Product information the more the better? A moderated mediation model to explain consumer purchasing intention in cross-border e-commerce

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Abstract
Purpose – The purpose of this paper is to identify the influence of product information on purchase intention and evaluate the moderated mediation effect of return policy leniency in cross-border e-commerce.
Design/methodology/approach – The methodology is to use multiple regression analysis on 406 qualified online survey responses to determine the influence of product description, product display, and product content on consumer purchasing intention through product involvement as well as the moderated mediation effect of return policy leniency.
Findings – The results show that product description and product content were positively associated with product involvement, while product display did not exhibit a significant relationship between it and product involvement. As hypothesized, product involvement mediated the relationship of product description and product content with consumer purchasing intention. The return policy leniency was also found to positively moderate the mediation path of product content on purchasing intention through product involvement.
Originality/value – This study bridges a gap in the literature on the influence of three kinds of product information on purchasing intention through product involvement in a cross-border e-commerce context. Especially the study is one of the first attempts to determine that good return policy do not apply universally due to implied boundary conditions. The results can be used to expand consumption in cross-border e-commerce.
Keywords Product information, Product involvement, Moderated mediation effect, Cross-border e-commerce, Information process, S-O-R model
Paper type Research paper

Nomenclature
CPI Consumer purchasing intention
PCO Product content
PDE Product description
RPL: Return policy leniency
PDI Product display
PRI Product involvement
CBEC Cross-border e-commerce
S-O-R: Stimulus-Organism-Response

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1. Introduction
Cross-border e-commerce (CBEC) refers to new business activities composed of transaction participants from different nationalities, conducting commercial activities on e-commerce platforms and building upon cross-border logistics to complete commodity distribution and related transactions (Gui et al., 2022; Baek et al., 2020; Zhu et al., 2020). CBEC has become increasingly popular since traditional e-commerce has reached the post-dividend stage and has become an important part of international trade (Mou et al., 2019; Zhu et al., 2019). Business-to-consumer (B2C) CBEC exceeded $1 trillion in trade volume in 2021 (Zhu et al., 2019). The World Trade Organization estimates that transactions will reach $4.8 trillion in 2026, and many consider the Asia–Pacific region to become the largest and most dynamic CBEC market in the future (Gui et al., 2022).

For B2C cross-border e-commerce operators, stimulating consumer attention has become a major challenge in the increasingly competitive global market. The product information disseminated by sellers will play an essential role in promoting consumer cognition, emotion, and will (Zhu et al., 2020). As a basic cue for perceiving products, product information can effectively assist consumers in reducing decision-making risks and reaching their expected individual rationality (Mou et al., 2020a; Gui et al., 2022). Unlike traditional e-commerce, buyers and sellers in cross-border platforms usually belong to different countries or regions (Baek et al., 2020). Transaction exposure resulting from information asymmetry may discourage consumers and cause the cross-border e-commerce market to shrink (Huang and Chang, 2019; Taherdoost and Madanchian, 2021). Thus, product information becomes an effective “communication bridge” between trading partners (Giuffrida et al., 2017). Sufficient and attractive product information not only enhances the online shopping experience but can also effectively resolve contractual uncertainties, thus alleviating consumers’ negative valence in general (Chang and Wildt, 1994; Mou et al., 2020a).

Previous studies on CBEC have largely concentrated on the perfect logistic system, the driving mechanism for consumption intention (behavior), and its influential effects (Hsiao et al., 2017; Zhu et al., 2019; Gui et al., 2022). While extensive research has been carried out on the influence mechanism of product information on consumption intention in traditional business and e-commerce (Chang and Wildt, 1994; Huang and Chang, 2019; Pavlou et al., 2007), few have dealt with CBEC (Zhu et al., 2019) as well as on the structure and dimensions of product information.

As the most influential theoretical framework in consumer information processing, elaboration likelihood model (ELM) identifies two routes to process information based on the possibility of fine processing toward input information (motivation or ability) (Cyr et al., 2018): the central route and the peripheral route (Petty and Cacioppo, 1983). The ELM suggests that involvement can moderate route selection and attitude change. However, little attention has been paid to the various effects of distinct forms of product information on consumer involvement. Furthermore, in the CBEC context, no detailed investigation has been conducted regarding whether consumers have preferred information types and processing styles.

In addition, CBEC operators are accustomed to promoting the sustainability in consumption intention by good guiding policies (Shao et al., 2021), banking on a long-term and stable effect on consumption in cross-border e-commerce. Nevertheless, traditional qualitative methods comprise the majority of previously published studies on guiding policy design, while quantitative research and targeted studies have been limited, particularly in cross-border e-commerce. Meanwhile, few have investigated the intervention effects on the consumer’s decision-making process and information disposal method. In particular, most studies examined mediators and moderators separately (e.g., Baek et al., 2020; Zhu et al., 2019; Mou et al., 2020b), little is known about the moderated mediation mechanism in a mixture model.
To address the current knowledge gaps in CBEC and the psychological mechanisms in consumer cognition and feedback, this study used product involvement as a potential mediator (Zhu et al., 2020; Sharma and Klein, 2020) based on the S (stimuli)-O (organism)-R (response) model to determine the effects of product information on purchasing intention through product involvement as well as testing the potential mediation effects of product involvement and determining the usability and validity of different product information in the virtual and multinational contexts. Furthermore, the perceived return policy leniency was selected as a potential moderator to understand the intervention effects of return policy leniency on consumer purchasing intention formation. Taken together, the main goal of the current study was to determine whether three types of product information the more the better and whether good policy applies universally to promote sustainability in CBEC consumption. Based on the results, several theoretical implications and practical recommendations are proposed and discussed.

