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Understanding Consumer Fashion Circular Behavior Regarding Second Hand Clothings in Indonesia: An Extended Theory of Planned Behavior and Value Belief Norm Theory Perspective

Diana Puspita-Sari, Purnawan Adi-Wicaksono*, Nuraini Rahmadi, Mirwan Surya-Perdhana, Ovy Ayuning-Nareswari

Diponegoro University (Indonesia)

dianapuspitasari@lecturer.undip.ac.id
*Corresponding author: *purnawan@ft.undip.ac.id*
nurainirahmad@students.undip.ac.id, mirwan@live.undip.ac.id,
ovyayuningnareswari@alumni.undip.ac.id

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Abstract:

Purpose: This research aims to identify and analyze factors that influence consumer willingness and provide a strategic framework to encourage consumer willingness to engage in circular fashion behaviors.

Design/methodology/approach: This research design utilizes a mixed methods approach. The sampling technique employed is purposive sampling with a sample size of 432 respondents. The research utilizes Partial Least Squares Structural Equation Modeling) with SmartPLS 3.0 software.

Findings: The findings of this research indicate that biospheric value, ascription of responsibility, awareness of consequences, environmental concern, economic benefit, personal norm, attitude, and perceived behavior control have a positive and significant influence on the intention to purchase second-hand clothing and willingness to engage in circular fashion behavior. Strategies that can be implemented to enhance consumer willingness include adopting an omni-channel strategy, re-evaluating the pricing of second-hand clothing, providing quality control, and implementing sustainable marketing.

Research limitations/implications: Respondents in this study are still broad because purchasing decisions have yet to be classified based on specific motivations such as economic reasons, hobbies, and collections. This circular fashion study only focuses on second hand clothing products, further research could broaden the scope to include upcycling, recycling, and other types of sustainable fashion.

Practical implications: This study analyzes the relationship between variables that influence consumer behaviour in purchasing second-hand clothing. These variables can be used as a reference for second-hand clothing sellers to increase their sales turnover.

Social implications: This research suggests several strategies that can be implemented to motivate consumers to adopt more sustainable consumption practices towards second-hand clothing.

Originality/value: This research aims to fill the gap by integrating psychological and environmental concepts, specifically the Theory of Planned Behavior and Value Belief Norm Theory, while also considering the perspectives of economic benefits and quality in order to enhance consumer behavior towards participating in circular fashion practices.

Keywords: theory of planned behavior, theory of values belief norms, second-hand clothing, circular fashion

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1. Introduction

The fashion industry has been experiencing an increase in development along with the growing demands of society. In the past decade, the global production capacity in the fashion industry has doubled, as this sector has exponentially grown, reaching an average production of 30 kg per user with an index of 100 million tons consumed annually by people worldwide (Shirvanimoghaddam, Motamed, Ramakrishna & Naebe, 2020). The high fashion production each year can have environmental impacts. The environmental impact caused by this industry has already been felt, but the fashion industry continues to grow with the emergence of fast fashion trends that rely on low prices, frequent consumption, and short-term use (Galatti & Baruque-Ramos, 2022). The "fast fashion" trend has become the dominant mode of production and consumption in the contemporary fashion industry, characterized by the utilization of natural resources to produce inexpensive clothing sold by retailers, which is then worn by consumers for a short period and then discarded (Brydges, 2021).

The fashion industry is considered to be a potential source of pollution and faces social challenges due to specific issues such as non-recoverable and mixed materials, as well as the use of hazardous chemicals for dyeing processes in production (Papamichael, Chatziparaskeva, Pedreño, Voukkali, Almendro-Candel & Zorpas, 2022). The fashion industry is the most resource-intensive and environmentally polluting industry, as the production of garments requires abundant energy and water, with dyeing processes requiring over 100 liters of water per kilogram of fabric (Provin, de-Aguiar-Dutra, Aguiar-de-Sousa-e-Silva-Gouveia & Vieira-Cubas, 2021). Post-consumer fashion waste is also a major concern, as many garments end up in landfills (Nayak, Houshyar, Patnaik, Nguyen, Shanks, Padhye et al., 2020). This is due to excessive and often irrational consumption of fashion products. Fashion products contribute to 10% of carbon dioxide (CO2) emissions and pollute rivers due to the production processes (Ikram, 2022). Emissions from fashion production activities are projected to increase by 60% by 2030 (Koay, Cheah & Lom, 2022).

