



Exploring purchase intention in cross-border E-commerce: A three stage model



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ABSTRACT

Cross-border e-commerce (CBEC) has been thriving in recent years, generating economic benefits for sellers and consumers. To keep up with this trend, sellers need to improve product cognition in order to improve consumers' interest and behavior. Little research has focused on the influence of product cognition on purchase intention in CBEC. This study employs the hierarchy-of-effects model and the commitment-involvement theory to develop a three-stage model to evaluate the impact of product cognition on purchase intention in CBEC. Data was collected on a popular Chinese CBEC platform. The analysis shows that product description and product awareness have a positive effect on trust beliefs, and both platform enduring involvement and platform situational involvement positively affect trust. Purchase intention is subject to the positive impact of platform situational involvement and trust beliefs in addition to platform enduring involvement. Finally, perceived trust plays a full mediation effect in the three-stage model, which indicates that, on CBEC platforms, consumers' processing and response is a sequence from product cognition to platform emotion and from platform emotion to behavior intention. The theoretical contribution of this study is a three-stage model involving two types of platform involvement in CBEC settings. Such model allows CBEC platform providers to increase consumers' purchase intentions by improving product description, product awareness and platform involvement.

1. Introduction

Compared to domestic e-commerce, the increasing interest in cross-border e-commerce (CBEC) is relatively recent. CBEC is becoming an important channel for promoting international trade (Mou et al., 2017) as it provides huge business opportunities for all countries and regions to reap benefits from global transactions. At present, Europe is the world's largest CBEC market, and the CBEC market in North America is at a high-speed development stage (ICIECC, 2018). In 2018, global business-to-consumer (B2C) CBEC transactions reached US\$ 676 billion, which increased by 27.5% over the previous year. It is estimated that this number will exceed US\$ 1 trillion in 2020 (ICIECC, 2018). In addition, Forrester (2018) predicts that CBEC will grow faster than domestic e-commerce in the next four years. By 2022, global CBEC sales will account for 20% of all e-commerce. Moreover, driven by China, the Asia-Pacific region will become the largest CBEC market.

CBEC brings various benefits to sellers and buyers, but it also intensifies market competition (Cui et al., 2019; Mou et al., 2019). In a CBEC setting, due to differences in language, culture, history, and

habits (Kim et al., 2017), consumers usually reveal different levels of attention to products, online stores, and advertisements on CBEC platforms (Porter, 2008; Mou and Shin, 2018). In such circumstances, attracting consumers' attention to notice the products and induce their purchase intention becomes an important issue for sellers (Kim, 2018). In other words, sellers need to increase consumers' cognition of their products (Lee et al., 2011). If consumers do not have an awareness of a product, they will not show any interest in it or desire towards it; hence no purchase will take place. Furthermore, in the long run, sellers will not be successful in CBEC because they are unable to attract more buyers and increase their market share (Mou et al., 2017).

In view of the abovementioned considerations, this study analyzes the role of product cognition on consumers' purchase intention on CBEC platforms. So far, academic research on CBEC has mainly focused on the fields of logistics (Hsiao et al., 2017), behavior (Cui et al., 2019), as well as effects (Wang and Lee, 2017). Little has been done to address the influence of product cognition on purchase intention in CBEC settings. Taking into account the sequential process of consumers' response to product information in the hierarchy-of-effects (HOE) model, we

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consider the effect of product cognition on purchase intention as a sequential process. In this study, we propose a three-stage model to detect the influence of product cognition on purchase intention in CBEC based on the HOE model and the commitment-involvement theory (Helgeson et al., 2002). Our three-stage theoretical model can identify several key factors responsible for systematically predicting consumers' purchase intention in CBEC. Moreover, it can reflect the consumers' entire processing and response process on CBEC platforms.

There have been studies on purchase intention in CBEC, however most of them focused on exploring and analyzing the motivation and risk perspectives (Mou et al., 2017; Lee et al., 2015). We believe there is a lack of research on the impact of product cognition on purchase intention. This study will therefore analyze the entire processing and response process from consumers' product cognition to their purchase intention on CBEC platforms, and investigate the key factors and their influencing mechanism at each stage of the process.

The potential contribution of this study will enable sellers to improve consumers' product cognition in order to attract more buyers and generate more profits on CBEC platforms. Moreover, it will help academics and practitioners understand the situation and dynamics of consumers at each stage by analyzing their entire processing and response process on CBEC platforms.

The remainder of this paper is organized as follows. First, the theoretical background for this study is reviewed. Second, we propose a research model and develop hypotheses based on the theoretical foundations gathered from the literature. Third, our research methodology is detailed. Finally, the data analysis results, implications and further research directions are presented.

2. Theoretical background

2.1. Purchase intention in CBEC

In view of its fast paced development, CBEC has naturally been the subject of academic research. Table 1 gives an overview of the major studies in this domain. From Table 1, we can see that existing research involved a wide range of issues and employed diverse research methods. It should be noted that prior work on CBEC can provide a great research basis for subsequent studies on this topic.

Scholars have also considered consumer purchase intention in the CBEC context. For instance, Yoon and Zhang (2018) validated the key factors affecting the cross-border adoption of feedback posted on social media. An experimental study confirmed that the adoption of opinions about Korean cultural products indeed influenced Chinese consumers' intention to purchase cultural products made in Korea. Furthermore, Han and Kim (2019) tested a research model to analyze the influence mechanism of purchase intentions in CBEC, and found that consumer informedness positively affected purchase intentions. In addition, Mou et al. (2017) drew on the valence framework to develop and test a research model of buyer repeat purchase intentions in CBEC. The results revealed that positive valences exerted the strongest effects on repeat purchase intention, and that negative valences were significant. Lee et al. (2015) identified factors that influenced fashion consumers' purchase intentions in cross-border online shopping. The results showed that three motivations (utilitarian, social, and hedonic) had positive effects on cross-border online shopping purchase intentions, but perceived risk did not negatively influence purchase intentions.

From our review of the literature on purchase intention in CBEC, we found that existing research mainly investigated the factors influencing purchase intention, while our study classifies the factors into different decision-making stages. We therefore expect our study to reach a more profound and comprehensive conclusion.