2. Theoretical background and hypothesis

2.1 The S-O-R model

Numerous improvements have been suggested to the S-R theory, given its limitations on showing the individual’s psychological state after being influenced by external stimuli. First proposed by Mehrabian and Russell (1974), the S-O-R model incorporates an organism as a mediator to depict individual’s psychological changes (Zhu et al., 2020) and has since become widely used in the field of psychology and behavior (Yang and Zhang, 2021). Stimulus refers to any environmental factor, such as consumer information, shopping environment, technological change, and user evaluation, that induces an individual to respond. Given no scope, researchers usually determine the stimulus according to the object and context of the study. Any environmental factor that causes an individual’s psychological changes and reactions can be considered a stimulus (Yang et al., 2021). For organism (O), the original model suggests that pleasure, arousal, and dominance may be experienced by the individual (Eroglu et al., 2003). For this study, only product involvement (arousal) was investigated. Response (R) refers to the specific behavioral outcome of the organism by the stimulus. In this study, the stimuli included the product information description, display, and content provided by the CBEC platforms and affiliated e-tailers. Product involvement is used to reflect the human psychological state that influences behavioral outcomes (Yang and Zhang, 2021). In the response stage, the consumer will generate purchasing intention.

2.2 Hypothesis

2.2.1 Mediation effect of product involvement. Signaling theory states that information is an important basis for consumers’ consumption decisions. Revolving information asymmetry has been a major strategy to acquire customer trust and promote purchasing intention (Akerlof, 1970; Chang and Wildt, 1994; Atkinson and Rosenthal, 2014; Smith et al., 2005). In the CBEC context, the information combination strategy is divided into three dimensions by Zhu et al. (2020), namely, product description, product display, and product content. Product description refers to objective, understandable, clear, and credible information provided by CBEC platforms and e-tailers to describe the products, addressing the consumers’ core needs and helping form an impression and sense of the product (Mou et al., 2019, 2020b). Product display is defined as product promotion in the virtual setting using the latest technologies (e.g., virtual reality and augmented reality) to catch customers’ attention through impressive, attractive, and eye-catching displays (Zhu et al., 2020; Horstmann, 2017). Product content refers to information on product attributes that can increase product awareness and make consumers more intuitively understand product information, such as specifications, styles, colors, and prices.
Since the 1960s, involvement has been applied in behavioral sciences. Originating from the social-judgment theory, involvement was originally defined as reflecting the audience’s attention and interest in stimuli from the perspective of media involvement, where the level of involvement indicates differences in the complexity of decision-making and information process (Michaelidou and Dibb, 2006; Zhu et al., 2020). Types of involvement are decided by different involved objects and research situations in prior studies. For example, Zaichkowsky (1985) divided involvement into product, advertisement, and decision-making involvement based on the different objects involved. Product involvement refers to the importance of a product to consumers or importance degree to products which consumers attach to; when the product is positively associated with consumer values and self-conception, product involvement will be activated (Ghali-Zinoubi and Toukabri, 2019; Michaelidou and Dibb, 2006).

The involvement function defined by Zaickowsky (1986) uses the product and contextual factors as explanatory variables for involvement. As an important external cue for product attributes, the product information is the main method to assess the targeted product quality and reach self-expected rational decision-making (Richardson et al., 1994). Olson and Jacoby (1972) found that consumer decision-making is a comprehensive analysis based on specific cues resulting from product attributes. According to the cue utilization theory (Olson and Jacoby, 1972), consumers freely switch intrinsic and external cues to make judgments and decisions based on the different types of product information (Baek et al., 2020). Further, uncertainty reduction theory suggests that in the initial encounter, communicating parties try to obtain corresponding information to decide their next move (Son et al., 2020). Flanagin (2007) argued that reducing uncertainty in initial interactions was crucial in C2C (consumer to consumer) transactions. These evidences and arguments indicate that consumers need to involve themselves in high quality product information to make relatively rational decisions in the CBEC consumption.

Viewed in this way, consumers need high-level involvement to prepare and process high amounts of information that provide consumption clues for subsequent purchase decisions through the information processing of the central and peripheral routes (Cyr et al., 2018). The description, display, and content information provided by CBEC platforms and e-tailers contain a wealth of cues to product quality and business reputation (Mou et al., 2020b; Akerlof, 1970). Kim and Han (2014) argued that consumers are willing to make more cognitive efforts and emotional involvement given adequate and credible product information. Bian and Moutinho (2011) found that consumer involvement in online products significantly affects behavioral intention. All things being equal, the higher the product involvement, the better the experience. The pleasant state of mind would make consumers more likely to give positive comments and encourage purchasing intention. In CBEC, external information can positively affect consumer purchasing intention through product and platform involvement (Mou et al., 2020b). Due to these arguments, the following hypothesis is formed.

