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Factors that affect consumer trust in product quality: a focus on online reviews and shopping platforms

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The growing popularity of online shopping means that consumers must determine product quality after they make a purchase decision and receive the product, a situation that is directly related to the issue of consumers' trust toward retailers. This study analyzes the marginal willingness to pay for attributes that influence consumer trust and purchasing decisions regarding products whose quality can only be determined after they are purchased. We select six attributes that influence trust in online shopping: (1) price, (2) number of reviews, (3) "star" rating, (4) review type (i.e., text, picture, and video), (5) length of text reviews, and (6) shopping platform. We conduct a conjoint survey by categorizing brands as famous and nonfamous and analyze the survey data using a multinominal logit model. The results reveal that consumers prefer high star ratings, a large number of reviews, and a trustworthy shopping platform, even if other similar products are less expensive. Additionally, feeling confident about a product's quality is more difficult for consumers in the case of nonfamous brands, which they have not experienced, compared with famous brands. The findings indicate that when consumers purchase products from nonfamous brands they are willing to pay more for all six attributes. These results can help retailers establish pricing strategies based on the value of trust by considering customer experience.

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Introduction

Online shopping allows consumers to search for and purchase all types of products, regardless of time or place. This convenience has led to explosive global growth in online shopping. Moreover, finding product information and comparing prices is easier online compared with in-person shopping. These factors make online purchasing more attractive to consumers. According to UN News (2021), online shopping as a percentage of all retail sales increased dramatically in 2020, from 16% to 19%. South Korea is an emerging nation characterized by widespread, high-speed Internet access and smartphone use, which has contributed to a surge in online shopping. In 2022, sales of online shopping malls in Korea were close to 210 trillion Korean won (KRW) (Statista, 2023). Over the past few years, the volume of online shopping has also grown steadily (Statista, 2023). This study investigates the key determinants of online shopping experiences of Korean consumers and their willingness to pay (WTP) for certain attributes in assessing product quality. Despite the advantages and convenience of online shopping, quality evaluation is difficult because consumers cannot directly experience the products they are buying. In particular, purchasing experience goods (e.g., clothes and cosmetics) online involves certain limitations, including the difficulty of evaluating the quality of these products until they are experienced in person. Consumers make purchase decisions on the basis of information, including photos, provided by sellers. However, sellers may display an image that is better than the actual product, or they may be unable to provide accurate product information. Consequently, in certain cases, consumers deem the quality of a product when it is received to be different from what they expected.

For this reason, a consumer's trust in a product is an important factor in online shopping. Previous studies mention trust as an important factor due to its decisive effect on online purchase decisions. In particular, trust is essential for experience-based purchases (Grabner-Kraeuter, 2002). Thus, retailers expend much effort to promote trust; however, consumers still continue to find it difficult to make confident decisions when purchasing experience goods online. Online reviews (Fernandes et al. 2021; Tata et al. 2020) and trustworthy shopping platforms (Hong and Cho, 2011) help provide consumers with confidence and convince them to make a purchase. Brand value is also an important factor in trust. According to Lau and Lee (1999), a brand's reputation influences trust in that brand. Muslim et al. (2019) propose that brand image and trust exert a positive causal relationship on the purchase of products from that brand. Ultimately, brand values such as image and reputation influence trust in and product purchases from that brand. However, having trust in experienced goods, especially when shopping for them online, is difficult. For this reason, people tend to shop online based on product reviews posted by others or based on trust of a shopping platform (Abedin et al. 2019; Lackermair et al. 2013; Wu and Lin, 2017).

Many studies note that online reviews affect decisions to purchase or trust a product (e.g., Lackermair et al. 2013; Riasanow et al. 2015), and others find that shopping platforms affect product trust, although they only play a mediating role in product sales. However, few, if any, studies combine these factors to determine which are most important to and valued by consumers. Thus, we pose the following question: which attributes of online reviews and shopping platforms do consumers trust and ascribe economic value to when purchasing experience goods?

No global, unified guidelines exist for online reviews that the majority of consumers check before purchasing a product. According to online shopping malls operated in different countries, consumers may or may not be compensated for writing reviews, and guidelines vary widely. For example, in the United States, Amazon does not compensate reviewers because it deems that consumers perceive reviews as a monetary reward. However, in China and Korea, consumers are economically rewarded for writing reviews. One of China's online shopping malls, Taobao, proposed a rule to provide a small monetary compensation only when a buyer leaves a positive review (Duan et al. 2019). Naver, one of the largest shopping platforms in South Korea, has proposed that buyers receive a reward when they purchase products online and write a review, which could be positive or negative. Thus, while the importance of reviews is increasing, no universal global guideline exists for such reviews.

This study focuses on the fact that consumers are highly dependent on reviews when purchasing experience goods online (Bei et al. 2004; Huang et al. 2009) and that shopping platforms want to generate trust among consumers (Sebastianelli and Tamimi, 2018). We seek to determine which attributes are most important to consumers in assessing product quality and the economic value assigned to these attributes. Trust in a brand varies according to the consumer's impression of that brand's value (Lau and Lee, 1999); thus, we aim to identify which products hold greater economic value among those with and without brand value. Hereafter, trust, as discussed in this study, is defined as a factor that influences purchase decisions by boosting consumer confidence in the quality of the product. The trust serves important functions for consumers by reducing perceived risk in online transactions and helping them to cope with uncertainty (Pavlou et al. 2007). Uncertainty in this context refers to the quality of products offered online, as assessing quality online is more difficult than with traditional offline (in-person) purchases (Grabner-Kraeute, 2002). Although online sellers provide information about their products to consumers, uncertainty about product quality remains, particularly with respect to experience goods for which quality can only be evaluated after the consumer experiences them first-hand. For example, the true quality of clothes, a type of experience goods, can only be evaluated through physical attributes such as fit and texture. Online reviews written by previous customers provide an indirect experience for new customers who are considering a purchase, helping them to assess product quality and reducing product uncertainty (Hu et al. 2008). The existing literature proposes that reviews, star ratings, and reliable shopping platforms can increase trust regarding experiential products.

The remainder of this study is structured as follows. First, we develop six key attributes that influence trust based on actual online shopping malls and the existing literature. Second, we collect data through a conjoint survey that presents products and services as a combination of characteristics using an orthogonal design. Third, we calculate average relative importance (RI) and marginal willingness to pay (MWTP) based on the results of a multinomial logit model. Finally, we suggest strategic implications based on the value of trust to enhance consumers' experiential factors.

