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An empirical test of the triple bottom line of customer-centric sustainability: the case of fast fashion

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Abstract

The aims of this study were (a) to determine if the triple bottom line (TBL) model can serve as an accounting framework for consumers' perceived sustainability of fashion brands; (b) to investigate whether TBL sustainability can be linked to brand relationships with fast fashion; and (c) to determine whether the predictive role of the TBL sustainability of fast fashion brands differs from that of sustainable fashion brands. Three research questions were formulated to achieve these goals. To this end, a series of statistical analyses were conducted on the consumer panel data (N = 732) gathered via a market research firm. The sample included US consumers who have shopped from either fast fashion brands or sustainable fashion brands. The results suggest that the TBL model is an effective tool for explaining a consumer's perception of a fashion brand's sustainability. The results also reveal disparate effects of TBL sustainability on brand outcomes between fast fashion brands and sustainable fashion brands. Detailed results with theoretical and managerial implications are discussed.

Keywords: Triple bottom line (TBL), Sustainability, Fast fashion, Sustainable fashion, Brand trust, Brand loyalty

Introduction

An increasing number of studies in the fashion apparel sector has pursued multiple topics ranging from the use of environmentally friendly fashion products to the corporate social responsibility (CSR), reflecting an "emerging megatrend" (Lubin and Esty 2010, p. 44) in the current business environment. However, the existing research on sustainability in the fashion apparel industry is still limited in two major respects. First, there is no clear consensus on what it means to be "sustainable" for fashion companies or brands and how sustainability, as it is perceived by consumers, can be measured. Concepts with no clear definitions can indeed result in a methodological issue because what is understood by study participants may be different from what is intended to be measured by a researcher. Second, there is a lack of understanding regarding a discrepancy between consumers' perception toward a brand's sustainability and their behavior toward the same brand. This discrepancy can be demonstrated by the fact that fast fashion (or "disposable" fashion)—encouraging over-consumption and disposability—continues to gain profits and popularity over the last decade (Joy et al. 2012). This leads researchers to

speculate that the predictive role of a brand's sustainability in forming consumers' positive brand relationships may *not* apply to fast fashion brands.

To address these issues, the current study employs triple bottom line (TBL) model that proposes three pillars of sustainability (i.e., economic, environmental, and social sustainability) (Elkington 1998) in measuring consumers' perceived sustainability of fashion brands. If the TBL serves as a central tool to support a firm's sustainability goals, it should be an important accounting framework that predicts not only consumers' perception toward the firm's sustainability efforts but also their relationships with the firm through trust and loyalty. In addition, to examine whether a fast fashion brand's sustainability as perceived by consumers predicts positive brand relationships, the impact of the TBL sustainability on brand relationships is evaluated for fast fashion brands. Lastly, the predictive role of the TBL sustainability on brand relationships is additionally tested for sustainable fashion brands to further verify the applicability of the TBL model to fashion brands in general. In sum, the objectives of this study were (a) to determine if the TBL model can serve as an accounting framework for consumers' perceived sustainability of fashion brands by explaining the concept from both conceptual and practical perspectives; (b) to investigate whether TBL sustainability can be linked to brand relationships with fast fashion; and (c) to determine whether the predictive role of the TBL sustainability of fast fashion brands differs from that of sustainable fashion brands.

Literature review and research questions

The following section illustrates how the TBL model explicates the three dimensions of fashion brands' sustainability perceived by consumers, and whether and how the TBL sustainability predicts brand relationships such as brand trust and brand loyalty. The illustration of TBL sustainability is approached from a customer-centric sustainability (Sheth et al. 2011) and applied to fast fashion brands as the central focus of this study. Thus, the following literature review depicts fast fashion paradox in relation to its unsustainable nature, followed by TBL of sustainability and its application to fast fashion brands. At the end, three research questions are formulated to achieve study objectives.

Fast fashion paradox

… while concerned about the environmental and social impact of their non-fashion purchasing decisions, [consumers] did not apply such principles to their consumption of fashion. They talked in general terms of saving the environment, were committed to recycling, and expressed dedication to organic food… Yet, these very same consumers routinely availed themselves of trend-led fashionable clothing that was cheap: i.e., low cost to them, but high cost in environmental and societal terms. (Joy et al. 2012, p. 280).

As described in the finding of Joy et al. (2012), consumers' environmental and social concern do not necessarily reduce their fast fashion consumption. Why do many consumers, despite their awareness of sustainability challenges facing in the current society, still develop a positive attitude toward fast fashion brands? Literature suggests several reasons. First, consumers may perceive that the benefits offered by fast fashion brands outweigh the negative aspects in terms of the unsustainable nature of fast fashion

business (e.g., poor quality, resource depletion) (McNeill and Moore 2015; Morgan and Birtwistle 2009). Fast fashion brands offer products that mimic current fashion trends in an affordable price almost every few weeks. Low cost, fresh designs, and quick response times allow for greater efficiency in meeting the demand of fashion-conscious consumers, especially those who cannot afford high-fashion products. Consumers' desire for fast fashion is coupled with the lack of alternatives offering similar benefits in the market (Kim et al. 2013). Second, there is a general lack of understanding among consumers about the impact of unsustainable production and consumption created by fast fashion products. Although the media covering the negative aspects of fast fashion brands (e.g., sweatshops, depletion of resources) have increased awareness of sustainability challenges, the highly fragmented and complex nature of the apparel supply chain (Kilduff 2005) makes it extremely difficult for average consumers to understand the cause and effect of fast fashion brands' businesses.

