Is time-constrained promotion actually effective? The moderating role of price discounts and previous online consumption experience

Jing-Bo Shao, Fei-Si Yao, Min Xie

Is time-constrained promotion actually effective? The moderating role of price discounts and previous online consumption experience

Jing-Bo Shao

School of Management,
Harbin Institute of Technology,
13 Fayuan Street, Nangang District, Harbin, China
Email: boboshao@163.com

Fei-Si Yao*

College of Economics and Management,
Nanjing University of Aeronautics and Astronautics,
29 Jiangjun Street, Jiangning District, 210016, Nanjing, China
and
School of Management,
Harbin Institute of Technology,
13 Fayuan Street, Nangang District, Harbin, China
Email: yaofeisicem@nuaa.edu.cn
*Corresponding author

Min Xie

School of Management,
Harbin Institute of Technology,
13 Fayuan Street, Nangang District, Harbin, China
Email: xieminminmin@163.com

Abstract: At present, time-constrained promotion is highly prevalent. However, it is not always as effective as it seems. We propose that contextual factors, including time constraints, price discounts and product price levels, as well as individual differences, such as previous online consumption experience, all have an impact on consumer purchase intentions. Specifically, time constraints influence consumer purchase intentions, and this effect is moderated by consumers' previous online consumption experience. Additionally, consumer perceived value mediates the relationship between time constraints and purchase intentions, and price discounts moderate the first stage of this effect. Meanwhile, product price levels moderate both the main effect and the two interaction effects. Academic and practical implications are discussed.

Keywords: time-constrained promotion; time constraints; price discounts; consumers' previous consumption experience; consumer perceived value; purchase intentions.

Biographical notes: Jing-Bo Shao is a Professor and PhD Supervisor in the School of Management at Harbin Institute of Technology. Her research interests include social media marketing, consumer behaviour, consumer equity, etc.

Fei-Si Yao is a Lecturer in the College of Economics and Management at Nanjing University of Aeronautics and Astronautics. Her recent interests include product's description style, consumer information process, consumer behaviour, etc.

Min Xie is a postgraduate student in the School of Management at Harbin Institute of Technology of China. Her recent interests include time-constrained promotion, consumer information process, consumer psychology, etc.

---

1   Introduction

Almost all consumers have an affinity for attractive products with a reasonable price. With the arrival of the 'internet +' era and the boom in e-commerce, time-constrained promotions, which come from the famous French discount website VP (Venteprivee.com), have gradually become a preferred method that online firms use to stimulate consumers' desire to purchase (Zhao and Ji, 2014). For both traditional online-to-offline (O2O) businesses, including Taobao, Vip.com, Red and Kaola.com and so forth, and emerging original design manufacturer (ODM) enterprises, such as NetEase Yanxuan, all employ time-constrained promotions for commodities from time to time (Li et al., 2016).

Time-constrained promotions fall under the heading of restrictive marketing. Companies often choose a special day or a period of time as the promotion time and at the same time emphasise product scarcity (Inman et al., 1997). When deciding whether to buy this product under time-constrained conditions, consumers may have several sources of information that they can consider in deciding whether to purchase this product (Inman et al., 1997). As the main feature of time-constrained promotions, time constraints are bound to be the primary predictor of consumers' purchase intentions (Dhar and Nowlis, 1999; Inman et al., 1997; Zhang and Li, 2017). Moreover, online businesses often select price discounts as 'material incentives' in real life, and they are always inseparably interconnected to time constraints in time-constrained promotions (Inman et al., 1997; Zhang and Li, 2017). Price discounts are also an important source of information that consumers need when considering whether to buy a product (Gong et al., 2015; Inman et al., 1997; Zhao and Ji, 2014). Likewise, in light of previous research, variables concerning individual differences such as previous online consumption experience can act as a driving factor that might play an active role in this process as well (Inman et al., 1997; Rodgers et al., 2005; Zhang and Lin, 2015). Finally, as a common and important

attribute of any product, prices are also a vital factor that can steer consumer purchase intentions under time constraints (Suri and Monroe, 2003).

Most academics have acknowledged that time constraints can promote consumer purchase behaviour, for example, fuelling consumers' willingness to buy (Suri and Monroe, 2003) and decreasing purchase delay (Dhar and Nowlis, 1999). Based on our observations, with the boom in e-commerce, the competition between online businesses is gradually growing fierce. When one online business website employs time-constrained promotions for its products, other businesses follow suit. As time-constrained promotions for products appear from time to time, we question whether this method is always effective. A stream of literature explores the moderating variables between restrictive marketing and consumer purchase behaviour from the perspective of individual differences, such as the need for cognition (Inman et al., 1997), perceived expensiveness (Michael, 1992), and the need for uniqueness (Fromkin, 1970). However, one important individual difference variable, consumers' previous online consumption experience (Rodgers et al., 2005), which is closely and directly linked to the consumer online shopping process, is poorly understood in restrictive marketing, especially in time-constrained promotion. Undoubtedly, consumers' previous online consumption experience permeates almost every aspect of consumer behaviour (Roth et al., 2016; Schwarz, 2004; Zhang and Lin, 2015), let alone in the context of online shopping. Therefore, it is worthwhile to examine the effect of consumers' previous online consumption experience on the above relationship.

Moreover, in terms of price discounts in the context of time constraints, extant evidence supports the view that a high price discount level prompts consumer purchase behaviour under time constraints (Inman et al., 1997; Zhao and Ji, 2014). This issue is not as straightforward as it might seem. The boomerang effect of price discounts has been revealed in other areas of consumer behaviour (Cai et al., 2016). Furthermore, price discounts are closely related to prices, and there is evidence that product prices affect consumers' perceived quality or perceived monetary sacrifice under time constraints (Suri and Monroe, 2003), which are two vital facets of consumer perceived value. Therefore, we argue that price discounts combined with time constraints have different effects on purchase intentions through consumer perceived value under time constraints.

Another important issue is that most empirical work has scarcely considered the role of the product price level in this relationship. The price level is an important product attribute that can influence consumers' judgement of quality (Suri and Monroe, 2003) and monetary sacrifice (Suri and Monroe, 2003) as well as their value-seeking tendency (Lee and Zhao, 2014; Richard, 1985). As mentioned above, there also exists research that investigates the effect of time constraints on consumer price judgements and that discovers that consumers have different price judgements for products with different price levels (Suri and Monroe, 2003). Since product price levels can affect consumer price judgements under time constraints, we suppose that they can also impact every aspect of our study, including the main effect and interaction effect.

Overall, we assume that the presence of time-constrained promotions for products with different price levels activates different purchase intentions and that consumers' previous online consumption experience moderates the relationship. We posit that time constraints in conjunction with price discounts also influence purchase intentions and that this effect changes across products with different price levels. The heuristic-systematic dual-processing model (Chaiken, 1980) and the persuasion knowledge model (PKM)

(Friestad and Wright, 1994) underpin our assumption. We use this theoretical framework to generate and test the contingency conditions under which time-constrained promotions are and are not effective through two studies.

The rest of this article proceeds as follows: first, we briefly discuss the relevant literature and develop our theoretical framework. Second, two pre-tests and studies are reported to test our hypotheses. Third, we conclude with a discussion of the implications of our findings.

2 Theory and hypotheses

2.1 Online time-constrained promotions, time constraints and purchase intentions

Time-constrained promotions are a time-constrained marketing tool designed to increase demand (Kotler and Levy, 1971). Specifically, online businesses implement special preferential prices for goods during a constrained period of time, and after this period of time, the prices of goods will return to the original higher price level (Sinha et al., 1999). The main intention of this prevalent online promotion is to take full advantage of the time constraints to limit the availability of special prices for goods and to them stimulate consumers and enhance their purchase intentions.

Purchase intentions, which are the subjective probability that someone will take purchase actions (Fishbein and Azjen, 1975) and are also called willingness to buy (Dodds et al., 1991), have a vital function in consumer decision making (Cavazza and Gabrielli, 2015). Not surprisingly, time constraints are a critical part of this stimulation. Importantly, time is quite important in consumers' decision making, as it is a time-consuming process. In time-constrained promotion, time constraints mean reducing the necessary time, and they certainly impose perceived time pressure on consumers (Suri and Monroe, 2003).

Due to time constraints, consumers will cut the time needed for information searching and processing (Dhar and Nowlis, 1999). For example, consumers tend to focus more on the unique characteristics of the goods in the consumption set but ignore the common features (Dhar and Nowlis, 1999). At the same time, consumers will speed up their information processing speed (Zur and Breznitz, 1981) and reduce their consideration of commodity attribute indicators, thus greatly reducing the number of alternative products (Ariely and Zakay, 2001). In addition, when faced with time constraints, consumers will quickly make decisions based on intuition (Lu et al., 2012), thereby reducing their purchase delay (Dhar and Nowlis, 1999). Collectively, these findings suggest that time constraints contribute to consumer purchase behaviour.

