairness is. Secondly, higher the consumers' perceived price fairness contributes to higher the consumers' transaction utility. Thirdly, the consumers' transaction utility positively impacts consumers' intention to participate in the online group buying. Fourthly, price dispersion doesn't have direct effect on consumers' transaction utility, but through a mediator, consumers' perceived price fairness.

6.2 Managerial Implications

Managerial implication of our findings is that manufacturers need to control the degree of price dispersion. Specifically, when manufacturers construct their channels, they should control pricing range, in case of consumers feeling unfair about the prices. As for retailers from different channels, they should cooperate with each other, rather than competing with low price. For example, traditional shops can focus on consumer experience, while online shops can take advantage of low cost. Last but not least, for online group-buying websites, price is not only thing that should be taken into consideration. On one hand, the price should be appealing, while on the other hand, fair. Theory of cognitive dissonance (Festinger, 1962) holds that people tend to make their belief coordinate with facts. When dissonance happens, they would change their belief to overcome it. Thus, if online groupbuying is far below ordinate level, consumers may think the products are fake to overcome the dissonance.

6.3 Limitations and Future Research

First, the experiment product in our research is a digital camera, which is product with high value and low frequency of purchase. However, there are various different categories of online group-buying products now. Sales of different products (i.e. physical goods vs. services) are based on different pricing strategy. In the future research, the robustness of our results can be explored by examining other physical goods and services. Second, Urbany et al.(1997) find that when the uncertainty of product quality is high, acquisition utility will dominate effect on consumers' purchase intention, while the effect of transaction utility will decrease. Thus, it would be interesting to examine the moderation effect caused by uncertainty of product quality. In addition, our empirical work was done in China and the external validity of the result could be test with more cross-culture studies.

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