**H1.** Product involvement mediates the relationship between product information and purchasing intention.

**H1a.** Product involvement mediates the relationship between product description and purchasing intention.

**H1b.** Product involvement mediates the relationship between product display and purchasing intention.

**H1c.** Product involvement mediates the relationship between product content and purchasing intention such that product information (product description H1a, product display H1b, product content H1c) positively affects consumer purchasing intention through product involvement.
2.2.2 Moderated mediation effect: return policy leniency as a moderator. “Refund products purchased online within seven days” has become a standard commitment to customers for most e-commerce platforms (Shao et al., 2021). It is often used to quell consumer concerns and to endorse the quality of the goods on sale (Oghazi et al., 2018). The return policy of CBEC can effectively enhance consumer perception on product quality, avoid commercial fraud and personal loss, and gain customer trust and loyalty (Six et al., 2010; Chang and Yang, 2022; Mou et al., 2017; Yang et al., 2020). In CBEC, customer satisfaction is highly influenced by the perceived leniency of the return policy (Jeng, 2017), which is determined by the restrictions, deadlines, the convenience of the process, and the return costs (Shao et al., 2021). Thus, CBEC platforms and e-tailers should exhibit customer care and benevolence when implementing return policies (Li et al., 2015).

However, in practice, information asymmetry may be magnified by the separation of the product experience and the online purchase decision (Mavlanova et al., 2012), reducing the reference value of product information provided by the seller. A lenient return policy could be an effective complement to the product information (Shao et al., 2021; Oghazi et al., 2018; Wood, 2001), enhancing the predictability and reliability of these consumption cues (Olson, 1972). The resulting stack effect could have a stronger impact on product involvement and fully activate consumer purchasing intentions. Moreover, lenient return policy has double attributes to CBEC consumption, namely, it not only signals sellers’ confidence in product quality but also quality commitment to consumers (Bonifield et al., 2010). Yu and Kim (2019) further argued that lenient return policies could significantly reduce perceived uncertainties in product information, effectively strengthening its influence on product involvement and generating a stronger impact on purchasing intention.

When harsh (low-leniency) return policies are implemented, the benevolence, integrity, and ability trust in e-commerce platforms and e-tailers may not be fully achieved (Gefen and Straub, 2004; Gui et al., 2022), together with endogenous uncertainties develop toward cross-border e-commerce, consumers will create a skeptical attitude toward the product information from the seller, reducing the elaboration likelihood of product information. Consumers would then turn to the peripheral route to complete their product awareness and purchasing decisions (Cyr et al., 2018; Bhattacherjee and Sanford, 2006), restraining product involvement and hindering the generation of purchasing intention (Roe and Bruwer, 2017). In addition, harsh return policies could inherently increase pre-contractual uncertainties. Since consumers tend to believe that the information provided by sellers is deliberately exaggerated (Mou et al., 2020a), negative valence is created that adversely affects purchasing intentions (Pavlou et al., 2007). The damage to the product image and business reputation debilitates the influence of product information on purchasing intention through product involvement (Krishna and Ahluwalia, 2008; Mou et al., 2020b). Due to these observations and discussion, the following hypothesis is made.

H2. In a CBEC setting, the mediation effect of product involvement is positively moderated by return policy leniency.

H2a. The higher the perceived return policy leniency, the greater the indirect effect of product description on purchasing intention through product involvement.

H2b. The higher the perceived return policy leniency, the greater the indirect effect of product display on purchasing intention through product involvement.

H2c. The higher the perceived return policy leniency, the greater the indirect effect of product content on purchasing intention through product involvement.

Based on the conceptual background and hypothesis, the research framework of the study is proposed in Figure 1.
3. Methodology

3.1 Measurement

The three-dimensional scale of product information was derived from (Zhu et al., 2020). The product description contains four items (Cronbach’s alpha = 0.821), while the product display (Cronbach’s alpha = 0.810) and product content (Cronbach’s alpha = 0.846) consist of three items each. The four-item scale for product involvement was adopted from Ghali-Zinoubi and Toukabri (2019), appropriate modifications were adopted to fit the context of CBEC by referring to Mou et al.’s (2020b) study. The three items measuring purchasing intention (Cronbach’s alpha = 0.856) were based on Mou et al.’s (2020b) study, while the five-item measure for return policy leniency (Cronbach’s alpha = 0.885) was adopted from Shao et al. (2021). Additionally, Chiu et al. (2014) and Akhtar et al. (2021) found that gender and income significantly affect consumer consumption; thus, gender and income were used as covariates. All items used a seven-point Likert scale ranging from 1 = “strongly disagree” to 7 = “strongly agree.”

All the measures used in this article had been validated in authoritative literature; appropriate revisions were adopted to fit the China and CBEC contexts. To ensure the statements were in line with the original items, language consultants (two with PhDs and one with a master’s degree) were asked to revise the English scales using the translation and back translation technique. After the initial questionnaire was completed, a pilot was conducted with 30 college students to address faulty wordings, typographic errors, and semantic fuzziness, and the Cronbach’s alpha coefficients for each construct exceeded the recommended criterion of 0.6 in pre-test stage (Hair et al., 2020). The research team made final deliberations and revisions and formulated the formal questionnaire. In addition, to ensure that the respondents are familiar with cross-border e-commerce platforms, two filtering items were incorporated in both the initial and subsequent formal questionnaire to screen invalid samples. First, the respondents were asked to name the cross-border e-commerce platform (B2C) they most frequently browsed or shopped. Second, the respondents were asked about the time and frequency they spent surfing the platforms in the past three months (Mou et al., 2020a; Gui et al., 2022).

3.2 Data collection and the sample

The formal survey was conducted from September to November 2021 using an online self-administered electronic questionnaire (https://wj.qq.com/) distributed to respondents previously contacted via WeChat and QQ. Multiple well-known B2C CBEC platforms in China, such as Amazon, Tmall Global, and eBay, were used to obtain better and more accurate conclusions (Zhu et al., 2020). Consumers of these platforms were chosen as the
target population since these platforms were mainstream and the users can aptly gauge CBEC consumption. The research goals were kept hidden, ensuring the protection of anonymity, and the order of the items was randomized. Thus, representative and reliable samples were obtained for the empirical analysis (Mou et al., 2020b).