However, we propose that time constraints may not always result in positive consumer behaviour and that the price level of a product may alter how consumer purchase intentions respond to time constraints. The heuristic-systematic dual-processing model (Chaiken, 1980) tells us that heuristics and systematics are two ways for people to process information, and one important factor impacting the way in which people make their selection is their motivation (Chaiken, 1980), as motivation has a close link to a people's willingness to process information (Eagly and Chaiken, 1993). A high price is one condition that boosts consumers' motivation to process information (Vaughn, 1980). The more consumers need to pay, the more motivated they are (Vaughn, 1980). When

consumers encounter a product with a relatively low price, they do not need to pay much for that product. Therefore, consumers may think 'I just need it', 'I can buy it', and so on, or they buy just because of the exquisite appearance of the product or because of the celebrity who endorses the product (Chaiken, 1980). Thus, for products with a low price level, consumers may not consider much and may be more likely to process information using heuristics. When there exists a time constraint on products with a low price level, people will further simplify the cognitive load or even depend on intuition to simplify and accelerate their information processing (Lu et al., 2012), which will reduce their purchase delay and increase their purchase intentions (Dhar and Nowlis, 1999).

When a product is marked at a relatively high price, consumers have to pay more and will tend to have higher expectations of utility because they want the product to be worth what they pay. With this fundamental desire, consumers will be motivated to logically and systematically think about the product's attributes (Chaiken, 1980). However, when there exists a time constraint on a product, there is insufficient time for consumers to systematically process information, and they will have to use heuristics. As this contradiction occurs (Jacob, 1984), consumers may feel stressed, tired and worried (Michael and Manuel, 1992), and they may perform negatively under time constraints (Michael and Manuel, 1992), leading to a decrease in purchase intentions.

Formally, we hypothesise the following:

H1a For low-price-level products, time constraints are positively related to purchase intentions.

H1b For high-price-level products, time constraints are negatively related to purchase intentions.

2.2 *The moderating role of consumers' previous online consumption experience*

Consumers will be affected by their previous consumption experience (Rodgers et al., 2005). Because at present online shopping is highly prevalent, in this research, we mainly focus on the online shopping context, and we employ the frequency of online shopping a certain period of time (Zhang and Lin, 2015) to indicate consumers' previous online consumption experience. Previous consumption experience is an important individual-level consumer factor, and consumers often rely on their previous consumption experience to make judgements and purchase decisions (Roth et al., 2016; Schwarz, 2004; Zhang and Lin, 2015).

Undoubtedly, consumers' previous consumption experience pervades every aspect of consumer behaviour (Rodgers et al., 2005; Wang and Huang, 2014; Wang et al., 2011) and is a key moderating factor that affects consumer behaviour (Jin and Park, 2006; Rodgers et al., 2005; Zhang and Lin, 2015). Consumers' persuasion knowledge gradually accumulates through previous online shopping experience (Friestad and Wright, 1994). The PKM postulates that consumers can cope with different persuasion attempts by marketers to meet their own goals by flexibly using their persuasion knowledge structure (Friestad and Wright, 1994). Consumers' exposure to various marketing persuasions and product advertisements propel their persuasion knowledge to develop (Friestad and Wright, 1994). According to the PKM, consumers will no longer be limited to the heuristics noted above to cope more effectively with persuasion attempts. For example, they will also develop heuristics to identify what kind of tactic is being used, to infer the

business's intentions underlying the use of this tactic, or to assess the effectiveness of the persuasion attempt (Friestad and Wright, 1994).

In the low-price-level product domain, for consumers who have more previous online consumption experience, their persuasion knowledge about online shopping is also richer. Such consumers are more familiar with the online business 'routine' (Friestad and Wright, 1994) and are sceptical about specific time constraints, viewing them as just a tactic used by businessmen who want to stimulate their psychological mediators (e.g., perceptions, desires and intention) and to boost sales (Friestad and Wright, 1994; Kotler and Levy, 1971; Sinha et al., 1999). Furthermore, they know that such time constraints employed for products occur one after another and will appear from time to time. It may be maintained that this persuasion attempt is not effective, and consumer will be able to control their psychological activities by using coping tactics, including ignoring the time-constrained tactics to throttle their purchase intentions (Friestad and Wright, 1994). However, for consumers who have less prior experience consuming online, their persuasion knowledge of online businesses is not as good as that of people who buy online often. They tend to use heuristics (e.g., consumers may think 'I just need it', 'I can buy it', and so on) under time constraints (Chaiken, 1980). Plus, time-constrained online advertising often works together with slogans such 'now or never' and 'only one day a year' or an online countdown (Li et al., 2016). All of these tactics might fuel their motivation to press the 'buy' button. Thus, we hypothesise the following:

H2a   In the low-price-level product domain, consumers' previous online consumption experience moderates the effect of time constraints on purchase intentions. The effect will be strengthened for consumers who have less previous online consumption experience and weakened for those who have more previous online consumption experience.

In the high-price-level product domain, consumers who have more previous online consumption experience have richer persuasion knowledge about online shopping. They are more likely to be aware that time-constrained tactics are not often used for high-price products, and if they miss this chance, they do not know when the next chance will come. Therefore, they will evaluate the time-constrained tactics for that product more effectively (Friestad and Wright, 1994). Because consumers think that marketing strategies exist in a range from relatively high favourability to low favourability (Isaac and Grayson, 2017), their evaluation of time constraints on products will be more favourable under this circumstance. Moreover, consumers with more previous online consumption experience are more used to coping with such time-constrained marketing tactics under limited time, which gives them more capacity to process information under time constraints (Chaiken, 1980). Combined with all these factors, for consumers with rich prior online consumption experience, time constraints will enhance their purchase intentions. However, consumers with less previous online consumption experience are not used to coping with such time-constrained marketing tactics under limited time. Thus, the time constraints imposed on a high-price-level product will only impose perceived pressure and cause these consumers to feel that there is not enough time for them to systematically process the necessary information (Wang and Cheng, 2013). Though they may know that the business uses time-constrained tactics mainly with the intention of boosting sales, they do not suppose that this method is effective (Friestad and Wright, 1994). Therefore, for consumers with less previous online consumption experience, time

constraints will not result in positive purchase intentions. Thus, we hypothesise the following:

H2b In the high-price-level product domain, consumers' previous online consumption experience moderates the effect of time constraints on purchase intentions. The effect will be strengthened for consumers who have more previous online consumption experience and weakened for those who have less previous online consumption experience.

2.3 The moderating role of price discounts between time constraints and consumer perceived value

Importantly, time-constrained promotions are often accompanied by material incentives such as price discounts (Lu and Huang, 2014). Many studies have found that price discounts are an effective means of promoting consumer decision making (Alavi et al., 2015; Coulter and Coulter, 2007; Gong et al., 2015; Hao and Gao, 2008; Hao et al., 2008). Especially in the context of time constraints, scholars have found the important role of price discounts (Zhao and Ji, 2014). As we take the product price level into account, we suppose that for products with different price levels, price discounts will have different effects.

Under time constraints, price discounts are sufficiently diagnostic for consumers to notice the price and to associate with it. The reason is that people are more automatically aware of numbers (Gong et al., 2015; Roitman et al., 2007) and, under time constraints, price discounts make it easier for consumers to visually perceive price changes. Moreover, regardless of whether their motivation is high or low, consumers tend to use heuristics under limited time (Suri and Monroe, 2003). Because price discounts are a form of price change, consumers are more likely to use price-quality or price-sacrifice heuristics under this condition (Rao and Monroe, 1988; Suri and Monroe, 2003). Which heuristic is chosen depends on the consumer's information processing motivation (Suri and Monroe, 2003). If consumers are more motivated, they will be more likely to use price-sacrifice heuristics (Suri and Monroe, 2003). If they are less motivated, they will be inclined to use price-quality heuristics (Suri and Monroe, 2003). Our study supposes that consumers are more motives to process information concerning high-price-level products relative to low-price-level products (Vaughn, 1980). Therefore, under time constraints, consumers are more likely to use price-sacrifice heuristics to judge the monetary sacrifice for high-price-level products (Suri and Monroe, 2003). For low-price-level products, consumers tend to use price-quality heuristics to form opinions about product quality (Suri and Monroe, 2003). The perceived monetary sacrifice and perceived quality are two important facets of consumer perceived value, which is the net utility generated by consumers' trade balance between the perceived gain and loss during the purchase or use of a product or service (Ma et al., 2014; Monroe and Chapman, 1987; Zeithaml, 1988). Therefore, both for high-and low-price-level products, the interaction between time constraints and price discounts can influence consumers' perceptions of product value, and the strength of the interaction effect depends on the price discount level.