While empirical evidence of this paradox of fast fashion consumption is still limited, several researchers have explored a discrepancy between consumers' awareness of sustainability and their desire for fast fashion brand products. For example, McNeill and Moore (2015) argue that even those consumers who express strong concern about environmental and social issues admit that they continuously engage in the consumption of fast fashion products due to their desire for updated fashion. Similarly, Park and Kim (2016) argue that, despite their awareness of the negative aspects of fast fashion products, consumers may still enjoy stylish, inexpensive fashion items. The current study builds upon these previous findings and investigates potential linkage between consumers' perception toward a fast fashion brand's TBL sustainability and their brand relationship with the fast fashion product.

Triple bottom line (TBL) of sustainability

The concept of sustainability in its contemporary form stems from the Brundtland Report, which was published in (1987) by the United Nation's (UN) World Commission on Environment and Development (WCED). This report proposes long-term strategies for achieving sustainable development by addressing three key elements: ecological environment, economy, and social equity (Edwards 2005). The environmental dimension of sustainability requires the long-term viability of resource use and emphasizes the issue of environmental degradation and resource depletion (Sheth et al. 2011). Economic sustainability refers to a dynamic economy that endures for a long period of time, while also recognizing the importance of providing secure, long-term employment (Edwards 2005). The social dimension of sustainability refers to the well-being of people and the community and equity/equality issues (Edwards 2005). Elkington (1998) incorporates these three facets of sustainability into actual business performance and argues that businesses should look not only at the traditional measures of economic performance (i.e., profits) but also consider the measures of social and environmental performances, reflecting "triple bottom line" (TBL) of sustainability.

Customer-centric sustainability (CCS)

The customer-centric sustainability (CCS) stems from the stakeholder perspective wherein firms integrate stakeholder expectations into their business actions and thereby

resolve different perspectives on sustainability issues and outcomes (Kozlowski et al. 2012). While a firm-centric view of sustainability is often criticized as having a lack of a long-term perspective and a genuine effort for societal and environmental values (Molthan-Hill 2014), a customer-centric view of sustainability puts customers in the foreground and seeks the viability of both consumers and businesses. Based on the norm of business-consumer reciprocity, Sheth et al. (2011) argue that sustainability outcomes must result from consumer-directed business actions if companies plan to make sustainability an integral part of their business strategies and operations. This argument is also in line with several other researchers' consumption-based view of sustainability (e.g., Huang and Rust 2011; Ramirez 2013). In a nutshell, from a CCS perspective, sustainability is viewed as "a joint product of marketing actions and consumer behavior" (Sheth et al. 2011, p. 24) and it can be achieved through the mutual effort of both companies and consumers. The following section reviews the three dimensions of CCS in the context of fashion brands including fast fashion brands.

CCS: economic dimension

While the economic dimension of sustainability is often considered merely as the conventional bottom-line of financial profitability (Slaper and Hall 2011), CCS extends this dimension to broad-based improvement in economic well-being and standard of living (Donaldson and Preston 1995). In this regard, Sheth et al. (2011) relate economic sustainability to the "economic well-being of consumers associated with financial aspects such as debt-burden, earning pressures, and work-life balance" (p. 24). These researchers also contend that improving the well-being of consumers does not conflict with maximizing a firm's financial benefits because implementing CCS and facilitating sustainable consumption can avoid hidden costs, such as the costs associated with producing excessive amount of merchandise and doing wasteful advertising. These efforts can also result in increased market share and more profits, as consumers reward firms for these efforts (Cronin et al. 2010).

Central to the effort for firms to facilitate sustainable consumption is offering quality products (Hanss and Böhm 2012; McNeill and Moore 2015). Specifically, Gruber et al. (2014) indicate that while the concept of sustainability itself is ambiguous, sustainability in consumers' minds is strongly connected to their perceptions of product quality (e.g., "if it is a high quality product, it should also be sustainable"). Thus, when fashion brands offer quality products, they can not only help their consumers achieve sustainable consumption but also communicate their "contribution to the sustainability of a larger economic system rather than focusing on their own financial success" (Fulton and Lee 2013, p. 355). Thus, this study will focus on the consumer's perception of the extent to which a brand offers quality products that help the consumer achieve sustainable consumption.

Fast fashion products are often criticized for being made with poor-quality materials and construction (Joy et al. 2012). Cline (2012) argues that apparel quality has been indeed eroded in the era of fast fashion. She maintains that, due to the disposable nature of fast fashion, low prices and trendy styles instead of craftsmanship and durability have become more important decision criteria for purchasing fashion products. In other words, consumers may still shop fast fashion products despite their perception of low product quality ("If it's under $20, honestly I don't mind spending it") (Cline 2012, p.

16). Therefore, the adverse impact that the fast fashion system has had on consumers' perceptions of product quality needs to be considered when examining the economic dimension of CCS of fast fashion brands.

CCS: environmental dimension

Environmental sustainability from a CCS perspective involves making responsible choices that will reduce the negative impacts of businesses on the ecological environment. With the growing movement toward ethical consumerism, consumers have become aware of the environmental damage caused by fashion businesses and have expressed their concerns over the negative impacts these businesses have made on the environment. While strong commitment is still rare (Plieth et al. 2012), there has been an increase in the initiative of fashion brands to improve environmental sustainability in such areas as use of environmentally friendly materials (e.g., organic cotton) and conducting a life cycle analysis on the materials used (Curwen et al. 2012).