2.2. Hierarchy-of-effects (HOE) model

The HOE model is a response hierarchy model that describes the

process of consumers' response to information, and systematically illustrates the transformation process from consumers' ignorance of a product to the actual purchase behavior (Smith et al., 2008). It is a sequential process consisting of three stages: *cognition*, *affect* and *conation*. In the cognition stage, consumers know or perceive product information and identify with products or services. This stage includes the perception of product, the awareness and understanding of product attributes, characteristics and advantages (Barry and Howard, 1990). In the affect stage, consumers' attitudes and affects towards products and platforms are gradually cultivated, and consumers form a good impression and a certain degree of preference for them. This stage can reflect the consumers' strong preference, such as the desire, conviction, and so forth (Barry and Howard, 1990). In the action stage, consumers' purchase desire is stimulated, and their strong preference leads them to take actions on the products. At that time, they will try, buy and use products and services (Barry and Howard, 1990).

Taking into account the various decision-making situations of consumers in CBEC, we adopt the operationalization of a sequential process consisting of cognition, affect and conation. This sequence is consistent with the processing and response of consumers in the context of CBEC. Initially, something attracts the attention of a consumer on a CBEC platform (cognition). Then, the consumer forms an interest and desire in something (affect). Lastly, the consumer takes action on the CBEC platform (conation). In this study, cognition is viewed as a mental activity that is reflected in consumers' thoughts, beliefs or knowledge of some products on CBEC platforms (Barry and Howard, 1990), and we call this stage *product cognition*. Furthermore, affect is treated as the degree of feelings and emotions which can be attributed to the CBEC platform (Wijaya, 2015). In this study, we refer to this stage as *platform emotion*. Finally, conation reflects the intension to perform a behavior (e.g., purchase) or the behavior itself on CBEC platforms (Egan, 2007). We refer to this stage as *behavior intention*.

In the product cognition stage, consumers begin with no awareness of the product. In this situation, a specific description of the product may arouse consumers' interest, so as to maintain their attention long enough to establish a mental connection between product description and product cognition (Smith et al., 2008). Once this connection is established, consumers will be aware of the product and consider it as a factor during their decision-making (Smith and Swinyard, 1988). Thus, we choose product description and product awareness as analytical variables during this stage. Product description is a synthesis of all elements related to the description of a product, and may produce an emotional response when purchasing products online (Park et al., 2005). On the other hand, product awareness refers to the degree to which consumers may become familiar with the products sold through product presentation or product description (Collins, 2007).

Previous studies in consumer research have shown several different conceptualizations and operationalizations of involvement (Drossos et al., 2014). The degree of involvement is positively correlated with individuals' cognitive participation (Petty et al., 1983). In the platform emotion stage, with the gradual increase of consumers' understanding of product description and product awareness, consumers are increasingly involved in the platform that displays these products (Celsi and Olson, 1988). They will pay more attention to their feelings and interests and therefore spend more time processing and responding on this platform. During the involvement process, consumers can continuously enhance the level of trust towards the product providers. Thus, during this stage we choose platform involvement and perceived trust as analytical variables. In this study, platform involvement refers to the perceived relevance of CBEC platforms based on consumers' values, interests and needs (Jiang et al., 2010). Additionally, perceived trust is regarded as consumers' confidence in product providers on CBEC platforms (Wang and Hazen, 2016).

In the behavior intention stage, consumers see a CBEC platform as a preference (Smith et al., 2008). On this preferred platform, products displayed will create potential behaviors from consumers (Peng et al.,

Table 1
Summary of studies on CBEC.

Topic	Major contents	Methods	Major results	References
Logistics	Analyzed the relationships between the feelings of customers and service elements of cross-border logistics service.	Partial least squares and text mining techniques	In addition to conventional customer surveys, user generated online content analysis should be an effective way of catching customer-oriented design elements.	Hsiao et al. (2017)
Drives and barriers	Reviewed scientific publications in the field of logistics underlying CBEC in China.	Systematic review	CBEC in China was gaining increasing interest, as shown by the rising amount of publications from 2013 onwards. However, studies investigating the relation between logistics and CBEC seemed to be lacking.	Giuffrida et al. (2017)
	Analyzed the mode of Chinese CBEC logistics. How to Explore the potential for CBEC transactions between Canada and the United States. Proposed and validated that CBEC as enterprise innovation should include business model innovation, not just institutional innovation or technological innovation. Explored whether distance was still important for online trade in physical goods. Explored the impact of CBEC on international trade in the context of China by analyzing information cost, negotiation cost, transportation cost, tariffs and middlemen cost separately.	Systematic review Systematic review Hierarchical regression Mathematical Modeling Mathematical Modeling	Summarized the ten major logistics modes for export trade and import trade. Constructed two distribution network models to analyze the process and program participation of Canadian or American enterprises. Business model innovation played a full mediating role in the relationship between government pro-innovation policy and firm performance, while technological innovation had a partial mediating effect. Distance-related trade costs were greatly reduced compared to offline trade in the same goods. CBEC had a positive role in promoting international trade only when the negative impact caused by tariffs cost and transportation cost was offset. In addition, CBEC had a positive effect on the growth of Chinese international trade each year.	Jiao (2016) Gessner and Snodgrass (2015) Chen and Yang (2017)
Effects	Examined distance effects on CBEC and in particular the importance of express delivery in reducing the time dimension of distance.	Correlation test and mathematical modeling	Express delivery reduced distance for cross-border demand. Furthermore, the adoption of express delivery was positively associated with e-loyalty in terms of repurchase rates.	Kim et al. (2017)
Consumers' behavior	Explored the determinants of the individual's decision to perform CBEC.	Logistic regression	Being a male was positively related to the probability of practicing CBEC. Education was positively and significantly related to the probability of being involved in CBEC within European Union countries. Computer and Internet Skills were significant and positive factors in practicing CBEC.	Valarezo et al. (2018)
Sellers' behavior	Examined service justice as the antecedent factor of dysfunctional customer behavior (DCB) and how it interacted with negative emotion and service dissatisfaction, which in turn, affected DCB.	Structural equation modeling (SEM)	Service justice had a negative significant correlation with negative emotion, and negative emotion significantly induced service dissatisfaction. In addition, both negative emotion and service dissatisfaction were positively correlated with DCB.	Lin et al. (2018)
	Examined both the antecedents and the impacts of sellers' trust on buyers and their perceived risk of chargeback fraud on sellers' intention to trade with buyers in CBEC. Identified sellers' behaviors and their decisions on which platforms to participate.	SEM	Sellers' trust in buyers had a negative impact on perceived risk of chargeback fraud, and had a positive impact on sellers' intention to trade.	Guo et al. (2017)
Culture	Explored 100 German companies' domestic, U.S., U.K. and Latin American websites and employed a cultural value analysis.	Sequential multi-method Analysis of variance (ANOVA)	More than 67% of sellers were interested in participating in cross-border platforms, where trust and perceived benefits were both important to the decision-making process. Cultural value depiction was not very strong in the relevant markets, thus a certain degree of 'cultural alienation' took place.	Cui et al. (2019) Sinkovics et al. (2007)