In the selection of sample data, prior control measures were taken in contacting respondents; adjustments were made to ensure sample representativeness. The screening criteria were as follows: (1) No variations in the answers to the measures; (2) The name given by the respondent is not a mainstream CBEC platform; (3) No shopping or browsing experience on CBEC platforms in the past three months. Among the 501 returned questionnaires, 406 were deemed qualified responses and were used for the final analysis, with an effective rate of 90.23%. The sample size reached a more acceptable level (ten times as many observations as the number of variables, or 200 and larger samples), as recommended by Hair et al. (2020). The respondent demographics is depicted in Figure 2.

4. Data analysis and results

4.1 Reliability and validity testing

Using SPSS 25, Cronbach’s alpha was calculated to reflect the scale’s internal consistency reliability. The results showed that Cronbach’s alpha for each construct was greater than the 0.7 threshold, indicating acceptable reliability in this study (Hair et al., 2020).

A measurement model comprising six latent variables was created in AMOS 23 for the confirmatory factor analysis (CFA). The fitting statistics are as follows: $\chi^2 = 496.754$, $df = 194$, $\chi^2/df = 2.561$, RMSEA = 0.062, CFI = 0.944, GFI = 0.900, TLI = 0.934, IFI = 0.945, NFI = 0.912, SRMR = 0.040. Convergent validity was determined through item standardized factor loading, composite reliability (CR), and average variance extracted (AVE). As shown in Appendix, each of the item’s loading exceeded 0.56, the CR value for each latent variable exceeded 0.7 (Rasool et al., 2021), and the AVE coefficient for each construct exceeded 0.5, indicating good convergent validity (Hair et al., 2020). Moreover, the square root of the AVE of each latent variable was greater than its correlations with other constructs, indicating acceptable discriminant validity (Hur et al., 2021).

![Figure 2. Respondents’ characteristics](Image)
4.2 Common method bias (CMB)

Since the sampling data on independent and dependent variables were all collected from the same respondents, CMB may occur in the self-reported data (Baek et al., 2020; Podsakoff and Organ, 1986; Mou et al., 2020a). In this study, program control and statistical control were employed to detect and minimize the potential CMB. First, several program remedies were used to minimize CMB, including protection of respondent anonymity (Le et al., 2019), hiding research motivation, using concise items, and counterbalancing item orders (Yang et al., 2022).

Second, three statistical methods were performed to evaluate the CMB. The correlation matrix summarized in Table 2 shows no correlation exceeded 0.9 (Pavlou et al., 2007), indicating that the CMB was not a serious threat. Harman’s single-factor test was then conducted to evaluate the CMB, and an exploratory factor analysis was applied with no rotation. The first factor explained 43% (less than 50%) of the total variance. Moreover, this study conducted CFA with the one-factor model in AMOS 23 ($\chi^2/df = 8.324$, RMSEA = 0.134, CFI = 0.718, GIF = 0.643, TLI = 0.689), the fitting indices proved to be weaker than that of the six-factor model ($\Delta\chi^2 = 1242.880$, $\Delta df = 15$, $p < 0.001$). Taken together, these results further indicate that the CMB is not a serious threat.

4.3 Descriptive statistics and correlation analysis

The mean, standard deviation (SD), and correlation matrix are listed in Table 1. The results show that the product description ($r = 0.452$, $p < 0.01$), product display ($r = 0.386$, $p < 0.01$), and product content ($r = 0.495$, $p < 0.01$) positively correlated with purchasing intention. Product description ($r = 0.485$, $p < 0.01$), product display ($r = 0.433$, $p < 0.01$), and product content ($r = 0.567$, $p < 0.01$) were also found to be positively correlated with product involvement. In addition, the results show that product involvement was positively correlated with purchasing intention ($r = 0.674$, $p < 0.01$) and that perceived return policy leniency had medium correlation with other constructs.

4.4 Potential mediation effect

To reduce the potential threat of multicollinearity, the mean structure of latent variables was used for the multiple regression analysis and subsequent hypothesis tests in PROCESS v3.3. The causal analysis results showed that product description ($B = 0.2469$, Bootstrap Lower Limit Confidence Interval [BootLLCI] = 0.1214, Bootstrap upper Limit Confidence Interval [BootULCI] = 0.3756, exclude 0) and product content ($B = 0.3941$, BootLLCI = 0.2816, BootULCI = 0.4997, exclude 0) positively affect product involvement,

<table>
<thead>
<tr>
<th>Variable</th>
<th>PDE</th>
<th>PDI</th>
<th>PCO</th>
<th>PRI</th>
<th>CPI</th>
<th>RPL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDE</td>
<td>0.741*</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PDI</td>
<td>0.620**</td>
<td>0.772*</td>
<td></td>
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<tr>
<td>PCO</td>
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<td>0.666**</td>
<td>0.804*</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PRI</td>
<td>0.483**</td>
<td>0.433**</td>
<td>0.567**</td>
<td>0.790*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPI</td>
<td>0.452**</td>
<td>0.386**</td>
<td>0.495**</td>
<td>0.674**</td>
<td>0.821*</td>
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</tr>
<tr>
<td>RPL</td>
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<td>0.478**</td>
<td>0.585**</td>
<td>0.699**</td>
<td>0.652**</td>
<td>0.780*</td>
</tr>
<tr>
<td>CR</td>
<td>0.826</td>
<td>0.815</td>
<td>0.846</td>
<td>0.869</td>
<td>0.861</td>
<td>0.886</td>
</tr>
<tr>
<td>Mean</td>
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<td>4.712</td>
<td>5.013</td>
<td>4.698</td>
<td>4.895</td>
<td>4.709</td>
</tr>
<tr>
<td>SD</td>
<td>1.165</td>
<td>1.162</td>
<td>1.183</td>
<td>1.143</td>
<td>1.104</td>
<td>1.116</td>
</tr>
</tbody>
</table>