Fast fashion brands also have implemented a variety of sustainability initiatives. For example, H&M offers the Conscious Collection made mostly out of recycled polyester and organic cotton and promote the idea of sustainable fashion through its advertising campaign (Dishman 2013). However, researchers argue that the sustainability approach taken by fast fashion brands is fundamentally different from that taken by sustainable fashion brands that operate to a triple bottom line. According to Park and Kim (2016), fast fashion brands' environmental sustainability efforts are largely reactive in that they attempt to merely satisfy a segment of environmentally conscious consumers by marketing their sustainable alternatives offered often in a limited quantity. They further argue that this reactive approach is in contrast to sustainable fashion brands' proactive approach toward environmental sustainability to transform the whole industry by taking a leadership in sustainable development (e.g., Patagonia's effort to develop a tool to measure the environmental impacts of apparel businesses).

CCS: social dimension

The social dimension of sustainability adds a sense of community to sustainable development in that it emphasizes cooperation and concern for others, which ultimately contributes to the well-being of a larger community (Edwards 2005). On a micro-level, social sustainability addresses how the product and its production processes affect people's lives. On a macro-level, it relates to how society as a whole (e.g., human health, traditional culture) is impacted by type of business (Waage et al. 2005). In the fashion apparel industry, the social aspect of CCS often relates to fair trade and ethical sourcing practices during the manufacturing phase because human right issues such as sweatshops, child labor, and poor working conditions are particularly pervasive (Fulton and Lee 2013). The increasing manufacturing flexibility that is required in the current fashion industry has exacerbated working conditions in garment factories (Gardetti and Torres 2012).

It goes without saying that fast fashion has significantly increased the pressure for flexibility. Under the fast fashion business system, retailers place small, more frequent orders with a short turnaround time and lower manufacturing costs (Parker and Dickson 2009). To deal with this demand for low-cost and flexibility, many manufacturers

rely on sub-contracting (i.e., outsourcing temporary workers), which has resulted in instability in employment in many of the developing countries and increased their workers' overtime (Gardetti and Torres 2012). The recent factory collapse in Bangladesh that resulted in the death of over 1000 workers demonstrates the urgent need for improved working conditions and better human rights that is facing the current fashion industry. Given this situation, it is apparent that fast fashion brands must incorporate social sustainability into their standard business practices (Stern 2007).

The impact of customer-centric sustainability on brand relationships

The literature provides evidence that sustainability of fashion brands as perceived by consumers positively influences their perceptions, attitudes, and behavior toward the brands. As early as in the 1990s, researchers found the tendency of apparel consumers to exhibit socially responsible consumption and environmental consumerism (e.g., Dickson and Littrell 1996; Kim and Damhorst 1998). Since then, researchers have found that consumers are increasingly concerned about the sustainability of apparel firms. Specifically, researchers find that consumer perceptions of apparel firms' business transparency positively influence brand trust, brand attitude (Kang and Hustvedt 2014) and purchase intention (Bhaduri and Ha-Brookshire 2011), and that consumers have favorable attitude toward environmentally sustainable fashion brands or products (e.g., organic cotton, cotton grown using sustainable farming practices) (Norum and Ha-Brookshire 2011; Hustvedt and Dickson 1996). Corresponding to these findings, researchers conclude that integrating sustainability into a business strategy not only improves a firm's brand image, but also elevates the level of product credibility, which leads to a deeper and stronger relationship with its customers (Molthan-Hill 2014; Schmitt and Renken 2012).

This study examines whether a fashion brand's perceived sustainability positively influences two brand relationships, brand trust and brand loyalty. Of the many brand-related outcomes, brand trust and loyalty were selected because these two constructs are often found as the outcomes of consumer perceptions of a firm's sustainability (Bhaduri and Ha-Brookshire 2011; Kang and Hustvedt 2014). This study proposes that the significant impact of a brand's sustainability on positive brand relationships may *not* hold for fast fashion because consumers may still develop brand trust and loyalty toward fast fashion brands even though they do perceive the negative aspects of those brands' sustainable management. Further, Park and Kim (2016) recently found that the approach to sustainability taken by fast fashion brands is fundamentally different from that of sustainable fashion brands such that the former is reactive in their sustainability initiative while the latter is proactive by taking a sustainability leadership in the entire fashion industry. Thus, recognizing the two different modes of approaches to sustainability taken by fast fashion brands and sustainably produced fashion brands ("sustainable fashion brands" hereafter), it is argued that consumers' perceptions of brand sustainability may be more strongly linked to their positive brand relationships for sustainable fashion brands than for fast fashion brands. While the TBL sustainability model and the impact of sustainability on brand relationships are theoretically established in many research studies (McNeill and Moore 2015; Sheth et al. 2011), there is limited empirical evidence in the literature to support the specific propositions made in this study (i.e., the applicability of the TBL model to fashion brands, and the weak association between the brand's

sustainability and brand relationships for fast fashion brands). Therefore, the following three exploratory research questions are formulated:

RQ1: Does the TBL model serve as an accounting framework for consumers' perceived sustainability of fast fashion brands as well as sustainable fashion brands?

RQ2: Do the three dimensions of sustainability (i.e., economic, environmental, social sustainability) of fast fashion brands as perceived by consumers predict brand relationships such as brand trust and loyalty?

RQ3: Does the predictive role of the TBL sustainability of fast fashion brands differ from that of sustainable fashion brands?