Indonesia is one of the countries facing ecological damage due to fashion production and excessive consumption patterns. Bright colors, patterns, and fabric textures in clothing are directly obtained from chemicals. Textile dyeing to produce colors is the second-largest freshwater polluter in the world (Shirvanimoghaddam et al., 2020). The use of cheap and easily produced petrochemical-based fabrics such as synthetics and polyester is highly detrimental to the environment (Colasante & D'Adamo, 2021). The Ministry of Environment in 2021 stated that the amount of fabric waste in Indonesia reached 6.57% of various types of waste and is expected to increase every year. According to data from the National Waste Management Information System for 2021, Indonesia currently generates 2.3 million tons of textile and fashion waste, equivalent to 12% of household waste (Safitri, 2022). Textile and fashion waste not only accumulates on land but can also pollute the oceans.

The fashion industry, which has traditionally operated with a linear approach to manufacturing and consumption, needs to transition to a circular economy (CE) approach. CE is developed to reverse unsustainable development patterns and create long-term prosperity by reducing, reusing, recycling, and recovering materials in the production and consumption processes (Centobelli, Cerchione, Chiaroni, Del-Vecchio & Urbinati, 2020). Thus, the concept of circular fashion emerged, which supports sustainable performance in the fashion industry. To achieve circular fashion, consumers need to be involved in choosing clothing made from easily biodegradable materials and accompanied by education to foster environmental awareness. This study aims to encourage consumers to apply the concept of circular fashion through the use of second-hand clothing. Research by Farrant, Olsen and Wangel (2010) showed that replacing new clothing with second-hand clothing can reduce global warming by 14% caused by cotton garments and reduce toxicity by 45% caused by polyester-cotton clothing.

Some authors have reviewed and examined the behavior of using recycled fashion (Brandão & da-Costa, 2021; Cesarina-Mason, Pauluzzo & Muhammad-Umar, 2022; Dangelico, Alvino & Fraccascia, 2022; Gomes, Moreira, Bouman, Ometto & van der Werff, 2022). Some authors have investigated the behavior of using second-hand clothing (Becker-Leifhold, 2018; Mohammad, Quoquab & Sadom, 2020; Gomes et al., 2022; Koay et al., 2022; Lou, Chi, Janke & Desch, 2022). From the studies conducted, research on the behavior of using second-hand clothing is dominated by developed countries such as Germany, Brazil, the Netherlands, and the United States, while there have been some studies conducted in developing countries such as Malaysia, but not many. Therefore, this study aims to predict the behavior of using second-hand clothing in a developing country, particularly in Indonesia, which has a potentially significant market. This study will consider consumer behavior towards fashion products by utilizing fashion for longer use. The theories commonly used to study CE behavior are the Theory of Planned Behavior (TPB)/Extended TPB (Jain, Khan & Mishra, 2017; Mohammad et al., 2020; Borusiak, Szymkowiak, Horska, Raszka & Zelichowska, 2020; Yeh, Guan, Chiang, Ho & Huan, 2021; Brandão & da-Costa, 2021; Cesarina-Mason et al., 2022; Dangelico et al., 2022; Fauzi, Hanafiah & Kunjuraman, 2022; Lin, Tseng, Chang & Yang, 2022; Lira & da-Costa, 2022). The Value Belief Norm (VBN)/Extended VBN (Becker-Leifhold, 2018; Floress, Shwom, Caggiano, Slattery, Cuite, Schelly et al., 2022; Gomes et al., 2022; Hein, 2022; Sari, Masruroh & Asih, 2021). Research by Sari et al. (2021) integrated TPB-VBN to analyze e-waste collection behavior. This research will develop the Theory of Planned Behavior (TPB) and Value Belief Norm (VBN) models expanded with economic benefits and perceived quality. Therefore, the aim of this study is to analyze consumers' willingness to participate in circular fashion behavior using the Theory of Planned Behavior (TPB) and Value Belief Norm (VBN) models extended with economic benefits and perceived quality (Extended TPB-VBN). The research will identify consumer behavior towards second-hand clothing products from the perspective of circular economy.

