Sustainable fashion – modeling consumer perceptions and the relationship between attitudes and buying behaviors in Germany

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Abstract

Purpose – This study aims to identify and analyze the key factors that influence German consumers' intention to purchase sustainable fashion, with particular attention to the well-documented attitude–behavior gap. The research focuses on the core constructs of the theory of planned behavior (TPB) – attitude, subjective norm and perceived behavioral control – along with individual factors like knowledge and perceived consumer effectiveness, and situational factors such as price and availability.

Design/methodology/approach – The research is grounded in the TPB, using a quantitative survey conducted with 216 German consumers. Multiple regression analysis was used to uncover the primary drivers and barriers influencing the intention to purchase sustainable fashion.

Findings – The results show that perceived consumer effectiveness ($\beta = 0.29$, $p < 0.001$) is the strongest driver of sustainable fashion purchase intention, suggesting that feeling empowered matters more than knowledge. Subjective norms ($\beta = 0.23$, $p < 0.001$) and perceived behavioral control ($\beta = 0.11$, $p < 0.01$) also play important roles, while high prices ($\beta = -0.12$, $p < 0.05$) and limited availability ($\beta = 0.10$, $p < 0.05$) act as barriers. Surprisingly, sustainability knowledge shows no significant influence ($\beta = 0.04$, $p > 0.05$).

Originality/value – This study advances TPB-based research by empirically integrating four context-specific variables – knowledge, perceived consumer effectiveness, price and availability – into a single model. This rare combination offers novel insights into the attitude–behavior gap in sustainable fashion and highlights perceived consumer effectiveness as a key leverage point. It provides actionable guidance for businesses and policymakers to encourage more sustainable consumer behavior in the fashion industry.

Keywords Sustainable fashion, Attitude–behavior gap, Theory of planned behavior
Consumer behavior, Germany

Paper type Research paper

1. Introduction

Fashion has served as a means of expressing individuality and personal style since the beginning of humanity (Wenrich, 2015). Today, new trends and fashion collections appear at increasingly shorter intervals. Often, garments are purchased for just one season. In Germany, consumers purchase an average of sixty clothing items per year (BMUV, 2022). Governments and regulators have recognized this issue, with the "Fast Fashion" sector facing heavy criticism. Some EU countries, such as France, are already deciding on fines for

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fast fashion products (Markert, 2023). Driven by a growing awareness of the environmental and social impacts of clothing production, consumers are increasingly demanding sustainable fashion options.

According to a study by Simon-Kucher and Partners (2022), 95% of consumers in Germany value sustainability. This development forces companies to rethink their production methods and become more transparent to meet the expectations of a critical customer base. Despite a strong awareness of sustainability, the market share of textiles with environmental labels in Germany was only 1.4% in 2020 (Umweltbundesamt, 2020). The attitude–behavior gap, the discrepancy between consumers' attitudes and their actual purchasing behavior, is a particularly pronounced phenomenon in the European Union. Despite strong environmental awareness and a willingness to act more sustainably, industry-specific market research studies such as those by YouGov (2021) or company reports like those by Zalando (2021) reveal a gap between consumers' good intentions and their actual purchasing behavior in the fashion sector. This phenomenon poses significant challenges for companies, as consumers demand sustainable fashion but do not purchase it. This study aims to investigate the difference between the attitudes and behaviors of German consumers and identify potential factors that influence this gap. Subsequently, recommendations will be derived to help companies make their products more sustainable.

The goal of this study is to answer the following research question: *What factors influence the intention to purchase sustainable fashion?* It begins with a theoretical framework introducing the theory of planned behavior (TPB) to explain the attitude–behavior gap, followed by an overview of barriers and factors influencing this gap. Seven hypotheses are developed, which will be tested throughout the study to answer the key question. The results will be presented through descriptive analysis and a regression analysis. The empirical findings serve as the foundation for concrete recommendations aimed at advancing sustainable fashion purchasing. The conclusion section reflects on these insights considering the research question.

2. Literature review

2.1 Attitude–behavior gap

Attitudes are a key driver of consumer behavior (Homburg, 2020; Fishbein and Ajzen, 2010). They reflect internal evaluations that are relatively stable over time. Studies show that German consumers generally have a positive attitude towards environmentally friendly products and practices (Splendid Research, 2021; Simon-Kucher and Partners, 2022).

Yet, consumer behavior in fashion often contradicts these attitudes:

- In 2020, the market share of textiles and clothing with an environmental label was only about 1.4% (Umweltbundesamt, 2020).
- In 2022, second-hand clothing accounted for only around 10% of the total clothing market in Germany (PwC Deutschland, 2023).
- The return rate for online fashion purchases is particularly high at 64%, with 72% of all returns in Germany being fashion items (Asdecker and Karl, 2022).

These examples highlight the discrepancy between positive attitudes and actual purchasing behavior, known as the attitude–behavior gap. This gap is also referred to as the intention–behavior gap (Caruana *et al.*, 2016) or knowledge–behavior gap (Markkula and Moisander, 2012). Both academic studies (Park and Lin, 2020; Jacobs *et al.*, 2018) and practical reports (Splendid Research, 2021; Zalando, 2021) confirm the existence of an attitude–behavior gap in the fashion industry. However, this phenomenon is also observed in

other areas related to sustainability, such as electric vehicles (Afroz *et al.*, 2015), sustainable food (Vermeir and Verbeke, 2006; Lindner, 2021) and organic food (Hughner *et al.*, 2007; Terlau and Hirsch, 2015). For companies marketing sustainable products, this gap poses a significant challenge, as the expected alignment between positive environmental attitudes and purchasing behavior is not always realized (Gupta and Ogden, 2006). Recent research has expanded the scope of sustainability studies, focusing on emerging consumption models like collaborative consumption, where Becker-Leifhold (2018) explored how personal values and the TPB influence intentions to engage in renting clothes rather than buying them. Although collaborative consumption offers new ways to reduce the environmental burden, traditional purchasing behaviors remain a key challenge for the fashion industry. The following section will present explanations for the attitude–behavior gap based on Ajzen's (1985) TPB.

2.1.1 Theory of planned behavior. The attitude–behavior gap can be explained using the TPB, developed by Icek Ajzen (1985). The TPB builds on the theory of reasoned action by adding the component of perceived behavioral control (PBC), which accounts for cases where individuals have limited control over their behavior (Ajzen, 1985; Fishbein and Ajzen, 1975; Erten, 2000). It predicts human behavior in specific contexts, with intention as the central variable, shaped by three factors: attitude, subjective norms and PBC (Ajzen, 1991) (see Figure 1).

