

Different Types of Product Presentation in Online Fashion Retailing -The Moderating Role of Need for Touch on Overall Certainty of Fit-

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Abstract

Product images in online fashion retail play a crucial role in shaping consumers' decision-making processes. This study investigates the effects of product display types (i.e., flat vs. human display) on consumers' purchase intentions and willingness to pay (WTP) in online fashion retailing. Using a basic shirt as the target product, we examine how overall certainty of fit (OCF) is perceived differently based on the product display type, and for which individuals the effect is amplified, considering individual differences in the need for touch (NFT). A one-factor (flat vs. human display type) between-subject experiment was conducted via an online survey platform (N = 212). The results indicated that the flat display mode generates a higher purchase intention than the human display, along with a marginally higher WTP. Additionally, the positive effect of a flat display on OCF was significant for individuals with low NFT. This study extends our understanding of online retail product displays and their influence on consumer behavior, yielding valuable insights for marketers to improve product presentation in online retail environments.

Key words: Product presentation, Overall certainty of fit (OCF), Need for touch (NFT), Online apparel shopping, Fashion product display

I. Introduction

The prevalence of online shopping allows consumers to purchase products ubiquitously. However, unlike traditional brick-and-mortar stores, online retailers often present limited product information due to the indirect and two-dimensional nature of product viewing. In this context, it becomes imperative to understand what additional information can facilitate consumers' purchase decisions when shopping online. Particularly in the fashion retail context, how to display product images play a pivotal role in consumers' decision-making processes (Baek et al., 2021; Lee et al., 2010; Wu & Li, 2021). Online fashion retailers commonly provide product images in various ways, in-

cluding product-only displays, products-over-a-mannequin displays, or products-over-a-human-model displays (Berg, 2015; Plotkina & Saurel, 2021; Yoo & Kim, 2012).

This research examines how online product displays affect consumers through the perception of fit certainty. We will focus on two prevalent display types: flat displays and human displays. A flat display is characterized by the exclusive presentation of the apparel product, devoid of any supplementary elements. In contrast, a human display features a human model wearing the apparel products. Previous research has primarily highlighted the positive effects of human displays. For example, displaying products on human models can enhance consumers' embodied mental simulations regarding the product, thereby influencing their purchase intentions (Bagatini et al.,

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2023). However, while the effectiveness of human displays has been explored in depth, little is known about the potential benefits of flat displays. This research aims to compare the effects of human displays and flat displays, particularly for products that are relatively basic and less emphasized for body fit.

Fit-related information, such as size and color, is a primary decision factor for online apparel products (Rosa et al., 2006). Beck (2003) demonstrated that consumers' difficulty in purchasing apparel products online is largely due to concerns about fit and size. When information provides a dependable indication of product fit, consumers are more likely to experience a sense of assurance regarding the fit, which can motivate their purchase. A higher level of perceived fit certainty leads to positive outcomes, including long-lasting satisfaction (Campbell et al., 2004). Thus, providing certainty about fit is a key determinant in driving shoppers to make a purchase. Meanwhile, some consumers have a strong desire to physically touch and feel apparel products before making a purchase decision, as this tactile experience allows them to gather pertinent information (Peck & Childers, 2003). This consumer characteristic, known as the "need for touch" (NFT), signifies a preference for acquiring information through the haptic system (Peck & Childers, 2003). Since few previous studies have investigated the moderating effect of NFTs on product display and OCF, this study addresses the interplay between consumers' NFT and product display types to explain when and for whom OCF is sufficiently perceived, leading to purchase intention.

By examining these factors, this research extends the current understanding of online retail product displays and their influence on consumer behavior, offering valuable insights for marketers to improve product presentation in online shopping.

II. Theoretical Background and Hypothesis Development

1. Visual Presentation of Product Information

Visual information, including both product images

and contextual images surrounding them, significantly influences consumers' attitudes toward apparel products, particularly their purchase intentions and overall positive responses (Baek et al., 2021; Kim & Lennon, 2008). The way products are displayed plays a pivotal role in influencing consumers' decision-making processes (Lee et al., 2010; Wu & Li, 2021), serving as a means for consumers to envision the product and gain a better understanding of its attributes (Verhagen et al., 2014; Qu & Baek, 2024).