2. Literature Review

The research aims to predict circular fashion behavior by adopting the Theory of Planned Behavior (TPB) as the basic model and extending it with the Value Belief Norm (VBN) theory, economic benefits, and perceived quality. The proposed research framework, as presented in Figure 1. A total of 12 hypotheses were taken from 13 variables/factors/constructs, including willingness to participate in circular fashion behavior, second-hand purchase intention, attitude, subjective norm, perceived behavior control, personal norm, ascription of responsibility, awareness of consequences, environmental concern, biospheric value, hedonic values, economic benefit and perceived quality. The following describes the factors that influence consumer intention to purchase a second-hand clothing and participate in e-waste collection programs, and then this intention will influence willingness to participate in circular fashion behavior. Indicators of each variable as shown in Appendix A.

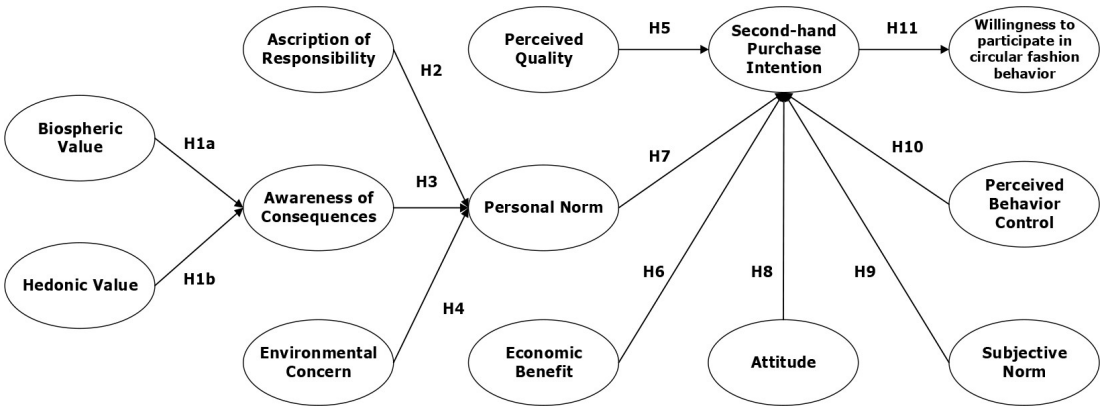

Figure 1. Conceptual Model

2.1. Value Belief Norm Theory

Individual behaviors, both directly and indirectly, contribute to environmental problems, making environmental protection an important consideration in one's decision-making (Stern, 2000).

2.2.1. Biospheric Value

The biospheric value indicates how individuals perceive the values of the natural environment (Cao, Li, Zhao, Qian & Xiang, 2022). Individuals with a strong biospheric value prioritize environmental concerns and make decisions based on the costs and benefits to an ecosystem (Sari et al., 2021). Previous research has found that biospheric value significantly influences awareness of environmental consequences, which explains circular behavior (Gomes et al., 2022). Consumers with a strong biospheric value tend to have a high level of environmental consciousness (Hiratsuka, Perlaviciute & Steg, 2018; Ghazali, Nguyen, Mutum & Yap, 2019).

H1(a): Biospheric value positively influences awareness of consequences.

2.2.2. Hedonic Value

The hedonic aspect represents the extent to which a product is capable of evoking emotions and creating pleasurable experiences for customers (Quoquab, Jaini & Mohammad, 2020). Generally, hedonic value connects daily consumption with the need for emotional satisfaction through stimulation, fulfillment of inner life, and shopping pleasure (Becker-Leifhold, 2018). Previous research has found that hedonic value influences awareness of environmental consequences, which explains circular behavior (Gomes et al., 2022). Ongoing sustainable behavior creates a positive relationship with hedonic value when such behavior provides hedonic benefits.

H1(b): Hedonic value positively influences awareness of consequences.

2.2.3. Ascription of Responsibility

Ascription of Responsibility refers to the belief that the actions of each individual can prevent or contribute to potential undesired consequences (Kiatkawsin & Han, 2017). Pro-environmental behavior in society strengthens when individuals are aware of the harmful impacts on the environment and feel mutually responsible for the negative outcomes on the environment (Verma, Chandra & Kumar, 2019). Furthermore, purchasing second-hand products is seen as a form of environmentally friendly and socially responsible consumption, closely related to personal morality and social responsibility (Borusiak et al., 2020). Research by Joanes (2019) indicates that ascription of responsibility positively influences personal norms to reduce clothing consumption.

