

## **An empirical investigation into the effectiveness of cost transparency: Evidence from apparel brands**

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### **Abstract:**

This study investigates the impact of cost transparency on consumers' perceptions of the brand and intentions to purchase its products. It also examines whether product-related attributes (product price and country-of-origin (COO) and consumer characteristics (socially responsible consumer behavior) moderate the effectiveness of cost transparency. Findings show that providing consumers with detailed cost breakdowns would lead to higher perceived quality and value and a more favorable brand attitude when compared to the conditions in which detailed cost information is not provided. The results also indicate that the cost transparency strategy is an effective way to generate a more favorable brand attitude, especially for lower-priced brands. Consumers who are more socially responsible in their behaviors perceived higher quality and expressed higher purchase intention for brands engaging in cost transparency practices. Theoretical and practical implications were also discussed.

**Keywords:** Cost transparency | consumer evaluation | apparel industry | socially responsible consumer behavior | product price

### **Article:**

#### **Introduction**

In today's saturated fashion apparel marketplace, firms actively seek ways to differentiate themselves to stand out in the business arena. One such method used by fashion apparel companies is highlighting their business authenticity and integrity through 'radical' business transparency (McKinsey & Company November 28, 2019; Septianto et al. 2021). This 'radical'

transparency may help firms communicate their innovative operational practices and highlight core organizational values, such as truthfulness, integrity, and sustainability, which play a critical role in a hyper-competitive business environment (Södergren 2021; Septianto et al. 2021).

Recent market research shows that consumers demand transparent cost information because it allows them to effectively evaluate products and make conscious purchase decisions (McKinsey & Company November 28, 2019). Cost transparency, one unique type of business transparency emerging in today's competitive environment, refers to the seller sharing cost-related information with the buyer, in many cases showcasing costs of materials, labor, transport, duties, etc. (Simintiras et al. 2015b; Peschel and Aschemann-Witzel 2020). As cost information represents the norm of secrecy in business organizations, disclosure of costs demonstrates differentiation and innovativeness and highlights 'radical' transparency (McKinsey & Company November 28, 2019; Septianto et al. 2021). Moreover, cost transparency increases consumer perceptions of fairness and justice because consumers see a firm's disclosure of cost information as a socially (and morally) orientated business accomplishment (Singh 2015; Carter and Curry 2010; Septianto et al. 2021).

Although there are an increasing number of examples of greater operational transparency in supply chains, cost transparency in consumer markets is not widespread. While supply chain transparency and price transparency are commonly discussed in the literature, very limited empirical research has been conducted on cost transparency, despite several conceptual and viewpoint papers discussing the topic in general. Literature also indicates that characteristics of the product and consumers could impact the effectiveness of companies' socially responsible business practices, such as cost transparency (Carter and Curry 2010; Mohr and Webb 2005). For example, Mohan, Buell, and John's study (2020) suggests that cost transparency becomes less effective as product price increases. Mohan, Buell, and John (2020) call for future research to explore additional, complementary mechanisms of the beneficial impact of cost transparency. Buell and Kalkanci's study (2021) implies that consumer reactions to corporate social responsibility transparency also depend on the consumer's traits because consumers are predicted to respond more positively to companies whose transparency initiatives are better aligned with their own moral foundations. However, very few studies to date have empirically investigated how other variables moderate the effect of business transparency practices. To the best of our knowledge, there has been no previous research on how product attributes and consumer traits interact with cost transparency in consumers' purchase decision-making, such as their evaluation of product quality and product value, their brand attitude, and purchase intention. Thus, there is still a gap in the literature concerning how marketers can best practice cost transparency. Particularly, examining how to effectively use the cost transparency strategy is critical for maximizing its benefits.

This study is an effort to address the above-stated gap. It aims to respond to the recent call from Septianto et al. (2021), who noted the need for investigating cost transparency, its marketing communication implications, and its boundary conditions. As apparel is the biggest non-food consumer goods category worldwide (Statista 2022) and business transparency is emerging as a critical strategy for fashion apparel companies, this study investigates the impact of apparel company's cost transparency business practice on consumers' perceptions of the apparel brand and intentions to purchase its product. Specifically, it examines the conditions under which cost transparency can be more (vs. less) effective. Thus, besides the effects of cost transparency on consumer evaluation of the product and brand attitude, in this study, we are also interested in whether product-related attributes (e.g., product price and country-of-origin (COO))

and consumer characteristics (e.g., socially responsible consumer behavior) would affect whether or how strongly consumers respond to an apparel company's cost transparency business practice. Therefore, three research questions guided this study to fill the literature gap: (1) How does cost transparency impact consumers' perceptions of the brand and intentions to purchase its products? (2) How do product-related attributes moderate cost transparency effectiveness? And (3) How do consumer characteristics, such as socially responsible consumer behavior, moderate the effectiveness of cost transparency?

## Literature review

### Theoretical grounding - signaling theory

In this study, we employed signaling theory to examine the effect of cost transparency on consumer behavior. The signaling theory has been used to study information asymmetry reduction in a competitive environment (Cambier and Poncin 2020). Information asymmetry happens when one entity – be it an organization or individual – has private information that would be useful for another entity's decision-making (Connelly et al. 2011). In the business context, signaling theory has often been applied to understand how a buyer and seller deal with asymmetric information before the actual purchase behavior occurs. It examines whether or how a business organization or individual communicates its specific worth to their buyers or consumers. Under the condition of information asymmetry, a signal serves as an extrinsic cue (e.g., brand name, price, advertising, etc.) to the product itself that buyers or consumers use to evaluate the product and make inferences about its quality or value (Kirmani and Rao 2000). The seller can use the signal to convey information credibly about unobservable product quality to the buyer (Rao, Qu, and Ruckert 1999). Thus, the essence of signaling theory focuses on intentional signals of the unobservable characteristic of quality.

In the branding context, signaling theory indicates that the marketing strategies embedded in a brand, such as transparent cost information, serve as an extrinsic cue, signaling product and brand information to consumers. Cost transparency can be used as a credible signal from which consumers may infer perceived product quality, perceived value, and brand integrity. Since transparency and sustainability normally go hand in hand, the cost transparency strategy also provides a compelling opportunity for firms that already endorse sustainability or integrity principles. Literature maintains that consumers develop favorable perceptions toward business organizations providing transparent information (Bhaduri and Ha-Brookshire 2011). It is suggested that delivering appropriate signals is an essential strategy for business success as this strategic action is likely to decrease information search cost and perceived risk while enhancing the perceived value of the product or brand, especially in the situation where consumers lack sufficient information about product quality and product value before purchasing the product. Thus, this research considers a firm's cost transparency as a positive signal that can trigger consumers' favorable attitudes towards a brand and its products. This study specifically considers the boundary conditions of cost transparency business practice. The study contributes to signaling theory by providing empirical evidence on how other variables moderate the effect of cost transparency signal. Practically, the study suggests how marketers can best practice cost transparency signals for maximizing their benefits.

