Journal of Theoretical and Applied Electronic Commerce Research
ISSN 0718–1876 Electronic Version
VOL 15 / ISSUE 1 / JANUARY 2020 / 66-80

This paper is available online at
www.jtaer.com
DOI: 10.4067/S0718-18762020000100106

Exploring Consumers' Buying Behavior in a Large Online Promotion Activity: The Role of Psychological Distance and Involvement

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Received 23 November 2017; received in revised form 20 December 2018; accepted 7 January 2019

Abstract

As a key marketing tool, online sales promotion has been widely used by online retailers to increase sales of products and brands. Most previous researches on online sales promotion have ignored the effect of consumers' psychological factors and the heterogeneity of product and consumers. The purpose of this study is to examine the role of psychological distance and involvement on consumers' buying behavior in large online promotion activities. The research model was examined using empirical analysis of data obtained from consumer surveys after the Double 11 promotion. Our results indicate that temporal distance has positive impact on purchase decision of high involvement products, while having negative impact on purchase decision of low involvement products. Social distance has negative impact on consumers' purchase decision. Temporal distance is positively associated with consumers' purchase-decision involvement, and then purchase-decision involvement positively impacts consumers' total consumption. Social distance has no impact on consumers' purchase decision involvement. These findings not only advance the understanding of the role of psychological distance and involvement in online sales promotion but also offer implications regarding strategies that online retailers can employ to publish their promotions at different times and encourage consumers more to share promotional information among their friends.

Keywords: Temporal distance, Social distance, Product involvement, Purchase decision involvement, Online sale promotion, Double 11 promotion, Online purchase behavior

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1 Introduction

As a key marketing tool, online sales promotion has been widely used by online retailers to increase sales of products and brands. Online consumers are also increasingly interested in sales promotions [14]. One example of this trend in the US is the increase in the number of homes using online coupons. In 2005, 12% of US homes utilized online coupons, and the trend had risen to 22% by 2011 [12]. At the same time, over 70% of US consumers use online coupons for between one and five of their Internet purchases [13]. The *Double 11* promotion is one of the emerging online promotion activities in China recently, which is carried out on November 11th every year by those biggest e-commerce platforms in China. In 2017, the sales of the *Double 11* promotion on Tmall.com and JD.com, the two biggest B2C platforms in China, were 26.1 billion dollars and 19.7 billion dollars, respectively. The *Double 11* promotion has become the largest online commercial activity in China and is classified by us as a large online promotion activity [59].

Although plenty of researchers have been studying online sales promotion, there are still two remaining limitations. First, few studies have identified the effect of psychological distance on online sales promotion. Most previous researches on sales promotions focus on monetary promotions, such as coupons and price discounts [6]. However, in addition to monetary promotions, psychological distance may also affect the buying behavior of online consumers [10], [29]. As an example, according to a particular holiday promotion rule, consumers maybe enjoy discounts within a specific time period; so even if consumers have completed their purchase decisions, in order to enjoy the maximum discounts, they would not conduct purchase process in the moment. The construal level theory (CLT) establishes that the individual forms different mental representations of the same object, event or other people, depending on the psychological distance that the individual perceives between the object and the self as the egocentric reference point [26], [55], [56], [57]. Some studies have used CLT to reveal the influence of psychological distance on consumers' expectation, evaluation and purchase behaviors [10], [29], [33], [65]. Therefore, this paper uses the CLT to study the effect of psychological distance on consumer behaviors in a large online promotion activity.

Second, most studies about online sales promotions have ignored the influence of the heterogeneity of product and consumer. Previous studies have always focused on the impact of online promotions on all products or consumers [23], [47], [59]. However, not sales promotions are equally effective for all products, and not all consumers respond in the same way to promotional stimuli on the Internet [14]. In fact, when buying different products, the consumer's decision-making process may also be different. For example, compared to books, the decision-making process of purchasing cars often needs to take more time and careful consideration. To solve the problem of heterogeneity, this paper uses the construct of involvement to classify products and consumers. Depending on some characteristics of the product, such as cost and complexity, the product can be classified as high or low involvement [25]. Prior studies have shown that durable products that are complex, expensive, and long-lived tend to have higher levels of consumer involvement in the purchasing decisions because of the high sunk cost of mistaken purchase decisions [48]. Therefore, they are usually classified as high-involvement products such as cars, trucks or appliances. Conversely, the consequences of making a wrong purchase decision are limited for consumable goods and low-cost products such as groceries, CDs and books [30]. As a result, consumers generally have low levels of involvement in those purchasing decisions.

Complementing this line of prior research, this paper seeks to analyze the role of psychological distance and involvement on consumers' buying behavior in large online promotion activities. We conduct an empirical analysis of data obtained from consumer surveys after the *Double 11* promotion to examine the effect of psychological distance on online buying behavior and how this effect is moderated by the product involvement. In addition, we also investigate the effects of psychological distance on consumers' purchase decision involvement and validate whether purchase decision involvement would salient facilitate the consumer purchase behavior.

2 Theoretical Foundation

This section discusses the theoretical basis and relevant literature for CLT and Involvement.

2.1 CLT

CLT is an account of how psychological distance affects individuals' thoughts and behavior [57]. CLT posits that people mentally construe objects that are psychologically distant with high-level, abstract, and stable features, while in the vicinity they construe the same objects or events with low-level, detailed, and contextualized features [56]. Psychological distance is defined as the subjective distance between an actor and event in the actor's psychological space, which assumes that different distance dimensions can be universalized under one mental space [34].

The CLT literature proposes four key dimensions of psychological distance: temporal, spatial, social, and probabilistic [39]. The temporal dimension of psychological distance is related to the time period between *the time a target event occurs and the time of judgment*; the spatial dimension is associated with the *physical distance* between a target event and an individual; the social dimension means the differentia between a person and the corresponding

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social target; the probability dimension is based on the perceived (lack of) probability of a hypothetical event happening [62].