Related literature

Factors influencing trust—online reviews and shopping platforms

Online reviews

Number of reviews, star ratings, review types, and text review length: Consumers rely on the content of reviews, number of reviews, and ratings to help in making purchase decisions (Riasanow et al. 2015). Previous studies find that high star ratings are more trustworthy and more reliable than low ones (Wu and Lin, 2017; Hong and Pittman, 2020). Online reviews created by previous consumers who have purchased the products are evolving from text to photo and video formats. Image-based reviews

improve consumers' understanding of experience goods more than search goods (Liu and Du, 2019). Xu et al. (2015) classify online product reviews as based on text, images, and videos and provide evidence that video-based reviews are more trustworthy than text-based reviews, and Agrawal and Mittal (2022) show that consumers prefer video reviews of products prior to purchasing online. Shopping platforms in South Korea provide additional reward points or mileage and encourage previous customers to post lengthier reviews that include detailed information and use of the product (Yi and Oh, 2021). Amazon suggests that written reviews be at least 20 words and no more than 5,000 words. The ideal length is 75–500 words (Amazon, 2022).

The majority of shopping platforms not only show content provided by reviewers but also provide the total number of reviews posted for a product and the average scores reviewers gave, and text reviews, photos, and videos are categorized separately. For text reviews, a shopping platform may set a minimum and maximum for the number of characters a review can include. In this manner, various attributes are combined in reviews on shopping platforms to provide information to potential purchasers and offer consumers confidence in the product in different ways but it is important to know which factors consumers consider more important.

Review guidelines of several countries: There are no universal guidelines or clear standards for writing online reviews; each country or shopping platform establishes its own standards. Many online shopping platforms offer reward points or miles to customers who write reviews, and these rewards can be exchanged for discounts on future purchases, free products, or other perks. These programs can help other buyers make purchasing decisions by considering reviews about the experiences previous consumers had with the products. For example, in South Korea, the platform Naver provides points when a consumer writes a review. Additionally, sellers can freely set and provide additional points for text, photo, or video reviews. Sellers are paid the sales price, excluding the value of the points paid to buyers. Sellers of household goods set 50 won for text reviews and 150 won for text and photo or video reviews, respectively. Sellers of cosmetics pay buyers 150 won for text reviews and 350 won for text and photo or video reviews (Table 1). Some platforms offer higher rewards for reviews of specific products or services, while others award a fixed number of points for all reviews. In other words, no guidelines exist regarding the number of points sellers pay to buyers, apart from points the platform provides for writing reviews. 11Street, a global shopping portal service from South Korea's leading shopping portal company, offers a fixed number of points. Buyers receive 50 points for providing text and photos of 10 characters or more and 100 points for video reviews. These points can be used to obtain discounts when purchasing other products in the future. Taobao, the largest shopping platform in China, lacks a review reward program that directly pays customers directly for their reviews. However, Taobao sellers offer incentives to customers who leave positive reviews, such as offering discounts or coupons on their next purchase (Duan et al. 2019). Previous studies show that positive reviews increase trust in sellers and allow them to sell the same product as other sellers at a premium price (Guo et al. 2011). Amazon lacks an official reward program for customers who write reviews but operates a program called Amazon Vine through which insightful reviewers receive free products from vendors. This provides an opportunity to share product experiences with other Amazon customers, helping them make purchasing decisions.[1]

Shopping platform. To maximize product sales, retailers use multiple channels, not only building their own shopping malls but also using shopping platforms provided by third parties. In South Korea, there are different types of online retailers, characterized by Rha et al. (2021) as online open markets (e.g., Gmarket) and online platforms (e.g., Naver shopping). Currently, Korean open market companies mainly consist of large open markets such as Coupang, Gmarket, Auction, and 11Street. Online platforms (e.g., Naver shopping) are bigger and more expansive than open markets. As an example, Naver began as a search platform for comparing product prices and connecting online shopping malls. It has expanded its influence in the online market by providing a shopping platform similar to an open market.

Previous research notes that well-known shopping platforms can promote trust to help consumers make purchase decisions. Sebastianelli and Tamimi (2018) organize virtual web pages for Amazon (as an example of a famous shopping platform) and Nile (a nonfamous shopping platform) to determine the impact of an online shopping platform's reputation on consumer trust. In this study, we classify shopping platforms into three levels, namely personal shopping malls independently operated by individuals or companies, open markets that connect consumers and sellers, and online platforms, which are more expensive than open markets, such as information brokerage services.

Relationship between brand value and trust. Consumers with high levels of trust in retail brands offline perceive those brands' websites more favorably and are more likely to purchase from them compared with other consumers (Zhang and Wang, 2021). A trusted and universally recognized retail brand can take the lead over a relatively small or new company in adopting a new business format (Kim and Jones, 2009). As mentioned above, evaluating the quality of experience goods is difficult before purchasing and using them. However, once they experience the quality of these goods, when consumers repurchase the same brand, they already know the quality (Alba et al. 1997).

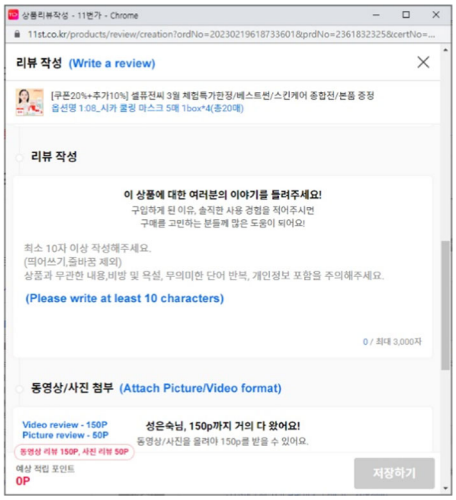
Consumers want to purchase products whose quality can be understood through experience, and brand names reduce uncertainty (Grabner-Kraeuter, 2002). Park and Lennon (2009) find that well-known brands influence purchase intentions and an online store's image. Reputation is important in online shopping (Qalati et al. 2021), and reputation-building is an important factor for lesser-known vendors by informing them of return and refund policies (Jarvenpaa et al. 2000). Positive online customer reviews increase the value of unknown products and help weak brands to create trust that is difficult to establish on their own (Ho-Dac et al. 2013). According to Liu (2023), famous brands reduce uncertainty for consumers purchasing goods whose quality is difficult to evaluate without first-hand experience. However, consumers face difficulties making purchase decisions involving nonfamous brands due to uncertainty. Thus, we examine the attributes that consumers view as important for building trust in nonfamous brands.