### Cost transparency for apparel brands

Lamming et al. (2001, 6) initially introduced the concept of cost transparency as ‘The sharing of costing information between customer and supplier, including data which would traditionally be kept secret by each party, for use in negotiations.’ Their study examined cost transparency in the context of supplier–company communication. In the context of brand–consumer communication, cost transparency refers to the brand’s disclosing product’s direct unit cost information to consumers, which can effectively improve the consumers’ decision-making regarding the price fairness and perceived value of the product (Singh 2015; Simintiras et al. 2015b). More specifically, in practice, cost transparency offers a breakdown of various items, including costs of materials, labor, duties, and transport (Septianto et al. 2021). The literature argues that from the company’s perspective practicing cost transparency will make firms more conscious of both the cost and pricing aspects of their products. Therefore, cost transparency would encourage companies to achieve more efficient utilization of resources, greater business transparency and efficiency, and competitive advantage (Simintiras et al. 2015b; Singh 2015).

Cost transparency, a disruptive trend in today’s business environment, is being accelerated by the intensely competitive marketplace, the powerful Internet, and the emerging sustainability movement (Singh 2015). In the apparel retail market, brands predominantly implement opaque pricing (i.e., a single number), which offers no information about the allocation of the apparel retail prices among the entities which bring an apparel product to market (Carter and Curry 2010). Thus, cost transparency is an innovative alternative strategy in which cost breakdown information is displayed so that the brands can justify their selling price and enhance their perceived value (Lowe 2015). Cost transparency offers clues about the price-setting process that increases consumer perceptions of procedural justice, price fairness, and other components of social utility. In contrast, opaque pricing or single number pricing mainly triggers economic considerations (Carter and Curry 2010; Ferguson and Scholder Ellen 2013).

Business transparency plays an essential role for apparel brands today. According to a report from McKinsey & Company (November 28, 2019), the apparel industry is characterized by its complex global supply chains and challenging business conditions. The pressure on apparel brands to enhance their business transparency is, therefore, escalating. Due to the growing concerns for social and environmental responsibility and the rise in the importance of business transparency, an increasing number of apparel brands apply a cost transparency strategy to share the cost structure of their products to their consumers, aiming to build a favorable brand image (Mohan, Buell, and John 2020). For example, several innovative fashion companies, such as Everlane, Oliver Cabell, and Nudie Jeans Co, have leveraged innovative practices and processes to clearly show their customers how their products are sourced, manufactured, and even priced for final markup (Strähle and Merz 2017; Egels-Zandén, Hulthén, and Wulff 2015; Singh 2015; Septianto et al. 2021). Apparel firms can utilize cost transparency to achieve resource conservation, greater differentiation, and competitive advantage. By showing itemized costs, apparel retailers utilize cost transparency to provide a clear justification for their retail prices, which may lead to consumers’ favorable perception of the given retail prices. Additionally, through cost transparency, these companies tell their customers the stories behind product components and operations details.

Table 1 compares this study with research that examines cost transparency. Previous research has explored the potential role of cost transparency for businesses and consumers (Jung, Jeong Cho, and Ellie Jin 2020; Kim, Kim, and Rothenberg 2020; Mohan, Buell, and John 2020; Lowe 2015; Simintiras et al. 2015b, 2015a; Singh 2015; Septianto et al. 2021; Yang and

Francesca Battocchio 2021). However, prior research is either conceptual in nature or has not provided empirical evidence of whether or how product attributes and consumers traits affect consumers' response to apparel firms' cost transparency. Simintiras et al. (2015b)'s study suggests that consumers do not always consider prices at their face value but in a broader perspective and ascribe greater meaning to them much above their monetary value. Thus, it is necessary to examine when the context (e.g., the different levels of the product price and the COO cues) and consumer attributes (e.g., socially responsible consumer behavior) influence consumers' response to cost transparency. Thus, the authors of the present study believe this work would contribute to cost transparency literature and lead to an impact on practice.

**Table 1.** Comparison of this study with previous research examining cost transparency of apparel consumer-firm relationship.

Author(s)/Study	Research Focuses and Key Findings	Independent Variables and Dependent Variables	Product/ Brand Focuses	Research Method	Data Analysis Method
Lowe (2015)	The purpose of this paper is to provide a viewpoint about the role of cost transparency in consumer markets and whether or not consumers should request cost transparency from sellers. The study maintains that cost transparency is not "necessary," and there are many situations where it might not influence consumer choice, but it is an attribute of the product that consumers may request and is a way for competitors to communicate their value proposition more clearly.	N/A	N/A	Viewpoint	N/A
Kuah & Weerakkody (2015)	This article focuses on the negative impacts arising from market, price and cost transparency. Recognizing the role that the Internet plays in promoting price transparency, it espouses how extant information can add costs and risks to the consumer's value judgment. Finally, the paper advocates that arbitrary judgments existing in cost accounting make it difficult to compare unit costs. This could result in consumers paying extra money to benefit from cost transparency.	N/A	N/A	Viewpoint	N/A

Singh (2015)	This paper is a thought piece in response to the paper by Simintiras et al. (2015a), “Should Consumers Request Cost Transparency?” Arguments based on past research and company practices show that companies practicing cost transparency can increase their customer following, brand loyalty, differentiation, and ultimately, profits.	N/A	Online apparel retailer “Honest By”	Viewpoint	N/A
Simintiras et al. (2015a)	The authors call for empirical studies to shed light on issues, including, but not limited to, drivers and challenges/ barriers of making unit cost available; appropriateness of unit cost information for different categories of products; information overload caused by cost transparency; effect of availability of unit cost on the consumer decision- making; empowerment of consumers through unit cost information; the impact of cost transparency on the realization of fairness, differentiation, competitive advantage and sustainability for businesses; and impact of cost transparency on market dynamics and consumer behavior.	N/A	N/A	Viewpoint	N/A
Simintiras et al. (2015b)	The measure for enabling a consumer price fairness judgment is unit cost information – the cost incurred by a firm to produce a product and/or service. The benefits and challenges stemming from the availability of unit cost information (i.e., cost transparency) to consumers and companies are presented, and the likely impact of cost transparency on addressing information asymmetries between buyers and sellers is discussed.	N/A	N/A	Conceptual	N/A
Sinha (2000)	The article argues that better-quality products, creative pricing strategies, imaginative bundling, and innovative thinking can all	N/A	N/A	Viewpoint / Conceptual	N/A