While consumers may have positive attitudes toward sustainable behavior, this does not always translate into action. Factors such as social norms and the availability of sustainable products can interfere with behavioral execution, even when intentions exist (Ajzen, 1991). Critics of the TPB in the context of green consumerism argue that the theory does not sufficiently consider factors like knowledge and personal skills, which also influence behavior (Joshi and Rahman, 2015; Paul *et al.*, 2016).

Attitude: In the TPB model, attitudes are enduring evaluations of behaviors that can be positive or negative and influence behavior (Ajzen, 1991). They are based on the evaluation of possible outcomes and the belief in their likelihood.

Subjective norm: Subjective norms encompass the social influence on behavioral intention and are based on both descriptive and injunctive norms, which relate to what others do or should do (Armitage and Conner, 2001).

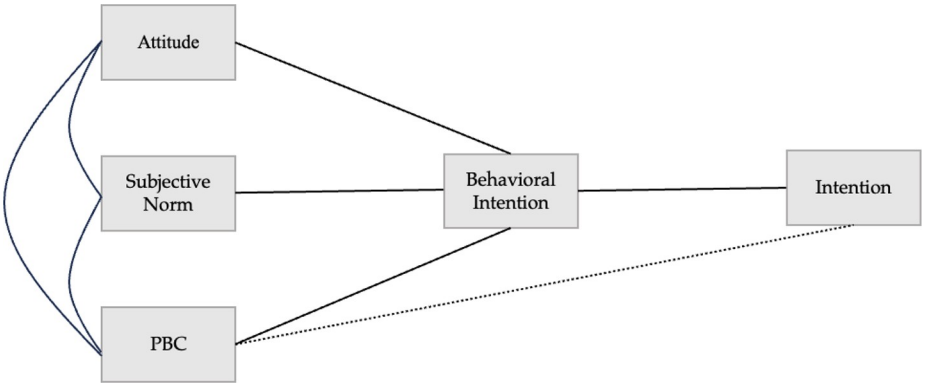

Figure 1. TBP model based on Ajzen (1991)
Source: Authors' own creation, based on Ajzen (1991)

Perceived behavioral control: This component reflects how easy or difficult a person perceives it to be to perform a behavior. It is determined by beliefs about one's abilities and the availability of resources (Ajzen, 2005; Fishbein and Ajzen, 2010). Discrepancies between perceived and actual control can directly influence behavior (Reinecke, 1997).

Intention: Intention is a central predictor of behavior in the TPB model, influenced by attitudes, subjective norms and PBC (Ajzen, 2005; Fishbein and Ajzen, 2010). However, gaps between intention and behavior can occur, often due to a lack of behavioral control or methodological issues (Brinkmann, 2014).

Behavior: In the TPB model, behavior is seen because of behavioral intentions, which are influenced by attitudes, subjective norms and PBC (Ajzen, 1991).

Background factors: Demographic characteristics, environmental influences and personal traits indirectly affect behavioral intentions and behavior (Ajzen, 2005; Fishbein and Ajzen, 2010). These factors should be considered in empirical studies as they form the basis for behavioral patterns (Brinkmann, 2014).

Despite some criticisms, the TPB remains a useful model for explaining complex behaviors, including sustainable consumption (Sutton, 2007; Manstead and Parker, 1995). This theory forms the foundation of this work, with additional context-specific factors included to provide a more comprehensive understanding of human behavior (Moser, 2016; Joshi and Rahman, 2015).

2.1.2 Additional factors influencing behavior. Although the TPB offers a robust framework for predicting social behavior, Ajzen (1991) himself acknowledged that the model could be expanded by incorporating additional variables to account for more complex psychological mechanisms. In response, numerous studies have extended the TPB by integrating individual or situational factors to enhance its explanatory power and adapt it to specific contexts. Research and practice have identified several additional factors that influence the decision to purchase green products. A particularly notable study by Joshi and Rahman (2015) conducted an extensive literature review of over 50 publications on green purchasing behavior from 2000 to 2014. They created an overview of empirically studied factors that influence purchasing behavior beyond attitudes. These factors, depending on the study, are referred to as motives, moderators, or barriers and can be categorized into individual and situational factors (Joshi and Rahman, 2015).

Individual factors: Individual factors such as attitudes, knowledge and perceived consumer effectiveness shape purchasing decisions. Although environmental awareness is high, the specific drivers of sustainable fashion choices are still not fully understood. Earlier studies focused on green attitudes and habits (Diamantopoulos *et al.*, 2003; Schwepker and Cornwell, 1991; Follows and Jobber, 2000; Lee, 2009). More recently, Jebarajakirthy *et al.* (2024) combined the TPB with the value-belief-norm model, highlighting the role of personal values and moral beliefs in explaining sustainable consumption.

Situational factors: Situational factors refer to external conditions that may facilitate or hinder green purchasing decisions – most notably price, availability and perceived product quality (Joshi and Rahman, 2015). Previous research highlights the importance of these factors, with studies by Wheale and Hinton (2007) and Chen and Chai (2010) emphasizing their role in shaping sustainable consumption.

In line with the extended applications of the TPB, this study includes both individual-level factors (knowledge and perceived consumer effectiveness) and situational constraints (price and availability), which have been widely recognized in prior research as relevant predictors of sustainable behavior. These variables either complement core TPB constructs or introduce contextual dimensions that enhance the model's predictive power in applied sustainability contexts (Yadav and Pathak, 2016; Chi *et al.*, 2023; Teixeira *et al.*, 2022;

Vermeir and Verbeke, 2006; Han and Han, 2023). Recent studies have also expanded the TPB to digital sustainability contexts: Rai *et al.* (2025) empirically examined how personalized apparel advertising influences green purchase intentions in online settings; Lin *et al.* (2023) focused on the role of sustainable content on TikTok in shaping consumer intention; and Nekmahmud *et al.* (2022) extended the TPB with social media marketing and green thinking. These examples illustrate how the TPB continues to evolve considering current digital and contextual dynamics, further supporting its relevance for analyzing sustainable fashion consumption behavior.

By integrating four additional factors into the TPB, this study offers a novel theoretical lens for understanding sustainable fashion consumption. This combination of individual and situational predictors has rarely been empirically tested and thus contributes uniquely to closing the attitude–behavior gap.

2.2 Hypotheses

Based on the previous sections, seven hypotheses are derived to address the research question. Three hypotheses are derived from the previously explained TPB model (attitude, subjective norm and PBC). In addition, two individual (knowledge, perceived consumer effectiveness) and two situational factors (price, availability) are examined. Knowledge was included because research shows it can influence behavior independently of attitude formation (Durán Gabela *et al.*, 2022; Longo *et al.*, 2019). In sustainable consumption, knowledge helps consumers evaluate the environmental impact of their choices (Zhang and Chabay, 2020). Perceived consumer effectiveness (PCE) complements PBC by emphasizing that individual actions can contribute to sustainability, extending TPB's focus on self-efficacy to the consumer's broader impact (Kovacs and Keresztes, 2022; Wang *et al.*, 2020).