Psychological distance has been applied to various areas of consumer research, including goal pursuit [19], product evaluation [33], decision creativity [49], consideration-set formation [22] and decision-making [53]. Kim et al. (2008) suggest that most of CLT research has concentrate only on one dimension of psychological distance [34]. Accordingly, some recent research has examined the influence of multiple dimensions. Chandran and Menon (2004) studies the interaction which in consumers' judgment of risk between temporal distance and social distance [8]. From the perspective of social and temporal distance, Bornemann and Homburg (2011) examine the relationship between perceived quality and price [5]. Zhao and Xie (2011) explore the interplay of social and temporal distance on consumers' responses to recommendation systems [65].

In recent years, some scholars have begun to pay attention to the impact of psychological distance on online consumer behavior. Chen and Lurie (2013) show temporal cues in online review texts are so important that their presence can weaken the perceived helpfulness of negative reviews [9]. Analyzing large-scale panel data from TripAdvisor.com, Huang et al. (2016) research how temporal distance and spatial distance independently and jointly affect online consumer evaluation [29]. They define temporal distance as the delay between a dining experience and the consumer's submission of a review, and spatial distance as the geographic distance between the location of the reviewed restaurant and the reviewer's place of residence [29]. Chung and Park (2017) investigate the influence of psychological distance on consumer evaluations of a company and its products when the company's behavior in social media is ambivalent in terms of morality or competence [10]. Hernández-Ortega (2017) analyze whether the social psychological distance is the underlying mechanism that mediates the effect of online consumer review aspects on the receiver's responses [26]. However, the influence of psychological distance on online purchase behaviors has received only little attention, especially in a large online promotion activity.

2.2 Involvement

Since products mean different things to different people, consumers form differing attachments to them [46]. In addition to the psychological distance, in order to better understand consumer behavior related to possessions, consumer researchers have often invoked the construct of involvement [24], [44], [46], [60]. Involvement is defined as the perceived personal relevance of a product based on individual consumer's values, interests, and needs [60], [24]. In the literature of consumer behavior, different kinds of involvement are said to exist when it comes to different objects that are the focus of consumers' involvement [44]. A consumer can be involved not only with a product, but also with consumption of the product and purchase decisions for the product and advertisements for the product [46].

In recent years, involvement with products and involvement with purchase decisions has received extensive research attention in the fields of information systems and marketing. Product involvement is defined by Mitchell (1979) as "an internal state variable at the individual level whose motivation attribute is caused by a particular stimulus or situation" [43]. Previous studies show that different levels of product involvement may result in distinct information processing strategies in online settings [25], [37]. The high involvement products generally have high capital value. In order to make the right purchase decisions, consumers often spend a lot of time collecting information for the high-involvement products [30]. Under the context of online shopping, Smith et al. (2013) find a direct relation between cognitive product involvement and perceived ease of use and usefulness of online shopping [51]. Drossos et al. (2014) also finds that the cognitive dimension of product involvement and impulsiveness significantly affect purchase intentions [15]. Verhagen and Bloemers (2017) research the influence of product involvement on the applicability of the hierarchies of effects in online store settings [58].

Involvement with purchase decisions also known as purchase decision involvement, is conceptualized as a behavior change in decision strategy and resulting choice that occurs only when the consumer sees the consumption or purchase situation as personally important or relevant [61]. Consumer research on involvement has shown that different levels of involvement result in different processes in the purchase and use of products [54]. In the fields of information systems, Novak et al. (2000) show that customers' level of involvement in their purchase decision making affects their behaviors, just like satisfaction and loyalty [45]. Cai et al. (2004) examines the relationships between tourists' purchase decision involvement and their information search behaviors [7]. They find that there are significant differences in using the internet as a destination information channel from one level of purchase decision involvement to another. Bojanic and Warnick (2012) pointed out that purchase-decision involvement is useful in forming a more in-depth understanding which is related to the observed behavior of event attendees [4].

Consumers' level of involvement in decision making is verified to play a crucial role in explaining customers' product selection activities. The effect of online sales promotion may not be the same for high vs low involvement products. However, prior research has rarely considered this problem.

We next develop our hypotheses, addressing these gaps in the literature.

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3 Research Hypotheses

In this paper, we use purchase decision and total consumption to capture the consumers' online buying behavior in large online promotion activities. Among them, the former is mainly used to represent the consumers' decision of single product; the latter used to identify the consumers' overall buying behavior.

Our hypotheses first investigate the role that psychological distance play in influencing consumers' purchase decision when involving high versus low involvement products. Next, we investigate the influence of psychological distance on consumers' total consumption in a large online promotion activity. Besides that, we also analyze the role of purchase-decision involvement as an intermediary variable between psychological distance and total consumption. Considering that large online sale promotions are always beyond space limitations, and its occurrence probability is not easy to measure, we select temporal and social distance to disclose the effect of the multiple dimensions of psychological distance on consumer behaviors in online sales promotion. Figure 1 presents the research model.

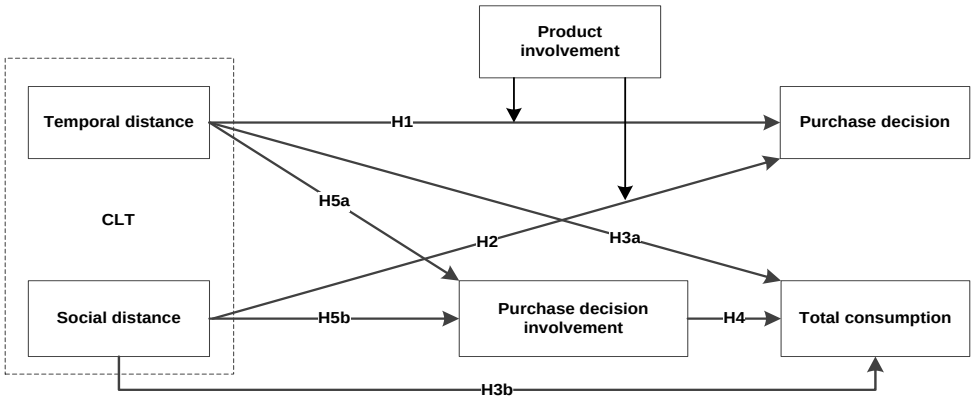

Figure 1: Research model

3.1 The Effects of Temporal and Social Distance on Purchase Decision of High versus Low Involvement Products

Temporal distance refers to the distance of time when an event that people perceived will take place using current situation as a benchmark. In the context of online sales promotions, consumers may receive promotional information of some products for a few weeks prior to the start of the promotion. However, for other products, consumers may only obtain the relevant promotional information on the day of the start of the promotion. Therefore, the temporal distance of different products may be different in some online promotion activities.