Methods

Instrument development

Because all constructs of this study were brand-specific, participants were first provided a list of fashion brands, from which they were asked to select the one brand they had purchased or used most recently. The brand each respondent selected was automatically embedded into the remaining questions pertaining to the brand. Measures of most of research constructs were adopted from existing scales or adapted to fit the specific context of the current study. Because measurement items for the three dimensions of fashion brands' TBL sustainability did not exist in the previous studies, a particular effort was made to develop or modify the existing scale items so as to address apparel-specific sustainability issues (e.g., sustainable fibers, fit, style). For example, a list of attributes for ethical clothes as identified by Jägel et al. (2012) were adapted, as their items well reflected a range of apparel sustainability that encompassed economic, environmental, and social sustainability. For environmental and social sustainability, a few other items measuring consumer beliefs about environmental and social aspects of the fashion industry (Shen et al. 2012) were modified. See Table 1 for final measurement items.

One of the research questions involved comparing a predictive role of TBL sustainability in brand relationship outcomes between fast fashion brands and sustainable fashion brands. Thus, it was important to select the two groups of brands that will be used in the survey questions. To this end, a pool of fashion brands was generated based on the review of relevant industry reports and academic literature. First, fast fashion brands were selected based on their business model (i.e., offering trendy, inexpensive products quickly to a market). Second, sustainable fashion brands were selected based on the two criteria delineated by Park and Kim (2016): (a) committed to sustainable business from the inception of business with a deep-seated commitment, and (b) approaching sustainability with transformative responses, operating to a triple-bottom line. Final brands selected were: *H&M, Forever 21,* and *Zara,* for fast fashion brands; and *Patagonia, Eileen Fisher* and *TOMS,* for sustainable fashion brands. Independent samples t tests indicated that fast fashion brands had significant lower levels in all three dimensions of sustainability than fast fashion brands: economic (t = 8.77, $p < .001$) environmental (t = 9.57, $p < .001$) and social sustainability (t = 8.56, $p < .001$).

Table 1 Demographic characteristics of respondents

Variable	Frequency	Percentage
Gender		
Male	225	30.7
Female	507	69.3
Ethnicity		
Caucasian	554	75.7
African–American	81	11.1
Hispanic	56	7.7
Asian or Pacific Islander	35	4.8
Native American	4	.5
Other	2	.3
Age		
18–24	18	2.5
25–30	95	13.0
31–40	255	34.8
41–50	170	23.2
51–60	126	17.2
61+	68	9.3
Education		
High school or less	93	12.7
Vocational/technical school (2 year)	38	5.2
Some college	197	26.9
College graduate (4 year)	260	35.5
Graduate degree (Master's, Phd)	107	14.6
Professional degree (MD, JD, etc.)	36	4.9
Other	1	.1
Income		
Under $20,000	41	5.6
$20,000–$29,999	53	7.2
$30,000–$39,999	52	7.1
$40,000–$49,999	71	9.7
$50,000–$59,999	95	13.0
$60,000–$69,999	66	9.0
$70,000–$79,999	74	10.1
$80,000–$89,999	51	7.0
$90,000–$99,999	59	8.1
Over $100,000	170	23.2

Finally, the measurement scales for brand trust and brand loyalty were adopted from previous research. The items for brand trust measure a consumer's belief that a certain brand is reliable and worthy of trust. As for brand loyalty, while a variety of measurements for brand loyalty exist, this study used Zeithaml et al's (1996) scales, measuring a consumers' willingness to generate positive word-of-mouth communication.

Sample

Among a total of 732 respondents, 372 selected fast fashion brands and 360 selected sustainable fashion brands. About 69 % of these participants were female, and slightly more than three-quarters of them (75.7 %) were white Americans. The largest number

(34.8 %) of participants was aged 31–40, followed by 41–50 (23.2 %), 51–60 (17.2 %), and 25–30 (13 %). The majority of respondents (82 %) had attended some college or earned Bachelor's or a higher degree of education. While the respondents were distributed fairly evenly throughout all income groups, the largest number of respondents (23.2 %) reported income over $100,000, followed by $50,000–$59,999 (13 %) and $70,000–$79,999 (10.1 %). An overview of the demographic characteristics of respondents is provided in Table 2.

Data collection

The data for this study were collected through a large U.S. market research firm that specializes in consumer online surveys during July in 2014. The firm launched the online survey and invited their panel members to take part in the survey via an email invitation. Respondents were reimbursed for their participation through their account.

Data analysis

To test if the TBL model can adequately explain consumers' perceived sustainability of fashion brands, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted on the TBL model. After evaluating the dimensionality of the measurement items for each of the three sustainability dimensions through EFA, CFA verified the factor structure of the observed variables. The impact of sustainability dimensions on brand relationships were examined by the analysis of structural equation modeling (SEM).

Results

This section presents the results of data analyses according to the three RQs.

RQ1: Does the TBL model serve as an accounting framework for consumers' perceived sustainability of fast fashion brands as well as sustainable fashion brands?

To answer the first RQ, a measurement model with the three dimensions of TBL sustainability (i.e., economic, environmental, social) was assessed. Because the TBL model has not been tested and applied to the context of fashion brands, exploratory factor analysis (EFA) was conducted to evaluate the dimensionality of the measurement items (Gerbing and Hamilton 1996). An EFA using principle component analysis with Varimax rotation was performed on the 17 measurement items for the three dimensions of sustainability of fashion brands. Five items were dropped due to their low factor loadings (less than .50) and cross-loadings with other factor items. Although one item ("[xyz]'s clothes was produced with a minimum effect on the environment (e.g., no gases, low carbon foot print) and animals") that was loaded with environmental sustainability (.677) also loaded with social sustainability (.512), we decided to keep this item, given its conceptual significance in measuring the environmental aspect of sustainability. The results of EFA (see Table 3) indicated that 12 items yielded a clear three-factor model, supporting the three dimensions of sustainability theorized in the TBL model.