Situational factors such as price and availability can either enable or hinder sustainable purchases. Both factors influence PBC by affecting consumers' ability to purchase sustainable fashion. Higher prices often deter purchases (Nath and Agrawal, 2022), while greater availability enhances convenience and accessibility (Weissmann and Hock, 2021).

In the context of this research, the variable attitude toward purchasing sustainable fashion is examined. Numerous studies investigating the purchase of sustainable products show that a positive attitude indicates a positive purchase intention (Ha and Janda, 2012; Al Mamun *et al.*, 2018). A similar effect is expected among German consumers:

H1. The variable attitude has a positive impact on the purchase intention of sustainable fashion in Germany.

Subjective norms are especially relevant in environmentally conscious societies like Germany (Umweltbundesamt, 2020). They reflect social expectations and may strongly shape purchasing behavior. The studies by Arvola *et al.* (2008) and Vermeir and Verbeke (2006) underscore the significant role that subjective norms play in purchasing behavior. They demonstrate that social pressure and expectations can strongly influence purchasing behavior. Based on this, it can be assumed that German consumers living in a social environment that supports the purchase of sustainable products are more likely to purchase such products. This is particularly true compared to individuals who do not experience such social influences. This leads to the following hypothesis for the study:

H2. The variable subjective norm has a positive impact on the purchase intention of sustainable fashion in Germany.

PBC reflects whether individuals feel capable of buying sustainably. In Germany, this perception may be particularly relevant because, despite high environmental awareness, practical barriers can limit the purchase of green products. Research by Ajzen (1985) and Al Mamun *et al.* (2018) highlights the importance of PBC in the purchasing process. A possible hypothesis is that increasing perceived control could directly lead to an increase in green product purchasing decisions. The following hypothesis is derived from this:

H3. The variable perceived behavioral control has a positive impact on the purchase intention of sustainable fashion in Germany.

The variable knowledge, which refers to consumers' knowledge of environmental issues and the specific benefits of sustainable products, has been frequently studied. Overall, 15 out of 18 studies concluded that a positive expression of the variable also positively influences purchasing behavior (Joshi and Rahman, 2015). Moreover, competence, smartness and proficiency may be regarded as the cornerstones of intended behaviors. Therefore, it is also assumed that a high level of knowledge among German consumers will positively affect purchase intention, leading to the following hypothesis:

H4. The variable knowledge has a positive impact on the purchase intention of sustainable fashion in Germany.

Perceived consumer effectiveness, i.e. the belief that one's actions make a difference, has been identified by researchers such as Gleim *et al.* (2013) as an important driver of green purchasing behavior. The perception that individual decisions can make a real difference to the environment is thus a strong motivational factor. Research by Gupta and Ogden (2009) also shows that PCE plays a significant role in promoting environmentally friendly purchasing decisions. It can be assumed that this factor also plays a crucial role among German consumers, as this construct is closely related to self-efficacy pertaining the impact of individual actions. Therefore, the following hypothesis is formed:

H5. The variable perceived consumer effectiveness has a positive impact on the purchase intention of sustainable fashion in Germany.

Although environmental awareness is high in Germany, price remains a critical factor, as the higher costs of environmentally friendly products often act as a barrier. This is supported by a study by Bray *et al.* (2011), which found that while consumers prefer environmentally friendly products, they are not willing to pay a significant price difference. Moderate pricing strategies that combine economic and ecological benefits may increase acceptance of green products. If sustainable products are not affordable even conscious consumers opt for less sustainable but cheaper alternatives. Moreover, Cerjak *et al.* (2010) show that price sensitivity influences purchasing decisions and suggest that adjusting pricing policies could increase purchase willingness:

H6. The variable price has a negative impact on the purchase intention of sustainable fashion in Germany.

The availability of environmentally friendly products is a crucial factor for consumers. The study by Young *et al.* (2010) shows that the convenience of access to, for example, secondhand products is a key factor in consumer behavior. Improved availability could positively influence purchasing behavior by increasing convenience and accessibility. Tregear *et al.* (1994) support this view by identifying availability as a significant factor in

purchasing decisions. As product access is a key determinant of sustainable behavior, it is hypothesized that greater availability of sustainable fashion in local stores positively influences purchase intention:

H7. The variable availability has a positive impact on the purchase intention of sustainable fashion in Germany.

3. Methodology

3.1 Research design

The study examines sustainable fashion consumption by identifying factors that influence consumers' purchase intentions. The hypotheses developed in the previous chapter are summarized in a research model. These hypotheses will be tested within the model and subsequently "not rejected" or "rejected." Testing the hypotheses serves as the basis for answering the research question. The research model (Figure 2) is based on Ajzen's TPB model. It incorporates the variables attitude, subjective norm, PBC and intention from the TPB model (Section 2.1.1). The focus in this research model is on the variable intention, while the variable Behavior is not directly examined for the following reasons: Both the TPB (Ajzen, 1991) and the theory of reasoned action (Fishbein and Ajzen, 2010) identify

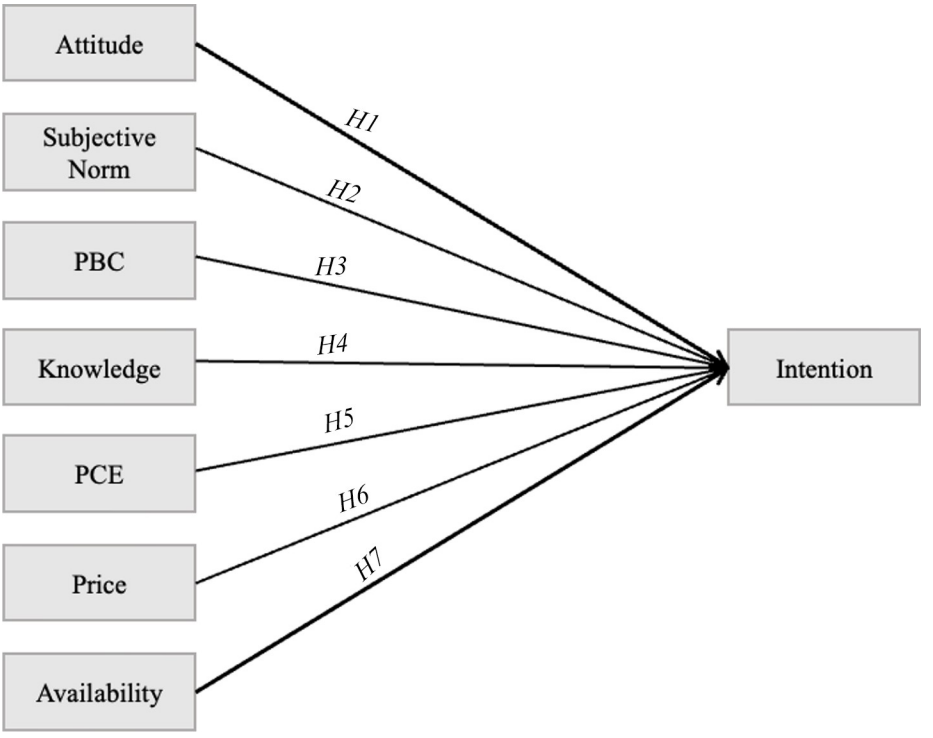

Figure 2. Theoretical framework for addressing research question
Source: Authors' own creation