H2: Ascription of responsibility positively influences personal norm.

2.2.4. Awareness of Consequences

Awareness of consequences refers to whether individuals are aware of the negative repercussions that arise for others or for valued entities when they fail to engage in pro-social actions. Awareness of consequences is measured to assess the extent to which consumers in Brazil and the Netherlands are concerned about the environmental and social issues caused by fast fashion (Gomes et al., 2022). Increased awareness of the consequences associated with this issue, in turn, is linked to perceived moral obligations to reduce clothing consumption (Joanes, 2019). Research by Borusiak et al. (2020) demonstrates that positive environmental consequence awareness has a significant impact on personal norms and the intention to purchase second-hand products among consumers in Poland.

H3: Awareness of consequences positively influences personal norm.

2.2.5. Environmental Concern

The research by Borusiak et al. (2020) indicates that environmental concern refers to individuals who are aware of environmental issues and actively support efforts to address them by contributing personally to solutions (Sari et al., 2021). Higher environmental concern typically leads to a greater intention to protect the environment, and purchasing environmentally friendly products is an effective choice for consumers (Zhang, Fan, Zhang & Zhang, 2019). Previous studies have found that consumers are generally more likely to consider the environmental effects of their purchasing habits while also caring about the environment (Verma et al., 2019). Research by Al-Mamun, Hayat, Masud, Makhbul, Jannat and Salleh (2022) shows that environmental concern from an ecological perspective influences the personal norms that arise towards the environment.

H4: Environmental concern positively influences awareness of consequences.

2.3. Perceived Quality

Perceived quality is defined as consumers' evaluation of the overall product based on its intrinsic (performance and durability) and extrinsic (brand) attributes (Asshidin, Abidin & Borhan, 2016). Perceived quality refers to consumers' assessment of the overall excellence of a product, where consumers receive information about the characteristics of a product while shopping for or consuming it (Nekmahmud & Fekete-Farkas, 2020). The research by Lou et al. (2022) indicates that perceived quality positively influences the intention of US consumers to purchase second-hand luxury goods. The study by Suhaily, Darmoyo, Boentoro and Anasthashia (2020) shows that perceived quality affects consumers' intention to purchase environmentally friendly products, such as high-quality stainless steel straws to reduce environmental pollution.

H5: Perceived Quality has a positive and significant effect on purchase intention.

2.4. Economic Benefit

Economic benefit is defined as the financial savings received by consumers when using reusable products (Lin et al., 2022). The research by Guiot and Roux (2010) shows that there are four motifs related to economic benefits for second-hand products, including consumers' desire to pay a lower price, the thrill of finding cheap items, the search for fair pricing, and the satisfying role of price. Generally, second-hand clothing has a lower financial price compared to new clothing. The affordability of second-hand clothing provides consumers with an opportunity to save money (Lou et al., 2022).

H6: Economic benefit has a positive and significant effect on purchase intention.

2.5. Personal Norm

Personal norms are intrinsic factors that reflect the desires of individuals and are related to self-expectations and attitudes based on norms and values regarding environmental behavior (Sari et al., 2021). Personal norms become stronger when individuals feel that they can contribute to solving or reducing environmental problems (Stern, Dietz, Abel, Guagnano & Kalof, 1999). Personal norms effectively influence an individual's intention to engage in solid waste management practices (Al-Mamun et al., 2022). The research by Borusiak et al. (2020) demonstrates that personal norms play a significant role in explaining the intention to purchase second-hand products in Poland. The study by Chaturvedi, Kulshreshtha and Tripathi (2020) shows that personal norms positively and significantly influence the intention of Gen Z consumers to purchase recycled clothing.

H7: Personal norm has a positive and significant effect on purchase intention.

2.6. Theory of Planned Behavior

The Theory of Planned Behavior (TPB) is considered a modification of the previously developed theory, Theory of Reasoned Action (TRA). It was first proposed by Ajzen in 1991 and has since been widely applied in various empirical studies. TPB is defined as a theory used to predict an individual's behavior (Ajzen, 1991).