In the context of online product displays, not only the product itself but also contextual cues such as the fitting model and background are important. For instance, the facial attractiveness of a model can elicit higher levels of pleasure and arousal among consumers (Yoo & Kim, 2012). Berg (2015) demonstrated that the presence of a head on a decorative model had an impact on consumers' gender-related preferences; male models with head-cropped and uncropped images generated significant differences in product attitude ratings, while female models did not show a significant difference. Lindström et al. (2016) also found that the presence of a head on a mannequin significantly affected purchase intention in a physical store, but not in an online store. Additionally, Baek et al. (2021) showed that the number of background images of a product is positively related to the consumption vision, leading to a higher willingness to pay (WTP).

Regarding how products are displayed, Kim et al. (2009) found that consumers prefer human models with apparel products in online shopping because they help consumers assess the drape and fit of the clothing. Also, Bagatini et al. (2023) revealed that human model displays enhance consumers' embodied mental simulation than flat pictures without human models in an apparel product context. On the other hand, consumers may not always favor apparel products displayed on human models if the display does not accurately show the fit. Regarding this point, Luangrath et al. (2022) found that in a non-diagnostic context, the positive effect of vicarious touch on product evaluation diminished. Thus, if a human model display does not accurately show the fit diagnostically, consumers may find

it no more convenient to gather information about the products compared to a flat display.

Furthermore, it is necessary to consider the characteristics of apparel products, such as fit, texture, and design. Suppose the fit of the apparel product is basic, simple, and easy to confirm without needing to simulate the fit mentally, consumers may smoothly perceive overall certainty of fit about the product, leading to higher purchase intention and WTP. To comprehend WTP has become crucial in accurately estimating market demand and developing an effective pricing strategy (Hinz et al., 2011). To explore the display effect, we focused on its impact on purchase intention and WTP, as they are well-established indicators of consumers' evaluation and valuation of a product. Based on the preceding research, we propose the following hypothesis:

- H1. The flat display will increase a) purchase intention and b) WTP compared to the human display.

2. Overall Certainty of Fit (OCF)

Perception of fit and size is a primary criterion when making apparel product purchases (Hsu & Burns, 2002). The inherent challenge faced by online consumers pertains to estimating the fit of apparel products solely based on limited visual representations, as online shopping precludes the possibility of physical try-ons (Almoussa & Almoussa, 2020). Consumers often assess whether the fit and color of clothing align with their preferences by comparing them to their self-image when viewing a virtual model that closely aligns with their ideal (Kim & Forsythe, 2008). The intrinsic connection between apparel products and considerations of fit, along with tactile attributes such as feel and touch, can be attributed to the high degree of bodily involvement (Rosa et al., 2006).

The concept of overall concern with fit was first introduced by Rosa et al. (2006). It is defined as the extent to which consumers accurately gauge the comfort and style of an apparel product from its online visual

representation while engaging in online shopping. Similarly, concern with fit and size is elucidated as the degree of expectation or perceived risk that consumers associate with the fit and size of such products when deliberating a purchase decision (Kim & Damhorst, 2010). Higher body esteem is associated with increased involvement in apparel and a heightened overall concern with fit, leading to a tendency to avoid online purchases (Rosa et al., 2006). Hong and Pavlou (2014) posited that uncertainty surrounding product fit often results in product returns, primarily due to consumers' inadequate access to comprehensive product information. Intriguingly, in cases where an abundance of consistent reviews concerning apparel products is available, consumers do not tend to experience product fit uncertainty as acutely, consequently resulting in fewer product returns (Wang et al., 2021).

Drawing upon previous findings, it is reasonable to anticipate that increased certainty about the fit of apparel products could mitigate concern with fit, subsequently fostering a propensity to engage in apparel product purchases. In this context, 'certainty' pertains to the degree of accuracy and confidence an individual holds concerning a particular aspect and functions as a mechanism through which consumers evaluate their decisions during transactions (Olsen, 1999). Olsen (1999) determined that when consumers were highly certain in their evaluation of products, they tended to show higher buying behavior compared with those who were less certain in their evaluation. Additionally, increased levels of perceived certainty generate favorable outcomes such as satisfaction (Campbell et al., 2004). Consequently, within the scope of this research, consumers' positive certainty regarding the fit of apparel products before purchase is denominated as "overall certainty of fit" (OCF).