intention as the strongest predictor of behavior. Therefore, intention serves as a valid proxy for anticipated behavior. Numerous studies confirm that in ethical consumption contexts, a gap between intention and behavior frequently occurs (Carrington *et al.*, 2010; Auger and Devinney, 2007; Carrigan and Attalla, 2001). These discrepancies between intention and actual behavior demonstrate that measuring intention is sufficient to study the theoretically predicted behavior patterns. In this specific inquiry, a gap between attitude and intention implies a gap between attitude and behavior. In addition to the core constructs, the model integrates four additional predictors: knowledge, perceived consumer effectiveness, price and availability (Section 2.1.2). By extending the classic TPB model with both individual and situational variables, this study introduces a context-specific innovation that enhances its explanatory power in the domain of sustainable fashion.

This study uses a quantitative research design, employing a questionnaire to efficiently collect standardized data from a large sample (Bryman and Bell, 2011). Data were collected via an online survey using the platform "Umfragen.UP."

To ensure that a diverse group of respondents was included in the sample, the convenience sampling method was employed. This approach allowed anyone who encountered the link to the online questionnaire to participate (Mishra and Alok, 2017). Personal and professional networks were also encouraged to invite additional participants to achieve a larger sample and ensure the external validity of the study. The link was accessed 570 times; 246 respondents started the survey, 12 of whom did not complete it. Seven were excluded for not having lived in Germany during the past year, as the questions focused on the German market. Another two participants were excluded because their completion time was too short to provide reliable responses. Nine further cases were excluded as outliers based on regression diagnostics (see Section 3.4). The final data set included $n = 216$ (111 female, 103 male, 2 nonbinary), aged under 16 to over 65. Of which, 61% has a university degree, 17% has an Apprenticeship and 22% having a high school diploma. The data set with $n = 216$ respondents provided a solid basis. While the limited sample size restricts the generalizability of the findings, the use of convenience sampling is a widely accepted method in exploratory research, particularly in the context of sustainable consumption (Mishra and Alok, 2017).

3.2 Measuring instruments

The first step in the development process was the operationalization of all eight variables. Operationalization involves determining how each variable will be addressed in the questionnaire, making them measurable. Many variables are not directly measurable and can only be captured through indirect questioning (Reinecke, 1997). It is essential that the constructs used are tested to ensure the reliability of the results. Therefore, as much as possible, tested constructs were used, which had already been employed in questionnaires on topics such as sustainable consumer behavior, the TPB, the attitude–behavior gap or sustainable fashion. The questions were then adapted to the topic of sustainable fashion, specified and simplified linguistically. This resulted in the following 27 items (see Table 1). A five-point Likert scale (1 = strongly agree; 5 = strongly disagree) was consistently used to capture participants' attitudes and opinions accurately. For the variable availability, Items 1 and 3 were reverse coded prior to analysis to ensure alignment with Item 2 in measuring the underlying construct consistently.

3.3 Data analysis

To analyze and clean the data, Microsoft Excel version 2402 and IBM's SPSS statistical software version 28.0.1.1 (14) were used. After completing the data collection, all

Table 1. Adapted survey items for sustainable fashion consumption

Variable	Items	Reference
Attitude	I prefer sustainable fashion over conventional fashion. Purchasing sustainable fashion is necessary to curb global warming Purchasing sustainable fashion is a good idea	Maichum *et al.* (2016)
Subjective norm	People whose opinions I value believe that I should buy sustainable fashion People whose opinions I value would endorse my decision to buy sustainable fashion People in my social circle buy sustainable fashion	Maichum *et al.* (2016)
Perceived behavioral control	I see myself as capable of purchasing sustainable fashion in future I have resources, time and willingness to purchase sustainable fashion There are likely to be plenty of opportunities for me to purchase green products	Maichum *et al.* (2016)
Knowledge	I know how to choose products and packaging that reduce waste I am very knowledgeable about alternatives to fossil fuels I am very knowledgeable about environmental issues I am aware that clothing production is often carried out by people in developing countries who are underpaid and work in sometimes dangerous conditions	Mostafa (2007)
Perceived consumer effectiveness	When I buy clothing, I try to consider how my purchase impacts the environment Every individual can have an impact on environmental issues, and what I do can make a significant difference. By purchasing environmentally friendly clothing, each consumer's behavior can have a positive impact on the environment and society	Roberts (1996)
Price	Sustainable fashion is expensive Sustainable fashion costs more than nonsustainable fashion Even if sustainable fashion were 25% more expensive than regular fashion, I would be willing to buy it If my income were higher, I would buy (more) sustainable fashion	Chang (2011)
Availability	The stores I usually visit offer little sustainable fashion It is easy for me to find sustainable fashion If I want to buy sustainable fashion, I have to visit multiple stores	Vermeir and Verbeke (2006)
Intention	I would buy sustainable fashion even if it has a less appealing design I would buy sustainable fashion even if it is less comfortable The likelihood of me buying sustainable fashion is very high When I need to replace clothing, I already plan to purchase sustainable fashion I intend to buy more sustainable fashion than conventional fashion	Ha and Janda (2012); Afroz *et al.* (2015)

Source(s): Authors' own compilation based on cited references (as indicated within the table)

questionnaire data were downloaded from Umfragen.UP. In SPSS, latent variables were created, reliability was tested using Cronbach's alpha, and item-total correlations were examined. Subsequently, means, variances, and standard deviations were calculated for the variables and analyzed descriptively. To test the derived hypotheses, a regression model was developed to analyze the influence of the independent variables – attitude, subjective norm, PBC, knowledge, perceived consumer effectiveness, availability and price – on the dependent variable, intention. All six assumptions for multiple linear regression were checked prior to interpretation (see Section 3.4). The hypotheses were subsequently tested within the regression model. In addition to the main predictors, age, education and income were initially included as control variables in the regression model to account for potential demographic influences on the relationship between predictors and the dependent variable, intention. However, they showed no significant effects and did not alter predictor relationships. Therefore, they were excluded from the final model to enhance model parsimony and interpretability.