	<p>help keep cost transparency from overwhelming a seller's ability to maintain brand loyalty and obtain relatively high-profit margins. Those managers who best understand the dynamics of cost transparency on the Net will be most prepared for the challenge.</p>				
Jung, Jeong Cho, and Ellie Jin (2020)	<p>This study investigated how the framing of cost information affects perceived gains and losses and tested the mediating roles of gain and loss perceptions in the relationship between cost information and price fairness, which in turn, increase buying intentions toward the apparel brand. The results showed that disclosing the true cost and markup of a product along with its retail price was a more effective way to increase the perceived gain of buying and also the loss of not buying the product than when only the retail price was presented. Differently framed cost information triggered price fairness and buying intentions only through gain perceptions but not through loss perceptions. The results of this research demonstrate the power of cost transparency using reference points for effective apparel brand strategies.</p>	<p>IV: cost information (multi-categorical variable)            DVs: perceived gains, losses, price fairness, and buying intentions</p>	Apparel	Experimental design Online survey	Confirmatory factor analysis (CFA), structural equational modeling
Mohan, Buell, and John (2020)	<p>Six studies conducted in the field and in the lab examine the effect of cost transparency on consumer purchase behavior, providing evidence of when and why the beneficial effect of cost transparency emerges. Taken together, the studies imply that the proactive revelation of costs can improve a firm's bottom line.</p>	<p>IV: cost transparency            DVs: willingness to buy, trust, and price fairness</p>	Fashion retail	Experiment design Online survey Experimental	ANOVA, mediation analysis
Kim, Kim, and Rothenberg (2020)	<p>The purpose of this study is to investigate how consumers react to fashion brands that provide price or production transparency. The study further examines whether the extent of information disclosure and perceived fairness</p>	<p>IVs: price/production fairness and price/production transparency            DVs: brand</p>	Fashion apparel	Experimental design Online survey	ANOVA, Tukey's HSD post hoc test

	of the information also play a role. The findings suggest that both price transparency and production transparency positively affect the overall brand equity and consumers' purchase intentions as long as the information is perceived to be fair regardless of the extent.	equity and purchase intention			
Septianto et al. (2021)	While prior research has explored why businesses should disclose their costs and how consumers may react to such cost transparency, it is still unclear how marketers can best communicate cost transparency. The research offers a practical examination of how and when cost transparency is effective, specifically by examining the moderating role of authentic and hubristic pride in the effectiveness of cost transparency. The results demonstrate that marketing messages that elicit authentic pride can increase the effectiveness of cost transparency.	IV: cost transparency DV: moral elevation and purchase likelihood MV: authentic (vs. hubristic) pride	Clothing brands	Experimental design Online survey	ANOVA, mediated moderation analysis
Yang and Francesca Battocchio (2021)	This study aims to understand the effects of brands' transparent communication (i.e., production transparency and cost transparency) on consumers' perceptions of a brand's perceived transparency and authenticity, as well as how such perceptions impact consumers' attitudes, trust, and behavioral intentions. The results revealed that transparency in the focal brand's communication of production and cost would increase consumers' perceptions of the brand's transparency and authenticity because of its perceived information sensitivity. Such positive effects were found to similarly impact consumers' attitudes, trust, and behavioral intention toward the brand.	IVs: transparent product and transparent cost DV: brand transparency, brand authenticity, and consumer response (brand trust, consumer attitude, behavior intention)	Fashion brands	Experimental design Online survey	ANOVA, confirmatory factor analysis, mediation analysis, ANCOVA
This study	Our study explored the	IV: cost	Apparel	Experimental	MANOVA,



	<p>conditions under which cost transparency can be more (vs. less) effective. We incorporated two product/brand-related factors (product price and country-of-origin) and one consumer characteristic variable (socially responsible consumer behavior) as moderators into the conceptual framework. Our results confirm that consumers respond positively to the detailed cost information disclosed by brands, and cost transparency could help create more favorable attitudes, especially for lower-priced brands. More importantly, cost transparency may be more effective among consumers who demonstrate a high level of social responsibility in their consumption behaviors.</p>	<p>transparency            DVs:            perceived quality, perceived value, brand attitude, and purchase intention            MVs: product price, Made in USA, and socially responsible consumer behavior</p>		<p>design            Online survey</p>	<p>ANOVA</p>
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IV – Independent variable; DV – Dependent variable; MV – Moderating variable.

### Development of hypotheses

#### The effects of cost transparency

As a relatively new practice in consumer–brand communications, cost transparency initiative is primarily driven by consumers (Mohan, Buell, and John 2020; Yang and Francesca Battocchio 2021). Revealing product and brand information that is usually hidden and sensitive breaks conventional business practices, resulting in higher perceived brand transparency (Yang and Francesca Battocchio 2021). Thus, cost transparency can be employed to develop intimacy between brands and consumers. Companies use this strategy to build trust and credibility with consumers (Ferguson and Scholder Ellen 2013; Mohan, Buell, and John 2020; Simintiras et al. 2015b) and as an innovative practice to communicate brands’ ethical and responsible operational processes (Septianto et al. 2021; Yang and Francesca Battocchio 2021). Simintiras et al. (2015b) have suggested that cost transparency deconstructs what’s behind the price sticker, thus reducing information asymmetry and giving consumers the opportunity to understand unit cost-price differentials better. Cost transparency will improve consumer decision-making and, therefore, enhance consumer empowerment (Simintiras et al. 2015b). A firm’s transparent practices can significantly impact consumers’ evaluations of and attitudes towards products, brands, and business organizations.

Cost transparency may serve as a quality signal through its informational effect (Seim, Ana Vitorino, and Muir 2017). According to the signaling theory, when consumers have little information about product quality before purchase or when product quality differentiation is low, brands with high-quality products may use the cost transparency strategy to send a desirable signal about their products. Providing detailed cost breakdowns can function as an informative

signal that a brand or firm can use to communicate credibly about unobservable product quality to the consumers (Kirmani and Rao 2000), enabling consumers to make a more thorough evaluation of the product and improving their perceptions of product quality. Thus, the following hypothesis is proposed:

H1a: Cost transparency positively impacts consumers' perceived quality of the product.

Cost transparency helps brands and retailers justify their selling prices by showing itemized costs. It allows consumers to better assess the product attributes and benefits and make more informed decisions (Seim, Ana Vitorino, and Muir 2017). Therefore, it improves consumer decision-making about what they pay for and what they get, enhancing their informed evaluations and judgments (Simintiras et al. 2015b). When consumers know what they are paying for, they can better understand the value of the products they purchase. Therefore, by strategically sharing cost information with consumers, cost transparency practice may enable consumers to form price fairness perceptions toward products, leading to a higher level of perceived value. Thus, the following hypothesis is proposed:

H1b: Cost transparency positively impacts consumers' perceived value of the product.