Flat displays, which include little information about body fit, might allow consumers to focus on the essential information derived from the product image without evoking body-related dissatisfaction, as opposed to human displays, which represent the fit of someone else's body. This is plausible considering individuals' limited capacity for cognition (Kakaria et al., 2023; Xi

et al., 2022). In online shopping contexts, information overload may arise due to complexity, which reduces consumers' desire to visit a shopping site (Huang, 2000). Simultaneously, an overload of information, particularly when it is complex or sensory, can overwhelm individuals and result in information overload (e.g., Malhotra, 1984). From this, it can be inferred that when consumers seek information about the fit of apparel products online, a simple flat display might facilitate a more effective assurance of fit compared to a human display, particularly for basic and simple products that do not require critical body fit information.

H2. OCF will mediate the effect of display type on purchase intention and WTP.

3. The Moderating Role of Need for Touch

To explore the relationship between display types and consumers' overall certainty of fit (OCF) in online shopping, it's important to consider the role of Need for Touch (NFT), specifically instrumental NFT. NFT refers to an individual's inclination to acquire and process information through the haptic sensory system (Peck & Childers, 2003). Instrumental NFT, characterized as an outcome-directed product touch with a salient purchase goal, involves the consumer's conscious effort to gather information for making product-related decisions (Peck & Childers, 2003).

Research indicates that instrumental NFT significantly impacts consumer behavior in online shopping. For instance, consumers with high instrumental NFT prefer vivid and clear product presentations (Flavián et al., 2017) and exhibit higher levels of imagery elaboration and haptic imagery in response to stimuli such as dresses (Park, 2006). Additionally, these consumers tend to have higher choice confidence when using touchscreens, as they can better imagine the haptic properties of products displayed on these devices (Hattula et al., 2023). Conversely, individuals with low instrumental NFT benefit more from mental simulations triggered by touch devices, leading to a higher positive product attitude (Lee & Choi, 2021).

In the context of online apparel shopping, where consumers cannot physically touch products, vicarious touch becomes crucial. Vicarious touch, incorporated through advertising or pictures, enables consumers to imagine touching products, thereby aiding their decision-making process (Peck et al., 2013; Pino et al., 2020). This is particularly relevant for consumers with high instrumental NFT, who might prefer human displays (showing someone wearing the product) over flat displays, as the former can serve as a substitute for physical touch, enhancing their certainty of fit. Given these insights, it is hypothesized that instrumental NFT will moderate the effect of display type on OCF, which will, in turn, influence purchase intention and WTP.

H3. Instrumental NFT will moderate the mediation effect of OCF between the display type and purchase intention.

Below is the research model of the study (Fig. 1).

III. Method

1. Stimuli

The stimuli were created with a product image (a shirt) downloaded from the Internet. A shirt was selected because it is gender-neutral and basic designed. We particularly chose a shirt as an item that is not much influenced by fit importance. To provide evidence for this, a pre-test was conducted ($N = 38$), involving four product categories (a shirt, blouse, jeans, and dress) in a within-subject design. A repeated-measure ANOVA on fit importance showed that the fit importance for the shirt ($M = 5.16$, $SD = 1.62$) was significantly lower than for the other three products ($M_{\text{blouse}} = 5.95$, $SD = 1.02$, $p = 0.002$; $M_{\text{jeans}} = 6.12$, $SD = 1.28$, $p < 0.001$; $M_{\text{dress}} = 5.71$, $SD = 1.23$, $p = 0.020$). Next, photos of the two display types (human and flat) were created, with only the upper half of the body visible for the human display, while for the flat display condition, only a product image was provided (Fig. 2).

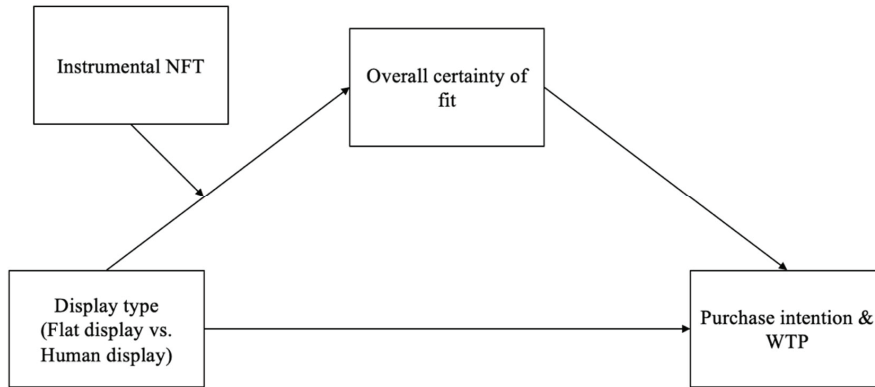


Fig. 1. The research model.