For high-price-level products, consistent with prior research, we suppose that a higher price discount combined with time constraints will enhance consumer perceived value. Because the regular price of expensive products is high, when the price discount is low, a small price discount means that the product is not much cheaper, and accordingly,

consumers will feel that it is not sufficiently appealing. The perceived quality will remain the same, and at this time, the perceived cost will basically be unchanged; accordingly, consumer perceived value will not change much. However, a high price discount means that the price of high-priced goods has dropped significantly, and when consumers perceive that the costs are greatly reduced, the perceived value will also increase correspondingly.

For low-price-level products, price discounts in the context of time constraints may have a different function. Price-quality heuristics are important heuristics that consumer frequently use in this situation (Stafford and Enis, 1969). When the price discount is low, the product's price is not reduced much, and consumers will not be suspicious of its quality. Consumers will think that they could pay less but are acquiring a product of the same quality and feel that they are 'picking up the item on the cheap'; thus, consumer perceived value is correspondingly enhanced. When the price discount is high, the present selling price is much lower than the regular reference price. If the selling price for originally low-price-level products is much lower than consumers' reference price, then they will initially be suspicious of the quality of this promotional item and believe that it is not good (e.g., the production date of the product is not fresh.). Although the perceived loss on the high-price-discount product is much reduced, consumers do not want to pay for poor-quality products, and subsequently, perceived value is also reduced.

Hence, we postulate H3:

H3a   For low-price-level products, the effect of time constraints on consumer perceived value will be mitigated when the price discount is higher.

H3b   For high-price-level products, the effect of time constraints on consumer perceived value will be accentuated when the price discount is higher.

2.4   *The relationship between consumer perceived value and purchase intentions*

Consumer perceived value is the net utility generated by consumers' trade balance between the perceived gain and loss during the purchase or use of a product or service (Ma et al., 2014; Monroe and Chapman, 1987; Zeithaml, 1988). For the purchase of goods, consumers will produce perceived value based on their own preferences and make value judgements; then, they will engender different levels of purchase intentions, and finally, they will make purchase decisions. Perceived value directly relates to the choices that consumers make; when the consumer's perceived value becomes more intense, the consumer's preference for and willingness to buy a good are also greater (Dodds and Monroe, 1985; Dodds et al., 1991; Tam, 2004). In other words, perceived value directly concerns consumer choice. Moreover, purchase intentions largely depend on the perceived value of goods or services (Dodds and Monroe, 1985; Dodds et al., 1991; Tam, 2004). The more intense the consumer perceived value, the greater the likelihood that consumers will express their preference for the good and the greater their willingness to buy (Dodds and Monroe, 1985; Dodds et al., 1991; Tam, 2004). Thus, we propose Hypothesis 4:

H4   Consumer perceived value is positively related to purchase intentions.

Figure 1 Theoretical model for low-price-level products
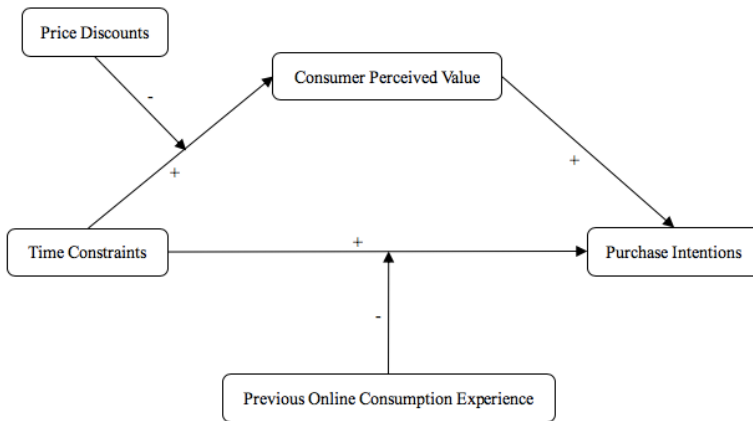
Figure 2 Theoretical model for high-price-level products
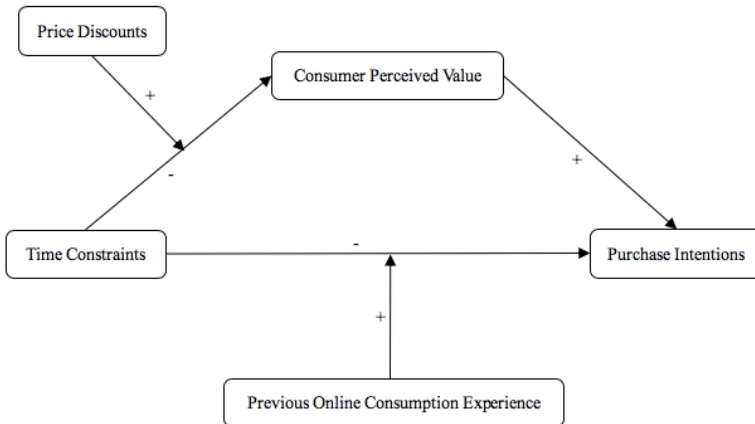
2.5 The relationship between time constraints, price discounts, consumer perceived value and purchase intentions

As our final hypothesis, we expect a combination of mediation and moderation based on Edwards and Lambert's (2007) first-stage moderation model. This means that we regard price discounts as a moderator (Z) between the independent variable (X), time constraints, and the mediator (M)s consumer perceived value, which, in turn, predicts consumer purchase intentions (Y). For both low-and high-price-level products, whether consumer perceived value is lower or higher will depend, as postulated in Hypothesis 3, on price discounts. In the low-price-level product domain, a high price discount will weaken the effect of time constraints on consumer perceived value, which, in turn, will lead to lower consumer intentions to purchase. However, for high-price-level products, this chain of effects should be less negative. In summary, we propose the following:

H5 Consumer perceived value mediates the relationship between time constraints and purchase intentions, and the strength of this mediation effect will depend on the price discount level.

Thus, here, we provide our theoretical model for low-price-level products and high-price-level products.

3 Pre-test

3.1 Pre-test of price level perception

Before beginning our investigation, we performed a pre-test to affirm whether the two products we intend to choose are perceived as having low and high price levels. For the low-price-level product, we intended to choose MI smart sports bracelet. MI, also known as Xiaomi, is a Chinese company specialising in intelligent hardware, smart homes and software development. For the high-price-level product, we intended to choose a Samsonite suitcase. Samsonite is a US company that designs, manufactures and sells luggage, backpacks and other products. With two questions, we presented the price range, referring to the official websites for these two products, and asked the participants whether they think the bracelet or suitcase is a low-price product or a high-price product in terms of price.

Two hundred Chinese consumers recruited from WJX.com (52% female) participated in this pre-test. A total of 60.5% of them ranged from 26 to 40 years of age; others were below 18 (2%), 18–25 (25.5%), 41–50 (7.5%), 51–60 (4%) and above 60 (0.5%). Eighty percent of participants perceived the MI smart sports bracelet as a low-price-level product. A total of 82.5% of participants perceived the Samsonite suitcase as a high-price-level product. Based on the results, the MI smart sports bracelet and the Samsonite suitcase can be regarded as low-and high-price-level products, respectively, in the following investigation.

3.2 Pre-test of information processing motivation

Based on the logic of differences in information processing motivation for products with different price levels, we proposed hypotheses related to the moderating role of a product's price level. Specifically, the logic is that consumers have higher information processing motivations for high-price-level products and lower information processing motivations for low-price-level products. Therefore, in this pre-test, we investigated whether different price-level products activate different information processing motivations.

We used three items (seven-point scale) to determine information processing motivations (very interested in reading-not interested in reading, very involved-not involved, very interested in understanding-not interested in understanding) for the low-price-level product (Cronbach's alpha = 0.743) and the high-price-level product (Cronbach's alpha = 0.723) based on Maheswaran and Sternthal (1990). Two hundred Chinese residents were recruited from WJX.com (56% female) to participate in this pre-test. Of these, 66.5% ranged from 26–40 years of age; others were below 18 (0.5%), 18–25 (19.5%), 41–50 (9%), 51–60 (4%) and above 60 (0.5%). We asked the participants

to recall one online purchase experience of buying low-and high-price products. Then, we used the above scale to measure their information processing motivations for low-and high-price-level products. The results show that the participants have higher information processing motivations for high-price-level products (M_{high} = 5.400) than for low-price-level products (M_{low} =5.133; $t(199)$ = –3.119, p < 0.01), which verified our logic.

4 Study 1

4.1 Method

4.1.1 Participants and design

The main purpose of study 1 is to explore our theoretical model with a low-price-level product. The participants were 45 business students from a comprehensive university in northern China. Because different participants may have diverse shopping motivations and price perceptions for the products we chose, we manipulated time constraints at two levels (1 day vs. 6 days) and price discounts at two levels (20% vs. 60%) in a within-group design. This study design could eliminate the effects of individual differences, such as shopping motivations and price perceptions, on the experiment (Boros et al., 2010). That means the potential influential factors which could affect our study results are not serious concerns in study 1.