CLT has drawn considerable scholarly attention to the functions of mental construal, wherein the cognitive representation of the world using different abstraction levels can result in an individual's asymmetric attention to core and peripheral features of an event [56], [64]. Temporal distance is an important factor affecting individuals' mental construal [38]. People tend to choose a desirability of an activity to represent a high-level construal (more abstract representation) in the distant future and choose the feasibility of attaining this end state represents a low-level construal (more concrete representation) in the near future [38]. CLT further demonstrates that the temporal changes in construal have an effect on individuals' preferences [18]. Specifically, when temporal distance increases, high-level construals of the choices become more influential, however, low-level construals become less influential. It is natural to ask which products are high level low-level construals and which products are low-level construals in large online promotion activities.

Product involvement can help us analyze this problem. As high involvement products generally possess higher capital values, consumers may need more time to consider before making the purchase decision, and their decision-making process emphasis more on desirability demands, which represent the high-level construals. On the contrary, low involvement products always emphasize feasibility demands, which represent the low-level construals. According to CLT, as temporal distance increases, high involvement products become more influential, whereas low involvement products become less influential. In other words, consumers are more likely to purchase high involvement products in the distant future; but withal preferring to purchase low involvement products in the near future. Thus, we propose:

H1a: When purchasing high involvement products, the temporal distance is positively related to consumers' purchase decision in large online promotion activities.

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H1b: When purchasing low involvement products, the temporal distance is negatively related to consumers' purchase decision in large online promotion activities.

CLT originated with the temporal perspective and has recently been extended to other dimensions such as social distance. The difference between self and others, similar and dissimilar others, or in-group and out-group members are all the examples of social distance [57]. Prior research has shown when making decisions for dissimilar others, consumers trend to highlight the core and main properties; while for similar others, consumers trend to concern the affiliated and secondary properties [57], [65]. In the context of online sales promotions, consumers can access promotional information through various channels such as advertising media and friends sharing. When faced with the promotional information from friends sharing, consumers will perceive similarity, which is capable to shorten social distance that individuals perceived. In contrast, confronted with promotional information from advertising media or online shopping platforms, consumers will feel powerful, a control resources without social interference, which is able to enhance the perceived social distance.

Previous research has analyzed the impact of social distance on consumer purchasing decision from the perspective of information transmission [57]. In terms of information transmitter, socially near individuals (conversant communication object) would trigger low-level, specific, detailed and marginal attributes of the information (the low-level construals); while the socially distant individuals (unconversant communication object) would trigger general, abstract and superordinate attributes (the high-level construals). In terms of information receiver, even if a product's own quality is constant, consumers would perceive it a higher-level construal from the recommendation of socially distant than from the corresponding proximal alternatives. According to the theory of product involvement and CLT, we can believe that high involvement products represent the high-level construals, which is compatible with the distant social distance. Low involvement products represent the low-level construals, which is compatible with the close social distance. Consequently, we propose the following hypotheses:

H2a: When purchasing high involvement products, the social distance is positively related to consumers' purchase decision in large online promotion activities.

H2b: When purchasing low involvement products, the social distance is negatively related to consumers' purchase decision in large online promotion activities.

3.2 The Effects of Temporal and Social Distance on Total Consumption

The CLT literature point out those construals will become more abstract when psychological distance increases and the perceptions of psychological distance will also increase when the level of abstraction increases [57]. Previous research has indicated that as psychological distance increases, behavior should be increasingly based on high-level construal aspects [57]. Therefore, we believe that temporally distant events and socially distant events would accordingly lead to a more abstract information expression which represents a high-level construal. As a result, online purchases will also increase in large online promotion activities, which will bring more consumption. The total consumption refers to the amount of money consumers spent during the online sale promotion. Together, the above makes it plausible to postulate:

H3a: In large online promotion activities, consumer's temporal distance is positively related to the total consumption.

H3b: In large online promotion activities, consumer's social distance is positively related to the total consumption.

3.3 The Role of Purchase Decision Involvement

In a consumption situation, customers' purchase decision involvement may have effect on their behaviors. Kokkinaki (1999) said that if the customer has higher level of involvement, they will search more detailed information on a product or service, and make more effort in selecting a product; as a result, they will obtain positive satisfaction [35]. Cai et al. (2004) find that tourist information preferences significantly differed from one level of purchase decision involvement to another in seven out of 13 instances [7]. In their study, high level of purchase decision involvement is described as *A tourist has already decided to visit the destination and is searching for more information*. In the context of online sales promotion, we define consumers involved with higher level of purchase-decision involvement as the users who has decided to purchase products during this promotion and is searching for more information. Jung and Yoon (2012) point out that customers show great interest in the decision-making process and seek a large number of information on products when they have a high level of involvement in purchase decisions; therefore, this high level of involvement may have a significant impact on their future purchasing behaviors [32]. Thus, we can speculate that consumers involved with higher level of purchase-decision involvement pretend to purchase more products. This leads us to postulate the following:

H4: In large online promotion activities, consumers' purchase decision involvement positively impacts total consumption.