Table 1. Descriptive statistics and correlation matrix

Note(s): N = 406, **p < 0.01, *p < 0.05 (two-tailed); the diagonal of the table is the square root of the AVE value
Source(s): Author’s own work
while product display did not significantly influence product involvement (B = 0.0099, BootLLCI = −0.1170, BootULCI = 0.1467, include 0). After controlling for the independent variables, product involvement was found to positively influence purchasing intention (B = 0.5408, BootLLCI = 0.4436, BootULCI = 0.6373, exclude 0). The results also suggest that the three direct paths of product description (B = 0.1174, BootLLCI = −0.0031, BootULCI = 0.2420, 0 included), product display (B = 0.0005, BootLLCI = −0.1205, BootULCI = 0.1149, 0 included) and product content (B = 0.1055, BootLLCI = −0.0060, BootULCI = 0.2214, 0 included) were not significant on purchasing intention.

Visualizations were generated to depict the differences in the effects of product information on product involvement and the influence of product involvement on purchasing intention. Figure 3 indicates that there were significant differences in the effects of the product description, product display, and product content on product involvement. Product display insignificantly affects product involvement. Besides, Figure 4 shows that product involvement significantly influences purchasing intention in CBEC.

The test procedure of Zhao et al. (2010) and the Bootstrap method proposed by MacKinnon (2008) and Hayes (2018) were implemented to evaluate the potential mediation effect. Resampling was set to 5,000, and the confidence level was placed at 95%. The results show that product involvement significantly mediates the mediation path of product description on purchasing intention (B = 0.1335, BootLLCI = 0.0656, BootULCI = 0.2056, excluding 0). Likewise, product involvement was found to significantly mediate the path of product content on purchasing intention (B = 0.2131, BootLLCI = 0.1432, BootULCI = 0.2939, excluding 0). However, the results suggest that product involvement did not significantly mediate the relationship between product display and purchasing intention (B = 0.0054, BootLLCI = −0.0610, BootULCI = 0.0789, including 0). Hence, H1a and H1c are supported, while H1b is rejected.
4.5 Moderated mediation effect test

Following the test method of moderated mediation effect proposed by Muller et al. (2005), three regression equations were used. Muller et al. (2005) stated that a moderated mediation model is premised on the fact that the direct path is not moderated; that is, the influence of the interaction term of the independent variable and the moderator on the dependent variable is not significant ($c_5$, $c_6$, or $c_7 = 0$). However, they further suggested that the precondition that the direct path is not moderated by the moderator can be eased.

Based on these arguments, in this study, the hybrid model can be identified as a moderated mediation effect if any of the following preconditions are found: (1) the influence of the interaction term of the product information (independent variable) and the moderator on the mediator is significant, and the mediator (product involvement) significantly affects the dependent variable ($a_5$, $a_6$, or $a_7 \neq 0$ and $b_1 \neq 0$); (2) the product information significantly influences the mediator, and the influence of the interaction term of the mediator and the moderator on the dependent variable is significant ($a_1$, $a_2$, or $a_3 \neq 0$ and $b_2 \neq 0$); (3) Both preconditions (1) and (2) are satisfied.

\[
CPI = c_0 + c_1PDE + c_2PDI + c_3PCO + c_4RPL + c_5RPL*PDE \\
+ c_6RPL*PDI + c_7RPL*PCO + e_1 \\
(1)
\]

\[
PRI = a_0 + a_1PDE + a_2PDI + a_3PCO + a_4RPL + a_5RPL*PDE \\
+ a_6RPL*PDI + a_7RPL*PCO + e_2 \\
(2)
\]

\[
CPI = c_0' + c_1'PDE + c_2'PDI + c_3'PCO + c_4'RPL + c_5'RPL*PDE \\
+ c_6'RPL*PDI + c_7'RPL*PCO + b_1PRI + b_2RPL*PRI + e_3 \\
(3)
\]

where CPI is consumer purchasing intention, PDE is product description, PDI is product display, PCO is product content, RPL is return policy leniency, and PRI is product involvement.