   After verifying the three-factor of TBL sustainability, CFA was conducted. The model fit indices were: $\chi^2(48) = 140.360$, $\chi^2/df = 2.924$, RMSEA = .05, CFI = .99, NFI = .98, TLI = .98. The construct validity of each construct was evaluated by both convergent

Table 2 Measurement items and reliability of constructs

Construct	Measures	Source	Composite reliability
Economic sustainability	[xyz]'s clothes are fit for purpose, hard-wearing, and durable	Jagel et al. (2012)	.90
	[xyz]'s clothes are soft, comfortable and provide a good fit		
	[xyz]'s clothes have good design and style		
	[xyz]'s clothes provide high quality in materials and stitching		
Environmental sustainability	[xyz] adopts environmentally friendly production practices	Jagel et al. (2012); Shen et al. (2012)	.93
	Toxic chemicals are not used in production by [xyz]		
	[xyz]'s clothes are produced with a minimum effect on the environment (e.g., no gases, low carbon foot print) and animals		
	[xyz]'s clothes are made from sustainable materials such as organic cotton and not be synthetic		
Social sustainability	[xyz] pays fair wage for factory workers and raw material suppliers	Jagel et al. (2012); Lichtenstein et al. (2004)	.92
	[xyz]'s products are made under safe and healthy working conditions, without child labor or sweatshops		
	[xyz] prefers local production of their clothing		
	[xyz] gives back to the communities in which it does business		
Brand trust	[xyz] delivers what it promises	Erdem and Swait (2004)	.99
	[xyz]'s product claims are believable		
	Over time, my experiences with [xyz] have led me to expect it to keep its promises, no more and no less		
	[xyz] has a name you can trust		
	[xyz] doesn't pretend to be something it isn't		
Brand loyalty	I would classify myself as a loyal customer of [xyz]	Zeithaml et al. (1996)	.88
	If asked, I would say good things about [xyz]		
	I would recommend [xyz] to a friend		

The name of a brand selected by an individual respondent was automatically embedded in [xyz]

and discriminant validity. The convergent validity of the measurement model was confirmed by two findings: (1) factor loadings for all 12 items were significant ($p < .001$) and exceeded the recommended level of .70; and (2) the average variances extracted (AVEs) for all the latent variables ranged from .62 to .88 (see Table 4), greater than the recommended threshold value of .50 (Fornell and Larcker 1981). Discriminant validity was

Table 3 Rotated component matrix of factor analysis

	Measurement items	Component		
		1	2	3
Economic sustainability	EC1: [xyz]'s clothes have good design and style	.851	.117	.194
	EC2: [xyz]'s clothes are soft, comfortable and provide a good fit	.810	.309	.230
	EC3: [xyz]'s clothes provide high quality in materials and stitching	.753	.304	.369
	EC4: [xyz]'s clothes are fit for purpose, hard-wearing, and durable	.701	.396	.335
Environmental sustainability	EV1: Toxic chemicals are not used in production by [xyz]	.229	.784	.376
	EV2: [xyz] adopts environmentally friendly production practices	.349	.719	.442
	EV3: [xyz]'s clothes are produced with a minimum effect on the environment (e.g., no gases, low carbon foot print) and animals	.337	.677	.512
	EV4: [xyz]'s clothes are made from sustainable materials such as organic cotton and not be synthetic	.398	.655	.451
Social sustainability	SO1: [xyz] prefers local production of their clothing	.311	.315	.791
	SO2: [xyz]'s products are made under safe and healthy working conditions, without child labor or sweatshops	.279	.378	.778
	SO3: [xyz] pays fair wage for factory workers and raw material suppliers	.272	.386	.752
	SO4: [xyz] gives back to the communities in which it does business	.322	.424	.728

Table 4 Construct validity of the second-order confirmatory model

	Environmental	Social	Economic
Environmental	.76		
Social	.88	.73	
Economic	.65	.62	.69

Diagonal entries show the AVE by the construct and off-diagonal entries represent the variance shared (squared correlation) between constructs

assessed in two ways. First, a series of nested models were specified that constrained the covariance between the pairs of constructs. The constrained models (i.e., constraining the correlation between the pairs of constructs to 1) were then compared to the base line model, which allowed the parameters to correlate freely. The difference in the Chi square statistics between the constrained and the standard model was significant (Anderson and Gerbing 1998), indicating discriminant validity between all the constructs. Second, a stricter test of discriminant validity was performed by examining the AVEs and the shared variance between all possible pairs of latent variables. When an AVE exceeds shared variance (i.e., squared correlation coefficients) between all possible pairs of latent variables, then discriminant validity is supported (Fornell and Larcker 1981). This second test revealed that the social and environmental dimensions of sustainability were highly correlated (see Table 4). Although a measurement model did not pass the second test for discriminant validity, it was still deemed valid, given the argument that multidimensional constructs by nature are difficult to establish for discriminant validity (Mathwick et al. 2001).