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ISSN 0718–1876 Electronic Version
VOL 15 / ISSUE 1 / JANUARY 2020 / 66-80

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www.jtaer.com
DOI: 10.4067/S0718-18762020000100106

In customer purchase behaviors, their level of involvement in purchase decision making are considered to have important influence on their satisfaction, loyalty and purchase intent [32]. It is natural to ask which factors affect consumers' purchase decision involvement. From the perspective of CLT, consumers' temporal and social distance may have the important impact on their purchase decision involvement in large online promotion activities. For the same online sales promotion activity, consumers' mental construal can be construed at different levels in terms of different diffusion path and time of the information. Specifically, consumers who receive the promotion information at an earlier time or from the socially distant individuals will construe a high level of mental construal, which would further influence consumers' purchase decision involvement [57]. Fujita et al. (2008) investigate the impacts of attitude evaluation on consumer behaviors under different temporal distance and find that if the decision tends to be made in the distant future, it is easier for consumers to consider the attributes associated with their own benefits and values [20]. Prior study has confirmed when involving personal values, consumers are more willing to make additional efforts to obtain related information and reduce the risk of uncertainty, so as to show a high level of purchase-decision involvement [28], [50]. Similarly, Belk (1982) find that differences in involvement caused by different social distance would invoke consumers' different purchase strategies; when individuals need to purchase a certain product as a gift (socially distant events) rather than buying for themselves (socially near events), they would entail a greater expenditure of time and money, which may increase the level of involvement in decision making [3]. Following this line of reasoning, we make the following conjecture:

H5a: In large online promotion activities, the temporal distance is positively associated with consumer's purchase-decision involvement.

H5b: In large online promotion activities, the social distance is positively associated with consumer's purchase-decision involvement.

4 Data and Measures

This section details the process of data collection and the measurement of related constructs.

4.1 Data Collection

The *Double 11* promotion was launched by Tmall.com (www.tmall.com) of the Alibaba Group in 2009 for the first time. After that, other e-commerce platforms in China such as Suning.com and JD.com joined the *Double 11* promotion. Now the *Double 11* promotion has become the largest online commercial activity in China and its sales on Tmall.com was 14.3 billion dollars in 2015 [1]. In 2016, it increased to 18.2 billion dollars [11].

The *Double 11* promotion presents an ideal environment for our study. First, it covered no less than 1,000,000 species of products from about 27,000 brands on Tmall.com, ranging from a pen to a house [59]. These products include low and high-involvement products. Second, it lasts only 1 day per year, i.e. November 11. Consumers and online retailers are facing time-limited pressure. Online retailers will release the relevant promotional information before the start of the *Double 11* promotion. Consumers also can access promotional information through various channels such as advertising media and friends sharing. These provide the conditions for analyzing the impact of temporal and social distance.

We conducted our empirical analysis using an online survey after the *Double 11* promotion on Tmall.com in 2015. The questionnaire was designed in English first and then translated into Chinese. In consideration of the reliability of the Chinese translation, all original items were translated into Chinese by two authors separately. Next, a third researcher whose native language was Chinese confirmed the meaning of the English version by comparing the two Chinese versions. If there was any divergence, the researchers would discuss the translation methods until a consensus was reached finally. The market report jointly released by Ebrun.com and Wenjuan.com shows consumers whose age ranges from 18 to 25 like the *Double 11* promotion the most [17]. Students are more likely to be attracted by new activities such as large online promotion activities [59]. Moreover, in general, consumers who have used Tmall.com will have a deeper understanding of Tmall's various promotions and shopping processes. So, in order to verify the accuracy and to check any ambiguous items, we randomly invited 20 college students with experience using Tmall.com to participate in a pilot test. The students answered the questionnaire and provided feedback that was used to improve ambiguous or poorly worded items. Based on the results of the pilot test, we made modifications to the wording of awareness and connectedness items.

Before conducting the survey, we also considered the sample size. Stevens (2002) pointed out that the sample size for social science research should be greater than 15 times the number of predictors [52]. There are 6 predictors in our model, so the sample size should be greater than 90. Moreover, since we need to test hypotheses using regression analysis, the observed data should generally be more than 20 times the number of independent variables [2], [41], [63]. In our empirical model, the maximum number of independent variables is 9, so the number of samples should be greater than 180. Thus, we set the minimum sample size at 180. The modified questionnaire was released through a professional survey service website named Sojump.com and lasted 7 days from November 15 2015 to November 21 2015. First, an invitation with a link to the survey site was spread through e-mail, QQ, Wechat and other communication tools. Second, when the respondents opened the link, they were asked to answer if they were

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DOI: 10.4067/S0718-18762020000100106

involved in the *Double 11* promotion on Tmall.com. If the respondent's answer is no, the individual is excluded from the survey and is redirected to a different webpage. Third, to verify the validity, a screenshot of the intraday purchase order is required to be submitted, as shown in Figure 2. Finally, we paid for every valid respondent 2 or 3 RMB.

Figure 2: Screenshot of purchase order

In total, 577 responses were received. We scrutinized and eliminated those questionnaires, which either had too many missing values or the same answers to all questions. Finally, 532 valid responses were obtained. As shown in Table 1, 40.2% respondents were male and 59.8% were female, with 67.5% respondents between 18 and 25 years old. 63.2% respondents held a bachelor's degree. The monthly income of 86.6% respondents is less than 5000 RMB. 64.7% respondents have more than 3 years of online shopping experience. The online shopping frequency of 56.9% respondents is between 2 and 4 times every month. 41.9% respondents use mobile devices to purchase products during the *Double 11* promotion. The shopping time during the *Double 11* promotion of 51% respondents is in the second half of the day. The results of this survey were nearly consistent with the market report jointly released by Ebrun.com and Wenjuan.com. This report shows that female consumers accounted for 51.3% and 48.7% consumers were male, with 76.5% consumers between 18 and 35 years old in the *Double 11* promotion on Tmall.com in 2016 [17].