Researchers have confirmed that consumers tend to develop good attitudes toward brands or organizations using the transparency strategy (Lowe 2015; Mohan, Buell, and John 2020; Jung, Jeong Cho, and Ellie Jin 2020). Kang and Hustvedt (2014) revealed that consumers' perceptions of a firm's efforts in maintaining operational transparency directly influenced the consumers' attitudes and trust toward the firm. The act of displaying confidential cost breakdown information signals to the consumers that the company (or brand) is willing to build a trustful relationship with them (Mohan, Buell, and John 2020; Singh 2015), enhancing consumers' fairness perceptions and affective evaluations. The research by Miao and Mattila (2007) indicates that consumers' perceptions of price fairness are more susceptible to the influence of contextual factors. Consumers' confidence in their price evaluations and perceptions is elevated in a high transparency condition. In addition, since cost transparency reveals the materials and the processes involved in the production of goods or services, it can increase consumers' perceptions of the company's reputation for corporate social responsibility (CSR). Thus, consumers tend to value the brand and products with transparent cost information. The following hypothesis is proposed:

H1c: Cost transparency positively impacts consumers' brand attitude.

Prior research shows that transparency increases consumers' willingness to buy (Egels-Zandén and Hansson 2016). Miao and Mattila (2007) demonstrate that given an identical selling price, the information presented in a highly transparent form (e.g., selling price with clear cost breakdowns) carries more persuasive power. Mohan, Buell, and John (2020) have specifically argued that cost transparency practice enables companies to achieve higher brand loyalty and higher sales. The study by Kim, Kim, and Rothenberg (2020) demonstrates that just presenting fashion products' cost breakdown information, regardless of the extent, triggers greater purchase

intention of the brand and its products, as long as the price is perceived as fair. Thus, we propose the following hypothesis:

H1d: Cost transparency positively impacts consumers' purchase intention toward the product.

The moderating roles of product price, country of origin (COO), and socially responsible consumer behavior

Recent research indicates that characteristics of the product could impact the effectiveness of price transparency (Carter and Curry 2010). As mentioned earlier, the apparel industry is characterized by its complex global supply chains and challenging business conditions. For low-end apparel brands, their merchandise is mainly made in developing countries that allow for low-wage labor, which raises social and ethical concerns (Ma, Lee, and Goerlitz 2016). For high-end apparel brands, they need to justify high-end product prices through true costs and unique characteristics associated with their products, such as innovative design, precious materials, and excellent workmanship. In both conditions, cost transparency could be utilized to provide justification for prices to enhance consumers' perceptions of brands' credibility and fairness. Literature also implies that consumer traits would affect how consumers respond to a company's sustainability initiatives or business transparency practices (Mohr and Webb 2005; Buell and Kalkanici 2021). Therefore, this research examines two specific product-related factors and one consumer personal trait variable that may moderate the effectiveness of cost transparency: product price, COO, and socially responsible consumer behavior.

Researchers have suggested that increased transparency comes with costs and can positively affect selling prices that can be charged (Peschel and Aschemann-Witzel 2020). Consumers are attracted by the brand's business transparency, but they need to justify their purchase decision of paying high selling prices. Consumers form their price perceptions and judgments based on their understanding of why that particular price was set. Thus, it is critical for brands to provide a clear rationale for the high selling prices. Lacking this cost information proof would negatively affect a brand (Jung, Jeong Cho, and Ellie Jin 2020; Singh 2015). Carter and Curry (2010) also indicate that when a firm or brand shares the details of cost breakdowns, customers are willing to purchase more expensive items, implying that effective cost transparency can support premium prices. Interestingly, opposite results were found in Mohan, Buell, and John's study (Mohan, Buell, and John 2020), where the benefits of cost transparency appeared to weaken as the price increased. In addition, Lowe (2015) has also suggested that the cost transparency strategy might not be appropriate for high-end products where high selling prices signal exclusivity rather than the true cost. Taken together, these results seem to imply the interaction between cost transparency and product price. Considering that fashion apparel brands' selling prices include more intangible components rather than true cost, based on the above discussion, we proposed that the cost transparency practice is more effective when the product price is relatively low. Based on the above rationale, the following hypotheses are proposed.

H2: There is an interaction effect between cost transparency and product price on perceived quality (H2a), perceived value (H2b), brand attitude (H2c), and purchase intention (H2d). When product price is low (vs. high), cost transparency will have a

stronger effect on perceived quality, perceived value, brand attitude, and purchase intention.

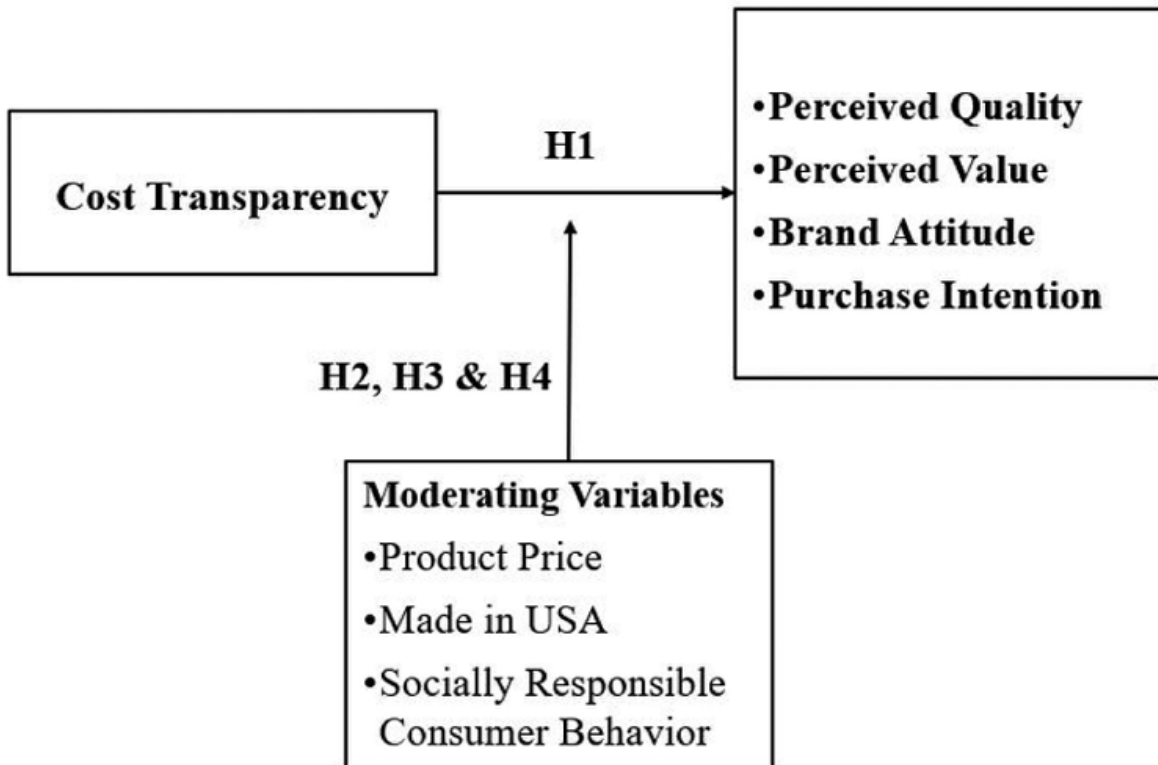
The market research shows that consumers demand transparent price information because it allows them to see how much it really costs to make a product and how and where the product is made (Schlossberg 13 October 2015). The literature confirms the significant role of the COO in consumers' decision-making processes as it impacts how consumers perceive and evaluate product attributes and benefits. COO cues have a significant effect on consumers' overall attitudes and purchase intention (Samiee 1994; Johansson 1989; Rao and Monroe 1989; Thorelli, Lim, and Ye 1989). For example, many American consumers perceive the products made in the US as higher quality and value (Ha-brookshire and Yoon 2012). In addition, COO cues, together with other cues, are widely used by consumers to evaluate products and develop their own judgments on what the product selling prices would be, which impacts their purchase intention (Zeithaml 1988). Moreover, Septianto et al. (2021) find that the cost transparency strategy is more effective among consumers experiencing authentic pride. Their study findings reveal that moral elevation explains the interactive effect between cost transparency and authentic pride in forming consumer perceptions and driving possible purchases. Clothing with a Made-in-USA label is typically more likely to induce authentic pride for US consumers, and the Made-in-USA label is perceived to have more social and ethical values. Based on the above rationale, the following hypotheses are proposed.