The results for moderated mediation effects are summarized in Table 2. In Equation (1), the main effect coefficient $c_1$ ($\beta = 0.128, p < 0.05$) and $c_3$ ($\beta = 0.133, p < 0.05$) are significant, while $c_2$ ($\beta = -0.031, p > 0.05$) is not significant. The interaction term coefficients $c_5$ ($\beta = -0.006, p > 0.05$), $c_6$ ($\beta = -0.053, p > 0.05$), and $c_7$ ($\beta = 0.034, p > 0.05$) are not significant. According to the above arguments, this study generated the moderated mediation model. In Equation (2), the interaction term coefficient $a_5$ ($\beta = -0.057, p > 0.05$) and $a_6$ ($\beta = -0.016,$
$p > 0.05$) are not significant, while $a_7$ ($\beta = 0.112$, $p < 0.05$) is significant; and mediator significantly influences dependent variable ($\beta = 0.404$, $p < 0.001$). The results suggest that the leniency of the return policy positively moderated the first stage of the mediation model (predictor variable = product content). In addition, the main effect coefficient $a_1$ ($\beta = 0.113$, $p < 0.05$) and $a_3$ ($\beta = 0.218$, $p < 0.001$) in Equation (2) are significant, while $a_2$ ($\beta = -0.030$, $p > 0.05$) in Equation (2) and the interaction coefficient $b_2$ ($\beta = 0.031$, $p > 0.05$) in Equation (3) are not significant. The results indicate that the return policy leniency did not moderate the second stage of the three mediation paths.

To more intuitively depict the moderated effect of return policy leniency on the first stage of the mediation model, the drawing method for the moderated effects recommended by Aiken and West (1991) was adopted. As shown in Figure 5, compared with low leniency in return policies, product content has a stronger impact on product involvement in more lenient return policies. This suggests that return policy leniency positively moderates the first stage of the mediation model, confirming the presence of moderated mediation effects.

To determine the moderator’s value range when the mediation and direct effects are significant, the Johnson-Neyman method proposed by Hayes et al. (2018) was used in this study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Dependent variable = CPI</th>
<th>Dependent variable = PRI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td><strong>Control variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>$-0.031$</td>
<td>$-0.031$</td>
</tr>
<tr>
<td></td>
<td>($-0.620$)</td>
<td>($-0.810$)</td>
</tr>
<tr>
<td>Income</td>
<td>$-0.081$</td>
<td>$-0.007$</td>
</tr>
<tr>
<td><strong>Independent variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDE</td>
<td>0.128*</td>
<td>0.085</td>
</tr>
<tr>
<td></td>
<td>(2.490)</td>
<td>(1.751)</td>
</tr>
<tr>
<td>PDI</td>
<td>$-0.031$</td>
<td>$-0.016$</td>
</tr>
<tr>
<td></td>
<td>($-0.572$)</td>
<td>($-0.313$)</td>
</tr>
<tr>
<td>PCO</td>
<td>0.133*</td>
<td>0.038</td>
</tr>
<tr>
<td></td>
<td>(2.246)</td>
<td>(0.664)</td>
</tr>
<tr>
<td><strong>Mediator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRI</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Moderator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPL</td>
<td>0.527***</td>
<td>0.313***</td>
</tr>
<tr>
<td></td>
<td>(10.981)</td>
<td>(5.927)</td>
</tr>
<tr>
<td><strong>Interaction term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDE $\times$ RPL</td>
<td>$-0.006$</td>
<td>$0.004$</td>
</tr>
<tr>
<td></td>
<td>($-0.114$)</td>
<td>(0.069)</td>
</tr>
<tr>
<td>PDI $\times$ RPL</td>
<td>$-0.028$</td>
<td>$-0.018$</td>
</tr>
<tr>
<td></td>
<td>($-0.535$)</td>
<td>($-0.344$)</td>
</tr>
<tr>
<td>PCO $\times$ RPL</td>
<td>0.034</td>
<td>$-0.026$</td>
</tr>
<tr>
<td></td>
<td>(0.578)</td>
<td>($-0.424$)</td>
</tr>
<tr>
<td>PRI $\times$ RPL</td>
<td>0.031</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.600)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.007</td>
<td>0.283</td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>0.007</td>
<td>0.276</td>
</tr>
</tbody>
</table>

**Note(s):** $N = 406$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; $t$-values located in the brackets
**Source(s):** Author’s own work

Table 2. Results for moderated mediation effect
The visualization of results was based on the method developed by Preacher et al. (2007) and Hayes et al. (2018). Figure 6 presents the 95% confidence band and critical value of the significance region. When the moderator’s raw value (return policy leniency) was between 3.753 and 7 (1 ≤ RPL ≤ 7), the indirect effect of product content on purchasing intention through product involvement was significant. However, the figure also shows that the direct effect is not moderated by the leniency of the return policy (the confidence interval includes 0). Therefore, H2c is supported, while H2a and H2b are rejected.
5. Discussion and implication

5.1 Discussion of the results

A moderated mediation framework was developed to evaluate the influence of product information on consumer purchasing intention through product involvement and explore the moderated effect of return policy leniency in CBEC. Based on the research findings, some interesting conclusions can be generated:

First, product description and product content were found to significantly influence product involvement, while product display did not significantly affect product involvement. Product involvement positively influenced purchasing intention in a CBEC context. Such findings broadly support the work of Zhu et al. (2020), Chang and Wildt (1994), and Horstmann (2017), which found product information to positively influence consumer purchases. Interestingly, Zhu et al. (2020) found that product display can significantly lead to impulse purchases and generate characteristics of irrationality. These rather contradictory results suggest that different types of product information can have differential effects on product involvement. Compared to description and content information, display information may be overloaded with artistic expressions in practice, resulting in “information haze.” Without an endorsement of a trusted spokesperson or agent, excessive packaging in product display can increase perceived risks in consumer decision-making (Smith et al., 2005) and promote impulse and irrational consumption. The findings also support the conclusions of Mou et al. (2020b), which found that subject to the consumer’s cognitive level, redundant and disorganized product information tends to block the consumers’ cue utilization. Therefore, critical and verifiable rather than excess and low-effect product information is needed to increase the motivation to receive and handle extrinsic cues and encourage customer trust (Gui et al., 2022).