4.1.2 Procedure

When the participants entered the lab, the researchers recorded their gender, age, education, monthly income and other demographic variables. At the beginning of the experiment, the participants were asked to imagine that they were shopping online and found that the MI smart sports bracelet was on time-constrained promotion. Then, the assistant presented the picture and description of the smart sports bracelet (such as its price, attributes, and functions) to the subject briefly on the platform. Next, the participants were required to combine this above scenario description and the related picture information browsing to respond to the relevant questions in the questionnaire that assessed the necessary latent constructs based on their own real feelings. The questionnaire included 4 pages, and except for the specific scenarios, the question items on each page were basically the same. At the beginning of each page, the key words of the specific time-constrained promotion scenario were presented in italics. For example, '*20% off only 1 day!!!*' was printed on the first page.

Because six people either returned incomplete questionnaires or answered in an unserious manner, rendering the data invalid, a total of 39 valid samples remained (61.5% male). The mean age in study 1 was approximately 23 years old (range 17–35). More than half were undergraduates (56.4%); postgraduates and PhD students accounted for 25.6% and 17.9%, respectively.

4.1.3 Variable measurement

- *Time constraints:* We manipulated the time constraints at two different levels: six days and one day. Six days represented a low time constraint level, while one day

indicated a high time constraint level. We coded 'six days' as '0' and 'one day' as '1'.

- *Price discounts:* Price discounts were also manipulated at two different levels: 20% off and 60% off, which meant low and high discount levels, respectively. We coded '20% off' as '0' and '60% off' as '1'.

- *Consumer perceived value:* The participant's evaluated consumer perceived value with multi-item seven-point scales (from completely disagree to completely agree). Consumer perceived value was measured according to Grewal et al.'s (1998) 12-item scale, including items 'taking advantage of a price-deal like this makes me feel good', 'I will get a lot of pleasure knowing that I am saving money at this reduced sale price', 'beyond the money I save, taking advantage of this price deal will give me a sense of joy' and so on. Notably, the original scale contains the items 'If I acquired this product, I think I would be getting good value for the money I spent' and 'I think that given this product's features, it is a good value for the money'. However, when we translated the items into Chinese, these two items had similar meanings. Therefore, we combined the two items into one.

- *Purchase intentions:* A seven-point scale (from completely disagree to completely agree) was applied to measure purchase intentions. Based on previous research and current issues, we used the item 'It is likely that I will buy the smart sports bracelet' to measure this construct (Jiang et al., 2010; Naylor et al., 2012; Grewal et al., 1998).

- *Consumers' previous online consumption experience*: Consumers' previous online consumption experience was measured by the frequency of online shopping in the last two months (Zhang and Lin, 2015). Four options, including 1 time, 2–5 times, 5–10 times, and more than ten times, were offered below this question for participants to choose. We coded '1 time' as '1', '2–5 times' as '2', '5–10 times' as '3' and 'more than ten times' as '4'.

4.2   Results and discussion

Table 1 shows the descriptive statistics and correlation coefficient of each variable. Because the dataset in this study contains both within-consumer variables (time constraints and price discounts) and between-consumer variables (gender, age, etc.), we need a multilevel analysis that takes the hierarchical data structure into account (Bryk and Raudenbush, 1992; Huyghe et al., 2017; Snijders and Bosker, 1999). The results are shown in Table 2. In model 1, an empty model is calculated allowing the intercept to vary across both the within-consumer and between-consumer levels. In model 2, we entered gender, age, education, and income as control variables, which had no effect on consumer purchase intentions and perceived value. We standardised the predictor variables before computing the interaction terms and entered the standardised scores in models 3, 4, 5 and 6.

Model 3 was used to test the main effect-time constraints and purchase intentions. Model 4 explored the mediating effect of perceived value between time constraints and purchase intentions. Model 5 analysed the moderating role of price discounts between time constraints and perceived value. Model 6 analysed the overall theoretical model. As a result, as shown in Table 2, H1a is marginally significant at the 0.1 level ($\beta = 0.145$, $Std. = 0.079$, $p < 0.1$), H2a is also significant ($\beta = -0.309$, $Std. = 0.109$, $p < 0.01$), H3a is

marginally significant ($\beta = -0.191$, *Std.* = 0.114, $p < 0.1$), and H4 is significant at the 0.001 level ($\beta = 0.671$, *Std.* = 0.088, $p < 0.001$). According to the conditions set in the first-stage moderation model, because H3a and H4 are supported, H5 is set accordingly.

Table 1 Descriptive statistics and correlations in study 1

		1	*2*	*3*	*4*	*5*
1	Gender[a]	-				
2	Age[b]	0.019	-			
3	Education[c]	0.053	0.913**	-		
4	Income[d]	0.031	0.452**	0.536**	-	
5	Consumer type[e]	–0.094	0.312**	0.168*	0.463**	-
6	Time restriction	0.000	0.000	0.000	0.000	0.000
7	Price discount	0.000	0.000	0.000	0.000	0.000
8	Previous experience[f]	–0.378**	0.567**	0.486**	0.511**	0.469**
9	Perceived value	0.029	0.146	0.145	0.181*	0.297**
10	Purchase intention	0.084	0.107	0.091	0.157*	0.250**
Mean		-	23.440	-	-	-
S.D.		-	4.144	-	-	-

		6	*7*	*8*	*9*	*10*
1	Gender[a]					
2	Age[b]					
3	Education[c]					
4	Income[d]					
5	Consumer type[e]					
6	Time restriction	-				
7	Price discount	0.000	-			
8	Previous experience[f]	0.000	0.000	-		
9	Perceived value	0.057	0.387**	0.095	-	
10	Purchase intention	0.203*	0.369**	–0.009	0.701**	-
Mean		0.500	0.500	2.380	4.520	4.430
S.D.		0.502	0.502	0.807	1.261	1.619

Notes: $N = 39$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; the values in the parentheses represent Cronbach' α reliability coefficient. [a]Gender ('0' male; '1' female). [b]Age ('1' under 18; '2' 18–25; '3' 26–30; '4' 31–40; '5' 41–50; '6' 51–60; '7' above 60). [c]Education ('1' high school and blow; '2' professional training; '3' bachelor; '4' master; '5' doctor). [d]Income ('1' 2,000 yuan and less; '2' 2,001–4,000 yuan; '3' 4,001–6,000 yuan; '4' 6,001 yuan and above). [e]Consumer type ('0' have bought; '1' have never bought). [f]Previous experience ('1' 1 times; '2' 2–5 times; '3' 5–10 times; '4' more than ten times).

Table 2   The results of hierarchical linear modelling analysis in study 1

| Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	4.429 (0.202)***	3.397 (1.352)**	3.497 (1.253)**	−0.002 (0.772)	3.716 (1.195)**	−0.386 (0.888)
Gender[a]		0.297 (0.421)	0.064 (0.331)	0.223 (0.28)	0.156 (0.313)	0.009 (0.339)
Age		0.076 (0.119)	0.035 (0.124)	0.045 (0.055)	−0.06 (0.12)	0.106 (0.07)
Education[b]		−0.372 (0.533)	−0.068 (0.524)	−0.313 (0.344)	0.463 (0.523)	−0.476 (0.369)
Income[c]		0.336 (0.254)	0.243 (0.229)	0.122 (0.194)	−0.094 (0.168)	0.318 (0.172)+
Time restriction			0.145 (0.079)+	0.527 (0.129)***	0.24 (0.098)*	0.582 (0.143)***
Perceived value				0.878 (0.087)***		0.671 (0.088)***
Price discount					1.068 (0.177)***	0.566 (0.225)*
Previous experience[d]						−0.154 (0.24)
Time restriction × Price discount					−0.191 (0.114)+	−0.051 (0.179)
Time restriction × Previous experience						−0.309 (0.109)**
σ^2	1.34	1.34	1.208	0.698	0.45	0.595
τ (intercept)	1.306	1.388	1.421	0.656	0.872	0.76
ΔR^2[e]		0.00	−0.099	−0.479	−0.664	−0.56
N (level 1)	156	156	156	156	156	156
N (level 2)	39	39	39	39	39	39
−2 log likelihood	548.81	550.011	540.333	452.407	405.701	434.883

Notes: The dependent variable for model 1, model 2, model 3, model 4 and model 6 is purchase intention. The dependent variable for model 5 is consumer perceived value. $N = 39$, $^+p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$; all data are unstandardised estimates and the values in the parentheses represent the standard error of the unstandardised regression coefficient. [a]Gender ('0' male; '1' female). [b]Education ('1' high school and blow; '2' professional training; '3' bachelor; '4' master; '5' doctor). [c]Income ('1' 2,000 yuan and less; '2' 2,001–4,000 yuan; '3' 4,001–6,000 yuan; '4' 6,001 yuan and above). [d]Online purchase experience ('1' 1 times; '2' 2–5 times; '3' 5–10 times; '4' more than ten times). [e]The proportion was calculated based on the parameters in model.