2.6.1. Attitude

Attitude is determined by an individual's prominent beliefs that state that behavior leads to certain outcomes and the individual's evaluation of those outcomes (Jain et al., 2017). Someone with a positive attitude towards a behavior is more likely to have a positive desire to engage in that behavior (Abbasi, Yow & Goh, 2020). Research by Borusiak et al. (2020) shows that attitude has a positive and significant influence on consumers' intention to purchase second-hand clothing for sustainable consumption. The study by Jain et al. (2017) indicates that attitude is the most important predictor of purchase intention for luxury fashion among Indian consumers.

H8: Attitude has a positive and significant effect on purchase intention.

2.6.2. Subjective Norm

Subjective norm refers to an individual's perception of what others think about a particular behavior (Ajzen, 1991). The research by Borusiak et al. (2020) menunjukkan shows that individuals are more likely to purchase second-hand products if they themselves or their friends approve of it. Therefore, the greater the social pressure received, the

greater the motivation to engage in a specific behavior (Ding, Liu, Yang & Ma, 2022). Previous studies have found that subjective norm positively influences the intention to participate in electronic waste collection programs (Sari et al., 2021). Other studies have also found that subjective norm positively influences consumers' purchase intention for environmentally friendly and remanufactured products in China (Zhang & Luo, 2021).

H9: Subjective norm has a positive and significant effect on purchase intention.

2.6.3. Perceived Behavior Control

Perceived Behavioral Control (PBC) refers to the individual's perception of their ability to perform a behavior, taking into account the opportunities and resources available to them that may be beyond their control, such as space, time, or skills (Abbasi, Chee-Keong, Kumar & Iranmanesh, 2022). Research by Ajzen (1991) shows that the more opportunities an individual has, the higher their perceived control over the behavior. Previous studies on second-hand clothing have found that PBC influences consumers' intentions in Malaysia (Koay et al., 2022). Another study found that PBC has a positive and significant influence on individuals' purchase of environmentally friendly organic clothing (Zhang et al., 2019).

H10: Perceived behavior control positively influences purchase intention.

2.7. Purchase Intention

Consumer purchase intention arises from the possibility or desire of an individual to buy environmentally friendly products (Suhaily et al., 2020). Many consumers are willing to pay less for air pollution and are willing to pay more for emission reductions through renewable fuels (Suhaily et al., 2020). Intention plays a significant role in shaping an individual's behavior (Ajzen, 1991). Intention strongly motivates individuals to engage in desired behaviors (Ajzen, 1991). Many researchers have explored the mediating role of intention in consumer purchase behavior in various studies (Jain et al., 2017).

H11: Purchase intention has a positive and significant effect on willingness to participate in circular fashion behavior.

3. Research Methods

3.1. Sampling and Data Collection

This study employed the purposive sampling technique, where the researcher selects samples based on specific criteria that are considered representative of a population (Sugiyono, 2011). The chosen criteria were respondents who have previously made purchases of second-hand clothing products. The questionnaire could be completed by both male and female respondents aged 17 years and above. This minimum age was adopted because consumers within this age range can be assumed to have sufficient understanding of the questionnaire's content. Data collection was conducted through focus group discussions and the distribution of online and offline questionnaires from January to April 2023. Prior to the comprehensive data collection, a pilot study was conducted with 30 respondents who were users of second-hand clothing. This stage was carried out using a pilot study to measure the validity and reliability of the data, ensuring that the research instrument was suitable for use.

3.2. Measurement

The variables measuring the intentions and behaviors of consumers in purchasing second-hand clothing were selected and modified based on previous literature. Firstly, biospheric value, awareness of consequences, and personal norm were each measured using 4 items and 5 items adapted from (Gomes et al., 2022). Hedonic value was measured using 4 items adapted from (Quoquab et al., 2020). Ascription of responsibility was measured using 5 items adapted from (Al-Mamun et al., 2022; Hein, 2022). Environmental concern was measured using 5 items adapted from (Sari et al., 2021; Zhang et al., 2019). Perceived quality was measured using 5 items adapted from (Lou et al., 2022). Economic benefit was measured using 4 items adapted from (Kim & Hyun, 2022; Lin et al., 2022). Attitude and perceived behavior control were each measured using 5 items modified from (Borusiak et al., 2020; Koay et al., 2022). Subjective norm was measured using 4 items modified from (Zhang et al., 2019; Borusiak et al., 2020). Purchase intention was measured using 4 items adapted from (Lou et al., 2022; Syahrivar, Kusuma, Pahlevi, Wei, Chairy & Genoveva, 2022). Finally, willingness to participate in circular fashion behavior intention was

measured using 4 items adapted from (Mohammad et al., 2020). This study utilized a measurement mechanism with a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (Sugiyono, 2011).