3.4 Validity and reliability

To ensure the quality of the study, key quality criteria such as reliability and validity were meticulously considered throughout the research process (Himme, 2007).

Reliability: Reliability was assessed through Cronbach's alpha to measure internal consistency. Each construct exceeded the recommended threshold of 0.7, confirming acceptable reliability levels (Gliem and Gliem, 2003). Specifically, Attitude had a Cronbach's alpha of 0.71, Subjective Norm 0.75, PBC 0.70, Knowledge 0.75, PCE 0.72, price 0.73, availability 0.71, and intention 0.87. Discriminatory power analysis was also examined, leading to the removal of the last item of knowledge and the two last items of price due to lower reliability (see A2). This adjustment enhanced the internal consistency of the remaining items.

Validity: To assess construct validity, a confirmatory factor analysis (CFA) was conducted using maximum likelihood estimation. The model fit was evaluated using the following indicators: χ^2 (247) = 599.904, $p < 0.01$; comparative fit index (CFI) = 0.849; Tucker–Lewis index (TLI) = 0.816; root mean square error of approximation (RMSEA) = 0.081 (90% CI: 0.073–0.090); and standardized root mean square residual (SRMR) = 0.077. These fit indices indicate an acceptable model fit, and all factor loadings exceeded the 0.5 threshold, supporting the constructs' convergent validity. While the CFI and TLI fall slightly below the commonly used threshold of 0.90, they are considered acceptable for complex models, particularly when other indicators such as RMSEA and SRMR fall within recommended ranges (Hu and Bentler, 1999). Therefore, the results suggest satisfactory construct validity, indicating that the measurement model appropriately captures the underlying latent variables.

3.5 Testing regression assumptions

Before interpreting the regression results, key model assumptions must be verified. These ensure the validity of multiple linear regression results (Field, 2018). These assumptions are based on the Gauss–Markov theorem, which defines the conditions for using the ordinary least squares (OLS) estimator (Backhaus *et al.*, 2021). Meeting them ensures that the OLS estimator is the Best Linear Unbiased Estimator (BLUE) (Fox, 2015). Below, the six assumptions are evaluated in detail (Field, 2018; Backhaus *et al.*, 2021).

Linearity: Multiple linear regression analyzes the linear relationships between variables. A scatterplot of standardized residuals versus predicted values was used to assess linearity. A

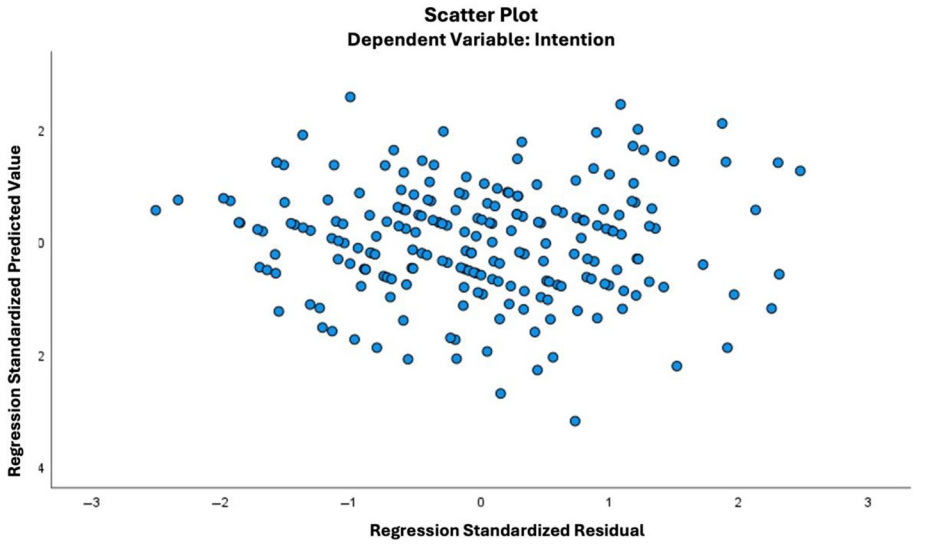

Figure 3. Scatter plot of regression model
Source: Authors' own analysis using SPSS

random distribution of points without any clear trend in Figure 3 shows that this condition is met.

No outliers: Outliers can distort the significance of trends in parametric statistical methods. SPSS offers features to detect and highlight outliers using casewise diagnostics. A total of nine outliers were removed, reducing the sample size to 216. After this adjustment, the condition was met.

Independence of residuals: The Durbin–Watson test was used to check for autocorrelation. A value of 1.976, which falls within the acceptable range of 1.5–2.5, confirms the absence of first-order autocorrelation.

No multicollinearity: To check for multicollinearity, the variance inflation factor (VIF) was used (Backhaus *et al.*, 2021). Ideally, the VIF for each variable should be below 5, but values below 10 are still acceptable. Another indicator of multicollinearity is the condition index, which should be below 30 per dimension (Field, 2018). In the present regression model, the highest VIF was 2.355 for the variable attitude, and the highest condition index was 24.876. These values fall within acceptable limits, indicating that no problematic multicollinearity exists, and this assumption is satisfied.

Homoscedasticity: The assumption of constant variance of residuals was checked using a scatterplot of standardized residuals against predicted values. As the points are evenly distributed along the horizontal axis without a funnel or diamond pattern (Figure 3), the assumption of homoscedasticity is met.

Normality of residuals: A P-P plot was used to check for normality of residuals. The points align along the straight line in Figure 4, confirming that the residuals are approximately normally distributed.

By meeting these six assumptions, which are based on the Gauss–Markov theorem, the OLS estimator is valid and unbiased. The regression results can now be interpreted, as detailed in Section 4.