In addition, the results suggest that description and content information in cross-border e-commerce have higher credibility and processing fluency than display information, significantly influence product involvement, and further increase purchasing intention. Another important deduction from the finding is that consumers tend to involve in credible and valuable product information and look for exhaustive and accurate analysis of received information (Zhu et al., 2019). If consumers become familiar with the product’s performance and consumption value, the choice dilemma and decision bias caused by information asymmetry can be eliminated, and the resultant self-perception rationality can effectively activate the desire to purchase (Akerlof, 1970).

Second, product involvement was found to have significant mediation effects in the paths of product description and product content on purchasing intention; however, its mediation role between product display and purchasing intention was not significant. These results match those observed in earlier studies by Zhu et al. (2020), who found that improving product involvement is an effective way to encourage consumption in CBEC. The product information provided by e-commerce platforms and retailers should achieve high processing and extraction fluency to enhance the consumer’s flow experience (Gui et al., 2022), thereby creating an immersive experience that meets consumer expectations (Baek et al., 2020) and improving consumer product involvement. Note that product involvement was found to have no significant mediation effect on the relationship between product display and purchasing intention. This implies that consumers cannot make rational decisions due to excessive product information in virtual marketplaces and unsuitable information types (Mou et al., 2020a). Consequently, even experienced buyers are difficult to extract the required signal combination from the product information like dense fog (information haze), thus eventually making product involvement lose its mediation role. The findings suggest that information conflict caused by the use of inappropriate information types can cause low product involvement and hinder consumer purchasing intention (Ghali-Zinoubi and Toukabri, 2019).
Third, return policy leniency was found to positively moderate the first stage of the mediation path of product content on purchasing intention through product involvement. The results suggest that the more lenient the return policy, the stronger the impact of product content on product involvement. Unlike product description and product display with an egotistic orientation, product content becomes more objective and credible due to the positive moderated effect of return policy leniency. The resulting benevolence and integrity of e-commerce operators will increase consumer trust and reduce endogenous uncertainties in CBEC (Oghazi et al., 2018; Gefen and Straub, 2004). Given the numerous pre-contractual and post-contractual uncertainties in CBEC (Mou et al., 2020a), the resulting negative valence can be minimized and gradually converted into positive by the moderated effect of return policy leniency, increasing trust in product information and encouraging product involvement (Sharma and Klein, 2020). However, contrary to expectations, no significant moderated effects were found on the other two mediation paths (predictor = product description and product display). This suggests that the benevolence and positive effects of lenient return policies are not universal and are generated with boundary conditions, i.e., the use of appropriate product information strategies.

5.2 Theoretical contributions
This study integrated the signaling theory, the involvement theory, and the cue utilization theory in an S-O-R paradigm to develop the hypothesis and explain the effects of different product information types on purchasing intention and conduction paths in CBEC. The results suggest that the influence of the signaling function for the different types of product information may not always be consistent with the consumers’ purchase decision process. Internal conflicts may hinder the impact of product information on purchasing intention through product involvement; thus, in response to the pending question on product information, the more, the better.

This study contributes to our understanding of the mediation role of product involvement in the path of product information on purchasing intention. The research findings offer new insights into the psychological processes and mechanisms regarding the relationship between different product information types and purchasing intentions. The results can help explain what kind of product information consumers need and trust, which can help improve product marketability. The results on the various mediation paths provide new perspectives on the importance of information strategy in CBEC, highlighting the importance of information accuracy provided by e-commerce operators in building consumer trust, leading to high product involvement and purchases.

This study is one of the first attempts to explore the moderated effect of return policy leniency on the hypothesized mediation mode, improving on traditional approaches in policy design. This study also analyzed the practical effects of guiding policy in generating purchasing intention in cross-border e-commerce using quantitative analysis. This new understanding provides significant implications for improving the effectiveness and accuracy of return policies and reducing the risk costs in policy implementation; thus, this contribution extended our knowledge of how to use valuable customer service resources well. Besides, the moderated mediation model results provide quantitative evidence regarding the importance of return policy details and theoretical guidance on improving policies related to CBEC consumption.

5.3 Practical implications
The findings of this study have some practical implications. First, cross-border e-commerce marketers must re-examine their offline persuasion strategies that were considered effective in the past and be able to precisely segment online product information. Due to the different
levels of effectiveness, they would also have to distinguish the functional borders of product description, display, and content and reset the consumers’ processing route for information. For product information with more intrinsic cues, high involvement can be better initiated by finely processing product information through the central route. The best cues can be identified through more deliberations to determine product quality and improve the effectiveness of product information in changing consumer attitudes and behavior. When marketers are unable to master intrinsic cues, they should concentrate on external cues, such as brand name, the website’s visual appeal, store reputation, and the image of the origin country. For low-involvement conditions, marketers may consider the predictive value and the confidence value to amplify the ability of external cues to influence the consumers’ purchasing decision process. Display information that presents the product’s positive image should be entrenched in the consumer’s use of external cues, thereby improving the influence of product display on product involvement. For instance, display information in AliExpress with demand as guidance, highlight the selling points of product rather than simply information gathering.