2019). During this stage, we choose purchase intention as the analytical variable. This variable measures the consumers' intention to purchase a product.

2.3. The commitment-involvement theory

The commitment-involvement theory is the combination of the involvement theory and commitment. The involvement theory is used to predict people's attitudes, and posits that when people are stimulated or in a certain situation, they feel a degree of relationship between the stimulation or situation and themselves, which leads to interest (Sherif and Cantril, 1947). Commitment can be regarded as "a variable which encompasses the ranges of allegiance an individual may be said to have for the social system of which he is member" (Hornback, 1971, pp. 65). Presently, many studies regard commitment-involvement as a different view of solving the relationship between consumers' behaviors and attitudes (Kahle and Homer, 1988). According to the commitment-involvement theory, when an individual had a strong commitment to an activity or behavior, she/he is unlikely to take the initiative to terminate this activity or behavior (Helgeson et al., 2002). Recently, the commitment-involvement theory has been extended to explain consumers' behavior in fields such as tourism (Ferns and Walls, 2012) and social psychological activities (Havitz and Mannell, 2005).

In this study, according to the commitment-involvement theory, platform involvement is divided into platform enduring involvement and platform situational involvement. Platform enduring involvement reflects a sustained level of concern with the platform. It can be stable for a long time (Albaum et al., 1998). This involvement is related to the consumers' experience with the platform (Hong, 2015), and reflects their long-term interest in it. Consumers with high levels of enduring involvement, to a large extent, perceive the platform as highly important and relevant (Im and Ha, 2011). In contrast to platform enduring involvement, platform situational involvement reflects temporary feelings for the platform in terms of consumers' desires, interests and convictions. It can be influenced by a special situation on the platform. Consumers' perceived relevance and importance for the platform is a state that occurs in some circumstances (Havitz and Mannell, 2005). Platform situational involvement increases if the consumers can foresee negative consequences on the platform, in which case they are more cautious about something (e.g., product) on the platform.

2.4. Perceived trust

In the online shopping process, consumers usually face a variety of uncertainties which can be alleviated through perceived trust. In CBEC settings, when consumers engage in online transactions, perceived trust plays an important role in eliminating uncertainty and uncontrollability. Considering the credibility of information provided by online merchants (Lemire et al., 2008), we choose the product provider's ability, benevolence, and integrity as measurements for perceived trust, which may influence consumers' behavior intentions toward the product. If consumers perceive the ability, benevolence and integrity of a product provider, they will increase perceived trust toward the provider and engage in purchase behavior with the provider on a CBEC platform.

Exploring perceived trust on CBEC platforms and the model developed in this study, ability refers to the group of skills, competencies, and characteristics that enable a seller to influence the process of providing products (Mayer et al., 1995). Benevolence is the extent to which a seller is believed to want to do good to consumers, aside from an egocentric profit motive (Mayer et al., 1995). Integrity involves the consumers' perception that the seller adheres to a set of principles that consumers find acceptable (Mayer et al., 1995).

3. Research hypotheses

3.1. Impacts of product cognition on platform emotion

3.1.1. Product description

Uncertainty reduction theory suggests that in initial interactions, the length and depth of communication can reduce uncertainty and enhance the trust between the communicating parties (Sunnafrank, 1986). In the case of product description, information quality can influence the consumers' perception and understanding of the information's credibility and accuracy (Kim et al., 2008). Moreover, it is important for consumers to obtain and process high quality product description (Miranda and Saunders, 2003). The extent of quality available in a product description on a platform helps consumers assess the attributes of the product and reduces uncertainty about the product (Racherla et al., 2012), thereby enhancing their perceived trust in the product and its provider. In addition, signal theory is used in situations of uncertainty and explains environments with incomplete information (Landgrebe, 2005). It can be used to explain the relationship between signals and trust. Consumers perceive high quality product description as a credible commitment of a high-quality product provider (Mavlanova and Benbunan-Fich, 2010). So consumers believe that these providers are reliable to a certain extent, and therefore consider them trustworthy. We hence hypothesize:

H1. High quality product description has a significant positive impact on perceived trust.

3.1.2. Product awareness

Yoon (2002) suggested that awareness is significantly related to online trust. Trust is a consumer's psychological state of confidence and positive expectations, and it plays a role when the consumer has high product awareness (Yoon, 2002). According to Cheskin (2000), a seller needs to be recognized as trustworthy in order to become an effective product provider. High product awareness enhances perceived trust in the sense that product awareness is a prerequisite to trust formation and it is necessary for trust to rise (Cheskin, 2000). Moreover, awareness can have an important impact on the creation of online trust. Greenfield Online (1998) found that surveyed customers (whether they purchased a product on the platform or not) believed that product awareness played a role in the constitution of their perceived trust. Thus, product awareness can be regarded as an important factor for gaining perceived trust in online product providers. We therefore hypothesize:

H2. High product awareness has a significant positive impact on perceived trust.