Relationship between experience goods and online review. A marketing viewpoint allows us to classify goods as either experience goods or search goods based on the attributes of product-related information. Search goods are products whose characteristics consumers can clearly determine prior to purchase (e.g., books). In contrast, experience goods refer to products whose characteristics consumers can only know after purchase (e.g., clothing) (Sebastianelli and Tamimi, 2018). Nelson (1970) states that experience goods are those that consumers must directly purchase and consume to evaluate quality. *Experience* can also refer to creating a preferred brand through multiple purchases. This study defines experience goods as products for which consumers lack complete certainty regarding quality and characteristics prior to consuming or using them.

The impact of online reviews may differ according to product type. In this study, we focus on experience goods, as evaluating

Table 1 Screenshots of reward points for writing reviews on online platforms and open markets in South Korea.

Shopping platform	Online platform (Naver shopping)	Open market (11Street)
Point system for posting reviews (text, photo, and video)	Sellers are authorized to set the points rewarded for writing reviews.	The shopping platform sets the points rewarded by sellers for reviews



quality prior to purchase is difficult due to the nature of experience goods, and thus consumers evaluate these products based on information provided by the retailer and reviews written by other consumers. An online shopping review is defined as a peer-generated direct evaluation of the product (Mudambi and Schuff, 2010). Attribute-based reviews provide a robust informational description of the product, while experience-based reviews provide subjective and emotional content (Luan et al. 2016). Consumers of experience goods tend to prefer experience-based reviews over those that are attribute-based because the characteristics of the product cannot be readily known before purchasing. Huang et al. (2009) find that consumers spend more time looking at reviews when purchasing experience goods than search goods, and Bei et al. (2004) find that consumers seeking to purchase experience goods frequently use online information provided by other consumers because they value the source of online information and tend to use online information more. As such, online shopping reviews provide important information and help potential consumers make decisions to purchase experience goods. As online shopping grows, consumers can access more useful and valuable online product reviews, which are a major factor in product evaluation (Luan et al. 2016).

Reviews written by consumers are an important factor in decision-making for various product purchases, but the attributes of reviews that are important for search versus experience goods may differ. In this study, we recognize that making a purchase decision involving experienced goods is risky due to the difficulty of evaluating quality and obtaining information before purchasing these products. We focus on the important attributes of reviews and shopping platforms for experience goods that can reduce uncertainty and influence customer trust.

Methodology

Conjoint analysis. We use conjoint analysis to analyze consumer preferences and the economic value of online shopping attributes that influence trust. Conjoint analysis refers to the product or service to be analyzed as a combination of several attributes and attribute levels. Underlying this notion is the theory of value proposed by Lancaster (1966), which emphasizes that people decide whether or not to buy a particular product based on a combination of product attributes. Here, a hypothetical alternative card that represents goods or services is presented to a survey respondent. In this manner, we create a virtual environment similar to the experience of purchasing products that consumers face. Respondents collect data via a choice, ranking, or rating written on each card according to their preference, and a researcher analyzes the respondents' preference systems. Additionally, this approach estimates consumers' WTP based on a composition of attributes by understanding the degree to which the combined attributes of the product influence consumers' evaluations (Green and Srinivasan, 1978).

To use a conjoint analysis, we must first determine the attributes and attribute levels for alternative cards. The levels are determined by referring to the existing literature and actual online shopping malls for attributes that influence trust. We use six attributes (price, number of reviews, star rating, type of review, length of text review, and shopping platform) and corresponding attribute levels that influence trust in online shopping, as shown in Table 2.

Multinomial logit model. We use a multinomial logit model, a type of discrete choice model, as shown in Eq. (1):

$$U_{nj} = V_{nj} + \epsilon_{nj} = \sum \beta' x_{nj} + \epsilon_{nj}, \quad (1)$$

where U_{nj} denotes the utility of consumer n when selecting alternative j, β' represents a vector that consists of estimates of each attribute, x_{nj} is the vector of attribute x, V_{nj} pertains to observable attributes (i.e., number of reviews, star ranking, types of review, the length of text reviews, and shopping platform), and $\in$ refers to unobservable attributes.

Suppose a consumer, who possesses the same utility shown in Eq. (1), selects alternative j between two alternatives (i or j) because alternative j provides more utility than alternative i. In this case, the multinomial choice model can be expressed as shown in Eq. (2). The equation shows only two alternatives;

Table 2 Attributes and attribute levels of online shopping.

Attributes		Explanation and attribute levels
Price[a]	Explanation	Price of the product in the online store (retailers sell products that are nearly the same but have slight differences)
	Levels	① Price: 50,000 KRW ② Price: 52,000 KRW ③ Price: 54,000 KRW
Number of reviews	Explanation	Total number of reviews left by customers who have previously purchased the product
	Levels	① 1 ② 10 ③ 100 ④ 1000
Star ratings	Explanation	Average star rating of purchase reviews left by customers who have previously purchased the product (based on a five-star rating)
	Levels	① ★ (one-star rating) ② ★★★ (three-star rating) ③ ★★★★★ (five-star rating)
Review type	Explanation	Format of reviews from customers who have previously purchased the product
	Levels	① Text reviews ② Text + picture reviews ③ Text + video reviews
Text review length[b]	Explanation	If the number of words in a text review is <20, it is classified as a general review; if the review has >300 words, it is classified as a premium review
	Levels	① General Reviews (<20 words) ② Premium Reviews (>300 words)
Shopping platform	Explanation	A shopping mall is divided into a personal shopping mall, open markets, and a personal shopping mall located on an online platform provided by Naver shopping. Hiphoper, Hyber, Stylec, and TheXshop are names of shopping malls
	Levels	① Personal shopping mall (Hiphoper, Hyber) ② Open market (Gmarket) ③ Online platform (Stylec, TheXshop)