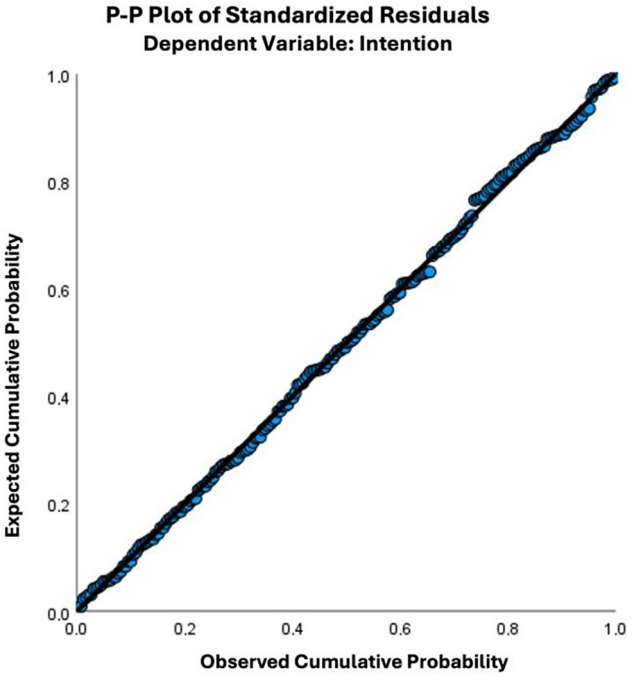

Figure 4. P-P plot of regression model
Source: Authors' own analysis using SPSS

4. Results

Table 2 shows that most of the variables correlated positively with each other with almost medium to strong effect sizes. The significant relationships with intention almost all had medium to high effect sizes. Overall, the strongest association was found between the intention and attitude ($r = 0.60$, $p < 0.01$). Besides attitude, the PCE and subjective norm were significantly positively correlated with the intention ($r = 0.59$ and $r = 0.55$, $p < 0.01$) with an effect size above 0.50. PBC was also significantly related to intention with a medium effect size ($r = 0.48$, $p < 0.01$). Whereas knowledge and availability were significantly related to the intention ($r = 0.30$ and $r = 0.26$, $p < 0.01$), but these relationships showed the weakest effect size out of the relationships with intention. Price had no significant correlation with intention.

Consequently, based on the theoretical framework (Figure 2), a multiple regression analysis was carried out. Figure 3 displays the standardized coefficients predicting sustainable fashion purchase intention. Note that the results are correlational and do not imply causality. The multiple regression analysis shows a significant model for intention as dependent variable (see Appendix). The variables accounted for about 59% of the variance of intention [$F(7,208) = 42.497$].

Attitude, subjective norm and PCE were the most significant predictors for intention ($p < 0.001$). The strongest predictor was PCE ($\beta = 0.29$, $p < 0.001$), followed by attitude ($\beta = 0.27$, $p < 0.001$) and subjective norm ($\beta = 0.23$, $p < 0.001$). PBC and availability were also positively associated with intention, although their effects were smaller. Whereas price was negatively associated with intention, while knowledge showed no significant association with the intention to buy sustainable clothes (see Figure 5).

Table 2. Descriptive statistics and intercorrelations for all variables

Variable	1	2	3	4	5	6	7	8
1. Attitude	1	0.579**	0.399**	0.377**	0.617**	0.197**	0.11	0.600**
2. Subjective norm	—	1	0.487**	0.284**	0.395**	0.141*	0.199**	0.554**
3. PBC			1	0.329**	0.451**	0.052	0.216**	0.475**
4. Knowledge				1	0.217**	0.039	0.130	0.295**
5. PCE					1	0.024	0.197**	0.585**
6. Price						1	0.067	0.037
7. Availability							1	0.258**
8. Intention								1
Number of items	3	3	3	3	3	2	3	4
Mean	3.83	3.22	3.30	3.33	3.48	3.93	2.03	2.56
SD	0.81	0.78	0.79	0.81	0.82	0.82	1.04	0.79
Cronbach's α	0.71	0.75	0.70	0.75	0.72	0.73	0.71	0.87

Note(s): PBC = perceived behavioral control; PCE = perceived consumer effectiveness; ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$
Source(s): Authors' own creation

5. Discussion

Although sustainability is increasingly valued by consumers, there remains a significant gap between their positive attitudes towards sustainable fashion and their actual purchasing behavior, known as the attitude–behavior gap. This study aimed to investigate the factors that are associated with the intention to purchase sustainable fashion among German consumers, using the TPB as a framework.

The research question examined the impact of attitude on purchase intention. Consistent with previous studies (Ha and Janda, 2012; Al Mamun *et al.*, 2018), the results confirmed that a positive attitude towards sustainable fashion significantly associated with a higher intention to purchase such products ($\beta = 0.27$, $p < 0.001$). This supports *H1* and confirms the importance of consumer attitudes in sustainable consumption. However, attitude alone does not fully explain intention, underscoring the complexity of influencing factors. The relationship between subjective norm and purchase intention was also confirmed, with social influences being significantly associated with purchase intentions ($\beta = 0.23$, $p < 0.001$). This finding aligns with the work of Arvola *et al.* (2008) and Vermeir and Verbeke (2006), who emphasized the importance of social pressure and norms in promoting sustainable behaviors. Thus, *H2* is supported, reinforcing the impact of perceived social expectations on sustainable fashion decisions. PBC was shown to have a significant, though moderate, association with purchase intention ($\beta = 0.11$, $p < 0.01$). This suggests that while consumers feel capable of making sustainable purchases, practical barriers such as availability and price still influence their decisions. This outcome is consistent with Ajzen's (1991) theory, which posits that perceived control relates to intentions, but may not be as strong a predictor as attitude or subjective norms. *H3* is thus supported.

Contrary to expectations, knowledge did not have a significant association with purchase intention ($\beta = 0.04$, $p > 0.05$), leading to the rejection of *H4*. This challenges the assumption that greater knowledge about sustainability directly translates into higher purchase intentions. Previous research has shown mixed results regarding the role of knowledge (Markkula and Moisander, 2012; Joshi and Rahman, 2015), suggesting that while consumers may be well-informed, knowledge alone does not significantly relate to purchasing decisions unless coupled with other motivating factors. This result aligns with prior research indicating