3.2. Impacts among internal variables of platform emotion

3.2.1. Platform involvement

Social judgment theory suggests that individuals with higher involvement can evaluate more results than other individuals, thus they may be difficult to persuade (Sherif et al., 1965; Hong, 2015). In other words, the higher consumers' involvement in a platform is, the less likely they are to be persuaded by other platforms and the greater their trust in this platform and its product providers is. Also, involvement may have various influences on consumer psychology (Eslami and Ghasemaghaei, 2018; Teichert and Rost, 2003). Symbolic and hedonic values may establish a psychological tie between consumers and product providers (Beatty et al., 1988). Thus, consumers with platform involvement are aware of the importance of product and purchase (Hong, 2015), which fosters the creation process of perceived trust.

With regards to the two types of platform involvement in this study, platform enduring involvement reflects consumers' long-term interest in CBEC platforms, while platform situational involvement represents consumers' temporary interest in CBEC platforms (Park et al., 2007).

Whether it is a long-term or temporary interest, consumers always need to make the right decision in the process of shopping. For this, consumers need to enhance the level of perceived trust in product providers and obtain sufficient information to comprehensively evaluate products and make good decisions (Hong, 2015). This indicates a positive relationship between platform enduring involvement or platform situational involvement and perceived trust on CBEC platforms. We therefore hypothesize:

H3a. Platform enduring involvement has a significant positive impact on perceived trust.

H3b. Platform situational involvement has a significant positive impact on perceived trust.

3.3. Impacts of platform emotion on behavior intention

3.3.1. Platform involvement

Previous research demonstrated that involvement affected consumers' attitudes and behaviors on a website (Eroglu et al., 2003; Kim et al., 2007). An involved consumer needs to evaluate more information, and spends more time and effort to make decisions and take actions (Jiang et al., 2010; Bian and Moutinho, 2008). High involvement indicates that consumers actively acquire and process as much information as possible on a platform (Schlosser, 2003). Therefore, the more consumers are involved with a website, the more they purchase on that website (Richard, 2005).

In this study, as far as the two types of platform involvement are concerned, enduring involvement with products on the platform may have a positive influence on purchase intention (Peter and Olson, 1996) because it is easier for consumers to make decisions in the light of product information. Furthermore, purchase experience on a platform can increase enduring involvement and further improve purchase intention (Laaksonen, 1994). On the other hand, situational involvement is usually caused by the shopping environment (Im and Ha, 2011). Enhanced situational involvement can eliminate consumers' uncertainties to some extent and reduce their costs and social risks in the shopping process. Thus, consumers will spend more time on a platform, which will produce higher purchase intentions on this platform. So we attempt to test the following hypotheses:

H4a. Platform enduring involvement has a significant positive impact on purchase intention.

H4b. Platform situational involvement has a significant positive impact on purchase intention.

3.3.2. Perceived trust

Online shopping requires consumers to evaluate sellers' social connections to help them make a better decision (Gefen et al., 2003). Perceived trust can determine consumers' reliance on the information and behaviors of product providers (Hajli et al., 2017). Mayer et al. (1995) studied three characteristics (ability, benevolence, and integrity) of the parties that influence trust. These three characteristics can enhance consumers' reliance on the product provider, reduce transaction uncertainty, and extend the relationship with product providers (Suh and Han, 2003). In other words, perceived trust can reduce consumers' risk perception while shopping on a platform, thereby enhancing their participation in "trust-related behaviors", such as making purchases. In addition, several prior studies have shown a direct effect between trust and purchase intention (Pappas, 2016; Lu et al., 2010, 2016). Accordingly, we expect that perceived trust will also positively influence purchase intention. We hypothesize:

H5. Perceived trust has a significant positive impact on purchase intention.

The research model of this study is shown in Fig. 1.

3.4. Mediation effects in the three-stage model

Our proposed three-stage model assumes that the consumer response process is ordered as follows: *product cognition-platform emotion-behavior intention* (see Fig. 1). This means that the influence of the early variables (product description and product awareness) on the later variable (purchase intention) is fully mediated. In view of this, the three-stage model will not show the direct effects of product cognition on behavior intention through other paths. Therefore, in order to test whether perceived trust in the model has mediation effects, we identified the significant paths in the model. We examined the full mediation effects of perceived trust to test whether our three-stage model can show the sequence of consumers' processing and response on CBEC platforms.

4. Methodology

For this research, we collaborated with DHGate.com, a well-known Chinese CBEC platform. DHGate.com was established in 2004 as the first online platform to provide business-to-business (B2B) cross-border transactions for small and medium-sized enterprises (SMEs) in China.

Our collaboration with DHGate.com stems from the following three reasons. (1) DHGate.com is a global online trade website, which meets the basic requirements of CBEC platforms. (2) DHGate.com has been conducting global online trade for over 14 years and has 2 million Chinese online suppliers and 22 million kinds of commodities, which enables us to test our research hypotheses reasonably. (3) DHGate.com has 19 million registered buyers from 222 countries and regions around the world. This gives us access to an appropriate population to survey for our research.

4.1. Scale design

We designed 30 items related to the 8 variables of the theoretical model, and used a 5-point Likert scale. Respondents were asked to rate items from 1 ("completely disagree") to 5 ("completely agree"). All the measurement items were adapted from prior validated measures. All measurement items are presented in Appendix A.

4.2. Data collection

We first conducted a pilot test to assess the comprehensibility of the scale, the clarity of the measurement items, and the appropriateness of the survey questions in the CBEC context. As for the recruitment of participants in our survey, we selected buyers who use the DHGate.com platform. Participation was entirely voluntary. Participants were provided with three options: "participate now", "maybe next time", or "do not ask again". Obviously, no matter which one of the three options they chose, participants would not lose anything or be negatively affected in any way. The sample selected for this study consisted of consumers with shopping experience on CBEC platforms, which allowed us to effectively analyze the influence of product cognition on behavior intention. During the survey, we did not record the personal information of respondents in order to ensure their anonymity. The survey was compiled in English, and was conducted from January 22, 2019 to February 28, 2019. In total, 515 respondents participated in our survey and 473 responses were deemed usable. Detailed descriptive statistics are shown in Table 2.

4.3. Descriptive statistics

The descriptive statistics of all measurement items are shown in Table 3. We conducted Kolmogorov-Smirnov tests to examine the normality in all items by using SPSS 17.0 software. In Table 3, the K-S Z scores indicate that there is a significant difference between the distribution of every item and the normal distribution.