Fig. 2. Stimuli (top: flat display; bottom: human display).

2. Design and Procedures

A one-factor (flat vs. human) between-subject experiment was designed. A total of 222 participants were recruited through the online survey platform, Prolific. After the attention check, 212 responses were used for the analysis ($M_{age} = 33.37$, 49.1% female, detailed demographic information is presented in Table 1). Data was collected from 29th to 30th April 2024. The experiment procedure was as follows: First, the participants were randomly assigned to one of the two experimental conditions. After seeing product images, participants were asked to complete the questionnaires including dependent variables. The moderator, instrumental NFT was measured while asking for demographic information, to avoid the effect of the experimental condition.

Table 1. Demographic information of respondents

Age		Sex		Ethnicity	
M	SD		Percentage		Percentage
33.37	7.56	Female	50.0%	White	71.7%
		Male	49.1%	Black or African American	10.8%
		Others	0.9%	Hispanic	6.6%
				Asian	8.0%
				Other	2.9%

3. Measurements

The dependent variable is purchase intention ($\alpha = 0.96$), adapted from Qu and Baek (2024). The overall OCF ($\alpha = 0.89$) scale was edited from the measurements of overall concern with fit (Rosa et al., 2006) and was measured on a seven-point Likert scale (1 = “Very important,” and 7 = “Not at all important”). Instrumental NFT ($\alpha = 0.89$) scale was based on Peck and Childers (2003). Instrumental NFT and purchase intention were measured on a seven-point Likert scale (1 = “strongly disagree,” and 7 = “strongly agree”). WTP was used with a sliding scale that ranged from \$0 to \$200 in USD to measure “the maximum price a buyer is willing to pay” (e.g., Wertebroch & Skiera, 2002).

IV. Results

1. Measurement Assessment

To test the reliability of constructs was established

using AMOS 26 and SPSS. As shown in <Table 2>, Cronbach’s alpha values of the constructs are higher than 0.7, meaning that the items of each construct are internally consistent. In the confirmatory factor analysis results, the constructs’ composite reliability (CR) values also showed ideal values, ranging from 0.90 to 0.96. The validity was assessed. Factor loadings of all the measurement items were higher than 0.7, which was accepted. The values of average variance extracted (AVE) exceeded 0.6. These results confirmed the convergent validity. The discriminant validity of the model was also checked. The square root of the AVE values is greater than the squared correlation coefficient between the constructs (Table 3). The model fit indices for the confirmatory factor analysis were revealed to be acceptable ($\chi^2(41) = 89.11, p < 0.001$, CFI = 0.97, TLI = 0.97, NFI = 0.95, RMSEA = 0.08).

2. The Main Effect of Display Type

One-way ANOVA indicated a significant effect of

Table 2. Results of confirmatory factor analysis

Construct	Measurements items	Factor loadings	Cronbach's α	CR
Purchase intention ($M = 3.55$, $SD = 1.60$)	How likely would you be to buy this product?	0.97	0.96	0.96
	How inclined are you to buy this product?	0.93		
	How willing are you to buy this product?	0.92		
Overall certainty of fit ($M = 4.27$, $SD = 1.53$)	Do you think the product would give the right fit?	0.86	0.89	0.90
	Do you think the product would fit you?	0.87		
	Do you think the product would give the right impression?	0.77		
	Do you think the product would match your style?	0.80		
Instrumental NFT ($M = 4.53$, $SD = 1.49$)	I place more trust in products that can be touched before purchase.	0.84	0.90	0.90
	I feel more comfortable purchasing a product after physically examining it.	0.82		
	If I can't touch a product in the store, I am reluctant to purchase the product.	0.77		
	I feel more confident making a purchase after touching a product.	0.89		

Table 3. Testing discriminant validity

	Purchase intention	OCF	Instrumental NFT
Purchase intention	0.89	0.54	0.14
OCF	0.29	0.69	0.08
Instrumental NFT	0.02	0.01	0.69