H3: There is an interaction effect between cost transparency and the Made-in-USA label on perceived quality (H3a), perceived value (H3b), brand attitude (H3c), and purchase intention (H3d). For the products having the Made-in-USA label (vs. not Made-in-USA), cost transparency has a stronger effect on perceived quality, perceived value, brand attitude, and purchase intention.

Firms' business transparency attracts belief- or values-driven consumers who are more willing to purchase from firms that align with their values (Vredenburg et al. 2020; Septianto et al. 2021). Literature suggests that personal trait variables, such as socially responsible consumer behavior, would interact with a company's social responsibility in their impact on consumer responses. Mohr, Webb, and Harris (2001, 47) provided a widely cited definition of socially responsible consumer behavior as 'a person basing his or her acquisition, usage, and disposition of products on a desire to minimize or eliminate any harmful effects and maximize the long-run beneficial impact on society.' Mohr and Webb (2005) pointed out that socially responsible consumer behavior could be seen as an enduring personality trait that involves the consumer's self-concept. People high on this trait would take into account the social consequences of their consumption behavior, and they attempt to use their socially responsible purchasing decision to improve society. Mohr and Webb (2005)'s study results provide some support for the idea that consumers who see themselves as attempting to bring about social changes through their purchasing behaviors (vs. those who do not) respond more strongly to information about the level of a company's social responsibility. They tend to take the initiative to choose products made by a highly responsible company. They tend to use their purchasing power to express their social concerns and support companies' socially responsible business practices. Cost transparency provides a cost breakdown specifying the costs of the product components, which likely affects

sustainability conditions in production. Cost transparency represents an important product attribute for socially responsible consumers (Lowe 2015). Thus, the following hypothesis is proposed:

H4: There is an interaction effect between cost transparency and consumers' socially responsible consumer behavior on perceived quality (H4a), perceived value (H4b), brand attitude (H4c), and purchase intention (H4d). When the measured trait of socially responsible consumer behavior is high (vs. low), cost transparency will have a stronger impact on perceived quality, perceived value, brand attitude, and purchase intention.



**Figure 1.** The conceptual model.

## Research design and methodology

### Study design

The experiment we conducted used a  $2 \times 2 \times 2$  fractional factorial design. As is shown in Table 2, four scenarios were developed to manipulate three independent variables: cost transparency, product price, and Made-in-USA. Specifically, the cost information (detailed cost information is not available or detailed cost information is available), product price (\$68 or \$204), and country of origin information (Not made-in-USA or Made-in-USA) were embedded in each ad, along with a picture of the product. Jeans, the world's most popular article of clothing, were selected as product stimuli in the study.

Attributes	Levels
1. Cost transparency	<p><b>1. No:</b> <i>the company does NOT provide consumers with detailed cost breakdowns for each of its products</i></p> <p><b>2. Yes:</b> <i>the company provides consumers with detailed cost breakdowns for each of its products</i></p>
2. Product price	<p><b>1. Low:</b> \$68</p> <p><b>2. High:</b> \$204</p>
3. Made in the USA	<p><b>1. No:</b> <i>products are NOT made in the USA</i></p> <p><b>2. Yes:</b> <i>products are made in the USA</i></p>
4. Socially responsible consumer behaviours	<p><b>1. Low:</b> <i>less socially responsible in consumer behaviours</i></p> <p><b>2. High:</b> <i>more socially responsible in consumer behaviours</i></p>

## Measures

### Product stimuli

Hypothetical advertisements were selected as the stimuli. Prior to the main study, pretests were used to obtain feedback, assess the clarity of the questions, and assess the reliability of the measures of the variables. In the pretest phase, 30 college students were invited to participate. Jeans were selected as the product category for the experiment due to their popularity among American consumers. In addition, jeans were an apparel category involving fewer changes in style and less affected by fashion trends; therefore, it is expected that price, quality, and brand reputation are the major factors affecting consumer purchase decisions.

### Independent variables

The availability of the detailed cost information was manipulated at two levels: absence and presence. In the present condition, the detailed cost breakdowns for a pair of jeans were provided in the ad, including material expenses, labor costs, operating costs, and net profit the company makes from this pair of jeans. By contrast, in the absence condition, only the total cost information was provided. Price was manipulated at two levels: low (\$68) and high (\$204; 3 times the low price). The prices were comparable to similar jeans found in the market at the time of the experiment. Similarly, the country-of-origin information was manipulated at two levels: Not made in the USA or Made in the USA (see Table 2). Two examples of the advertisements are provided in Appendix A & B. The scale used to measure socially responsible consumer behavior consists of six items adapted from Roberts (1995) and Mohr and Webb (2005), including items such as ‘I make any effort to buy apparel products made of natural and eco-friendly materials’ and ‘I am more likely to buy products from companies who work hard to provide a safe and healthy working environment to their employees.’