The TBL model validated by both EFA and CFA suggests that the TBL model can be used as an accounting framework for consumers' perceived sustainability of fashion brands. Since RQ1 is asking the applicability of TBL model for both fast and sustainable fashion brands, individually, the analyses described above were repeated for a separate sample of fast fashion brands and sustainable fashion brands. Results were generally similar to that of analysis for the entire sample. However, several measurement items for the environmental and social dimensions of sustainability were not grouped together as theorized. For instance, for fast fashion brands, two items for social sustainability ("[xyz]'s products are made under safe and healthy working conditions, without child labor or sweatshops," "[xyz] prefers local production of their clothing") were grouped as one factor and the rest of two items for social sustainability and four items for environmental sustainability were grouped as another factor. For sustainable fashion brands, two items for environmental sustainability ("toxic chemicals are not used in production by [xyz]," "[xyz] adopts environmentally friendly production practices") were grouped on one factor and the rest of two items for environmental sustainability and four items for social sustainability were grouped together as another factor. Yet for both groups of brands, economic sustainability was clearly represented as one single factor.

Despite these differences, we decided to keep the items for each sustainability dimension as originally developed given that (a) EFA does not set any a priori constraints on the estimation of components and only analyzes the structure of the interrelationships among variables and (b) the high correlation between social and environmental sustainability is somewhat expected because the sub-dimensions of sustainability are conceptually intertwined, sharing an underlying theme of overall sustainability. Keeping all measurement items same as that of the entire sample, CFA was conducted on fast fashion sample as well as sustainable fashion sample. The results remained similar (see Table 5 for detailed results).

In sum, RQ1 was answered based on the results of EFA and CFA supporting a three-dimensional factor structure and validity of the measurement model. Thus, the TBL model does serve as an accounting framework for consumers' perceived sustainability of fast fashion brands as well as sustainable fashion brands.

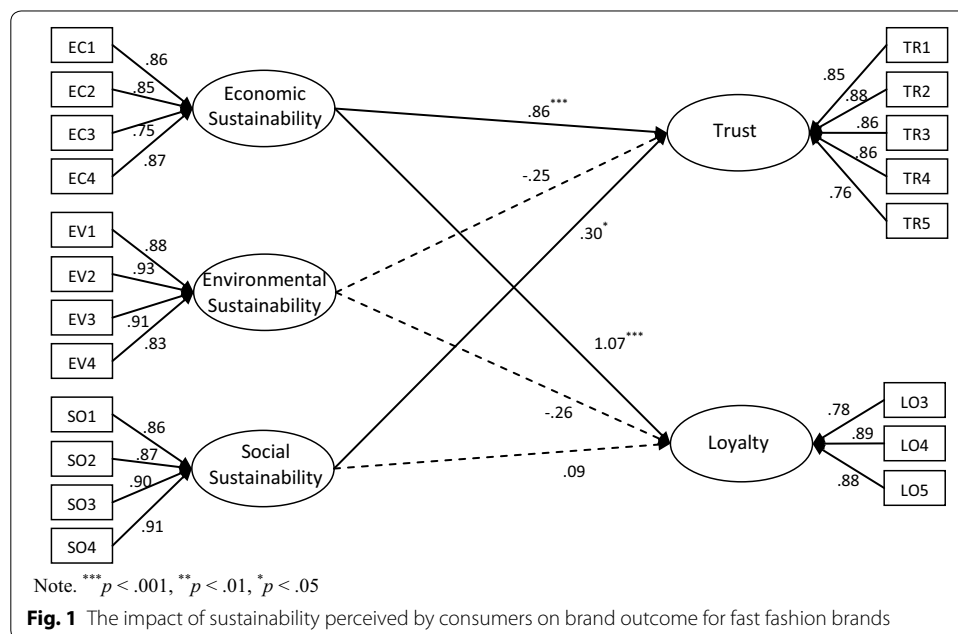**Table 5 Assessment of measurement model for each brand group**

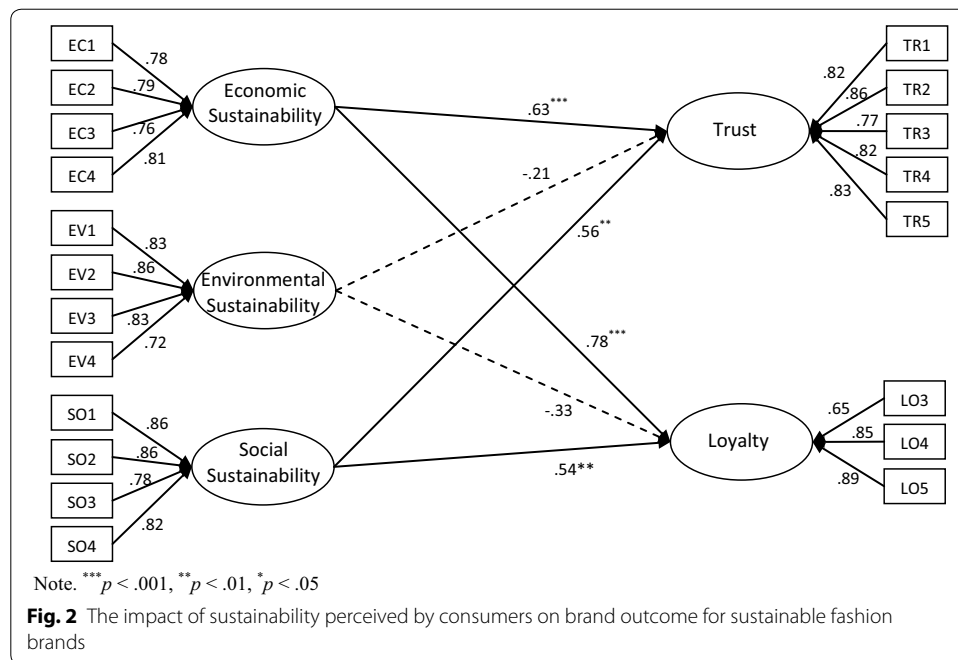| Assessment criteria	Fast fashion group	Sustainable fashion group
Model fit (after refinement)	$\chi^2(49) = 134.185$, $\chi^2/df = 2.738$, RMSEA = .07, CFI = .98, NFI = .97, TLI = .98	$\chi^2(50) = 97.996$, $\chi^2/df = 1.960$, RMSEA = .51, CFI = .98, NFI = .97, TLI = .98
Convergent validity	Factor loadings for all 12 items were significant ($p < .001$) and exceeded the recommended level of .70	Factor loadings for all 12 items were significant ($p < .001$) and exceeded the recommended level of .70
	AVEs for all the latent variables greater than the recommended threshold value of .50 (ranged from .65 to .86)	AVEs for all the latent variables greater than the recommended threshold value of .50 (ranged from .50 to .84)
Discriminant validity	Significant difference between the constrained and the baseline model	Significant difference between the constrained and the baseline model
	High correlation between environmental and social sustainability (squared correlation between constructs = .86, AVE for environmental sustainability = .69)	High correlation between environmental and social sustainability (squared correlation between constructs = .84, AVE for environmental sustainability = .66)