Second, CBEC marketers must further optimize their persuasion strategies by focusing on product information and reducing consumers’ perceived uncertainties (Mou et al., 2020a). The results show that product description and product content can significantly enhance product involvement while product display loses its default function. While preliminary, the findings suggest that consumers are more likely to use external cues in product quality evaluation, given the difficulty of reaching for internal cues in a CBEC context. Therefore, marketers should be more coherent in transmitting cues or signals and reduce inconsistencies in directing internal and external cues (product information) to improve consumer product involvement. This would help consumers reduce impulse consumption, make more rational judgments, and generate a more positive consumer experience that can lead to better satisfaction and increased loyalty. Platform such as Amazon provide “Question and Answer” feature to communicate with consumers, as complementary for product information to eliminate consumer concerns in pre-purchase stage. Eventually, marketers would be able to establish a long-term mechanism to promote CBEC consumption in a virtual context.

Furthermore, the results of the mediation effects test highlight the importance of product involvement and bridge the gap between different product information types and CBEC consumption. One thing worth reviewing is how display information was found to have a diminished role. This implies that marketers should provide more reliable display information instead of excessive rendering. Product features, usefulness, and advantages must be emphasized to attract consumers and reconstruct the mediation path of display information on purchasing intention through product involvement.

Third, the return policy has to shift from wide coverage to precise guidance due to good policies are not always universal. The findings contribute to our understanding that a product’s return policy is an important external cue in consumer decision-making, helping consumers make quality judgments. CBEC retailers must control inappropriate product information and avoid amplifying consumers’ endogenous risk perception. They should also strive to improve cue utilization and promote product information in order to trigger higher product involvement and further expand cross-border e-commerce consumption. Together, converging lenient return policy and appropriate product information is essential for CBEC consumption.

5.4 Limitations and future directions
The major limitation of this paper is its use of cross-sectional data, limiting the ability to generate causal inferences. Subsequent research should consider longitudinal studies to further explore the causalities analyzed in this paper. Another limitation of this article is the
acquisition of sampling data through self-administrated questionnaires. Although several control strategies were adopted to eliminate extremely high correlations and filtering mechanisms were adopted to detect invalid responses, the threat of common method bias and other sampling errors could not be completely avoided. Future studies could explore the use of face-to-face questionnaire surveys to better determine whether the consumers are familiar with cross-border e-commerce.

References


MacKinnon, D.P. (2008), Introduction to Statistical Mediation Analysis, Erlbaum, Mahwah, NJ.


(The Appendix follows overleaf)
Appendix

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Description</td>
<td>Product description is objective on this platform</td>
<td>0.568</td>
</tr>
<tr>
<td>(AVE = 0.549, CR = 0.826)</td>
<td>Product description is understandable on this platform</td>
<td>0.824</td>
</tr>
<tr>
<td></td>
<td>Product description is clear on this platform</td>
<td>0.862</td>
</tr>
<tr>
<td></td>
<td>Product description is credible on this platform</td>
<td>0.671</td>
</tr>
<tr>
<td>Product Display</td>
<td>Product display is impressive on this platform</td>
<td>0.702</td>
</tr>
<tr>
<td>(AVE = 0.595, CR = 0.815)</td>
<td>Product display is attractive on this platform</td>
<td>0.816</td>
</tr>
<tr>
<td></td>
<td>Product display is eye-catching on this platform</td>
<td>0.792</td>
</tr>
<tr>
<td>Product Content</td>
<td>Product content is informative on this platform</td>
<td>0.795</td>
</tr>
<tr>
<td>(AVE = 0.647, CR = 0.846)</td>
<td>Product content provides necessary information (e.g. color, shape, price) on this platform</td>
<td>0.810</td>
</tr>
<tr>
<td></td>
<td>Product content illustrates the benefits of product on this platform</td>
<td>0.808</td>
</tr>
<tr>
<td>Product Involvement</td>
<td>Products sold on this platform are important to my daily life</td>
<td>0.757</td>
</tr>
<tr>
<td>(AVE = 0.624, CR = 0.869)</td>
<td>Shopping on this platform requires a lot of information and thoughtfulness</td>
<td>0.812</td>
</tr>
<tr>
<td></td>
<td>Products sold on this platform match my image and personality</td>
<td>0.811</td>
</tr>
<tr>
<td></td>
<td>Products sold on the platform are closely related to my life. If I make mistakes in shopping, I will suffer great losses</td>
<td>0.778</td>
</tr>
<tr>
<td>Purchasing Intention</td>
<td>I intend to purchase products on this platform in the future</td>
<td>0.781</td>
</tr>
<tr>
<td>(AVE = 0.674, CR = 0.861)</td>
<td>I would purchase products on this platform in the future</td>
<td>0.871</td>
</tr>
<tr>
<td></td>
<td>I am inclined to purchase products on this platform in the future</td>
<td>0.808</td>
</tr>
<tr>
<td>Perceived Return Policy Leniency</td>
<td>Compared with the return policies of other retailers, this return policy is very lenient</td>
<td>0.761</td>
</tr>
<tr>
<td>(AVE = 0.609, CR = 0.886)</td>
<td>Compared with the return policies of other retailers, this return policy is less restrictive</td>
<td>0.743</td>
</tr>
<tr>
<td></td>
<td>This return policy has a very long time before the deadline for returns</td>
<td>0.763</td>
</tr>
<tr>
<td></td>
<td>This return policy makes me feel very convenient</td>
<td>0.858</td>
</tr>
<tr>
<td></td>
<td>This return policy makes reasonable charges for the return cost</td>
<td>0.770</td>
</tr>
</tbody>
</table>

Table A1. Construct and items

Note(s): N = 406

Source(s): Created by the authors

About the authors

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