To further illustrate the moderating role of consumers' previous online consumption experience and price discounts, this study adopted the methods of Aiken and West (1991). In Figure 3, it is obvious that for consumers who have rich previous online consumption experience, a high time constraint weakens their purchase intentions. For consumers whose previous online consumption experience is relatively rare, the higher time constraint increases their purchase intentions. Figure 4 shows that a price discount that is too deep weakens relationship between time constraints and consumer perceived value, ultimately making purchase intentions decrease.

Figure 3 Simple slope analysis of consumer consumption experience in study 1
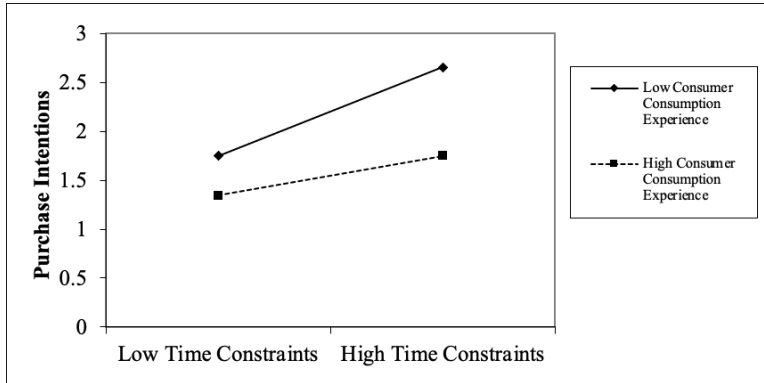
Figure 4 Simple slope analysis of price discounts in study 1
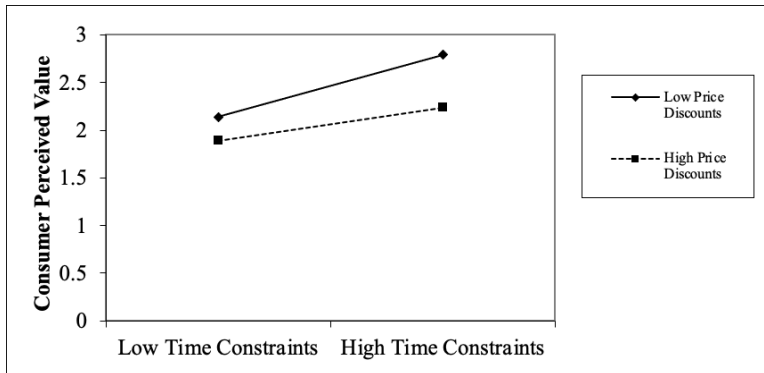
In conclusion, the results of study 1 show that in the low-price-level product domain, time constraints boost consumers' willingness to buy, and this relationship can be further enhanced for consumers with less previous online consumption experience. The interaction of time constraints with price discounts also impacts purchase intentions through consumer perceived value. Counterintuitively, time constraints attenuate consumer perceived value with increasing price discount levels, which also weakens consumer purchase intentions.

5   Study 2

5.1   Method

5.1.1   Participants and design

The main purpose of study 2 is to explore our theoretical model with a high-price-level product. Because the product involved in study 2 was at a high price level, the general student population cannot afford it. Thus, this study intends to set the research object in the wage-paid population. To encourage respondents to complete the questionnaire and enhance the recovery rate, all questions adopt the choice method. All variable measurements were consistent with those of study 1. However, in terms of demographic data, except for the participants' occupation, choice questions were adopted in our questionnaire. Regarding age, we coded '18-25 years' as '1', '26–30 years' as '2', '31–40 years' as '3', '41–50 years' as '4', '51–60 years' as '5', and regarding income, we coded 'below 2,000 yuan' as '1', '2,001–4,000 yuan' as '2', '4,001–6,000 yuan' as '3', 'more than 6,000 yuan' as '4'. For gender, we set males as '0' and females as '1'.

In contrast to study 1, we employed a between-group experimental design that included a total of 2 (time constraints: 1 day vs. 6 days) × 2 (price discounts: 20% vs. 60%) scenarios. To eliminate the influence of different product categories on participants' shopping motivations, we used the same product for the above four groups. Each participant was randomly assigned to a situation. A total of 210 copies of situational questionnaires (each scenario consisted of approximately 52 copies) were distributed through an online platform. In this study, 210 cases were distributed on a questionnaire platform in China, and each participant completed this questionnaire for monetary compensation. Because some participants returned incomplete questionnaires, 189 valid samples remained, representing a response rate of 90%.

Males accounted for 43.4% of the sample. Most of the participants (84.8%) ranged from 26 to 40 years of age; others were 18–25 (3.3%), 41–50 (10%) and 51–60 (1.9%). The majority (75.7%) had a bachelor's degree and those with a master's degree and with less than a bachelor's degree represented 12.9% and 11.4%, respectively. The income of most participants (96.7%) was more than 4,000 yuan, and 64.3% had an income of more than 6,000 yuan per month; others (3.3%) earned from 2,001 yuan to 4,000 yuan every month. In terms of the participants' professions, our sample covered approximately 35 types, including engineer (5.7%), accountant (5.2%), sales (4.8%), manager (3.8%), enterprise staff (3.8%) and so on.

5.1.2   Procedure

The questionnaire instructions indicated that the information in the questionnaire was for academic research purposes only, and external confidentiality was ensured to eliminate the doubts of the subjects. First, the participants needed to provide their demographic data. In the main body of the questionnaire, each group of participants was asked to imagine that they were shopping online at present and to read the time-constrained promotion information of the Samsonite suitcases. The picture of and information about the suitcase (such as its price, attributes, and functions) were also presented. The participants decided the browsing time on their own. The remaining part of the questionnaire included demographic variables such as the gender, age, education and monthly income of the subjects and some items about our needed variables. In terms of

variable measurement, the manipulation and measurement of all variables were consistent with study 1.

Table 3 Descriptive statistics and correlations in study 2

		1	2	3	4	5
1	Gender[a]	-				
2	Age[b]	–0.185*	-			
3	Education[c]	0.041	–0.087	-		
4	Income[d]	–0.117	0.023	0.164*	-	
5	Consumer type[e]	–0.102	0.117	–0.177*	0.072	-
6	Time restriction	0.029	0.002	–0.119	0.115	0.020
7	Price discount	–0.014	0.002	–0.001	0.001	0.105
8	Previous experience[f]	0.144*	0.067	0.202**	0.103	0.005
9	Perceived value	0.067	0.001	0.108	0.062	–0.075
10	Purchase intention	0.130	0.027	0.131	0.075	–0.149*
Mean		-	-	-	-	-
S.D.		-	-	-	-	-
		6	7	8	9	10
1	Gender[a]					
2	Age[b]					
3	Education[c]					
4	Income[d]					
5	Consumer type[e]					
6	Time restriction	-				
7	Price discount	0.005	-			
8	Previous experience[f]	–0.034	0.090	-		
9	Perceived value	–0.110	0.078	0.106	-	
10	Purchase intention	–0.093	0.074	0.069	0.726**	-
Mean		0.487	0.487	-	5.420	5.60
S.D.		0.501	0.501	-	0.805	1.147

Notes: $N = 189$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$; the values in the parentheses represent Cronbach' α reliability coefficient. [a]Gender ('0' male; '1' female). [b]Age ('1' under 18; '2' 18–25; '3' 26–30; '4' 31–40; '5' 41–50; '6' 51–60; '7' above 60). [c]Education ('1' high school and blow; '2' professional training; '3' bachelor; '4' master; '5' doctor). [d]Income ('1' 2,000 yuan and less; '2' 2,001–4,000 yuan; '3' 4,001–6,000 yuan; '4' 6,001 yuan and above). [e]Consumer type ('0' have bought; '1' have never bought). [f]Previous experience ('1' 1 times; '2' 2–5 times; '3' 5–10 times; '4' more than ten times).

5.2 Results and discussion

Because the participants are derived from the wage-paid population and different participants may have diverse shopping motivations and price perceptions of the products we chose, three two-way ANOVAs are conducted to show that there are no significant

gender, age, education and income differences between the four groups (for gender, $F(2, 187) = 0.053$, $p = 0.948$; for age, $F(2, 187) = 0.243$, $p = 0.785$; for education, $F(2, 187) = 0.457$, $p = 0.634$; for income, $F(2, 187) = 1.010$, $p = 0.366$), which means that there are no significant differences in shopping motivations and price perceptions among the four groups.