RQ2: **Do the three dimensions of sustainability (i.e., economic, environmental, social sustainability) of fast fashion brands as perceived by consumers predict brand relationships such as brand trust and loyalty?**

To answer the second RQ, a structural equation model (SEM) was set up to examine the effect of the three dimensions of sustainability on two dependent variables, brand trust and brand loyalty. SEM was conducted on the fast fashion brand group only (n = 372). The fit indices for a structural model were acceptable: $\chi^2(161) = 530.371$, $\chi^2/df = 3.294$, RMSEA = .08, CFI = .95, NFI = .95, TLI = .94. The result of this analysis revealed that environmental and social sustainability did not significantly predict brand relationships (although the impact of social sustainability on trust was supported at the p value of .05). However, the impacts of economic sustainability on brand trust and loyalty were both significant (see Fig. 1). Therefore, while the TBL model can adequately explain consumers' perceived sustainability of fast fashion brands (RQ1), its predictive role in brand outcomes such as brand trust and loyalty is rather weak (RQ2). Particularly, the impacts of environmental and social sustainability for fast fashion brands on brand relationship variables were marginal. Further implications of this result are presented in the Discussion section.

RQ3: **Does the predictive role of TBL sustainability of fast fashion brands differ from that of sustainable fashion brands?**

To answer the third RQ, the same SEM model was repeated on sustainable fashion brand group (n = 370). The model fit indices were: $\chi^2(161) = 425.376$, $\chi^2/df = 2.642$, RMSEA = .07, CFI = .96, NFI = .93, TLI = .95. The results indicated that both economic and social sustainability significantly affected brand trust and loyalty while environmental sustainability did not have any significant impact on either of brand outcomes (see Fig. 2). Thus, the predictive role of TBL sustainability of fast fashion brands does differ from that of sustainable fashion brands. Particularly, social sustainability turned

Note. $^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$

Fig. 1 The impact of sustainability perceived by consumers on brand outcome for fast fashion brands

Note. $^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$

Fig. 2 The impact of sustainability perceived by consumers on brand outcome for sustainable fashion brands

out to be a significant predictor of both brand trust and loyalty for sustainable fashion brands. The significant impact of economic sustainability and insignificant impact of environmental sustainability for fast fashion brands remained same for sustainable fashion brands. Table 6 summarizes the results of SEM analyses for each brand group.

Discussion

One of the objectives of this study was to determine if the TBL model can serve as an accounting framework for consumers' perceived sustainability of fashion brands (RQ1). To this end, the three facets of sustainability theorized in the TBL model were applied to consumers' evaluation of fashion brands' sustainability from a CCS perspective. The successful validation of the model of sustainability in terms of its factor structure and construct validity suggests that the TBL model is an effective tool for explaining

Table 6 Standardized path coefficients: comparison between fast fashion brands and sustainable fashion brands

	Structural path	Fast fashion		Sustainable fashion	
		Standard estimate	t value	Standard estimate	t value
Economic sustainability	Econ → Trust	.86	10.20***	.63	8.18***
	Econ → Loyalty	1.07	11.17***	.78	8.33***
Environmental sustainability	Env → Trust	−.25	−1.72	−.21	−.98
	Env → Loyalty	−.26	−1.80	−.33	−1.43
Social sustainability	Soc → Trust	.30	2.12*	.56	2.91**
	Soc → Loyalty	.09	.68	.54	2.64**

* $p < .1$

** $p < .01$

*** $p < .001$

a consumer's perception of a fashion brand's sustainability. As ecology, economy, and social equities are becoming ever more interwoven to produce "a seamless net of causes and effects" (Edwards 2005, p. 18), we need a more comprehensive model of sustainability that can conceive the interaction between the three core elements of sustainability. The research model and the measurement proposed in this study offer greater insights into how consumers will perceive a fashion brand's sustainability and also what criteria they use for their evaluation of a fashion brand's sustainability.