Table 1: Descriptive statistics of respondents' characteristics

Measure	**Category**	**Frequency**	**Percentage (%)**
Gender	Male	214	40.2
	Female	318	59.8
Age	<18	9	1.7
	18-25	359	67.5
	26-34	130	24.4
	35-45	31	5.8
	>45	3	0.6
Education background	Senior high school and less	121	22.7
	Undergraduate	336	63.2
	Postgraduate	64	12.0
	Doctor degree and more	11	2.1
Monthly income (in thousands)	<1	222	41.7
	1-3	133	25.0
	3-5	104	19.5
	5-8	50	9.4
	>8	23	4.3
Experience in online shopping	>5year	144	27.1
	3-5 year	200	37.6
	1-3 year	153	28.7
	<1 year	35	6.6
The frequency of online shopping every month	0-1	124	23.3
	2-4	304	57.1
	5-7	64	12.0
	>7	39	7.3
The terminal of online shopping	PC	309	58.1
	Mobile devices	223	41.9
Shopping time during the Double 11 promotion	0-6 o'clock	157	29.5
	6-11 o'clock	104	19.5
	11-14 o'clock	70	13.2
	14-18 o'clock	64	12.0
	18-24 o'clock	137	25.8

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4.2 Measure

The questionnaire was divided into two parts. The first part contained seven questions related to the demographic information reported in Table 1 above. The second part consisted of 7 items to measure the constructs of participants' temporal distance (1 item), social distance (1 item), purchase decision involvement (3 items), purchase decision (1 item) and total consumption (1 item).

Temporal distance (TD) refers to a dummy variable, which is estimated based on whether the time interval between consumers perceiving the promotion and the starting of the promotion within a week or not. Respondents were asked to answer this question: *When did you know the information of the Double 11 promotion?.* They were provided with two choices: *before November 4, 2015*; *From November 4 to November 7, 2015*. Value 1 represents high temporal distance (the time interval is beyond a week) and the value of 0 represents low temporal distance (the time interval is within a week).

Social distance (SD) is determined by the respondents' acquisition channel of promotion information. The item is *How do you get the information of the Double 11 promotion?.* Respondents were provided with two choices: *friends sharing*; *advertising media or online shopping platforms*. Value 0 indicates less social distance means that information acquired from friends sharing, and value 1 indicates more social distance means that information acquired from advertising media or online shopping platforms. The measure of SD is consistent with previous studies [21], [57].

Purchase decision involvement (PDI) refers to the degree the consumer is involved in the purchase decision of the *Double 11* promotion. The construct items of PDI were selected from previously validated measurements and had been slightly modified to fit the specific context under the *Double 11* promotion [32], [46]. Three 5-point items (strongly agree/strongly disagree), anchored by *In order to participate in the Double 11 promotion I am willing to collect the information initiative, When I need to make a purchase decision, I will consider a lot of factors* and *It is crucial for me to participate in the Double 11 promotion.* The reliability of the scale is good ($\alpha = 0.832$). Results of the factor loading are 0.810, 0.898 and 0.800 respectively. Meanwhile, construct validity of the scale is acceptable (KMO value=0.783, $p<0.001$).

Purchase decision (PD) measures whether consumers purchase the high or low involvement products. In this paper, PD is designated as a binary dummy variable. Respondents were asked to answer this question: *What products did you buy during the Double 11 promotion?*. They were provided with 16 choices (Women's apparel/Underwear, Men's clothing/Sports, Shoes/Bags, Beauty aisle/ Personal care, Watches/Eyeglass/Jewelry, Mobile phone/Digital products/ Computer, Maternal and child supplies/Toys, Retail/Tea and wine/Imported food, Fresh/Fruit, Large appliances/Household appliances, Furniture and Building Materials, Automobiles/Accessories/Supplies, Home textiles/Home decoration/Flowers, Medicines and health, Kitchen ware/Storage/ Pets, and Books and Audio), which were provided by Tmall.com. Products classified into high or low-involvement is based not only on the capital value, but also on the product characteristics like complexity and cost [30], [36]. Prior studies indicate that digital and other durable products with high capital value, complex functionality and long life generally possess the higher level of involvement in the purchase decision thus defined as high involvement products [33], [36], while books, groceries, CD and other are consumables often classified as low involvement products due to the low capital value and sunk cost [30]. So, if consumers choose one or more of the following options: Watches/Eyeglass/Jewelry, Mobile phone/Digital products/ Computer, Large appliances / Household appliances, Furniture and Building Materials, and Automobiles/Accessories/ Supplies, we think they have purchased the high involvement products. Otherwise, we think they have purchased the low involvement products.

Total consumption (TC) is the amount of money respondents spent during the *Double 11* promotion. In a questionnaire, it is inappropriate to require respondents to make accurate calculations of their TC. To increase the response to such question, respondents were provided with five options: TC⩽100 RMB;100 RMB＜TC⩽500 RMB;500 RMB＜TC⩽1000 RMB;1000 RMB＜TC⩽5000 RMB;TC＞5000 RMB. In the following empirical analysis, TC is measured in thousands.

Besides, monthly income (MI), gender (GE), education background (EB), the frequency of online shopping (SF), shopping time (ST) and the terminal of online shopping (STE) are used as control variables because they are all displayed as major consumer characteristics, and thus are likely to influence consumers' purchase behavior subsequently. Table 2 presents the descriptive statistics and the correlation matrix of key variables.

5 Empirical Models and Results

In this section, empirical models and data analysis results are provided.

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This paper is available online at
www.jtaer.com
DOI: 10.4067/S0718-18762020000100106

5.1 Empirical Models

The key dependent variables in our research model include purchase decision (PD), total consumption (TC) and purchase decision involvement (PDI). Empirical analysis and model estimates are often suitable better for economic variables specified in logarithms [31], [41]. Hence, we specify the three dependent variables in logarithmic form.