Table 4   The results of hierarchical regression in study 2

Variables	Purchase intention		
	Model 1	*Model 2*	*Model 3*
Gender[a]	0.294(0.169)[+]	0.199(0.119)[+]	0.193(0.118)
Age[b]	0.101(0.110)	0.082(0.077)	0.075(0.076)
Consumer type[c]	–0.332(0.168)[+]	–0.214(0.117)[+]	–0.192(0.117)
Time restriction		–0.035(0.117)	–0.037(0.115)**
Previous experience[d]		0.141(0.118)	–0.165(0.102)
Consumer perceived value		1.017(0.072)***	1.005(0.072)***
Time restriction × Experience			0.287(0.150)[+]
R^2	0.040	0.544	0.553
Adjusted R^2	0.024	0.529	0.536
ΔR^2	0.040	0.504	0.009

Notes: Dependent variable: purchase intention. $N = 189$, *$p < 0.05$, ** $p < 0.01$, ***$p < 0.001$, [+]$p < 0.1$; the values in the parentheses represent Cronbach' α reliability coefficient. [a]Gender ('0' male; '1' female). [b]Age ('1' under 18; '2' 18–25; '3' 26–30; '4' 31–40; '5' 41–50; '6' 51–60; '7' above 60). [c]Consumer type ('0' have bought; '1' have never bought). [d]Previous experience ('1' 1 times; '2' 2–5 times; '3' 5–10 times; '4' more than ten times).

Table 5   The results of hierarchical regression in study 2

| Variables	Consumer perceived value		
	Model 1	*Model 2*	*Model 3*
Gender[a]	0.103(0.120)	0.109(0.120)	0.070(0.117)
Age[b]	0.022(0.078)	0.023(0.078)	0.013(0.076)
Consumer type[c]	–0.115(0.120)	–0.126(0.120)	–0.107(0.117)
Time restriction		–0.178(0.117)	–0.548(0.159)**
Price discount		0.141(0.118)	–0.233(0.161)
Time restriction × Price discount			0.761(0.229)**
R^2	0.010	0.030	0.085
Adjusted R^2	–0.006	0.003	0.055
$\Delta R2$	0.010	0.020	0.055

Notes: Dependent variable: consumer perceived value. $N = 189$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, [+]$p < 0.1$; the values in the parentheses represent Cronbach' α reliability coefficient. [a]Gender ('0' male; '1' female). [b]Age ('1' under 18; '2' 18–25; '3' 26–30; '4' 31–40; '5' 41–50; '6' 51–60; '7' above 60). [c]Consumer type ('0' have bought; '1' have never bought).

Table 3 depicts the descriptive statistics of the variables and their correlation coefficients. To further test the hypotheses in this study, we used hierarchical regression. The results in Table 4 show that time constraints have an obviously negative impact on purchase intentions (β = –0.037, Std. = 0.115, $p < 0.01$), which is the opposite of the results of study 1 and consistent with H1b. As we expected in H2b, consumers' previous online consumption experience significantly moderates the relationship between time constraints and purchase intentions at the 0.1 level (β = 0.287, *Std.* = 0.150, $p < 0.1$). Moreover, consistent with H3b, price discounts and time constraints exert a significant interaction effect on perceived value (β = 0.761, *Std.* = 0.229, $p < 0.01$), as shown in Table 5. H4 is also proven (β = 1.005, *Std.* = 0.072, $p < 0.001$). According to the conditions set in the first-stage moderation model, because H3b and H4 are supported, H5 is set accordingly.

Figure 5 Simple slope analysis of consumer consumption experience in study 2
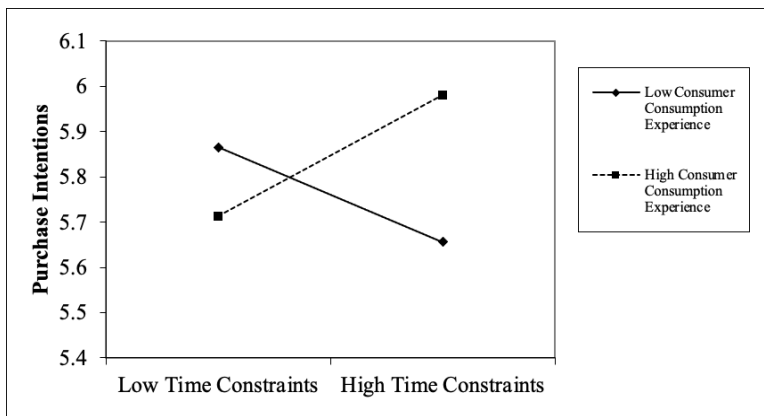
Figure 6 Simple slope analysis of price discounts in study 2
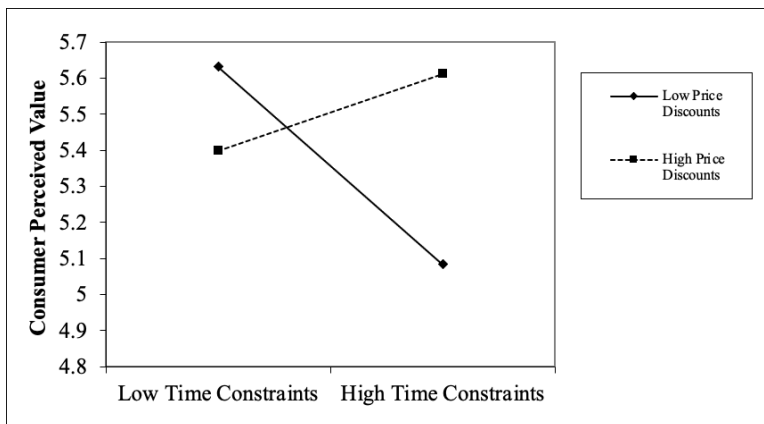
To further visually illustrate the moderating role of consumers' previous online consumption experience and price discounts, study 2 draws Figures 5 and 6 using the methods of Aiken and West (1991). Figure 5 indicates that for high-price products, the effect of time constraints on purchase intentions is positive for consumers with rich

previous online consumption experience but and negative for consumers who rarely shop online. The direction of moderation is contrary to that in study 1. Figure 6 vividly illustrates that high time constraints accompanied by an increase in the price discount level enhance the consumer perceived value of high-price-level goods.

The results of study 2 show that directions of all the variables appear to be different from those of study 1. Specifically, for high-price-level goods, constraining only the selling time weakens consumers' willingness to buy. In addition, for consumers with more online shopping experience, time constraints facilitate their intention to buy high-price products. Moreover, when the time constraints work hand in glove with a high price discount, consumer perceived value increases, and consumers' purchase intentions are enhanced accordingly.

6   General discussion

Consumers are often bombarded with massive time-constrained promotions ranging from low-priced to high-priced products. Additionally, consumers' previous consumption experience may have played a role in consumers' purchasing journey. Drawing from the literature on the heuristic-systematic dual-processing model (Chaiken, 1980) and the PKM (Friestad and Wright, 1994), we provide evidence across two products with different price levels that time constraints, consumers' previous online consumption experience and price discounts exert different influences on purchase intentions. Specifically, for low-priced products, time constraints are positively related to consumer purchase intentions, and this effect is strengthened for consumers with less previous online consumption experience. Moreover, the effect of the time constraints is moderated by the price discount level. Under time constraints, if an online business employs a high price discount on low-price-level products, consumers will perceive a greater decrease in product quality, which will reduce the consumer perceived value for that product and further reduce purchase intentions. For high-price-level products, all of the strength of the effect will reverse. Overall, time constraints affect consumer purchase intentions. The strength of this influence depends on consumers' previous online consumption experience and price discounts. For products with different price levels, the strength of the effect will reverse as well.

6.1   Theoretical implications

This study provides a more balanced view of the relationship between time constraints and purchase intentions, which has received abundant attention from researchers for many years (Dhar and Nowlis, 1999; Inman et al., 1997; Li et al., 2016; Lu et al., 2012; Suri and Monroe, 2003). Although there has been much research on how time constraints increase consumers' likelihood to buy (Dhar and Nowlis, 1999; Inman et al., 1997; Suri and Monroe, 2003), we found that the presence of time constraints per se may not always produce positive purchase intentions. The product price level and consumers' previous online consumption experience can interact with time constraints to influence purchase intentions. Although marketing research has already tested the moderating effect of consumers' previous consumption experience (Rodgers et al., 2005; Zhang and Lin, 2015), few studies have investigated how the moderating role of consumers' previous consumption experience works in online shopping and in the context of time constraints.

Since previous consumption experience penetrates consumers' persuasion knowledge (Friestad and Wright, 1994) and information processing (Chaiken, 1980), consumers' previous online consumption experience will undoubtedly play an important role in the online shopping journey with the boom in e-commerce. Most previous studies have regarded time constraints as a promotion, and indeed, they have found the positive role of time constraints in consumer purchase intentions. However, we also found the positive relationship is established under two conditions:

1   in low-price-level products, which will also be strengthened for consumers with less previous online consumption experience

2   in high-price-level products, which will be positive for consumers who have more previous online consumption experience.