The numeric value of the diagonal: AVE (average variance extracted); The numeric value of the bottom of the diagonal: Squared correlation coefficient (Φ^2); The numeric value of the top of the diagonal: Correlation coefficient.

display type on purchase intention. Participants exhibited greater purchase intention when viewing the flat display condition than the human display condition ($M_{\text{flat}} = 3.77, SD = 1.56; M_{\text{human}} = 3.33, SD = 1.61; F(1, 21) = 4.15; p = 0.043$), showing the purchase intention for flat (vs. human) display is higher, supporting H1a. Similarly, an ANOVA on WTP revealed a higher WTP in the flat display condition compared to the human display condition ($M_{\text{flat}} = 29.58, SD = 14.56; M_{\text{human}} = 26.26, SD = 14.35; F(1, 21) = 2.78; p = 0.097$) at a marginal level, supported H1b (see Fig. 3).

3. The Moderating Role of Instrumental NFT for the Effect of Display Type on OCF

We conducted a moderated mediation analysis in

the Hayes' PROCESS macro (Preacher & Hayes, 2008) using Model 1 (5,000 bootstrapping samples) (Hayes, 2017) with display type (0 = human display, 1 = flat display) as the independent variable. In this analysis, OCF was the dependent variable and instrumental NFT was the moderator. The result showed the moderating effect of instrumental NFT on OCF was significant ($\beta = -0.33, SE = 0.14, p = 0.02$). The Johnson-Neyman (JN) point for OCF was 3.35, suggesting that the positive effect of flat (vs. human) display on OCF was significant for those who have lower instrumental NFT than 3.35 (on a 7-point scale), the difference disappeared for those who have instrumental NFT higher than the JN point. <Fig. 4> shows the result of the moderated mediation effect of instrumental NFT on OCF.

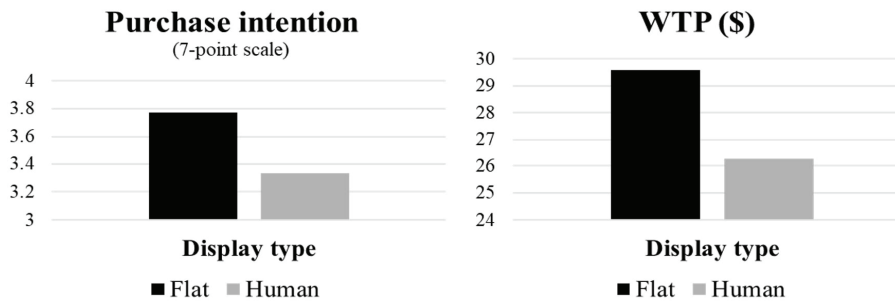


Fig. 3. Main effect of display type on purchase intention & WTP.

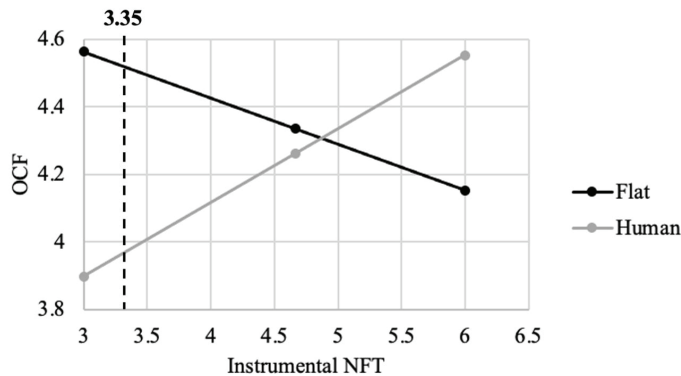


Fig. 4. The moderated mediation effect of instrumental NFT on OCF.

4. The Moderated Mediation Effect

Next, we conducted a moderated mediation analysis in the Hayes' PROCESS macro (Preacher & Hayes, 2008) using Model 7 (5,000 bootstrapping samples) (Hayes, 2017) with display type (0 = human display, 1 = flat display) as the independent variable. In this analysis, purchase intention was the dependent variable, OCF was the mediator, and instrumental NFT was the moderator. The result was significant (indirect effect = -0.18, SE = 0.08, CI_{95%} = [-0.35, -0.03]). Similarly, the result was also significant for WTP as the dependent variable (indirect effect = -1.16, SE = 0.57, CI_{95%} = [-2.38, -0.13]). The moderated mediation effect was significant. These results supported H2 and H3.