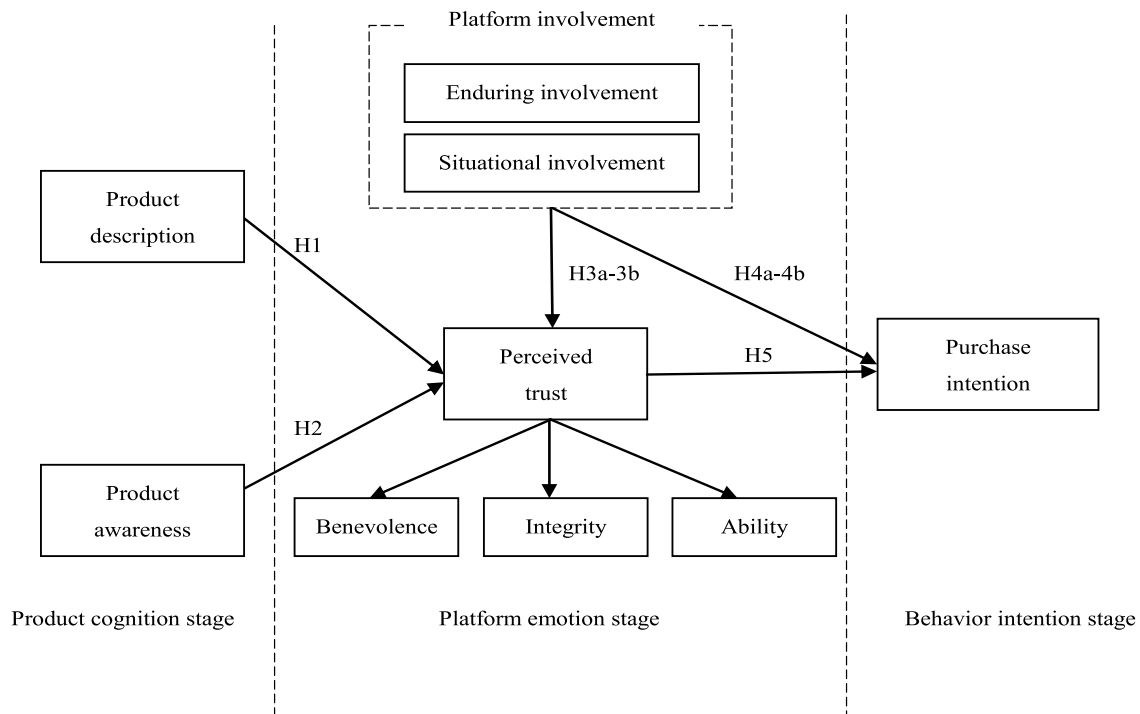


Fig. 1. Research model.

Table 2
Descriptive statistics of the respondents' characteristics.

Demographics	Category	Frequency	Percentage
Gender	Male	252	53.3
	Female	221	46.7
Age	≤20	40	8.4
	21–30	132	27.9
	31–40	94	19.9
	41–50	103	21.8
	51–60	61	12.9
	≥61	43	9.1
Experience in CBEC	Less than one month	38	8.0
	One to three months	67	14.2
	Three to twelve months	118	24.9
	More than one year	250	52.9

5. Data analysis and results

5.1. Reliability and validity test

SPSS 17.0 software was used to conduct an exploratory factor analysis. The analytical results show a KMO value of 0.95 and an approximate chi-square value of 14543.579 ($p < 0.001$), which indicates that the data can be analyzed using the exploratory factor analysis (Williams et al., 2010). In this analysis, we used the principal component extraction technique and the varimax rotation method. As a result, 8 factors were extracted, which explains 77.13 percent of variance totally. Notably, the factor loadings of EI2 and SI5 were both less than 0.7, which means that the correlations between these two items and loaded factors were not strong on this scale. Thus, we deleted the two items (EI2 and SI5). Other factor loading results are shown in Table 4.

We tested the reliability of the scale using SPSS 17.0 software and Lisrel 8.1 software. The analytical results are shown in Table 4. We can see that the values of Composite Factor Reliability (CFR) and Cronbach α are greater than 0.7, indicating that this scale is indeed reliable (Royal and Hecker, 2016).

In the validity test, we tested the convergent validity and

Table 3
Descriptive statistics of all measurement items.

Variables	Items	Mean	Standard deviation	Skewness	Kurtosis	K-S Z score	p
PD	PD1	3.96	1.08	-0.87	-0.02	5.99	< 0.01
	PD2	3.96	1.04	-0.84	0.03	5.20	< 0.01
	PD3	3.76	1.44	0.22	-1.32	5.75	< 0.01
PA	PA1	4.10	1.06	-1.07	0.45	4.87	< 0.01
	PA2	4.02	1.05	-0.95	0.30	4.75	< 0.01
	PA3	4.13	1.02	-1.18	0.96	3.98	< 0.01
EI	EI1	4.04	1.12	-1.12	0.58	5.59	< 0.01
	EI2	3.61	1.28	-0.60	-0.68	4.16	< 0.01
	EI3	3.90	1.12	-0.87	0.11	4.88	< 0.01
	EI4	3.92	1.12	-0.89	0.11	4.83	< 0.01
	EI5	3.92	1.15	-0.89	0.01	5.25	< 0.01
SI	SI1	4.01	1.15	-1.12	0.50	5.42	< 0.01
	SI2	4.02	1.12	-1.16	0.77	5.17	< 0.01
	SI3	3.85	1.14	-0.87	0.12	4.78	< 0.01
	SI4	3.38	1.36	-0.39	-0.97	4.54	< 0.01
	SI5	3.86	1.28	-0.92	-0.24	5.32	< 0.01
PT	PTB1	4.14	1.05	-1.31	1.28	5.73	< 0.01
	PTB2	4.06	1.09	-1.14	0.72	5.53	< 0.01
	PTB3	4.12	1.01	-1.15	0.98	5.59	< 0.01
PTI	PTI1	3.97	1.08	-0.89	0.18	5.13	< 0.01
	PTI2	3.94	1.11	-0.89	0.17	5.09	< 0.01
	PTI3	3.94	1.12	-0.90	0.12	5.02	< 0.01
	PTI4	3.93	1.09	-0.88	0.15	4.84	< 0.01
PTA	PTA1	3.89	1.10	-0.81	0.02	4.72	< 0.01
	PTA2	3.97	1.07	-0.95	0.44	4.91	< 0.01
	PTA3	3.99	1.08	-1.05	0.58	4.92	< 0.01
	PTA4	3.95	1.12	-0.99	0.34	4.79	< 0.01
PI	PI1	4.28	1.13	-1.70	2.05	7.46	< 0.01
	PI2	4.27	1.12	-1.65	1.99	7.28	< 0.01
	PI3	3.97	1.32	-1.16	0.16	6.54	< 0.01