As stated above, under these two conditions, consumers either depend more on heuristics or are proficient in information processing. Thus, consumers do not need to allocate many cognitive resources to process information under limited time, which corresponds to the findings of Inman et al. (1997), who show that restrictive marketing results in an increase in purchase intentions for individuals with a low need for cognition.

Moreover, we provide evidence of a more holistic role of price discounts in time constraints. Our results support the proposition that price discounts interact with time constraints to influence consumer perceived value and that the interaction effect depends on the product price level. Across two studies with two products with different price levels, we find evidence that whether a high degree of time constraints has a negative or positive influence and whether, consequently, consumer perceived value is weaker or stronger depends on the price discount. We have shown that for low-price-level products, weaker consumer perceived value may emerge when the price discount is too high in the context of constraint times. In contrast, for high-price-level products, a high price discount under time constraints engenders an increase in consumer perceived value. These findings further extend previous research on the positive effect of price discounts under time constraints (Inman et al., 1997; Zhao and Ji, 2014) and complement research discovering the negative effect of high price discounts under deal-of-the-day (DoD) promotions (Eisenbeiss et al., 2015). These results may be interpreted as important evidence that price discounts do not always result in positive outcomes under a more general time-constrained promotion. Whether or not a positive outcome is obtained is also contingent on a product's price level. It is worth noting that Suri and Monroe (2003) considered the moderating role of information processing motivation when exploring the effects of time constraints on prices and products' judgements. They directly manipulated information processing motivation and did not consider the relationship between a product's price level and information processing motivation. In contrast to their study, our research incorporated price discounts and focused on the effectiveness of online time-constrained promotion. Although our study did not directly examine the effect of information processing motivation, we assumed that the product price level is related to information processing motivation based on prior research, and this was also established in the pre-test. Our research not only extends Suri and Monroe's (2003) research results in investigating the effectiveness of online time-constrained promotions but also compensates for the gap in their research.

The final contribution of this study is that we find the internal mechanism for the effect of time constraints on purchase intentions and integrate existing research (Suri and

Monroe, 2003). We provide evidence for the predicted mediation of the relationship of time constraints with the relevant outcome variables via consumer perceived value – which is contingent on price discount. In line with Hypothesis 5, for high-price-level products, we found indirect positive effects between time constraints and purchase intentions when there is a high price discount. However, for low-price-level products, this indirect effect becomes negatives. As suggested by a previous study (Suri and Monroe, 2003), this means that for products with different price levels, a price discount accompanied by time constraints will encourage consumers to use different heuristics (i.e., price-quality heuristics or price-monetary sacrifice), which can produce an entirely different consumer perceived value and, in turn, different purchase intentions.

6.2   Practical implications

Firstly, online business could effectively use the psychological state of consumer under constraint time to propel consumer to buy. Our research offers two main practical implications. First, online retailers can effectively use the psychological state of consumers under time constraints and make deft use of time constraints with different consumer sets to propel consumers to buy. Big data and iCloud computing are advised to more flexibly screen consumers with different levels of previous online consumption experience (Trusov et al., 2016). For consumers with less previous online consumption experience, selling products under time constraints may be more efficacious for industries with low-price-level commodities. In addition, for consumers with rich previous online consumption experience, marketing goods during a certain period of time is more likely to work for industries with high-price-level merchandise. This could help businesses profit from different customer sets for different products. To further strengthen the effect, online retailers can also shorten the time or put a countdown in a conspicuous place in the interface to deliberately bring the time constraints to consumers (Eisenbeiss et al., 2015).

Online businesses should also pay attention to the fact that high price discounts should be treated dialectically, as they do not always brings benefits. For high-price-level commodities, a high price discount level combined with time constraints can undoubtedly enhance consumer perceived value and ultimately give consumers the impetus to buy. Unfortunately, implementing a high price discount level may also cause the consumer perceived value of low-priced goods to decrease. Thus, for low-priced goods, imposing relatively low price discounts may be more effective.

Second, consumers need to be more patient and rational in the context of time-constrained promotion. When consumers encounter an item online under time-constrained promotion that they long for or for which they just feel that the price cut is suitable, they need to think twice. It is advisable for consumers to further consider whether they have needed to use this product recently or whether they really need this product. Though heuristic thinking is more efficient under time constraints, more systematic thinking is also needed since online businesses are adept at implementing time-constrained promotions and are more familiar with consumer psychology.

6.3   Limitations and future research

Although our research yields meaningful results, it is not without limitations. Although our research yields meaningful results, it is not without limitations. First, though study 1 employed a lab experiment, we did not stimulate the participants' online purchase

intentions in a real online context. Future research could consider creating a real online shopping scenario to replicate our framework or to explore relevant issues. Second, we chose only two goods to represent low-priced and high-priced products. To eliminate the effect of different product categories on our experiment, we employed a within-group design in study 1 and used the same product for all groups in study 2. However, whether our framework could apply to other products or whether other types of products (needed vs. wanted) could influence our framework still remains unknown, and future studies are needed to further explore these issues. Third, all discounts used in our study were communicated with a '----% off' frame. For purchase preconditions, different verbal presentations of price discounts are likely to be differentially effective. The question of how other price discount expressions moderate our framework still needs future work. Finally, it is apparent that our study was conducted in the Chinese context, which inevitably influenced our research because the special culture and consumption values of China unconsciously exert a subtle influence on consumer behaviour. It would be helpful to examine our model in the context of other cultures.

Acknowledgements

References

Aiken, L.S. and West, S.G. (1991) *Multiple Regression: Testing and Interpreting Interactions*, Sage, Newbury Park, CA.

Alavi, S., Bornemann, T. and Wieseke, J. (2015) 'Gambled price discounts: a remedy to the negative side effects of regular price discounts', *Journal of Marketing*, Vol. 79, No. 2, pp.62–78.

Ariely, D. and Zakay, D. (2001) 'A timely account of the role of duration in decision making', *Acta Psychologica*, Vol. 108, No. 2, pp.187–207.

Boros, S., Meslec, N., Curseu, P. and Emons, W. (2010) 'Struggles for cooperation: conflict resolution strategies in multicultural groups', *Journal of Managerial Psychology*, Vol. 25, No. 5, pp.539–554.

Bryk, A. and Raudenbush, S. (1992) *Hierarchical Linear Models: Applications and Data Analysis Methods*, Sage Publications, Newbury Park.

Cai, F., Bagchi, R. and Gauri, D.K. (2016) 'Boomerang effects of low price discounts: how low price discounts affect purchase propensity', *Journal of Consumer Research*, Vol. 42, No. 5, pp.804–816.

Cavazza, N. and Gabrielli, V. (2015) Affordant shapes of product holder influence product evaluation and purchase intention', *Current Psychology*, Vol. 34, No. 2, pp.1–19.

Chaiken, S. (1980) 'Heuristic versus systematic information processing and the use of source versus message cues in persuasion', *Journal of Personality and Social Psychology*, Vol. 39, No. 5, pp.752–766.

Coulter, K.S. and Coulter, R.A. (2007) 'Distortion of price discount perceptions: the right digit effect', *Journal of Consumer Research*, Vol. 34, No. 2, pp.162–173.

Dhar, R. and Nowlis, S.M. (1999) 'The effect of time pressure on consumer choice deferral', *Journal of Consumer Research*, Vol. 25, No. 4, pp.369–384.

Dodds, W. and Monroe, K. (1985) 'The effect of brand and price information on subjective product evaluations', *Advances in Consumer Research*, Vol. 12, No. 3, pp.85–90.

Dodds, W.B., Monroe, K.B. and Grewal, D. (1991) 'Effects of price, brand, and store information on buyers' product evaluations', *Journal of Marketing Research*, Vol. 28, No. 3, pp.307–319.

Eagly, A.H. and Chaiken, S. (1993) *The Psychology of Attitudes*, Harcourt Brace Jovanovich College, Orlando, FL.

Edwards, J.R. and Lambert, L.S. (2007) 'Methods for integrating moderation and mediation: a general analytical framework using moderated path analysis', *Psychological Methods*, Vol. 12, No.1, pp.1–22.

Eisenbeiss, M., Wilken, R., Skiera, B. and Cornelissen, M. (2015) 'What makes deal-of-the-day promotions really effective? The interplay of discount and time constraint with product type', *International Journal of Research in Marketing*, Vol. 32, No. 4, pp.387–397.

Fishbein, M. and Ajzen, I. (1975) 'Belief, attitude, intention and behaviour: an introduction to theory and research', *Philosophy and Rhetoric*, Vol. 41, No. 4, pp.842–844.

Friestad, M. and Wright, P. (1994) 'The persuasion knowledge model: how people cope with persuasion attempts', *Journal of Consumer Research*, Vol. 21, No. 1, pp.1–31.