3.3. Analysis Tools

This study adopts a variance-based analysis approach called Structural Equation Modeling (SEM) using the Partial Least Squares (PLS-SEM) technique. The analysis tool employed is SmartPLS 3.0. PLS-SEM is used when the structural model is complex and includes many construct, indicators and/or model relationship (Hair, Risher, Sarstedt & Ringle, 2019; Marin-Garcia & Alfalla-Luque, 2019), small population restricts the sample size (Hair et al., 2019). PLS produces more accurate path coefficients estimates when sample sizes are less than 500 (Vinzi, Chin, Henseler & Wang, 2010), and distribution issues are concern, such as lack of normality (Garson , 2016; Hair et al., 2019). When the assumptions of CB-SEM are violated (inadequate sample size, non-normal data, lack of parsimony), standard errors in CB-SEM are inflated and PLS-SEM tends to exhibit lower variability of estimates, CB-SEM uses maximum likelihood estimation whereas standard PLS-SEM uses ordinary least squares. The former requires larger sample sizes. For smaller samples, PLS-SEM is sometimes preferred. PLS-SEM converges quickly and is less likely to fail to converge on a solution compared to CB-SEM. A corollary is that compared to CB-SEM, PLS-SEM may be able to handle much larger and more complex models (Garson, 2016). PLS-SEM was used in this study because the sample size was less than 500, the model is complex (many indicators and lots of constructs) and the data were not normally distributed. The analysis process begins with the construction of a model, which includes the measurement model and the structural model. The measurement model is evaluated by testing the validity and reliability of the constructs through factor loading, construct reliability, construct validity, and confirmatory factor analysis. Subsequently, the structural model is evaluated by testing the research hypotheses through the calculation of path coefficients and conducting significance tests using bootstrap resampling.

4. Result and Discussion

4.1. Preliminary Analysis

The respondents who rate the predictor variable and those who rate the dependent variable are the same people, thus potentially causing bias in the assessment (e.g., common method bias) (Nguyen, Nguyen, Nguyen & Greenland, 2021). Common method bias usually occurs in research where independent and dependent variable data are obtained from the same subjects in a measurement context with the same context items and item characteristics (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). To ensure that common method bias did not appear in this study, use Harman's single factor (Bagozzi & Yi, 1990; Richardson, Simmering & Sturman, 2009). The test results for all variables show that one factor formed can explain a variance of 29.384%. This value indicates that in this study, there was no common method bias (Malhotra, Kim & Patil, 2006).

To ensure that there was no observed heterogeneity of demographic factors, including gender, age, education and income, a homogeneity test was carried out. The results of the homogeneity test show that all samples from the study were taken from a homogeneous population because all demographic factors have a significance level (p) of more than 0.05 (O'Neill & Mathews, 2000). This value indicates that no observable heterogeneity emerged in the data between male vs male gender (p=0.047); age 25 years and under and over 25 years (p=0.485); Diploma or less education vs bachelor's degree or higher (p=0.505) and monthly income level of IDR 2 million or less vs more than IDR 2 million (p=0.096).

4.2. Descriptive Analysis

A total of 432 responses were collected for data analysis. Descriptive analysis was conducted to examine the characteristics of the respondents, including gender, age, highest education level, income, and occupation. The descriptive statistics results show that most respondents were female, accounting for 276 people (63.8%), with the majority falling within the age range of 17-25 years, totaling 259 people (59.95%). Most respondents had completed high school as their highest education level, with 211 people (48.84%). Most of the respondents mostly ranged above Rp. 1,000,000, with 139 people (25.17%). Table 1 presents the distributions of the study sample. Complete descriptive statistics are presented in Appendix 2.

4.3. Evaluation of Measurement Models

The measurement model was evaluated by conducting tests for validity and reliability. Reliability testing in this model was done using internal consistency reliability, while validity testing was conducted through convergent validity and discriminant validity.