We model the influence of temporal distance (TD) and social distance (SD) on consumers' purchase decision, which is specified in Eq. (1). In order to study the effects of temporal distance (TD), social distance (SD) and purchase decision involvement (PDI) on total consumption (TC), we constructed model (2). Similarly, we model the influence of temporal distance (TD) and social distance (SD) on consumers' purchase decision involvement (PDI), which is specified in Eq. (3).

$$\ln(PD_i) = \beta_1 * TD_i + \beta_2 * SD_i + \beta_3 * ST_i + \beta_4 * STE_i + \beta_5 * GE_i + \beta_6 * EB_i + \beta_7 * SF_i + \beta_8 * MI_i + \varepsilon_i \quad (1)$$

$$\ln(TC_i) = \beta_1 * TD_i + \beta_2 * SD_i + \beta_3 * PDI_i + \beta_4 * ST_i + \beta_5 * STE_i + \beta_6 * GE_i + \beta_7 * EB_i + \beta_8 * SF_i + \beta_9 * MI_i + \alpha + \varepsilon_i \quad (2)$$

$$\ln(PDI_i) = \beta_1 * TD_i + \beta_2 * SD_i + \beta_3 * ST_i + \beta_4 * STE_i + \beta_5 * GE_i + \beta_6 * EB_i + \beta_7 * SF_i + \beta_8 * MI_i + \alpha + \varepsilon_i \quad (3)$$

In the above three equations, *i* represents the consumer. β_S are the model coefficients, α is a constant, and ε_i indicates the error term.

Table 2: The descriptive statistics and the correlation matrix of key variables

	Mean	S.D.	TC	TD	SD	PDI	MI	GE	EB	STE	SF	ST
TC	2.36	0.97	1									
TD	0.53	0.50	0.11	1								
SD	0.76	0.43	-0.01	-0.01	1							
PDI	3.09	1.11	0.18	0.10	-0.07	1						
MI	2.10	1.72	0.47	-0.04	-0.03	0.07	1					
GE	0.40	0.49	0.07	-0.04	-0.10	0.02	0.21	1				
EB	1.93	0.65	0.12	0.12	-0.02	-0.02	0.07	-0.02	1			
STE	1.60	0.50	-0.07	0.01	0.01	-0.04	0.01	0.09	0.11	1		
SF	2.03	0.81	0.31	0.01	-0.02	0.19	0.39	-0.05	-0.04	-0.08	1	
ST	2.87	1.58	-0.17	-0.23	0.03	-0.15	0.11	0.05	-0.07	0.06	-0.05	1

Note: TC and MI are measured in thousands; Pearson's correlation coefficient was used for calculating the correlation matrix of key variables

5.2 Results

This study investigates the influence of temporal and social distance on consumers' purchase decision, the influence of temporal and social distance on total consumption, and the influence of temporal and social distance on purchase decision involvement. Related research results are provided in this section.

5.2.1 The Influence of Temporal and Social Distance on Consumers' Purchase Decision

To examine the different influence of temporal and social distance on consumers' purchase decision during the *Double 11* promotion, we divide the data into two samples (high involvement products vs. low involvement products). The purchase decision in this paper is a binary dummy variable, which subjects to the binomial distribution and the residual sum to zero. So, we take PD as a dependent variable, estimated Eq. (1), and, respectively, obtain the binary logistic regression results, as shown in Table 3.

As reported in Table 3, when purchasing high involvement products, gender (GE) and the frequency of online shopping (SF) have positive and significant relationships with consumers' purchase decision. When purchasing low involvement products, monthly income (MI) and the frequency of online shopping (SF) have significant influence on consumers' purchase decision.

According to the regression analysis results in Table 3, we find that the coefficient of TD is positive and statistically significant in Table 3, Column (2), which demonstrates that temporal distance has an expected positive impact on purchase decision when purchasing high involvement products, supporting H1a. We also find that the coefficient of TD is negative and significant in Table 3, Column (3). This suggests that temporal distance has an expected negative impact on purchase decision when buying low involvement products, which supports H1b. The results also

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reveal that the coefficients of SD in the two sample sets are negative and significant, which suggest that social distance has negative impact on consumers' purchase decision, refuting H2a and supporting H2b. To further examine the interaction effect of psychological distance and product involvement on purchase decision, we use a two-way ANOVA analysis to check the robustness. Temporal distance was found to significantly influence purchase decision when buying high involvement products [F (1,530) =4.434, MSe=0.162, η2=0.081, p=0.036] and low involvement products [F (1,530) =5.592, MSe=0.120, η2=0.130, p=0.018]. Specifically, when purchasing high involvement products, the temporal distance is positively related to consumers' purchase behavior (Mdistant=0.25, Mnear=0.17), while purchasing low involvement products are on the contrary (Mdistant=0.18, Mnear=0.27). Social distance also was found to significantly influence purchase decision for both high involvement products [F (1,530) =4.545, MSe=0.175, η2=0.122, p=0.033] and low involvement products [F (1,530) =10.342, MSe=0.084, η2=0.142, p=0.001]. Moreover, the social distance is negatively related to consumers' purchase behavior when buying high and low involvement products. The results are shown in Figure 3. As can be seen, the results of ANOVA analysis are similar to the results of logistic regression.

Table 3: Estimation results of purchase decision

Variable	High Level Involvement Products	Low Level Involvement Product
TD	0.57** (0.23)	-0.58*** (0.22)
SD	-0.46* (0.25)	-0.74*** (0.23)
ST	-0.23 (0.10)	-0.26 (0.14)
STE	-1.57 (0.09)	-0.23 (0.08)
GE	1.42*** (0.24)	0.14 (0.23)
EB	-0.02 (0.18)	0.19 (0.17)
SF	0.43*** (0.15)	0.33** (0.15)
MI	0.03 (0.10)	-0.28** (0.11)
Observations	532	532
R^2	0.18	0.21

Note: PD as the dependent variable. Standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