### Dependent variables

Perceived quality, perceived value, brand attitude, and purchase intentions were measured by existing scales. Product quality perception was measured with three items adapted from Rao and Monroe (1989). Some of the sample items were 'The quality of this brand is reliable,' and 'I trust the quality of the products from this brand.' Three items for perceived value were adopted from Netemeyer et al. (2004). Some of the sample items were 'This brand's products are good value for the money' and 'All things considered (price, quality, and value), this brand's products are considered to be a good buy.' Based on the previous research on brand evaluation and attitude (Klein and Dawar 2004), four items were developed for brand attitude. Some of the sample items were 'I feel favorable towards the brand' and 'In my opinion, this brand is trustworthy.' Intentions to purchase were measured using three items (Dodds, Monroe, and Grewal 1991). The participants were asked to indicate the likelihood of buying the product being shown in the experiment. All of the scales had a 5-point response format ranging from strongly disagree (1) to strongly agree (5).

### Manipulation checks

The questionnaire included three manipulation check questions for the three independent variables (one item for each variable). Respondents were asked to express their agreement or disagreement with the three statements: 'This brand breaks down the pricing details of its products, so consumers know exactly how much its products cost to make' (cost transparency/transparent pricing), 'The price of the product is high' (product price), and 'This product is made in the USA' (Made-in-USA).

### Sample and data collection

We used Amazon's Mechanical Turk (MTurk) in this study to distribute the survey. MTurk is widely used for data collection in the social sciences because it allows researchers to rapidly collect large amounts of high-quality human subjects' data at a substantially lower cost than professional survey providers. Despite its growing popularity, there are ongoing concerns about potential risks to MTurk data quality. Thus, we used several strategies to minimize low-quality data. For example, as suggested in previous studies, we only recruited US workers who have approval ratings of >95% and have 100 or more approved HITs (Hauser and Schwarz 2016). We also included two attention check questions in surveys, and the survey ended for those not answering correctly. A total of 305 adult US consumers (over age 18) were recruited from MTurk and were paid \$1 to participate in this experiment. Participants were asked to complete an online survey through the MTurk platform, and each participant was randomly assigned to one of the four versions of the ads.

A brief company description was first provided to the participants before they were asked to review the assigned advertisement: 'Brand A is an American clothing company that designs and manufactures elegant and high-quality clothing. Below is an example of this company's products'. The cost breakdown of the product, product price, and country of origin information was embedded in the introduction description. Two examples of the advertisements are provided in Appendix A & B. After reading the description, participants were asked to complete a questionnaire that collected information on the dependent measures (perceived quality, perceived value, brand attitude, and purchase intentions), manipulation check, as well as standard demographics.

## Data analysis and results

### The sample

Of the 305 collected questionnaires, 275 responses were considered valid and were used in the study. Thirty responses were dropped either because of their incomplete responses or because the questionnaires were improperly filled out. About 62% of the respondents are female, over 93% of the participants were between the ages of 18 and 44, and over 55% of the respondents reported having at least a bachelor's degree. See Table 3 for select subject characteristics.

In the present study, two out of the six items measuring SRCB were excluded from further analysis because their factor loadings were less than 0.4. Based on the sum of the remaining four items, participants were classified into the low SRCB group (N = 110, M = 3.70) and high SRCB group (N = 165, M = 4.92) based on socially responsible consumer behaviors using a median split. The high SRCB group is more socially responsible in their consumption behaviors than the low SRCB group.

**Table 3.** Sample characteristics

Characteristics	N	%
<b>Gender</b>		
Male	105	38.2
Female	170	61.8
<b>Age</b>		
18-24	128	46.5
25-34	86	31.3
35-44	42	15.3
45-54	9	3.3
55-64	10	3.6
<b>Education</b>		
Not a high school graduate	2	0.7
High school graduate	24	8.7
Some college	98	35.6
College degree	145	52.7



Professional degree	3	1.2
Master's and Doctorate	3	1.2
<b>Income</b>		
Less than \$10,00	45	16.4
\$10,000-\$19,000	32	11.6
\$20,000-\$29,000	34	12.4
\$30,000-\$39,000	33	12.0
\$40,000-\$49,000	19	6.9
\$50,000-\$59,000	22	8.0
\$60,000-\$69,000	11	4.0
\$70,000-\$79,000	10	3.6
\$80,000-\$89,000	11	4.0
\$90,000-\$99,000	7	2.5
\$100,000-\$149,000	25	9.1
More than \$150,000	26	9.5

### Manipulation checks

The manipulation check question of transparent pricing revealed that, except for 12 respondents (6%), the manipulations were successful. In addition, the manipulation check question dealing with the product price revealed that 98% of the respondents answered the question correctly. Moreover, all the respondents correctly indicated whether the product was made in the USA. Therefore, responses to the manipulation check questions indicated that the manipulations were successful. These subjects who didn't correctly answer the manipulation questions were not dropped from the analyses because excluding these subjects from the analysis would not have significantly changed the results.

### Reliability and validity of measures

An exploratory factor analysis (EFA) was first conducted on the 13 items measuring perceived quality, perceived value, brand attitude, and purchase intentions with a varimax rotation. Exploratory factor analysis produced four distinct factors among the items. Cronbach's alpha was then used to examine the internal consistency reliability of the four dependent variables, with a minimum criterion of approximately 0.70 (Hair et al. 2019). In the study, the

values of Cronbach's alpha for 'perceived quality', 'perceived value', 'brand attitude', and purchase intentions" were 0.74, 0.82, 0.87, and 0.88, respectively. Thus, they were accepted as being reliable for the research.

Next, a confirmatory factor analysis (CFA) for the measurement model with five constructs was next performed to assess the convergent and discriminant validity of the four dependent variables and SRCB. The goodness-of-fit statistics indicated that all criteria met the recommended values in the measurement model ( $\chi^2/df = 1.72$ ; GFI = 0.93; AGFI = 0.90; CFI = 0.97; RMR = 0.04, and RMSEA = 0.05). The results confirmed convergent validity since all items loaded significantly ( $p < 0.001$ ) on the underlying latent constructs (Anderson and Gerbing 1988). Unidimensionality and convergent validity of the constructs were assessed by the composite reliability measure and the average variance extracted (AVE), respectively. The composite reliability varied from 0.78 to 0.89, satisfying the criteria of 0.6. The average variance extracted varied from 0.65 to 0.81, thus satisfying the criteria of 0.50. Table 4 shows the factor loadings, composite reliability, and average variance extracted. In addition, discriminant validity was tested by conducting  $\chi^2$  difference tests between all possible pairs of constructs (Anderson and Gerbing 1988). The  $\chi^2$  difference tests confirmed significantly lower  $\chi^2$  values ( $p < 0.001$ ) for the unconstrained model for all comparisons that were tested, implying the achievement of discriminant validity (Bagozzi and Phillips 1982).