[a]KRW (Korean won) is the currency of Korea. As of April 3, 2023, 1 USD is equal to 1,315.00 KRW.
[b]We excluded reviews that range from 20 to 300 words because too many examples would be included when making the choice cards. For example, not only 100-word reviews but also 300-word reviews could be included in medium reviews; however, we cannot show all of these cases due to the limited number of choices established for the survey.

however, in reality, more than two alternatives exist.

$$P_{nj} = \text{Prob}\left(V_{ni} + \epsilon_{ni} < V_{nj} + \epsilon_{nj}, \forall\, i \neq j\right) = \text{Prob}(\epsilon_{ni} < \epsilon_{nj} + V_{nj} - V_{ni}, \forall\, i \neq j). \quad (2)$$

The logit model assumes type-1 error (Gumbel distribution); thus, the choice possibility can be expressed as shown in Eq. (3).

$$P_{nj} = \frac{e^{V_{nj}}}{\sum_i e^{V_{ni}}} = \frac{e^{\beta' x_{nj}}}{\sum_i e^{\beta' x_{ni}}}. \quad (3)$$

Choice possibility indicates that when consumer n chooses alternative j, this formula is called multinomial logit.

We calculate the relative importance (RI) and MWTP based on the results of the multinomial logit model. Relative importance is the influence of a given attribute, expressed as a percentage, when selecting one of various alternatives and can be calculated using part-worths. This study calculates the RI of each consumer, which is divided by the number of consumers N. Finally, we calculate the RI. In Eq. (4), the part-worth of attribute k refers to the value obtained by multiplying the interval of the level of attribute k by the estimated coefficient. RI is obtained by calculating the ratio of attribute k to the sum of the partial values of all attributes.

$$\text{RI}_k = \frac{1}{N}\sum_{n=1}^{N}\frac{\text{part} - \text{worth}_{nk}}{\sum_k \text{part} - \text{worth}_{nk}} \times 100. \quad (4)$$

MWTP is mainly used in economics and is referred to as the monetary value of a consumer's WTP in order to preserve one's utility per unit of specific attribute changes. In this study, we calculate MWTP, as expressed in Eq. (5).

$$\text{MWTP}_k = \left[-\frac{\partial U_i/\partial x_i}{\partial U_i/\partial p_i}\right] = \left[-\frac{\beta_{ik}}{\beta_{i(\text{price})}}\right]. \quad (5)$$

Survey and data

Survey design. We selected six attributes, with 3, 4, 3, 3, 2, and 3 attribute levels, so combining them produces a total of 648 alternatives ($3 \times 4 \times 3 \times 3 \times 2 \times 3$). However, selecting enough respondents would be difficult if we used all 648 alternatives. Therefore, we apply the fractional factorial design using the orthogonal design embedded in SPSS Statistics 25 (IBM, Armonk, NY), which produces 25 final alternatives. Among the variants of conjoint analysis, we employ the choice-based one to identify consumer preferences in online shopping.

An important feature of this study is that we distinguish between famous and nonfamous brands, which are classified into two categories. Therefore, a total of 50 choice cards are composed of five choice situations, which are shown on five choice cards for each set. The respondents decide on 10 choice cards (five cards each for famous and nonfamous brands; see the sample alternatives in Fig. 1). For example, in a scenario in which long-sleeve T-shirts are to be purchased, the respondents would select only one out of the five alternative cards. Specifically, the respondents are instructed as follows: considering price, number of reviews, star ranking, type of reviews, length of text reviews, and shopping platform, choose the preferred online shopping service. Five surveys each were conducted for the purchase of famous (Nike brand) and nonfamous (no brand name) products. The respondents answered a total of 10 questionnaires and examined 50 alternative cards. Figure 1 presents a sample used in the conjoint survey.

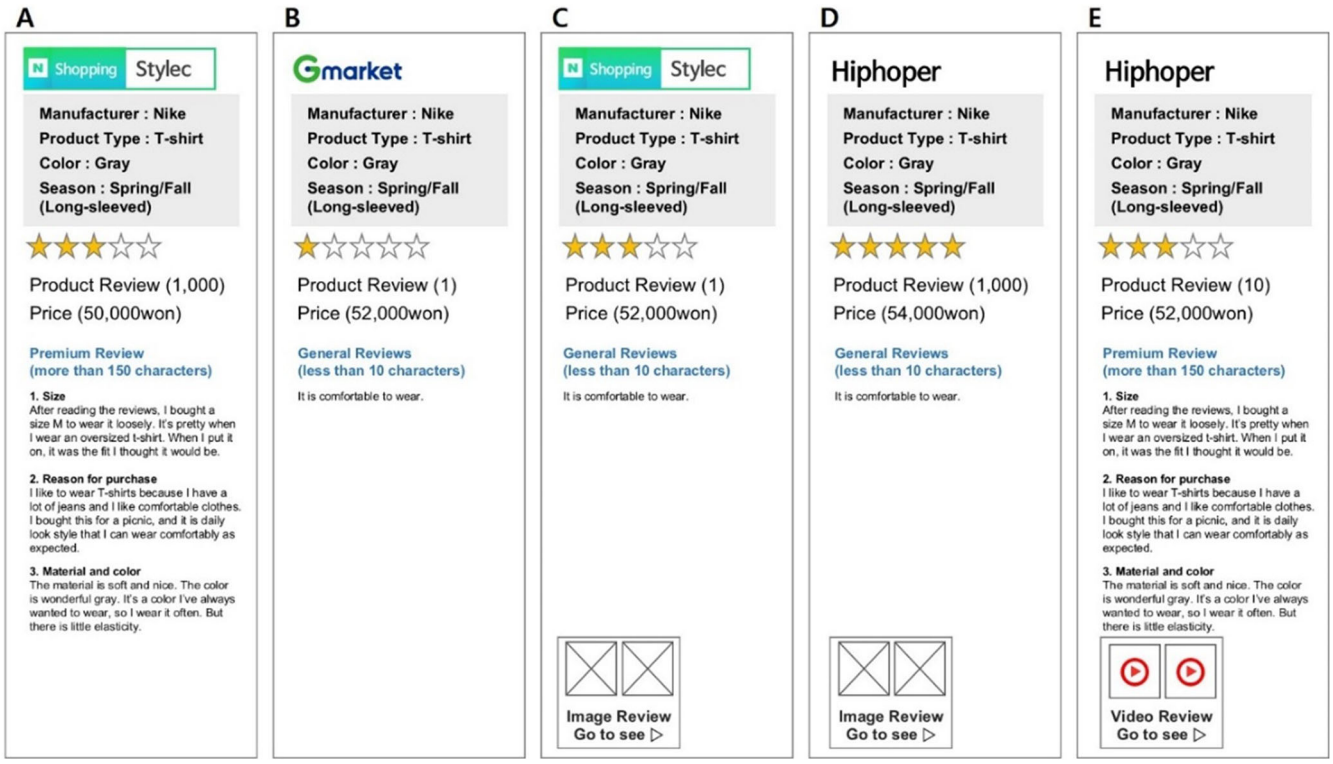


Fig. 1 A sample alternative card in famous long-sleeve T-shirt brand survey questionnaire.