discriminant validity respectively. The analytical results of convergent validity are also shown in Table 4. We can see that all average variance extracted (AVE) values are greater than 0.5, which confirms the convergent validity of the scale (Muhammad et al., 2011). The analytical results of discriminant validity are shown in Table 5 where the square root (diagonal values) of all AVE values exceed the correlation

Table 4
Statistical results of some indicators.

Factors	Items	Loadings	AVE	CFR	Cronbach α	
PD	PD1	0.74	0.55	0.79	0.84	
	PD2	0.74				
	PD3	0.75				
PA	PA1	0.80	0.63	0.84	0.90	
	PA2	0.80				
	PA3	0.78				
EI	EI1	0.71	0.62	0.87	0.94	
	EI3	0.82				
	EI4	0.79				
	EI5	0.82				
SI	SI1	0.76	0.55	0.83	0.87	
	SI2	0.74				
	SI3	0.74				
	SI4	0.72				
PT	PTB	PTB1	0.64	0.84	0.94	
		PTB2				0.82
		PTB3				0.81
	PTI	PTI1	0.84	0.74	0.92	0.95
		PTI2	0.86			
		PTI3	0.87			
		PTI4	0.86			
	PTA	PTA1	0.81	0.66	0.88	0.94
		PTA2	0.82			
		PTA3	0.82			
		PTA4	0.79			
	PI	PI1	0.79	0.60	0.82	0.86
PI2		0.81				
PI3		0.73				

Table 5
Statistical results of discriminant validity.

Factors	PD	PA	EI	SI	PTB	PTI	PTA	PI
PD	0.74							
PA	0.56	0.79						
EI	0.52	0.56	0.79					
SI	0.58	0.56	0.69	0.74				
PTB	0.48	0.50	0.57	0.64	0.80			
PTI	0.49	0.47	0.57	0.68	0.67	0.86		
PTA	0.51	0.52	0.62	0.67	0.68	0.68	0.81	
PI	0.52	0.55	0.58	0.68	0.52	0.56	0.57	0.77

coefficients between two factors, which means that the discriminant validity of the scale is acceptable.

5.2. Common method biases test and multiple collinearity test

Using Harman’s single factor test, we analyzed the common method biases. The results of the principal component analysis indicate that the factor with the largest proportion of variance explains 29.93 percent of the total variance. Therefore, there are no common method biases in our study (Podsakoff and Organ, 1986). Furthermore, as can be seen in Table 5, the correlation coefficients between any two factors are less than 0.7, which means there is no serious multiple collinearity in our study.

5.3. Hypothesis test

We conducted the hypothesis test using structural equation modeling in Lisrel 8.7 software. The main fitting indices and evaluation criteria are shown in Table 6. Comparing the main fitting indices with the evaluation criteria values, we found all the main fitting indices values in our model to be acceptable, which indicates that the data and model fitted well.

Fig. 2 shows the values of normalized path coefficients in our model. There was a significantly positive effect of product description on

perceived trust ($\beta = 0.12, p < 0.05$). So H1 was supported. Moreover, a significant positive effect of product awareness on perceived trust was found ($\beta = 0.15, p < 0.01$). Therefore, H2 was supported. Additionally, the other two variables that influence perceived trust were found to be significant: enduring involvement ($\beta = 0.16, p < 0.01$) and situational involvement ($\beta = 0.32, p < 0.001$). So H3a and H4a were both supported. Lastly, situational involvement ($\beta = 0.71, p < 0.001$) and perceived trust ($\beta = 0.09, p < 0.05$) both produced significant positive impacts on purchase intention. However, enduring involvement did not significantly influence purchase intention ($\beta = 0.03, p > 0.05$). So H4b and H5 were both supported, but H3b was not supported. In the hypothesis test, the direct and indirect effects of the research model are displayed in Table 7. Table 8 shows the total effects and the coefficient of determination (R^2) in our model.

5.4. Mediation effect test

According to the theoretical model and statistical analysis results, the path coefficients of product description ($\beta = 0.12, p < 0.05$) and product awareness ($\beta = 0.15, p < 0.01$) to perceived trust were significant respectively, and the path coefficient of perceived trust to purchase intention was significant ($\beta = 0.09, p < 0.05$), which means that perceived trust played a full mediation role in our model. To test the full mediation effect, following (Wen and Ye, 2014), we used the Mplus 7.0 software’s Bootstrap method to test the above mediation effects. After setting up the repeated 2000 Bootstrap samples and 95 percent bias-corrected confidence intervals, the confidence intervals of the mediation effects of perceived trust were found to be [0.047, 0.106] and [0.022, 0.068] respectively. The zero point was not included in these two confidence intervals. This verifies the full mediation effect of perceived trust. Therefore, in our three-stage model, there was no alternative path representing direct effects from product cognition to behavior intention. In other words, consumers’ processing and response on CBEC platforms is a sequential activity.

6. Findings and conclusion

This study developed a three-stage model in order to assess the influence of product cognition on behavior intention in a CBEC setting based on the HOE model and the commitment-involvement theory, as well as the possible mediation effects of perceived trust. Our model enabled us to identify the following interesting insights.

First, a high quality product description has a significant positive impact on perceived trust on CBEC platforms. This is consistent with the findings of previous studies in traditional e-commerce settings (e.g., Ha (2004) and Lee et al. (2011)). In CBEC settings, there are various barriers between consumers and sellers, such as language, culture, etc., but a high quality product description still plays an important role in the formation of perceived trust. A high quality product description can alleviate foreign customers’ uncertainty about products and reduce their perceived risk to some extent. Our results also show that a high quality product description can enhance consumers’ trust beliefs towards product providers.