V. General Discussion

This study examined the effect of product displays (flat vs. human) on consumers' purchase intention and WTP in the online retailing context, with the mediating role of OCF and the moderating effect of instrumental NFT. The results showed that the flat (vs. human) display led to a higher purchase intention and WTP. Additionally, when consumers have low instrumental NFT, the flat display was more effective in inducing higher OCF than the human display. The positive effect of flat (vs. human) display on OCF appeared for those with a low instrumental NFT (lower than 3.35 out of a 7-point scale). On the other hand, when consumers have high instrumental NFT, there is no significant difference between the flat display and the human display on OCF.

The findings of this research diverge from trends observed in previous studies (Bagatini et al., 2023; Boardman & McCormick, 2019; Kim et al., 2009; Yoo & Lennon, 2014). Previous studies have shown that human models wearing or displaying apparel products significantly influence consumers' purchasing decisions, often surpassing the efficacy of flat displays (Bagatini et al., 2023; Boardman & McCormick, 2019; Kim et al., 2009; Yoo & Lennon, 2014). However, this

study reveals that flat displays elicited higher purchase intention and WTP compared to human displays.

We conjecture that this discrepancy arises from differences in the core mechanisms and product characteristics. While prior research focuses on mental stimulation as facilitating factors for display type in leading to purchase intention (Bagatini et al., 2023), this study highlights the effect of OCF perception in explaining how display type affects purchase intention. Specifically, using a basic shirt that has relatively less critical importance for body fit (based on our pretest results), the current study suggests that flat displays can more positively affect online shoppers' fit perception and behavioral intentions than human displays. In other words, for clothing items that consumers can easily imagine fitting well, displaying the item on a human model does not necessarily increase purchase intention or WTP.

Furthermore, we attribute the lack of a superior effect from human displays over flat displays to factors such as information overload and contamination concerns. Since individuals have a limited capacity for cognitive load, increased task complexity can reduce performance and fluency if it exceeds their workload capacity (Kakaria et al., 2023; Xi et al., 2022). Consequently, information complexity can diminish consumers' desire to visit a shopping site (Huang, 2000). Additionally, concerns about product contamination may arise simply from seeing a product displayed on a human model, even virtually. When human models wear apparel products in displays, this perception of contamination can lead to decreased product evaluations and WTP (Argo et al., 2006). This could be further studied empirically in future studies.

This study also highlights the distinctive moderating role of instrumental NFT. Results revealed that the positive effect of flat display over human display on OCF disappeared for those with high instrumental NFT. This suggests that even for clothing that allows for easy fit simulation and does not necessarily need to be displayed on a human model, those with a high NFT still require some fitted image to satisfy their tactile

needs. For them, a more vivid and clear simulation through a human display results in higher purchase intention and WTP.

This study has some limitations. First, since stimuli that inherently have little importance of fit (a basic shirt) were used in this research, future research could employ products that have high importance of fit (e.g., a fitted dress or a formal suit) and examine the interaction effect between fit importance and display type. Furthermore, as our investigation focused primarily on apparel products designed for wearing on the body, future research could expand the scope to include product categories with minimal fit considerations, such as bags, shoes, and accessories. This comprehensive approach would facilitate a deeper exploration of how different display methods impact consumers' purchase intention across diverse product categories, thereby enhancing our understanding of the effect of visual product presentation in online retailing. Third, the underlying mechanism of the moderating effect of the instrumental NFT on OCF could be studied in future research. As we conjectured in the discussion, consumers may have perceived a different level of cognitive load or contamination concerns when viewing a product display over a human body compared to a flat one. Thus, future research should investigate factors such as contamination concern (Argo et al., 2006), ease of imagining products (Flavián et al., 2017), and/or cognitive overload (Kakaria et al., 2023; Xi et al., 2022) to corroborate the current findings.

1. Acknowledgement

Not applicable.

2. Ethics and consent

Not applicable.

3. Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

4. Conflicting interests

Not applicable.

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6. Authors' contributions

HZ developed research ideas/hypotheses, designed experiments, conducted empirical analysis, and drafted initial manuscript. EB supervised the experimental design and empirical analysis and reviewed the manuscript. All authors read and approved the final manuscript.

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