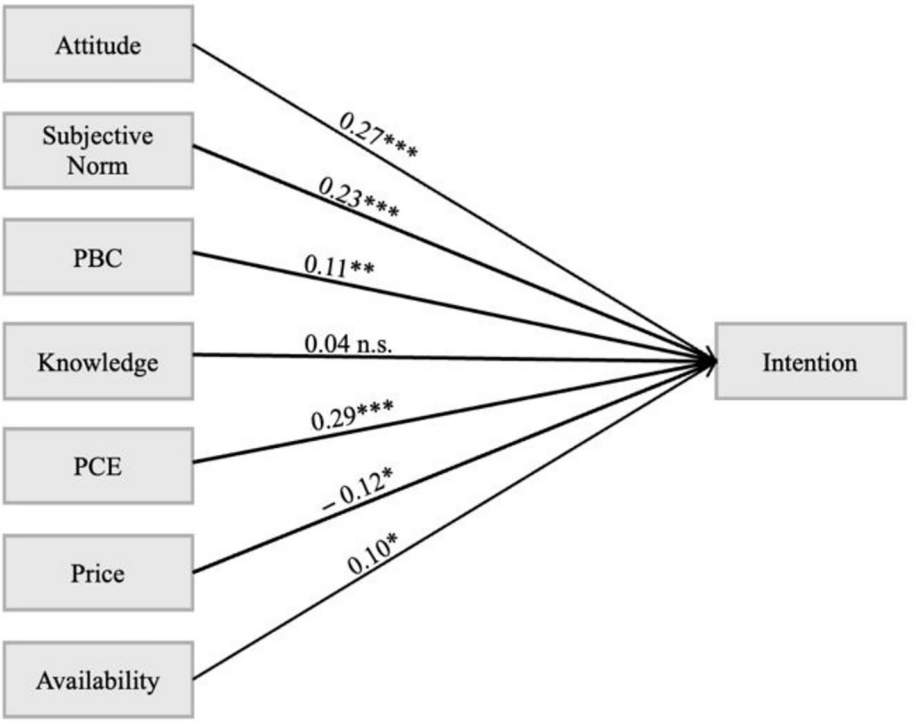

Figure 5. Results of the multiple regression analysis based on Figure 2
Note(s): ***$p \leq 0.001$; **$p \leq 0.01$; *$p \leq 0.05$; n.s. = not significant ($p > 0.05$). The directional arrows show the predictive power
Source: Authors' own creation

that environmental knowledge alone rarely drives purchase intentions unless it is internalized and perceived as personally relevant (Zhang and Chabay, 2020). Moreover, psychological and practical obstacles such as perceived effort, complexity, or skepticism toward green claims can hinder intention formation (Gleim *et al.*, 2013). Indriani *et al.* (2019) further show that knowledge may only affect intentions indirectly through attitudes, underscoring the need for future research on how cognitive and emotional mechanisms interact. PCE emerged as the strongest predictor of purchase intention ($\beta = 0.29$, $p < 0.001$). This finding underscores the importance of consumers' belief in their ability to make a difference through their purchasing choices, which is significantly linked to sustainable behavior (Gleim *et al.*, 2013; Gupta and Ogden, 2009). The significant relationship of this factor supports *H5*, suggesting that empowering consumers to recognize the impact of their actions is crucial for promoting sustainable fashion consumption. Moreover, our findings indicate that pro-environmental attitudes may only translate into actual purchase intentions when consumers feel personally empowered to contribute. PCE thus introduces a distinct psychological dimension of individual agency and moral relevance – particularly significant in the fashion context, where ethical values and identity expression often go hand in hand. The negative association of price on purchase intention ($\beta = -0.12$, $p < 0.05$) supports *H6* and aligns with previous studies that identified cost as a significant barrier to the adoption of sustainable products

(Bray *et al.*, 2011). Despite positive attitudes towards sustainability, the higher cost of sustainable fashion can deter consumers from making purchases, highlighting the need for pricing strategies that make sustainable options more accessible.

Finally, availability was found to positively associated with purchase intention, though it had the weakest effect among the significant predictors ($\beta = 0.10$, $p < 0.05$). This supports *H7* and is consistent with findings from Young *et al.* (2010), who emphasized the importance of product availability in consumer decision-making. Improved availability could enhance convenience, thereby increasing the attractiveness of sustainable fashion.

Demographic variables such as age, education and income showed no significant effects on purchase intention. This underlines the explanatory strength of the main predictors, which remained robust across different population groups. Moreover, the findings of this study confirm that attitude, subjective norms, PBC, perceived consumer effectiveness, price and availability are significantly associated with the intention to purchase sustainable fashion. However, knowledge did not show the expected impact, suggesting that while awareness is necessary, it is not sufficient on its own to relate to purchasing behavior. These results contribute to a deeper understanding of the attitude–behavior gap and offer valuable insights for businesses and policymakers aiming to encourage sustainable fashion consumption.

6. Practical implications

The study identifies key drivers of sustainable fashion purchasing in Germany and offers practical implications for businesses and policymakers. A key recommendation is to strengthen perceived consumer effectiveness by increasing consumer awareness of how individual purchasing decisions can positively impact the environment. Businesses and government entities can achieve this through targeted educational initiatives and transparent communication about the benefits of sustainable choices. Marketing should highlight both environmental and quality benefits to reinforce the sense of agency. Regarding pricing, differentiated strategies that align with varying levels of consumer environmental awareness are crucial. Companies might consider justifying higher prices by showcasing the added sustainability value of these products or employing reference pricing to highlight the long-term economic and environmental benefits of sustainable fashion compared to conventional options. In addition, policymakers could encourage transparency by introducing regulations that require companies to disclose full lifecycle costs, helping consumers make more informed choices.

By implementing these recommendations, both fashion businesses and government agencies can effectively support environmentally conscious consumer behavior. Businesses should focus on accessible pricing and targeted communication, while policymakers can aid through regulatory measures that promote fair pricing and increased product transparency.

These recommendations are grounded in the empirical results of this study. Specifically, PCE emerged as the strongest predictor of purchase intention, underscoring the need to empower consumers through communication and education. Likewise, the significant negative influence of price and the enabling role of availability justify calls for fair pricing strategies and better product access. Together, these insights support the targeted measures outlined above. One promising direction for practitioners is the use of personalized sustainability nudges integrated into existing digital shopping experiences. For example, fashion retailers could implement checkout prompts that show customers the environmental savings of their cart compared to conventional products or recommend more sustainable alternatives in real-time. In addition, loyalty programs could reward repeat purchases of sustainable items, transforming sustainability from a one-time message into an ongoing consumer journey.

7. Limitation and future research

This study focuses on sustainable fashion consumption, with particular attention to the factors influencing purchase intentions within the German market. While the findings offer valuable insights, there are limitations that must be acknowledged. Firstly, although the construct of price was measured using four items, the focus on price sensitivity and willingness to pay may not fully capture the broader complexity of value perception in sustainable fashion. Future studies could enhance this by including additional dimensions, such as the perceived price-performance ratio. Moreover, while this study examined purchase intention, it did not directly measure actual purchasing behavior. To address the intention–behavior gap, future research should apply longitudinal or experimental designs to assess real behavioral outcomes. Moreover, the TPB provided a strong theoretical foundation for this study. However, to fully capture the complexity of sustainable fashion consumption, expanding the model by incorporating elements from complementary frameworks – such as the comprehensive action determination model or the motivation-opportunity-ability model – could offer deeper insights. Future studies could also integrate variables like style preferences, fashion involvement or brand loyalty into the TPB framework. Finally, the generalizability of the results is also constrained using convenience sampling, which may not fully represent the wider population. However, the study mitigated this limitation by actively distributing the survey across diverse networks and achieving a heterogeneous sample in terms of age, gender and educational background. In addition, outliers were removed to enhance data quality. Nonetheless, future studies should use representative sampling to strengthen external validity. Addressing these limitations will further strengthen the robustness of future research on sustainable fashion consumption and provide a more comprehensive understanding of consumer behavior in this evolving field. Furthermore, future research could examine sustainable fashion consumption across different demographic groups or countries to assess generalizability. Experimental or longitudinal designs may yield deeper insights into how shifts in perceived consumer effectiveness or pricing affect behavior over time. Moreover, digital tools – such as impact apps or influencer campaigns – offer promising avenues to test targeted interventions within evolving consumer environments.