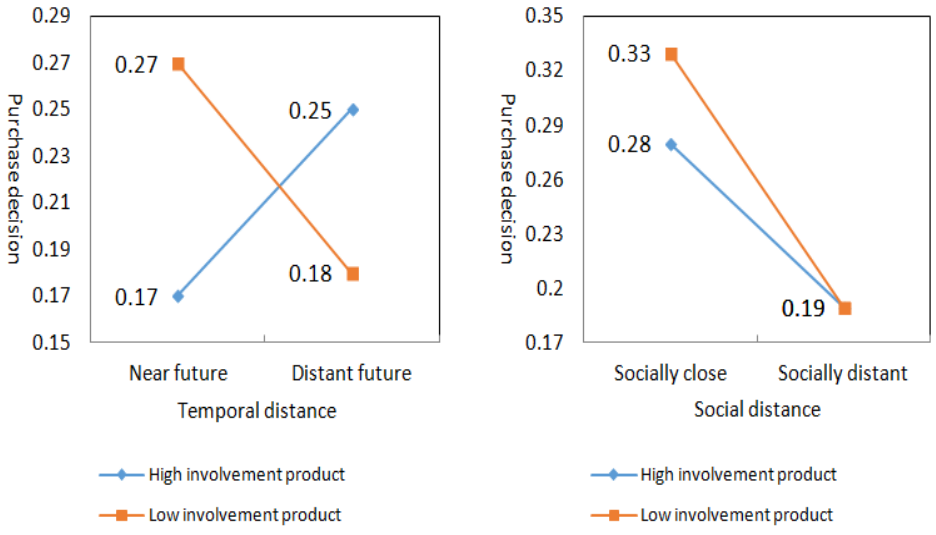

Figure 3: The interaction effect of psychological distance and product involvement on purchase decision

5.2.2 The Influence of Temporal and Social Distance on Total Consumption

We take TC as the dependent variable, estimated Eq. (2), and obtained the regression results, as shown in Table 4.

As reported in Table 4, shopping time (ST), the terminal of online shopping (STE), education background (EB), the frequency of online shopping (SF) and monthly income (MI) have significant relationships with total consumption.

Journal of Theoretical and Applied Electronic Commerce Research
ISSN 0718–1876 Electronic Version
VOL 15 / ISSUE 1 / JANUARY 2020 / 66-80

This paper is available online at
www.jtaer.com
DOI: 10.4067/S0718-18762020000100106

Specifically, ST and STE exhibit a negative impact. The results indicate that later shopping time may impede total consumption during the *Double 11* promotion. The results also suggest that consumers who use mobile terminals to shop may spend less.

According to the regression analysis results in Table 4, we find that the coefficient of TD is positive and statistically significant, which suggests that temporal distance has an expected positive impact on total consumption, supporting H3a. We also find that the coefficient of SD is insignificant, which demonstrates that social distance has no impact on total consumption, refuting H3b. Moreover, we find that the coefficient of PDI is positive and statistically significant, suggests that consumers' purchase decision involvement positively impacts total consumption, supporting H4.

Table 4: OLS Regression Results of Total Consumption

Variable	Beta	Standard errors	T-value	P
TD	0.10	0.07	1.42	**
SD	0.07	0.08	0.82	NS
PDI	0.21	0.04	5.79	***
ST	-0.09	0.02	-4.10	***
STE	-0.12	0.07	-1.75	*
GE	-0.01	0.07	-0.01	NS
EB	0.14	0.05	2.66	***
SF	0.10	0.05	1.96	*
MI	0.34	0.03	9.97	***
Observations	532			
R^2	0.12			

Note: TC as the dependent variable. *p < 0.10, **p < 0.05, ***p < 0.01, NS for nonsignificant p values.

5.2.3 The Influence of Temporal and Social Distance on Purchase Decision Involvement

We took PDI as the dependent variable, respectively, estimated Eq. (3) with SPSS16.0, and obtained the regression results, as shown in Table 5.

Table 5: OLS Regression Results of Purchase Decision Involvement

Variable	Beta	Standard errors	T-value	P
TD	0.25	0.08	2.96	***
SD	-0.14	0.10	-1.50	NS
ST	-0.08	0.03	-3.05	***
STE	-0.04	0.08	-0.50	NS
GE	-0.01	0.09	-0.05	NS
EB	-0.13	0.06	3.43	**
SF	0.25	0.06	4.40	***
MI	0.14	0.04	3.43	***
Observations	532			
R^2	0.13			

Note: PDI as the dependent variable. *p < 0.10, **p < 0.05, ***p < 0.01, NS for nonsignificant p values.

As reported in Table 5, shopping time (ST), education background (EB), the frequency of online shopping (SF) and monthly income (MI) have significant relationships with consumers' purchase decision involvement. Specifically, ST and EB exhibit a negative impact. The results indicate that later shopping time or better educational background may lower consumers' purchase decision involvement during the *Double 11* promotion.

According to the regression analysis results in Table 5, we find that the coefficient of TD is positive and statistically significant, which suggests that temporal distance has an expected positive impact on consumers' purchase decision involvement, supporting H5a. We also find that the coefficient of SD is insignificant, which demonstrates that social distance has no impact on consumers' purchase decision involvement, refuting H5b.

Overall, except for H2a, H3b and H5b, all hypotheses received support, as shown in Table 6.

Table 6: Results of hypothesis testing

Hypothesis	H1a	H1b	H2a	H2b	H3a	H3b	H4	H5a	H5b
Hypothesis confirmed?	Y (Yes)	Y	N (No)	Y	Y	N	Y	Y	N

Journal of Theoretical and Applied Electronic Commerce Research
ISSN 0718–1876 Electronic Version
VOL 15 / ISSUE 1 / JANUARY 2020 / 66-80

This paper is available online at
www.jtaer.com
DOI: 10.4067/S0718-18762020000100106

6 Discussion, Implications and Limitations

In this section, we discuss the research findings, describe the theoretical contributions and practical implications, and propose the directions for future work.

6.1 Discussion of Findings

Our study that investigates the impact of psychological distance and involvement on consumers' buying behavior in the large online promotion activity has several notable findings. First, temporal distance has positive impact on purchase decision of high involvement products, while having negative impact on purchase decision of low involvement products. Social distance has negative impact on consumers' purchase decision. Our results validate the important influence of psychological distance on online user behaviors, which is in line with the majority of prior research [9], [26], [29]. The finding also shows that product involvement moderates the effect of temporal distance on consumers' purchase decision. This is similar to the study of Eyal et al. (2009) [18], which suggests that higher correspondence is found when behaviors are construed on a higher level and when behavior is planned for the more distant future than when the same behavior is construed on a lower level or is planned for the more proximal future. However, our results also suggest the effect of social distance isn't moderated by product involvement, which are different from the study of Gu et al. (2012) [25]. They find that a retailer's internal word of mouth (WOM) has a limited impact on its sales of high-involvement products, whereas external WOM sources have a significant influence on sales. For consumers, the external WOM may mean farther social distance. So, the results of Gu et al. (2012) indicate that social distance may have positive impact on purchase decision of high-involvement products [25]. Two factors might motivate these mixed results. On the one hand, we ignore the effect of online WOM on consumers' purchase decision when analyzing the impact of promotional information from different sources (different social distance). In fact, a vast number of studies have confirmed the important impact of online WOM on online purchase behaviors [16], [27], [40], [41], [42]. On the other hand, Chinese consumers like to share promotion information and talk about their shopping decisions in the *Double 11* promotion [59]. Moreover, some consumers join the promotion together. These may result that promotional information from friends sharing has a greater impact on consumer purchasing decisions than advertising media.