Fromkin, H.L. (1970) 'Effects of experimentally aroused feelings of undistinctiveness upon valuation of scarce and novel experiences', *Journal of Personality and Social Psychology*, November, Vol. 16, No. 3, pp.521–529.

Gong, Y.P., Hou, W. and Tian, S. (2015) 'Discounts or gifts? Not just to save money a study on neural mechanism from the perspective of fuzzy decision', *Journal of Marketing Science*, Vol. 11, No. 2, pp.99–117.

Grewal, D., Monroe, K.B. and Krishnan, R. (1998) 'The effects of price-comparison advertising on buyers' perceptions of acquisition value, transaction value, and behavioral intentions', *Journal of Marketing*, Vol. 62, No. 2, pp.46–59.

Hao, L.G. and Gao, C.Y. (2008) 'Research on consumer behavioral response to sales promotion', *Journal of Beijing Technology and Business University (Social Science)*, Vol. 23, No. 5, pp.45–49.

Hao, L.G., Gao, C.Y. and Jia, J.M. (2008) 'A case study on the impact of the way of the price discount presentation on the effectiveness of sales promotion', Management World, Vol. 10, pp.106–114.

Huyghe, E., Verstraeten, J., Geuens, M. and Van Kerckhove, A. (2017) 'Clicks as a healthy alternative to bricks: how online grocery shopping reduces vice purchases', *Journal of Marketing Research*, Vol. 54, No. 1, pp.61–74.

Inman, J.J., Peter, A.C. and Raghubir, P. (1997) 'Framing the deal: the role of restrictions in accentuating deal value', *Journal of Consumer Research*, Vol. 24, No. 1, pp.68–79.

Isaac, M.S. and Grayson, K. (2017) 'Beyond skepticism: can accessing persuasion knowledge bolster credibility?', *Journal of Consumer Research*, Vol. 43, No. 6, pp.895–912.

Jacob, H. (1984) 'Subjective vs. objective time measures: a note on the perception of time in consumer behavior', Journal of Consumer Research, Vol. 11, No. 1, pp.615–618.

Jiang, L., Hoegg, J. and Dahl, D.W. (2010) 'The persuasive role of incidental similarity on attitudes and purchase intentions in a sales context', *Journal of Customer Research*, Vol. 36, No. 5, pp.778–791.

Jin, B. and Park, J.Y. (2006) 'The moderating effect of online purchase experience on the evaluation of online store attributes and the subsequent impact on market response outcomes', *Advances in Consumer Research*, Vol. 33, No. 1, pp.203–211.

Kotler, P. and Levy, S.J. (1971) 'Demarketing, yes, demarketing', *Harvard Business Review*, Vol. 49, No. 6, p.74.

Lee, K.K. and Zhao, M. (2014) 'The effect of price on preference consistency over time', *Journal of Consumer Rese*arch, Vol. 41, No. 1, pp.109–118.

Li, Y., Li, D.J. and Ma, M.L. (2016) 'Research on situation suitability of purchase restrictions of promotion: a comparative analysis of time-limited and quantity-limited promotions', *Journal of Marketing Science*, Vol. 12, No. 2, pp.58–74.

Lu, C.B. and Huang, C.F. (2014) 'The influence mechanism of time pressure with need for cognitive closure on undoing regrets arising in decision-making of sales promotion', *Economic Management*, Vol. 36, No. 3, pp.145–158.

Lu, C.B., Yu, R.H. and Cao, H.J. (2012) 'The internal relation mechanism between time pressure and information searching for promotion decision making', *Science Research Management*, Vol. 33, No. 10, pp.151–160.

Ma, B., Zhang, L., Wang, G. and Li, F. (2014) 'The impact of a product-harm crisis on consumer perceived value', *International Journal of Market Research*, Vol. 56, No. 3, pp.341–366.

Maheswaran, D. and Sternthal, B. (1990) 'The effects of knowledge, motivation, and type of message on ad processing and product judgments', *Journal of Consumer Research*, Vol. 17, No. 1, pp.66–73.

Michael, L. (1992) 'Scarcity's enhancement of desirability: the role of naive economic theories', *Basic and Applied Social Psychology*, Vol. 13, No. 1, pp.67–78.

Michael, W.E. and Manuel, G.C. (1992) 'Anxiety and performance: the processing efficiency theory', *Cognition and Emotion*, Vol. 6, No. 6, pp.409–434.

Monroe, B. and Chapman, J.D. (1987) 'Framing effects on buyers' subjective product evaluations', *Advances in Consumer Research*, Vol. 14, No. 1, pp.193–197.

Naylor, R.W., Lamberton, C.P. and West, P.M. (2012) 'Beyond the 'like' button: the impact of mere virtual presence on brand evaluations and purchase intentions in social media settings', *Journal of Marketing*, Vol. 76, No. 6, pp.105–120.

Rao, A.R. and Monroe, K.B. (1988) 'The moderating effect of prior knowledge on cue utilization in product evaluations', *Journal of Consumer Research*, Vol. 15, No. 2, pp.253–264.

Richard, T. (1985) 'Mental accounting and consumer choice', *Marketing Science*, Vol. 4, No. 3, pp.199–214.

Rodgers, W., Negash, S. and Suk, K. (2005) 'The moderating effect of on-line experience on the antecedents and consequences of on-line satisfaction', *Psychology and Marketing*, Vol. 22, No. 4, pp.313–331.

Roitman, J.D., Brannon, E.M., Andrews, J.R. and Platt, M.L. (2007) 'Nonverbal representation of time and number in adults', *Acta Psychologica*, Vol. 124, No. 3, pp.296–318.

Roth, Y., Wänke, M. and Erev, I. (2016) 'Click or skip: the role of experience in easy-click checking decisions', *Journal of Consumer Research*, Vol. 43, No. 4, pp.583–597.

Schwarz, N. (2004) 'Metacognitive experiences in consumer judgment and decision making', *Journal of Consumer Psychology*, Vol. 14, No. 4, pp.332–348.

Sinha, I., Chandran, R. and Srinivasan, S.S. (1999) 'Consumer evaluations of price and promotional restrictions: a public policy perspective', *Journal of Public Policy and Marketing*, Vol. 18, No. 1, pp.37–51.

Snijders, T. and Bosker, R. (1999) *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*, Sage Publications, London.

Stafford, J.E. and Enis, B.M. (1969) 'The price-quality relationship: an extension', *Journal of Marketing Research*, Vol. 6, No. 4, pp.456–458.

Suri, R. and Monroe, K.B. (2003) 'The effects of time constraints on consumers' judgments of prices and products', *Journal of Consumer Research*, Vol. 30, No. 1, pp.92–104.

Tam, J.L.M. (2004) 'Consumer satisfaction, service quality and perceived value: an integrative model', *Journal of Marketing Management*, Vol. 20, Nos. 7–8, pp.897–917.

Trusov, M., Ma, L. and Jamal, Z. (2016) 'Crumbs of the cookie: user profiling in customer-base analysis and behavioral targeting', *Marketing Science*, Vol. 35, No. 3, pp.405–426.

Vaughn, R. (1980) 'How advertising works: a planning model', *Journal of Advertising Research*, Vol. 26, No. 5, pp.27–33.

Wang, P. and Huang, Q. (2014) 'Impacts of buying experience on Chinese consumers' perception of brand characteristics and brand preference: based on ELM perspective', *Commercial Research*, Vol. 5, pp.125–133.

Wang, P., Zhuang, G.J. and Dong, W.W. (2011) 'The impact of brand-origin confusion and buy experience on brand image perception of Chinese consumers', *Forecasting*, Vol. 30, No. 4, pp.8–13.

Wang, Y.P. and Cheng, Y. (2013) 'An analysis of online consumers' psychology reactance and acceptance intention to proactive recommendation services: the influences of reference groups and time pressure', *Management Review*, Vol. 25, No. 2, pp.70–78

Zeithaml, V.A. (1988) 'Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence', *Journal of Marketing*, Vol. 52, No. 3, pp.2–22.

Zhang, B. and Lin, J.B. (2015) 'The paradigm of consuming behavior to traceable sub-tropic fruits under the background of quality safety: the moderating effects of purchase experience', *Management Review*, Vol. 27, No. 8, pp.176–189.

Zhang, Y. and Li, Q.G. (2017) 'Research on the impact of price discount mode and time pressure on online impulse buying of consumers', *Prices Monthly*, Vol. 2, pp.75–80.

Zhao, B.G. and Ji, M.S. (2014) 'Influencing factors of consumers' purchase intention on online flash sale', *Journal of Beijing University of Posts and Telecommunications (Social Sciences Edition)*, Vol. 16, No. 2, pp.37–43.

Zur, H.B. and Breznitz, S.J. (1981) 'The effect of time pressure on risky choice behavior', *Acta Psychologica*, Vol. 47, No. 2, pp.89–104.