8. Conclusion

The study sought to determine the key factors associated with German consumers' intentions to purchase sustainable fashion. The research question addressed the factors that significantly relate to or inhibit the intention to buy sustainable fashion, despite consumers' generally favorable attitudes. Although attitudes were positive, they did not fully translate into purchase intentions. The intention to buy sustainable fashion is significantly associated with PCE, subjective norms and PBC, while price and availability serve as key barriers. Sustainability knowledge had no significant impact, suggesting awareness alone does not drive behavior. PCE emerged as the strongest predictor, highlighting the role of perceived individual impact on sustainable behavior. Subjective norms also played a key role in shaping intentions.

However, the research also highlighted significant barriers to sustainable fashion consumption. Price emerged as a critical factor, with the perception of sustainable fashion as expensive deterring many consumers from purchasing these products. This finding underscores the need for strategies that make sustainable fashion more accessible and affordable to a wider audience. Availability was also identified as a factor, although its influence was less significant compared to other variables, suggesting that while access to sustainable products matters, it is not the sole determinant of purchasing decisions. The nonsignificant role of knowledge challenges the assumption that awareness alone leads to more sustainable behavior.

Beyond this specific finding, the study contributes to theory by extending the TPB framework with four context-specific variables – knowledge, PCE, price and availability.

This offers a more holistic model to explain sustainable fashion consumption and highlights the need to address both cognitive and situational factors in consumer decision-making. Moreover, this specific configuration has rarely been empirically tested in the context of sustainable fashion. It therefore contributes to the theoretical advancement of TPB by adapting it to a highly topical and underexplored consumer domain.

In conclusion, the findings of this study provide important insights into the drivers and barriers of sustainable fashion consumption among German consumers. The findings highlight the need to enhance PCE to empower consumers in their sustainable choices. In addition, there is a clear necessity for fair pricing strategies that make sustainable fashion more accessible, as well as continued efforts to improve the availability of these products.

To this end, companies should implement educational campaigns that stress the tangible impact of sustainable purchases. Businesses could use pricing strategies that emphasize the long-term value of sustainable products. Government regulations on lifecycle cost transparency may further support informed consumer decisions. Together, these measures can help bridge the attitude–behavior gap and promote sustainable fashion adoption.

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Appendix

Table A1. Results of the multiple regression analysis for predicting intention

Variables	b	SE	β	t	p
Attitude	0.269	0.067	0.274	4.016	***
Subjective norm	0.233	0.061	0.231	3.801	***
PBC	0.115	0.057	0.114	2.011	*
Knowledge	0.035	0.048	0.036	0.723	n.s.
PCE	0.277	0.058	0.286	4.799	***
Price	−0.110	0.045	−0.115	−2.436	*
Availability	0.072	0.035	0.095	2.047	*
R^2 *(adj.)*	*0.572*				

Note(s): Adj. = Adjusted R^2, ***$p \leq 0.001$; **$p \leq 0.01$; *$p \leq 0.05$; n.s. = not significant ($p > 0.05$), b = regression coefficient, SE = standard error, β = standardized coefficient, $t = t$-values
Source(s): Authors' own creation

Table A2. Results of the item discriminatory power analysis

#	Discriminatory power	Code	Item	Answer options
1	0.525	A1	I prefer sustainable fashion over conventional fashion	5-point Likert Scale
2	0.591	A2	Purchasing sustainable fashion is necessary to curb global warming	5-point Likert Scale
3	0.553	A3	Purchasing sustainable fashion is a good idea	5-point Likert Scale
4	0.586	SN1	People whose opinions I value believe that I should buy sustainable fashion	5-point Likert Scale
5	0.553	SN2	People whose opinions I value would endorse my decision to buy sustainable fashion	5-point Likert Scale
6	0.577	SN3	People in my social circle buy sustainable fashion	5-point Likert Scale
7	0.537	PBC1	I see myself as capable of purchasing sustainable fashion in future	5-point Likert Scale
8	0.465	PBC2	I have resources, time and willingness to purchase sustainable fashion	5-point Likert Scale
9	0.563	PBC3	There are likely to be plenty of opportunities for me to purchase green products	5-point Likert Scale
10	0.489	K1	I know how to choose products and packaging that reduce waste	5-point Likert Scale
11	0.495	K2	I am very knowledgeable about alternatives to fossil fuels	5-point Likert Scale
12	0.448	K3	I am very knowledgeable about environmental issues	5-point Likert Scale
13	0.449	K4	I am aware that clothing production is often carried out by people in developing countries who are underpaid and work in sometimes dangerous conditions	5-point Likert Scale
14	0.411	PCE1	When I buy clothing, I try to consider how my purchase impacts the environment	5-point Likert Scale
15	0.654	PCE2	Every individual can have an impact on environmental issues, and what I do can make a significant difference	5-point Likert Scale
16	0.642	PCE3	By purchasing environmentally friendly clothing, each consumer's behavior can have a positive impact on the environment and society	5-point Likert Scale
17	0.569	P1	Sustainable fashion is expensive	5-point Likert Scale
18	0.569	P2	Sustainable fashion costs more than nonsustainable fashion	5-point Likert Scale
19	0.539	P3	Even if sustainable fashion were 25% more expensive than regular fashion, I would be willing to buy it	5-point Likert Scale
20	0.482	P4	If my income were higher, I would buy (more) sustainable fashion	5-point Likert Scale
21	0.434	AV1	The stores I usually visit offer little sustainable fashion	5-point Likert Scale
22	0.545	AV2	It is easy for me to find sustainable fashion	5-point Likert Scale

(*continued*)

Table A2. Continued

#	Discriminatory power	Code	Item	Answer options
23	0.545	AV3	If I want to buy sustainable fashion, I have to visit multiple stores	5-point Likert Scale
24	0.586	I1	I would buy sustainable fashion even if it has a less appealing design	5-point Likert Scale
25	0.596	I2	I would buy sustainable fashion even if it is less comfortable	5-point Likert Scale
26	0.597	I3	The likelihood of me buying sustainable fashion is very high	5-point Likert Scale
27	0.568	I4	When I need to replace clothing, I already plan to purchase sustainable fashion	5-point Likert Scale
28	0.557	I5	I intend to buy more sustainable fashion than conventional fashion	5-point Likert Scale

Note(s): All items are measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree)
Source(s): Authors' own creation

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