Second, the results reveal that temporal distance have positive impact on total consumption. This is in accordance with the CLT literature, as well, which demonstrates that behavior will increase based on high-level construal aspects as psychological distance increases [57]. At the same time, we find that social distance has no impact on consumers' total consumption. Obviously, the results are different from the studies of Trope et al. (2007) and Yan et al. (2016) [57], [59]. According to the study of Trope et al. (2007), confronted with information processed by high construal, consumers tend to make more positive decisions, which suggest that social distance has positive influence on total consumption [57]. However, Yan et al. (2016) suggest that when facing with the promotional information from friends sharing (less social distance), consumers tend to purchase more products [59]. This implies that social distance has negative influence on total consumption. Thus, we can conclude that the relationship between social distance and total consumption is quite complex, which calls for further analysis in future research.

Third, our findings also indicate that the temporal distance is positively associated with consumers' purchase-decision involvement, and then purchase-decision involvement positively impacts consumers' total consumption. This is similar to the results of Pronin et al. (2008) and Jung and Yoon (2012) [32], [50]. Pronin et al. (2008) suggest that consumers will show a high level of purchase-decision involvement if the decision tends to be made in the distant future [50]. Jung and Yoon (2012) find that when customers' purchase decision involvement is high, they show much interest in their decision-making process and seek a lot of information on products; as a result, such a high level of involvement greatly influences their future purchase behaviors [32]. However, we find that social distance has no impact on consumers' purchase decision involvement. The results are different from the study of Belk (1982) [3]. Belk (1982) points out that social distance may increase the level of involvement in decision making. In our paper, different promotional channels represent different social distances [3]. But, consumers may receive promotional information for the same online retailer or the same product from different promotional channels such as friends sharing and advertising media. Therefore, it is very difficult to distinguish the impact of different promotional channels on consumer purchase involvement in a large online promotion activity, which is helpful to explain the unexpected results.

6.2 Contributions and Implications

This paper contributes to the literature in three ways. First, the influence of psychological distance on online purchase behaviors has received little attention, especially in a large online promotion activity. Our results show that temporal and social distance has important influence on consumers' purchase decision, which demonstrates that in addition to monetary promotions, psychological factors are also important for online buying behavior in online sales promotion.

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Second, various studies on psychological distance have all ignored the moderating effect of product involvement, which has a significant impact on consumers' reliance on a particular decision-making process. According to prior research, when consumers buy high involvement products online they most likely make use of the think-feel-do hierarchy [58]. To our best knowledge, this study is the first to examine how the effect of psychological distance on purchase decisions is moderated by the effect of product involvement. Moreover, the discussions of our main findings demonstrate that product involvement moderates the impact of temporal distance on purchase decisions, but does not moderate the impact of social distance.

Finally, our study also contributes to the involvement literature by considering the influence of purchase-decision involvement on consumers' total consumption and the effect of temporal and social distance on consumers' purchase-decision involvement. Are all the consumers responding to promotion stimuli by the same way in the online setting? Our study provides a clear answer to this question. Consumers with higher decision-making involvement spend more in the large online promotion activity. Moreover, the sooner a consumer receives the promotion information for the relevant product, the higher his/her decision-making involvement.

This research also offers implications for the practice of management. On the one hand, for products of different level of involvement, online retailers should publish and distribute their promotions at different times. For high involvement products, they should release their promotions earlier before the start of online promotions. However, for low involvement products, the most reasonable way maybe they announce their promotions is closest to the start of the promotion and even after the start of the online promotion. On the other hand, promotional information from friends sharing has a greater impact on consumer purchasing decisions than advertising media. Online retailers should encourage consumers more to share relevant promotional information among their friends. For example, they may try to give more discounts or coupons to consumers who spread promotional information on WeChat or Facebook.

6.3 Limitations and Future Research

Nevertheless, this study has limitations. First, in our survey, candidates may purchase together high and low involvement products, which may result in a deviation in the data for the purchase decision of different involvement products.

Second, although we have studied the effects of temporal and social distance on consumers' online buying behavior, ignoring the effect of their interaction. In fact, Zhao & Xie (2011) found that recommendations from distant others are more influences in shifting distant-future preferences than those from close others, while recommendation from close others are more influential than those from distant others in shifting near-future preferences [65]. Thus, one possible extension to this paper is to examine the interplay of social and temporal distance on consumers' online buying behavior.

Third, this article examines the impact of the time and channel of releasing promotional information on consumer purchase behavior from the perspective of psychological distance, but ignores the influence of monetary promotions such as coupons and price discounts. Future research can be considered to provide a unified view of the impact of psychological distance, involvement and monetary promotions on online sales promotion.

Finally, some linear models were utilized in our analysis. However, the linear relationship may be unable to capture the entire picture and, as a result, the current estimates might be biased. Future research should employ some econometric methods to solve this issue. Many techniques exist that can be utilized for this, such as instrumental variables, the difference-in-differences model, etc.

Acknowledgments

This paper is supported by the National Natural Science Foundation of China (No: 71764006, No: 71363022, No: 71874126, No: 71373192, No: 71361012) and Foundation of Jiangxi Educational Committee (No: GJJ170335).

Dr. Zhao Yang is the corresponding author of this paper.

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