Second, high product awareness has a significant positive influence on perceived trust on CBEC platforms. Previous research has shown that, on traditional e-commerce platforms, high product awareness has a significant positive influence on trust (Smith and Wheeler, 2002; Komiak and Benbasat, 2004). On CBEC platforms, consumers see a variety of foreign online products, and they usually need to spend more mental effort and dedicate more cognitive capacity to identify such products than they would for domestic online products. If a product can attract consumers’ awareness in a more appealing way, such as using colorful and moving pictures, interesting animations, videos, etc., then consumers will be more impressed by the product. This will increase their positive feelings and emotions towards the product and the product provider. The results of this study prove that such feelings and

Table 6
Fitting indices and evaluation criteria of research model.

Fitting indices	Absolutely indices			Parsimony indices			Incremental indices		
	GFI	AGFI	RMSEA	PNFI	PGFI	CFI	NFI	IFI	
Values of fitting indices	2.93	0.91	0.88	0.07	0.81	0.68	0.99	0.98	0.99
Evaluation criteria values (Ullman and Bentler, 2012)	< 3	> 0.9	> 0.8	< 0.08	> 0.5	> 0.5	> 0.9	> 0.9	> 0.9

emotions are reflected in consumers’ perceived trust in product providers.

Third, platform involvement has a significant positive effect on perceived trust in CBEC settings. More specifically, both platform enduring involvement and platform situational involvement have a significant effect on perceived trust. This conclusion is consistent with those obtained in traditional e-commerce environments (Hong, 2015). In CBEC, a platform brings consumers into contact with providers, facilitating value exchange between them. Once consumers have a high involvement on a platform, they will spend more time and effort engaging in some activities on this platform. With the increase of involvement, consumers will gradually show trust and commitment towards this platform. Our results show that whether platform involvement is enduring or situational, it will eventually influence the level of consumers’ trust in product providers.

Fourth, platform situational involvement has a significant positive effect on purchase intention, but this effect is not significant in the relationship between platform enduring involvement and purchase intention. This conclusion is different from the results obtained in traditional e-commerce settings (Jiang et al., 2010; Huang et al., 2010). On a CBEC platform, in theory, consumers with higher platform involvement may make purchase decisions when facing products and product providers (Richard, 2005). However, previous research indicates that consumers do not have significant purchase intention under the enduring involvement of such platform, which shows that consumers’

Table 7
Direct effects and indirect effects of research model.

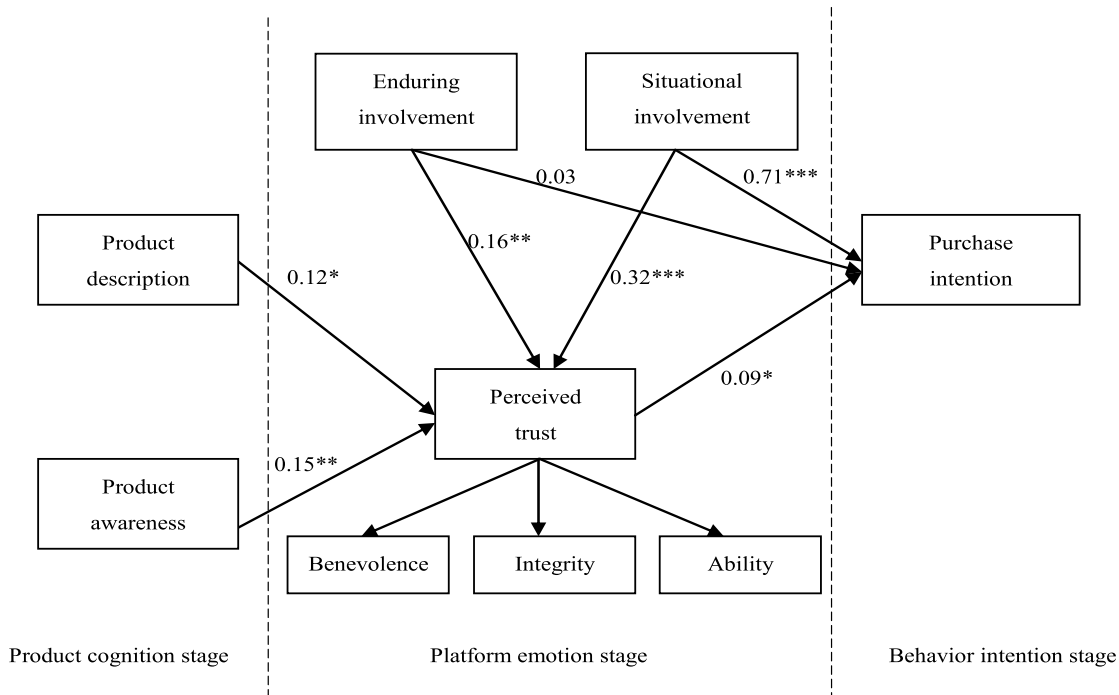
Factors	Direct effects					Indirect effects				
	PD	PA	EI	SI	PT	PD	PA	EI	SI	
PT	0.12	0.15	0.16	0.32	–	–	–	–	–	
PI	–	–	0.03	0.71	0.09	0.01	0.01	0.02	0.03	

Table 8
Total effects and coefficient of determination (R²) in research model.

Factors	Total effects					R ²
	PD	PA	EI	SI	PT	
PT	0.12	0.15	0.16	0.32	–	0.40
PI	0.01	0.01	0.05	0.74	0.09	0.62

psychological activities and behavioral motivations in the enduring involvement of the platform are more complicated than those in the platform’s situational involvement, which eventually leads to a non-significant purchase intention.

Fifth, perceived trust has a significant positive impact on purchase intention in CBEC settings. This finding is also true for traditional e-commerce (e.g., Lu et al., 2016; Lu et al., 2010). CBEC is a transaction



Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Fig. 2. Hypothesis testing results.

between buyers and sellers in different countries, but its essence is still e-commerce. Therefore, as one of the critical factors of influencing decision-making in e-commerce, perceived trust still plays a large role in the whole transaction process. This conclusion shows that perceived trust also influences consumers' purchase intention in CBEC settings.