**Table 4. Confirmatory factor analysis for the constructs.**

Latent Variables and Observed Indicators	Standardized Factor Loading	t-value <sup>3</sup>
<b>Perceived Quality (<math>\alpha = 0.74</math>, CR = 0.78, AVE = 0.66<sup>1</sup>)</b>		
I trust the quality of products from this brand.	0.60	2
Products from this brand would be of very good quality.	0.73	8.84
The quality of this brand is reliable.	0.77	9.13
<b>Perceived Value (<math>\alpha = 0.82</math>, CR = 0.85, AVE = 0.80)</b>		
All things considered, this brand' products are considered to be a good buy.	0.79	-
This brand's products are good value for the money.	0.84	15.43
What I get from products from this brand is worth the cost.	0.86	15.86
<b>Brand Attitude (<math>\alpha = 0.87</math>, CR = 0.84, AVE = 0.65)</b>		
I feel good about this brand.	0.82	-
In my opinion, this brand is trustworthy.	0.71	12.63

I feel favorable towards the brand.	0.76	13.86
In my opinion, this brand cares about its employees and customers.	0.63	10.09
<b>Purchase Intentions (<math>\alpha = 0.88</math>, CR = 0.83, AVE = 0.81)</b>		
If I need to shop for a blouse, the likelihood that I buy this product is high.	0.80	-
In the near future, I would consider purchasing this brand's products.	0.84	15.68
My willingness to buy this brand's products is very high.	0.88	16.54
<b>Socially Responsible Consumer Behaviors (<math>\alpha = 0.83</math>, CR = 0.89, AVE = 0.675)</b>		
I make any effort to buy apparel products made of natural and eco-friendly materials.	0.68	-
Apparel companies should make every effort to reduce the pollution from their factories.	0.82	11.46
Companies should pay a reasonable salary to its employees.	0.84	11.56
I am more likely to buy products from companies who work hard to provide a safe and healthy working environment to their employees.	0.64	9.37
(1) $\alpha$ = Cronbach's alpha, CR = composite reliability, AVE = average variance extracted (2) "-" means the path parameter was set to 1, therefore, no t-value was given (3) All loadings are significant at 0.001 level		

## Hypothesis Tests

We conducted a multivariate analysis of variance (MANOVA) with price transparency, product price, made in the USA, and socially responsible consumer behavior as independent variables. Perceived quality (PQ), perceived value (PV), brand attitude (BA), and purchase intentions (PI) were the dependent variables.

The results of MANOVA indicated a significant main effect of cost transparency (Wilks lambda = 0.95, F = 3.32), a significant two-way interaction effect between price transparency and product price (Wilks lambda = 0.97, F = 3.36), and a significant two-way interaction effect between price transparency and socially responsible consumer behavior (Wilks lambda = 0.97, F = 3.68). To provide for and to interpret the various individual and combined effects, we conducted a series of specific sub-design analyses, and the results are presented in Table 5.

The first set of hypotheses (H1a, 1b, 1c, and 1d) predicted that providing consumers with detailed cost breakdowns would lead to higher perceived quality and value, more favorable brand

attitude, and higher purchase intentions when compared to the conditions in which detailed cost information is not provided. We conducted a multivariate analysis of variance (MANOVA) on four dependent variables. The results of MANOVA revealed a significant main effect for cost transparency on perceived quality ( $M_{\text{Cost breakdowns}} = 4.18$ ,  $M_{\text{No cost breakdowns}} = 3.84$ ), perceived value ( $M_{\text{Cost breakdowns}} = 3.75$ ,  $M_{\text{No cost breakdowns}} = 3.46$ ), and brand attitude ( $M_{\text{Cost breakdowns}} = 4.09$ ,  $M_{\text{No cost breakdowns}} = 3.82$ ). Thus, hypotheses 1a, 1b, and 1c were supported by the empirical data. This implies that when a company provides consumers with detailed cost information for its products, consumers tend to perceive its products to be of higher quality. Transparent pricing can also help the company create a higher perceived value for its products and generate a more favorable attitude toward the brand.

The second set of hypotheses (H2a, 2b, 2c, and 2d) predicted that product price would moderate the relationship between cost transparency and the four dependent variables. The results of MANOVA indicate a significant interaction between cost transparency and product price for brand attitude. The subsequent analysis and simple effects tests suggest that a cost transparency strategy can help create a more favorable attitude for lower-priced brands ( $M = 4.15$ ) than for higher-priced brands ( $M = 3.67$ ). Since only hypothesis 2c was supported by the empirical data, the expected influence of product price was only partially confirmed by the evidence.

The third set of hypotheses predicted that Made in the USA would moderate the relationship between cost transparency and the four dependent variables: perceived quality, perceived value, brand attitude, and purchase intentions. None of these effects were significant ( $p > 0.05$ ). Thus, hypotheses 3a, 3b, 3c, and 3d were not supported.

The fourth set of hypotheses (H4a, 4b, 4c, and 4d) predicted that socially responsible consumer behavior would moderate the relationship between cost transparency and the four dependent variables. The results of MANOVA indicate a significant interaction between cost transparency and socially responsible consumer behavior for perceived quality and purchase intention. The subsequent analysis and simple effects tests suggest that consumers who are more socially responsible in their behaviors perceived higher quality ( $M_{\text{High SRCB group}} = 4.34$ ,  $M_{\text{Low SRCB group}} = 3.88$ ) and expressed higher purchase intention ( $M_{\text{High SRCB group}} = 3.56$ ,  $M_{\text{Low SRCB group}} = 3.10$ ) for brands engaging in cost transparency practices than consumers who are less socially responsible in their consumption behaviors. Thus, hypotheses 4a and 4d were supported.

## Discussion and conclusion

When more consumers are interested in transparency and more businesses embrace cost transparency, academic interest in transparency also increases. However, there is currently a lack of quantitative studies explicitly examining the effects of business transparency on consumers' perceptions and behaviors. Considering previous literature concerning cost transparency is primarily conceptual and limited, this study empirically investigates the impact of cost transparency on consumers' brand perceptions and purchase intentions in the context of the apparel industry. Since it is one of the few empirical studies that address the effect of cost transparency on consumers, it is expected that the findings of this study will provide empirical evidence for the effectiveness of cost transparency strategy and will enrich the marketing literature on business transparency in general and cost transparency in particular.

This study contributes to the theoretical field of cost transparency. The most important contribution is that we have explored the conditions under which cost transparency can be more

(vs. less) effective. While prior research has examined the reasons for businesses to disclose their costs and how consumers respond to cost transparency (Lim et al. 2018; Lowe 2015; Mohan, Buell, and John 2020; Simintiras et al. 2015b), it is not clear what brands/products can benefit more from sharing cost-related information, and which types of consumers react more (less) favorably to this strategy. Thus, we incorporated two product/brand-related factors (product price and country-of-origin) and one consumer characteristic variable (socially responsible consumer behavior) into the conceptual framework. We believe that the improved framework can help us investigate cost transparency's effects more effectively and improve our understanding of how different types of brands/products could utilize the cost transparency strategy to appeal to their target audience. Expressly, in line with previous research, our results confirm that consumers respond positively to the detailed cost information disclosed by brands. We also found that cost transparency could help create more favorable attitudes, especially for lower-priced brands. More importantly, we further demonstrate that cost transparency may be more effective among consumers who demonstrate a high level of social responsibility in their consumption behaviors.