Further, although previous studies have provided evidence that consumer perceptions of fashion firms' sustainable management positively influences desired marketing outcomes such as brand loyalty and brand trust, the inconsistency found in sustainability conceptualization prevents the adequate theoretical development of consumers' perceptions of fashion brand sustainability and the resultant brand behaviors. Therefore, this research contributes to the current literature by first proposing and then testing a model for fashion brand's sustainability that constitutes its core elements and furthers our understanding of a consumer's perception of a fashion brand's sustainability. For practitioners, the model of sustainability in this study can provide useful diagnostic information, as it includes the basic, fundamental aspects of sustainability (i.e., the three dimensions of sustainability) that consumers use in their evaluation of fashion brand sustainability.

This study also delineates the predicting power of a different facet of sustainability on brand outcomes across different types of fashion brands (RQ2 and RQ3). One of the notable findings is that, for both fast fashion brands and sustainable fashion brands, economic sustainability of brands that has been largely ignored in the existing literature, was a significant predictor of both brand trust and loyalty. This result suggests that, no matter where in the continuum of sustainability a fashion brand lies (i.e., whether it is a sustainable fashion brand or a fast fashion brand), putting quality products at the forefront in the marketing communication can be an effective strategy to build strong brand relationships. This result can be also interpreted such that, while consumers' environmental or social concern may be compromised for their desire for fashion (McNeill and Moore 2015), quality of products may not be. Therefore, emphasizing right products that are intrinsically linked to product attributes, such as right styles, fits, materials, and durability must be considered as fundamental components of the fashion brands' sustainability claim.

Interestingly, environmental sustainability, where a majority of current brands mainly focus on in their sustainable management and marketing (Plieth et al. 2012; Niinimäki 2010), was not a significant predictor of brand relationships for either of fast fashion brands or sustainable fashion brands. This result suggests that, although many fashion brands emphasize the environmental aspects of their sustainable management (e.g., use of environmentally sustainable fiber) in their sustainability marketing communication, environmental sustainability as a single factor alone may not necessarily elicit positive brand relationships such as brand trust or brand loyalty. While this result for fast fashion brands can be related to previous researchers' findings that consumers' desire for new fashion often outweighs their attitudes toward sustainability (Joy et al. 2012; McNeill and Moore 2015), it is noteworthy that the same result (i.e., the insignificant impact of environmental sustainability on brand outcomes) was found in sustainable fashion brands. This result indicates that, even for those consumers who shop from sustainably

produced fashion brands, the mere fact that brands are environmentally sustainable may not be persuasive enough to develop strong brand relationships.

As for social sustainability of brands, disparate effects on brand outcomes were found for different types of fashion brands. That is, for sustainable fashion brands, social sustainability played a significant role in creating brand relationships, while its impact was weaker for fast fashion brands (i.e., the impact on brand trust was significant at the p value of .05 and not significant on brand loyalty). One possible explanation for this result is that, for a sustainable fashion brand, its social sustainability is well-embedded in its overall brand value so it creates clear, strong brand values (i.e., positive brand relationships in this case), whereas for a fast fashion brand, several external factors might interfere with the impact of a brand's social sustainability on brand relationships. For instance, consumers' existing perception about fast fashion brands' unsustainable images (e.g., the use of sweatshop) and their actual consumption experience may weaken the link between their perceived social sustainability of a given fast fashion brand and brand relationships. Perhaps, a brand's social sustainability can be better noted by consumers for sustainable fashion brands than for fast fashion brands. In other words, a fast fashion brand's claim of being socially responsible may not be as effective as a sustainable fashion brand's claim, as consumers' perception of the brand's social sustainability does not lead to positive brand outcomes.

The research model in this study could be extended by adding possible mediators and moderators among constructs. Particularly, if a brand's environmental or social sustainability does not predict brand relationships, what then are the factors that could strengthen or weaken this relationship? Future research could investigate additional factors that can lead to meaningful brand outcomes. In addition, conceptualizing the three dimensions of TBL sustainability requires further investigation. Particularly, economic sustainability in the CCS perspective in this study mainly focuses on the quality of products offered by brands. However, there could be other aspects of fashion brands that are associated with the economic well-being of consumers (e.g., reasonable price of products). It seems necessary to further conceptualize the CCS sustainability as well as its measurement.

Lastly, researchers could replicate this study on other types of brands that offer goods and services. The significance of implementing a sustainable business in the current environment is undeniable across many business sectors. Therefore, future research could apply the model of sustainability proposed in our study to other industry sectors, such as fast-moving consumer goods, restaurants, and grocery retailing. The measurement scale will need to be modified to fit the specific business sector so it captures precise industry-specific information about sustainability. Using the TBL model as a guiding framework, future research also could refine the ways in which the three dimensions of sustainability of brands for fashion or other product categories are both conceptualized and measured.

Conclusion

Overall, this research provides significant and beneficial contributions from both academic and managerial perspectives. From a theoretical standpoint, this study supports using the TBL framework to understand consumers' perceptions of fashion brand sustainability. The findings also further our understanding of a consumer's perception of a fashion brand's sustainability and its role in forming brand relationships for fast fashion

brands as well as sustainable fashion brands. From a managerial perspective, this study also emphasizes the point that consumers perceive economic, environmental and social sustainability from fashion brands, whether they are fast or sustainable brands. Consequently, fashion firms must work toward meeting all three pillars of sustainability to achieve strong sustainability (Molthan-Hill 2014). The failure of a firm to fully incorporate these three pillars of sustainability in its business may inflict significant damage to its brand image as well as the way its customers perceive its ongoing sustainability efforts.

Authors' contributions
HP carried out research and drafted the manuscript. Y-KK guided the analysis of the results and revision of the draft. Both authors read and approved the final manuscript.

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Competing interests
The authors declare that they have no competing interests.

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