Finally, perceived trust plays a full mediation role between product description and purchase intention as well as between product awareness and purchase intention on CBEC platforms. In other words, according to our model, platform emotion plays a full mediation role between product cognition and behavior intention. Although this study does not analyze the direct effect between product cognition and behavior intention, our research suggests that product cognition can affect behavior intention through platform emotion. This conclusion reflects a dynamic path for consumers to engage in a series of sequential activities on CBEC platforms. This path embodies the dynamic process from cognition to emotion and from emotion to intention.

7. Implications

7.1. Theoretical implications

The main theoretical contribution of this study is that we developed a three-stage model in CBEC settings based on the HOE model. This model describes the three stages that consumers go through when they establish or form the purchase intention on CBEC platforms. Our empirical results support the validity of our model. From the model we learned that consumers on CBEC platforms move over time through the successive steps of product awareness, product description (product cognition), platform involvement, perceived trust (platform emotion), and purchase intention (behavior intention). In the traditional e-commerce environment, product cognition is not a main factor influencing behavior intention. But in the CBEC environment, since consumers typically have different language and cultural backgrounds, the influence of product description and product awareness on consumers cannot be ignored. Furthermore, product cognition needs to go through a process to influence behavior intention. Hence we believe that researchers should consider the effects of product description or product awareness and analyze such effects on other factors and the whole influencing process in the context of CBEC. In addition, according to the commitment-involvement theory, our research focused on the important impact of two types of platform involvements (enduring involvement and situational involvement) on perceived trust and purchase intention respectively. Our empirical analysis showed that both types of platform involvement can significantly influence perceived trust, but only situational platform involvement can significantly affect purchase intention. It suggested that platform involvement can affect purchase intention either alone or through perceived trust. Our analysis makes up for the lack of studies related to CBEC, and can provide a basis for exploring consumers' behavior intentions from the perspective of involvement. Our findings suggest that research should focus on the products, services and functionalities of CBEC platforms in order to explore their potential impacts on consumers' purchase intention from the perspective of involvement. Unlike traditional e-commerce, CBEC consumers, merchants, platforms providers, and third parties are all novel. Thus the adoption of involvement theory can help researchers identify novel insights and implications.

7.2. Practical implications

Additionally, our conclusions suggest a number of practical implications for product providers implementing marketing plans on CBEC platforms. On the one hand, product providers should improve the description and awareness of the products sold on their CBEC platforms through marketing methods that enhance consumers' cognitive levels regarding these products. For consumers around the world, sellers should make product information clear and easy to understand,

and stimulate consumers' attention in various ways, for instance by using videos, pictures, etc. In this case, consumers' perceived trust can be increased, which will increase purchase intention and purchase behavior. On the other hand, in light of the functions and characteristics of CBEC platforms, after they succeed in understanding the shopping habits of consumers in different countries/regions, product providers should create a shopping environment conducive to consumers' processing and response to information, and try to make consumers spend as much time as possible on CBEC platforms, even for the purpose of browsing. If necessary, product providers can also increase communication with consumers on how to browse and find products on their CBEC platform, how to effectively use the functions of the platform, and how to conveniently purchase products. This will potentially increase consumers' involvement on such platforms, which can stimulate consumers' purchase activities.

8. Limitations and future research

The main limitation of this study is that data collection was carried out on a single CBEC platform in China. Future studies could expand the data collection process using multiple channels. This will be beneficial to obtain more comprehensive and profound conclusions. In addition, this research only analyzed one of the dynamic response paths that influenced consumers' purchase intentions on CBEC platforms based on the HOE model. Consumers' purchase intention can be analyzed from multiple perspectives and within multiple disciplines. Therefore, future research can be carried out based on this consideration.

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Appendix A

Measurement Items.

Product description (PD) [Smith et al. \(2008\)](#).

PD1: The products' descriptions were easy to understand.

PD2: I was able to comprehend the descriptions made about the products.

PD3: The products' descriptions were hard to understand.

Product awareness (PA) [Smith et al. \(2008\)](#).

PA1: I am aware of the products on this platform.

PA2: I can recall the products on this platform.

PA3: I can recognize the products on this platform.

Enduring involvement (EI) [Ferns and Walls \(2012\)](#).

EI1: The pleasure of shopping on this platform is important.

EI2: The pleasure of shopping on this platform is of great concern.

EI3: The pleasure of shopping on this platform means a lot.

EI4: The pleasure of shopping on this platform is significant.

EI5: The pleasure of shopping on this platform matters a lot.

Situational involvement (SI) [Havitz and Mannell \(2005\)](#).

SI1: The shopping activity on this platform interests me a lot.

SI2: I am really enjoying buying products on this platform.

SI3: I am confident that shopping on this platform is the right

activity right now.

SI4: Shopping on this platform gives a glimpse of the type of person I really am.

SI5: I will be annoyed if shopping on this platform proves to be a poor activity.

Perceived trust (PT) [Mou et al. \(2016\)](#).

PTB1: (Benevolence) I expect this platform's product provider has good intentions toward me.

PTB2: (Benevolence) I expect this platform's product provider is acting in my best interest.

PTB3: (Benevolence) I expect this platform's product provider means well.

PTI1: (Integrity) This platform's product provider is truthful.

PTI2: (Integrity) I would characterize this platform's product provider as honest.

PTI3: (Integrity) This platform's product provider would keep its commitments to deliver quality products.

PTI4: (Integrity) This platform's product provider is sincere and genuine.

PTA1: (Ability) I believe this platform's product provider is effective in assisting me to search for products.

PTA2: (Ability) This platform performs its role of product provider very well.

PTA3: (Ability) Overall, this platform is a capable and proficient provider of products.

PTA4: (Ability) In general, this platform is a very knowledgeable provider of products.

Purchase intention (PI) [Hsu et al. \(2016\)](#).

PI1: I intend to purchase products on this platform in the future.

PI2: I would purchase products on this platform in the future.

PI3: I am inclined to purchase products on this platform in the future.

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