4.3.1. Reliability Analysis

Reliability testing was conducted using Cronbach's Alpha and Composite Reliability to measure internal consistency reliability. According to commonly used criteria, Cronbach's Alpha and Composite Reliability values greater than 0.7 indicate sufficient reliability for the constructs (Hair, Black, Babin & Anderson, 2018).

Variable	Category	Frequency	Percentage
Gender	Female	276	63,8 %
	Male	156	36,2 %
Ages	17 – 25 years	259	59,95 %
	26 – 35 years	140	32,41 %
	36 – 45years	24	5,5 %
	> 45 years	9	2,8%
Education Degree	Junior high school	5	1,16 %
	Senior high school	211	48,84 %
	Diploma	65	15,04 %
	Bachelor	132	30,5 %
	Postgraduate	18	4,1 %
	Engineering professional program	1	0,23 %
Monthly Income (IDR)	1.000.000	139	32,17 %
	1.000.000 – 1.999.999	111	25,69 %
	2.000.000 – 2.999.999	78	18,05 %
	3.000.000 – 4.000.000	68	15,74 %
	> 4.000.000	36	8,33 %
Total		432	100 %

Table 1. Sample Distributions

Table 2 shows the values of Cronbach's Alpha and Composite Reliability for each construct. The minimum and maximum values for Cronbach's Alpha are 0.721 and 0.893, respectively, indicating that all constructs have Cronbach's Alpha values above 0.7. Similarly, the minimum and maximum values for Composite Reliability are 0.843 and 0.921, respectively, indicating that all constructs have Composite Reliability values above 0.7. Therefore, it can be concluded that all constructs in this study have adequate reliability based on the testing using Cronbach's Alpha and Composite Reliability.

4.3.2. Convergent Validity

The principle of convergent validity testing involves examining high correlations among measured indicators. Convergent validity testing can be conducted by looking at the Average Variance Extracted (AVE) parameter. The recommended AVE value is greater than 0.5, and if there are AVE values below 0.5, the indicator with the lowest factor loading should be eliminated (Fornell & Larcker, 1981). Ideally, outer loadings should be higher than 0.7 (Heanseler, Ringle & Sinkovics, 2009). In this study, several items were eliminated because they had factor loadings lower than 0.7. Thus, all constructs were successfully validated, and the results are presented in Table 2.

Variable	Indicators	Outer Loading	Cronbach's Alpha	AVE	CR
Biospheric Value	BV2	0,734	0,850	0,688	0,868
	BV3	0,891			
	BV4	0,855			
Hedonic Value	HV1	0,776	0,763	0,642	0,843
	HV2	0,844			
	HV3	0,782			
Awareness of Consequences	AC1	0,805	0,854	0,627	0,893
	AC2	0,730			
	AC3	0,812			
	AC4	0,749			
	AC5	0,855			
Ascription of Responsibility	AR2	0,838	0,815	0,676	0,862
	AR3	0,745			
	AR4	0,877			
Environmental Concern	EN1	0,884	0,783	0,701	0,921
	EN2	0,855			
	EN3	0,877	0,783	0,701	0,921
	EN4	0,793			
	EN5	0,773			
Perceived Quality	PQ2	0,742	0,861	0,675	0,910
	PQ3	0,851			
	PQ4	0,866			
Attitude	AT1	0,771	0,893	0,632	0,895
	AT2	0,785			
	AT3	0,813			
	AT4	0,746			
	AT5	0,856			
Economic Benefit	EB1	0,765	0,721	0,705	0,905
	EB2	0,861			
	EB3	0,878			
	EB4	0,850			
Personal Norm	PN1	0,896	0,883	0,718	0,861
	PN2	0,874			
	PN3	0,729			
	PN4	0,880			
Subjective Norm	SN1	0,833	0,818	0,732	0,891
	SN3	0,850			
	SN4	0,883			
Perceived Behavior Control	PBC1	0,788	0,867	0,616	0,865
	PBC2	0,743			
	PBC3	0.831			
	PBC4	0,775			

Variable	Indicators	Outer Loading	Cronbach's Alpha	AVE	CR
Purchase Intention	INT1	0,800	0,764	0,741	0,919
	INT2	0,849			
	INT3	0,885			
	INT4	0,905			
Willingness to Participate in Circular Fashion Behavior	BHV1	0,776	0,810	0,727	0,888
	BHV2	0,889			
	BHV4	0,888			