Data collection. A total of 528 consumers participated in the experiment over the period from April 28, 2021 to May 4, 2021. The survey was conducted by a survey company in South Korea. The online panel, created by the company, consisted of consumers with experience in online shopping nationwide, covering various age groups from 20 to 50 years, which includes millennials and Generation Z. The questionnaire was intended for respondents who have used online shopping (i.e., online, mobile, or both) services within the last three months. Table 3 shows that the respondents included 50.19% of men and 49.81% of women and was nearly evenly distributed by age group (22.73%, 21.21%, 27.84%, and 28.22% for the 20–29, 30–39, 40–49, and 50–59 age groups, respectively). In terms of occupation, office workers or technicians (46.21%) account for the greatest proportion of the respondents.

Table 3 Descriptive statistics.

Item		Frequency	Percentage
Gender	Male	265	50.19%
	Female	263	49.81%
Age	20–29	120	22.73%
	30–39	112	21.21%
	40–49	147	27.84%
	50–59	149	28.22%
Education level	High school or below	83	15.72%
	University	49	9.28%
	Bachelor	348	65.91%
	Higher education (Masters and PhD)	48	9.09%
Occupation	Household	58	10.98%
	Student	55	10.42%
	Professional/free vocational	57	10.80%
	Office worker/technician	244	46.21%
	Self-employed	35	6.63%
	Service worker	24	4.55%
	Elementary worker	25	4.73%
	Unemployed	7	1.33%
	Others	23	4.36%

Results

We seek to identify which attributes are relatively more important in online shopping and the price consumers are willing to pay for each attribute. The analysis is divided into two parts to determine the importance and economic value from the consumers' perspective. In the first part, we analyze consumer preferences and MWTP for each attribute of online shopping, assuming that consumers intend to purchase long-sleeved T-shirts, which are experience goods. In the second part, products are classified as either a famous manufacturer brand (Nike) or a lesser-known manufacturer's brand (no brand name). We analyze the importance and MWTP of each attribute in formulating strategies for selling experience goods offered by famous and nonfamous brands.

Initial analysis. Table 4 shows that among the attributes of online shopping services, the star rating is the most important factor for consumers (RI = 28.75%). The star rating has a greater effect than the number of reviews in evaluating product quality and increasing purchase intention, a finding that is consistent with Flanagin et al. (2014). The order of the relative importance of the other attributes is as follows: number of reviews (RI = 17.38%), online platform (RI = 12.03%), price (RI = 10.83%), premium reviews (RI = 10.26%), open market (RI = 8.27%), picture reviews (RI = 7.39%), and video reviews (RI = 5.10%). Interestingly, these results indicate that consumers considered star rating, number of reviews, online shopping platform, and premium reviews to be more important than price when making an online shopping decision. Lastly, we find that consumers prefer to shop on trusted shopping platforms and prefer reviews written by other consumers.

Table 4 Results for online sales of long-sleeved T-shirts (famous brand: Nike).

Attribute	Attribute scale	Coefficient (std. err)	Relative importance (%)	MWTP (KRW)
Price	KRW (\)	−0.0002*** (0.0000)	10.83	-
Number of reviews	Number	0.0011*** (0.0000)	17.38	642.80/100 reviews
Star rating	Number	0.4446*** (0.0156)	28.75	2655.95
Picture review	Yes/no	0.4570*** (0.0673)	7.39	2730.21
Video review	Yes/no	0.3155*** (0.0704)	5.10	1885.00
Premium review	Yes/no	0.6345*** (0.0511)	10.26	3790.43
Open markets	Yes/no	0.5114*** (0.0583)	8.27	3055.26
Online platforms	Yes/no	0.7442*** (0.0746)	12.03	4446.08

*std.err means standard error.

We calculate MWTP to determine the economic value of each attribute, as shown in Table 3. When making online purchases, consumers face uncertainty in evaluating product quality, especially in terms of experience products. Consumers frequently use reviews to address product quality uncertainty (Wu et al. 2013). The MWTP for reviews is 6.428 KRW, increasing to 642.80 KRW and 6428 KRW when the number of reviews reaches 100 and 1000, respectively. In the case of a star rating, the MWTP per star is 2655.95 KRW. Based on this, products with average reviews of four stars are expected to sell at a price that is 7967.85 KRW higher than a similar product with one-star reviews. The respondents disclosed that they would pay 2,730.21 KRW more for text + picture reviews and 1885.00 KRW more for text + video reviews. Reviews with pictures and/or videos can increase customer trust by providing more intuitive information than text reviews alone. We define reviews with over 300 words as premium reviews and find that the MWTP for such reviews is 3790.43 KRW, which is higher than for general reviews containing fewer than 20 words. Premium reviews include more information about the consumer's experience with the product, which can increase consumer confidence and promote purchase decisions (Mudambi and Schuff, 2010). This finding is consistent with Cao et al. (2011), who find that longer reviews are more helpful. To encourage customers to write premium reviews after purchase, online shopping companies in South Korea offer more rewards to consumers.

Sellers often sell the same products simultaneously through shopping malls and platforms. Our results show that when purchasing from a trustworthy shopping platform compared with a personal shopping mall, the study participants were willing to pay 4446.08 KRW and 3055.25 KRW on online platforms and open markets, respectively. We found that even when a product of similar quality is available, the amount that consumers will pay varies according to the shopping platform. For example, a product that can be purchased for 50,000 KRW at a personal shopping mall can be priced as high as 54,446.08 KRW on an online platform. Given this, we conclude that retailers will sell more on trusted shopping platforms, such as online platforms or open markets, than on personal shopping malls with 400 reviews. Hence, using a trusted shopping platform to sell experience goods is helpful in the early stages of a product's life when no reviews are posted. Consumers' MWTP can be used as a reference for online retailers in establishing pricing policies for their products.