In addition to theoretical contributions, the empirical findings of this study provide practical insights to brand executives and marketing managers engaging in cost transparency practices. Our findings demonstrate that consumers value transparent pricing more than opaque pricing and respond favorably to cost transparency. Specifically, the results of our study suggest that when a firm voluntarily discloses its costs, consumers tend to perceive its products to be of higher quality and value the product more. Our study also found that when a company provides a detailed breakdown of the costs of their products, consumers become more attracted to the brand. In summary, our results provide concrete, empirical evidence confirming the suggestions by CSR scholars that transparency plays a positive role in the customer-company relationship. These findings are consistent with prior studies which have demonstrated the potential positive effect of cost transparency on consumer attitudes and behaviors (Carter and Curry 2010; Lim et al. 2018; Mohan, Buell, and John 2020). Thus, it is recommended that by focusing on conscious consumers, marketers start and continue using the cost transparency strategy as an innovative marketing tool to highlight their openness and honesty with consumers and/or showcase the value their brands can deliver to their customers. Digital platforms have been approved to be useful media for firm-consumer interaction (Cochoy et al. 2020; Insch 2008). Accordingly, in order to achieve the maximal benefits of cost/price transparency, we recommend that marketers incorporate digital communication platforms into their transparency projects (such as factory tour videos and using QR codes to track manufacturing processes) to move beyond cost information disclosure.

However, our study didn't confirm the findings from Septianto et al. (2021) and Egels-Zandén and Hansson 2016 that cost transparency could directly influence consumer purchase likelihood. This implies that although consumers take companies' responsibility efforts into account in their decision-making, disclosing the costs alone is not enough to convince consumers to buy companies' products. However, the linear regression results provided evidence of the positive impact of perceived value ( $\beta = 0.86$ ,  $t$  value = 7.86,  $p < 0.001$ ) on consumers' purchase intentions towards products with a detailed cost breakdown. This suggests that perceived value is an important mediator of consumer intentions to purchase those products. Therefore, while providing cost transparency, marketers should also make sure that the detailed cost breakdowns can demonstrate their unique value proposition compared to their competitors in order to generate positive purchase intentions among consumers.

An interesting but not surprising finding from this study is that cost transparency is especially effective for low-priced brands to communicate brand integrity and create positive attitudes towards the brand. This evidence confirms the results of the work from Mohan, Buell, and John (2020), the benefits of cost transparency appeared to weaken as the price increased. As we discussed earlier, the apparel industry is characterized by its tremendous use of environmental resources, complex production, and challenging labor conditions (Dyer and Ha-brookshire 2008). Many inexpensive clothes are made overseas in less developed countries due to the low cost of labor. When their clothes are manufactured overseas, American consumers want to know how, where, and by whom their apparel product was made. Cost transparency offers consumers a window into relations among key parties who create and supply low-cost apparel products. Thus, one possible explanation of this result is that companies providing detailed cost breakdowns for their products attempt to be transparent, thus signaling to consumers that their products are sustainable and ethically made even though they may be made in a low-cost country. This result also proved that American consumers care more about getting 'fair and honest' prices than getting the lowest price for apparel consumption (Crawford and Mathews 2001). In summary, our research suggests that the cost transparency strategy is especially beneficial for low-end, offshore-outsourced products to form or improve consumers' attitudes toward the brands offering these products. Although brand attitude may not directly affect consumers' behaviors, researchers have suggested that brand attitude should directly affect brand image, and a positive brand attitude can also enhance brand value (equity) (Faircloth, Capella, and Alford 2001; Keller 1993). Thus, companies offering these products should especially consider using the cost transparency strategy to connect with their customers and develop trusting and lasting relationships.

Research shows more consumers are letting their social concerns affect their buying decisions. Our study confirmed that conscious consumers especially reward companies whose products and business practices reinforce good ethics and transparency (Singh 2015). This segment of consumers value price/cost transparency and are more willing to purchase products offered by brands engaging in transparency efforts. They would also play a role as opinion leaders for other consumer followers, using WOM (increasingly social media) to bring attention to the level of transparency being created around their CSR efforts (Kang and Hustvedt 2014). As a result, brands that are embracing transparency would be well advised to engage in strategic interaction with and marketing initiatives aimed at socially responsible consumers.

### **Limitations & future studies**

Some limitations must be considered when considering the findings presented here. First, our study mainly examined the business-to-consumer market in this paper; future research could examine the effect of cost transparency in business-to-business industries, such as has been done in the steel industry (Septianto et al. 2021). Second, this study was carried out only focusing on the apparel industry because business transparency is both a unique problem and a critical strategy for the apparel industry due to the global nature of its supply chain. However, supply chain transparency, especially cost transparency, has also become an integral part of supply chain management and corporate social responsibility initiatives for several other industries such as food, consumer electronics, and beauty products. Literature maintains that more companies in various industries are moving toward being innovative and strategic in achieving greater supply chain transparency (Simintiras et al. 2015b; Singh 2015). We propose that it is worthwhile for

these industries to adopt cost transparency practices to help companies in these industries connect with consumers and develop intimate relationships. Although we believe that these product sectors can also benefit from this study's findings, it is important to point out that the product context plays a role in the current research findings; thus, additional studies should examine multiple contexts for generalization. Third, the brand (Brand A) used in the study was a made-up brand. This means that the subjects who participated in the experiment had no previous conceptions of the brand. This was done in order to avoid the confounding impacts of consumers' prior brand attitudes and experiences. However, previous studies have shown that a brand's reputation could influence consumers' brand attitudes and behavioral intentions. Thus, future studies are encouraged to investigate if brand reputation moderates cost transparency effects on consumers' perceptions and behaviors. Fourth, it is worth pointing out that confounding factors (such as fairness perceptions) may impact the analytical results of this study, and these issues must be examined further in future studies. Finally, according to previous studies, signaling theory involves three primary elements: the signaler, the receiver, and the signal itself (Connelly et al. 2011). The present study only examines how some of the characteristics of the signaler and the receiver moderate the cost transparency effectiveness. Future research should expand these results to understand how the characteristics of the signal itself, such as signal clarity and credibility, affect the effectiveness of the signal and cost transparency strategy.

### **Disclosure statement**

No potential conflict of interest was reported by the author(s).

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## **Appendices A & B**