Additional analysis (famous versus nonfamous brands). We expect to see a difference in the importance of these attributes for experience goods offered by famous versus nonfamous brands for online shoppers, which we analyze separately here. Table 5 presents the results.

When purchasing a famous brand, the relative importance of the attributes is as follows: star rating (RI = 28.75%), number of reviews (RI = 17.38%), online platforms (RI = 12.03%), price (RI = 10.83%), premium reviews (RI = 10.26%), open markets (RI = 8.27%), picture reviews (RI = 7.39%), and video reviews (RI = 5.10%). However, when purchasing a nonfamous brand the relative importance for the attributes is somewhat different, as follows: star rating (RI = 29.18%), number of reviews (RI = 18.39%), online platforms (RI = 11.69%), premium reviews (RI = 10.36%), price (RI = 9.49%), open markets (RI = 7.86%), picture reviews (RI = 7.09%), and video reviews (RI = 5.95%). For nonfamous brands, premium reviews were considered to be more important than price, but not for famous brands.

Analyzing the respondents' MWTP, we find they would pay 642.80 KRW to purchase a product from a famous brand when the number of reviews is 100. However, respondents answered that they would pay 776.30 KRW to purchase nonfamous products with the same number of reviews. This suggests that when consumers purchase products from nonfamous brands, they prefer one with reviews to reduce quality risks, even when the product is more expensive than a similar product that has fewer reviews. In the case of star rating, the respondents would pay 2655.95 KRW more and 3076.04 KRW more to purchase a product from famous and nonfamous brands, respectively. For reviews with a picture and text, the respondents would pay 2730.21 KRW and 2988.61 KRW to purchase products from famous and nonfamous brands, respectively. In the case of video reviews with text, they would pay 1885.00 KRW more for famous brands compared to 2509.49 KRW more for nonfamous brands, and for premium reviews, they would pay 3790.43 KRM more and 4368.33 KRW more for famous and nonfamous brands, respectively, compared with general reviews. In the case of open markets, they would pay 3055.26 KRW and 3313.40 KRW more for famous and nonfamous brands, respectively. Moreover, the respondents stated that they would pay 4446.08 KRW and 4931.55 KRW for famous and nonfamous brands, respectively, on online platforms. These results suggest that brands that are relatively unknown can sell products at a higher price using shopping platforms. We also find that products sold on shopping platforms can receive many choices from consumers. Another interesting result is that MWTP is higher when consumers are purchasing nonfamous brands across all attributes. The same result is seen in Zhu and Zhang (2010), who find that when consumers purchase a game that is also an experience good, consumer reviews are more influential for less popular games compared with those for popular games. Our results show that nonfamous brands command a relatively high MWTP because consumers trust online platforms and open markets more than they do famous brands. This finding is consistent with previous studies that show the reputation of shopping platforms influences initial trust formation (Sebastianelli and Tamimi, 2018).

Conclusion and study limitations

Discussion and implications. We examine six attributes related to online reviews and shopping platforms that influence consumer

Table 5 Estimation results for a nonfamous long-sleeved T-shirt brand (no brand name).

Attributes	Attribute scale	Coefficient (std. err)	Relative importance (%)	MWTP (KRW)
Price	KRW (\)	−0.0002*** (0.0000)	9.49	-
Number of reviews	Number	0.0012*** (0.0001)	18.39	776.30/100 reviews
Star rating	Number	0.4620*** (0.0158)	29.18	3076.04
Picture review	Yes/no	0.4489*** (0.0689)	7.09	2988.61
Video review	Yes/no	0.3769*** (0.0706)	5.95	2509.49
Premium review	Yes/no	0.6561*** (0.0513)	10.36	4368.33
Open markets	Yes/no	0.4976*** (0.0585)	7.86	3313.40
Online platforms	Yes/no	0.7407*** (0.0756)	11.69	4931.55

*std.err means standard error.

trust. When consumers buy experience goods online, they particularly value reviews and the type of shopping platform. Kim et al. (2012) find that trust is the most important factor in purchase decisions, which is consistent with the findings in this study; that is, reviews and shopping platforms are the most important attributes in online purchase decisions. Specifically, the most important attribute for consumers in selecting an online shopping service is star rating (RI = 28.75%; MWTP = 2655.95 KRW per star).

Premium reviews (those with more than 300 words) have a higher MWTP than of general reviews because premium reviews increase the quality of information. The lengthier the review, the more information; therefore, consumers are more interested in longer reviews and evaluate them as useful (Salehan and Kim, 2016).

The trust provided by the platform in online shopping reduces the risk created by the uncertainty consumers face regarding products and purchase decisions. E-retailer reputations exert the greatest influence on building initial trust (Sebastianelli and Tamimi, 2018). The respondents reported that when using a trustworthy shopping platform, they would be willing to pay 4446.08 KRW and 3055.26 KRW for online platforms and open markets, respectively, instead of personal shopping malls. Thus, the preference for online platforms and MWTP were significantly different versus open markets.

The majority of shopping platforms impose referral fees on sellers, with online platform fees (e.g., Naver) of approximately 5% and open market fees (e.g., Gmarket) of approximately 13%. Online platforms have the advantage of strong consumer preference and MWTP but produce lower sales commissions than open markets do. This difference has implications for building trust with consumers and increasing sales in the early stages of a product's life. If no reviews or star ratings are posted for experience goods, it is difficult for consumers to make purchase decisions. Online shopping vendors that use a trusted shopping platform improve their chances of being selected by consumers.

Our study shows that when purchasing a nonfamous brand, consumers assign high levels of importance to star ratings, the number of reviews, premium reviews, and the type of online platform rather than the price. Interestingly, MWTP is higher when consumers are making a decision to purchase nonfamous brands than when buying famous brands across all attributes studied. In other words, consumers rely more on reviews when purchasing nonfamous brands. For example, when deciding where to buy a similar product from a nonfamous brand, consumers show a willingness to buy from a large shopping platform even if they have to pay more than they would pay for a famous brand (4931.55 KRW more versus 4446.08 KRW more). Using conjoint analysis, we identify the attributes that consumers consider to be influential in purchasing products. Keen et al. (2004) noted that the retail format (Internet, catalog, and retail) is more important than the price for a CD, which is a low-cost, low-risk product; however, price is more important for a computer, which is a high-cost, high-risk product. For low-cost, low-risk products, consumers show higher levels of MWTP at higher prices to obtain the product quickly. This result is consistent with previous findings that consumers are more willing to pay for nonfamous brands than for famous brands when purchasing products because predicting quality is difficult. Without brand awareness, it takes more effort for consumers to evaluate attributes and make decisions. Thus, reviews exert a greater impact on sales for weak brands than for strong brands.

This study provides insights into the online shopping industry and other business practitioners. Many existing studies related to trust in online shopping focus on determining the factors that influence trust, but few studies categorize and analyze the characteristics of consumer goods in detail. The results here indicate that experience goods, reviews, star ratings, and shopping platforms can increase product trust and that consumers may be willing to pay more for products of the same perceived quality. Online shopping companies in South Korea offer points/mileage to buyers who write reviews based on their experience with a given product. Online shopping sellers offer cashback, mileage, and rewards for consumers who write positive reviews, which can influence consumer purchase decisions (Duan et al. 2022). However, to the best of our knowledge, there is no data regarding the degree of importance of these reviews; thus, rewards are set based on a company's discretion. Our results provide guidelines on the value of consumer reviews to online shopping companies across different types of shopping platforms. In the case of nonfamous brands, assessing product quality is difficult. Our results confirm that the price that consumers are willing to pay differs according to reviews and type of shopping platform for the difference between brands. A seller pays a referral fee to sell in a store on a shopping platform (e.g., Amazon or eBay). When a product of similar quality is sold on trusted shopping platforms, consumers are willing to purchase it even if the price is higher. Based on these results, online shopping companies can consider whether or not selling in a store on a shopping platform can result in higher sales, even if they have to pay a sales commission. In the case of experience goods and nonfamous brand products, we find that reviews, star ratings, and types of shopping platforms can increase product trust and serve as a basis for gaining the trust of consumers.

Limitations and suggestions for future studies. Our study has certain limitations. First, our analysis is limited to experience goods, so the generalizability of the results may be limited. Future research could be extended to other product groups, such as search goods, building on these results.

Second, due to the use of conjoint analysis, we could not apply all combinations of attributes and attribute levels. Thus,

the study considered several sub-attributes based on an analysis of the existing literature and the judgment of the researchers. Moreover, conjoint analysis poses unavoidable limitations. Therefore, the attribute levels that influence trust that the study did not consider should be expanded and analyzed.

Third, to determine the MWTP, we chose clothing as our experience good, calculated the representative price by referring to actual online shopping, and conducted a survey. We verified prices through three pilot surveys and literature studies; however, the price range used and the difference between the lower and higher price ranges could be expanded. Additional research using other product groups and price ranges would provide useful information for retailers.

Fourth, despite the rapid development of online shopping, risks remain when making purchase decisions. We analyze the RI of shopping platforms, MWTP, and reviews as factors of trust that can compensate for difficulties in purchasing goods online. Naver, which was classified as a search engine in South Korea until recently, is expanding its influence on online shopping by combining search services with fees that are lower than those of other open markets. Meanwhile, Google, the leading global search engine, intends to move into the online shopping market by strengthening its shopping search function. Therefore, future studies should conduct additional research to expand the types of platforms to include global search engines and open markets.

Fifth, in the case of a discrete choice experiment, there is a possibility of attribute non-attendance or deliberate randomization. In this study, either or both may have occurred due to the cognitive effort of having to make 10 choices. However, people have substantial experience reviewing choices in the digital world, and this is a familiar subject. In addition, the deliberate subjects may not occur because we ensured that the number of attributes did not exceed seven, which is the maximum number that can be memorized; thus, excessive cognitive efforts would not be required. Further studies could aim to address this by dividing subjects into famous and nonfamous goods.

Lastly, this study presents research that can be analyzed with a mixed logit model, which is similar to existing studies. However, we used the multinomial logit model to compensate for the less favorable heterogeneity of the consumers who write the reviews. The attributes valued by consumers who write reviews differ according to the brand (or lack thereof) of experience goods sold in online shopping platforms. Therefore, considering the differences in the amount the consumers are willing to pay for each attribute is noteworthy. Researchers could re-analyze this aspect using a mixed logit model in a future study.

Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Note

1 See https://www.amazon.com/vine/about in detail.

References

Abedin E, Mendoza A & Karunasekera S (2019) What makes a review credible? Heuristic and systematic factors for the credibility of online reviews. In: Australasian conference on information systems

Agrawal SR, Mittal D (2022) Optimizing customer engagement content strategy in retail and E-tail: available on online product review videos. J Retail Consum Serv 67:102966

Alba J, Lynch J, Weitz B, Janiszewski C, Lutz R, Sawyer A, Wood S (1997) Interactive home shopping: consumer, retailer, and manufacturer incentives to participate in electronic marketplaces. J Market 61(3):38–53

Amazon (2022) Product reviews—AWS Marketplace. https://docs.aws.amazon.com/marketplace/latest/buyerguide/buyer-product-reviews.html

Bei LT, Chen EY, Widdows R (2004) Consumers' online information search behavior and the phenomenon of search vs. experience products. J Fam Econ Issues 25(4):449–467

Cao Q, Duan W, Gan Q (2011) Exploring determinants of voting for the "helpfulness" of online user reviews: a text mining approach. Decis Support Syst 50(2):511–521

Duan Y, Chen C, Huo J (2019) The impact of monetary rewards for online reviews. Asia Pac J Market Logist 31(5):1486–1515

Duan Y, Liu T, Mao Z (2022) How online reviews and coupons affect sales and pricing: An empirical study based on e-commerce platform. J Retail Consum Serv 65:102846

Fernandes S, Venkatesh VG, Panda R, Shi Y (2021) Measurement of factors influencing online shopper buying decisions: a scale development and validation. J Retail Consum Serv 59:102394

Flanagin AJ, Metzger MJ, Pure R, Markov A, Hartsell E (2014) Mitigating risk in ecommerce transactions: perceptions of information credibility and the role of user-generated ratings in product quality and purchase intention. Electron Commer Res 14(1):1–23

Grabner-Kraeuter S (2002) The role of consumers' trust in online-shopping. J Bus Ethics 39(1):43–50

Green PE, Srinivasan V (1978) Conjoint analysis in consumer research: issues and outlook. J Consum Res 5(2):103–123

Guo S, Wang M & Leskovec J (2011) The role of social networks in online shopping: information passing, price of trust, and consumer choice. In: Proceedings of the 12th ACM Conference on Electronic Commerce. pp 157–166

Ho-Dac NN, Carson SJ, Moore WL (2013) The effects of positive and negative online customer reviews: do brand strength and category maturity matter? J Market 77(6):37–53

Hong IB, Cho H (2011) The impact of consumer trust on attitudinal loyalty and purchase intentions in B2C e-marketplaces: Intermediary trust vs. seller trust. Int J Inf Manag 31(5):469–479

Hong S, Pittman M (2020) eWOM anatomy of online product reviews: interaction effects of review number, valence, and star ratings on perceived credibility. Int J Advert 39(7):892–920

Hu N, Liu L, Zhang JJ (2008) Do online reviews affect product sales? The role of reviewer characteristics and temporal effects. Inf Technol Manag 9:201–214

Huang P, Lurie NH, Mitra S (2009) Searching for experience on the web: an empirical examination of consumer behavior for search and experience goods. J Market 73(2):55–69

Jarvenpaa SL, Tractinsky N, Vitale M (2000) Consumer trust in an Internet store. Inf Technol Manag 1(1):45–71

Keen C, Wetzels M, De Ruyter K, Feinberg R (2004) E-tailers versus retailers: which factors determine consumer preferences. J Bus Res 57(7):685–695

Kim BY, Kim J, Kan YY (2012) Analysis of consumer preferences for cosmetic essence-for-men via choice-based conjoint with new design of choice sets. Kor J Appl Stat 25(6):987–997

Kim HW, Xu Y, Gupta S (2012) Which is more important in Internet shopping, perceived price or trust? Electron Commer Res Appl 11(3):241–252

Kim S, Jones C (2009) Online shopping and moderating role of offline brand trust. Direct Market 3(4):282–300

Lackermair G, Kailer D, Kanmaz K (2013) Importance of online product reviews from a consumer's perspective. Adv Econ Bus 1(1):1–5

Lancaster KJ (1966) A new approach to consumer theory. J Polit Econ 74(2):132–157

Lau GT, Lee SH (1999) Consumers' trust in a brand and the link to brand loyalty. J Mark Focused Manag 4:341–370

Liu H (2023) Comparative analysis of fresh food e-commerce brand attitudes based on STM theme model. PLoS ONE 18(3):e0282521

Liu Y, Du R (2019) The effects of image-based online reviews on customers' perception across product type and gender. J Glob Inf Manag 27(3):139–158

Luan J, Yao Z, Zhao F, Liu H (2016) Search product and experience product online reviews: an eye-tracking study on consumers' review search behavior. Comput Hum Behav 65:420–430

Mudambi SM, Schuff D (2010) Research note: what makes a helpful online review? A study of customer reviews on Amazon. com. MIS Q 34(1):185–200

Muslim M, Mubarok RR, Wijaya NHS (2019) The effect of brand image, brand trust and reference group on the buying decision of sneakers. Int J Financ Account Manag 1(2):105–118

Nelson P (1970) Information and consumer behavior. J Polit Econ 78(2):311–329

Park M, Lennon SJ (2009) Brand name and promotion in online shopping contexts. J Fash Market Manag 13(2):149–160

Pavlou PA, Liang H, Xue Y (2007) Understanding and mitigating uncertainty in online exchange relationships: a principal-agent perspective. MIS Q 31(1):105–136
Qalati SA, Vela EG, Li W, Dakhan SA, Hong Thuy TT, Merani SH (2021) Effects of perceived service quality, website quality, and reputation on purchase intention: The mediating and moderating roles of trust and perceived risk in online shopping. Cogent Bus Manag 8(1):1869363
Rha JY, Lee B, Nam Y, Yoon J (2021) COVID-19 and changes in Korean consumers' dietary attitudes and behaviors. Nutr Res Pract 15(Suppl 1):S94–S109
Riasanow T, Ye HJ & Goswami S (2015). Generating trust in online consumer reviews through signaling: an experimental study. In: 2015 48th Hawaii international conference on system sciences. IEEE, p 3307–3316
Salehan M, Kim DJ (2016) Predicting the performance of online consumer reviews: a sentiment mining approach to big data analytics. Decis Support Syst 81:30–40
Sebastianelli R, Tamimi N (2018) E-tailer website attributes and trust: understanding the role of online reviews. Online Inf Rev 42(4):506–519
Statista (2023) Online shopping transaction volume in South Korea from 2010 to 2022. https://www.statista.com/statistics/280922/b2c-e-commerce-sales-in-south-korea/
Tata SV, Prashar S, Gupta S (2020) An examination of the role of review valence and review source in varying consumption contexts on purchase decision. J Retail Consum Serv 52:101734
UN News (2021) Global e-commerce jumps to $26.7 trillion, fuelled by COVID-19. https://news.un.org/en/story/2021/05/1091182
Wu TY, Lin CA (2017) Predicting the effects of eWOM and online brand messaging: source trust, bandwagon effect and innovation adoption factors. Telemat Inform 34(2):470–480
Wu J, Wu Y, Sun J, Yang Z (2013) User reviews and uncertainty assessment: a two stage model of consumers' willingness-to-pay in online markets. Decis Support Syst 55(1):175–185
Xu P, Chen L, Santhanam R (2015) Will video be the next generation of e-commerce product reviews? Presentation format and the role of product type. Decis Support Syst 73:85–96
Yi J, Oh YK (2021) The informational value of multi-attribute online consumer reviews: a text mining approach. J Retail Consum Serv 65:102519
Zhang X, Wang T (2021) Understanding purchase intention in o2o e-commerce: the effects of trust transfer and online contents. J Theor Appl Electron Commer Res 16(2):101–115
Zhu F, Zhang X (2010) Impact of online consumer reviews on sales: the moderating role of product and consumer characteristics. J Market 74(2):133–148

Competing interests
The authors declare no competing interests.

Ethical approval
This article does not contain any studies with human participants performed by any of the authors.

Informed consent
Since the experiment was conducted through one of a survey company, the company received consent instead and asked for it.

Additional information
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