Table 2. Measurement Model

4.3.3. Discriminant Validity

Discriminant validity testing can be conducted using the Fornell-Larcker criteria and cross-loading (Heanseler et al., 2009). Table 3 presents the results for the Fornell-Larcker criteria. The results of the Fornell-Larcker criteria show that the square root of AVE for the same latent variables has a higher correlation than with other latent variables. This demonstrates that the study meets the criteria for discriminant validity, indicating that the constructs in this research are well-formed and have satisfactory discrimination.

	AR	AT	AC	BV	EB	EN	HV	PBC	PQ	PN	INT	SN	BV
AR	**0,822**												
AT	0,323	**0,795**											
AC	0,343	0,592	**0,792**										
BV	0,210	0,377	0,394	**0,829**									
EB	0,220	0,680	0,547	0,325	**0,840**								
EN	0,232	0,679	0,692	0,341	0,488	**0,837**							
HV	0,404	0,198	0,199	0,285	0,164	0,138	**0,801**						
PBC	0,269	0,230	0,248	0,168	0,117	0,247	0,240	**0,785**					
PQ	0,557	0,428	0,319	0,319	0,302	0,274	0,447	0,251	**0,821**				
PN	0,342	0,604	0,745	0,281	0,516	0,702	0,073	0,179	0,318	**0,848**			
INT	0,210	0,707	0,618	0,299	0,623	0,674	0,086	0,297	0,327	0,693	**0,861**		
SN	0,361	0,689	0,579	0,270	0,544	0,514	0,218	0,362	0,452	0,570	0,619	**0,856**	
BHV	0,367	0,602	0,529	0,460	0,513	0,523	0,320	0,240	0,471	0,577	0,605	0,494	**0,852**

Table 3. Discriminant Validity-Fornell Larcker

4.4. Structural Model Evaluation

First, the structural model is evaluated by considering the assessment criteria, namely the R-Square values to explain the overall model. R-Square values have suggested thresholds, where values above 0.67, 0.33, and 0.19 are considered substantial, moderate, and weak, respectively (Heanseler et al., 2009). The results of the structural model, with R-Square values of 0.650 for INT, 0.630 for PN, 0.366 for BHV, and 0.163 for AC, indicate moderate effects for INT, PN, and BHV, and a weak effect for AC. Next, a model is considered to have a good fit if the SRMR value approaches 0.08 (Hu & Bentler, 2009). This study has an SRMR value of 0.078, which indicates a good model fit. Finally, the structural model is evaluated by testing the research hypotheses. The bootstrapping technique with 500 resamples is applied to assess the structural model using SmartPLS 3.0.

Table 4 and Figure 2 present the results of hypothesis testing. The results of the structural equation model indicate that 9 research hypotheses are supported. H1a confirms that biospheric value positively influences awareness of

consequences for second-hand clothing (H1a: β = 0.367, p < 0.001), thus supporting H1a. However, hedonic value does not have a significant effect on awareness of consequences (H1b: β = 0.113, p > 0.05), thus H1b is not supported. Ascription of responsibility, awareness of consequences, and environmental concern have positive and significant effects on personal norm (H2: β = 0.101, p < 0.01), (H3: β = 0.461, p < 0.001), (H4: β = 0.360, p < 0.001), hence supporting H2, H3, and H4. However, perceived quality and subjective norm do not have a significant effect on consumers' intention to purchase second-hand clothing (H5: β = -0.038, p > 0.05) and (H9: β= 0.080, p > 0.05), therefore H5 and H9 are not supported.

Factors such as economic benefit, personal norm, attitude, and perceived behavior control have a significant positive effect on consumers' intention to purchase second-hand clothing (H6: β = 0.191, p < 0.001), (H7: β =0.363, p<0.001), (H8: β = 0.290, p < 0.001), and (H10: β = 0.123, p < 0.01), thus supporting H6, H7, H8, and H10. Lastly, H11 confirms that intention to purchase second-hand clothing positively and significantly influences consumers' willingness to participate in circular fashion behavior (H11: β = 0.605, p < 0.001), therefore H11 is supported.

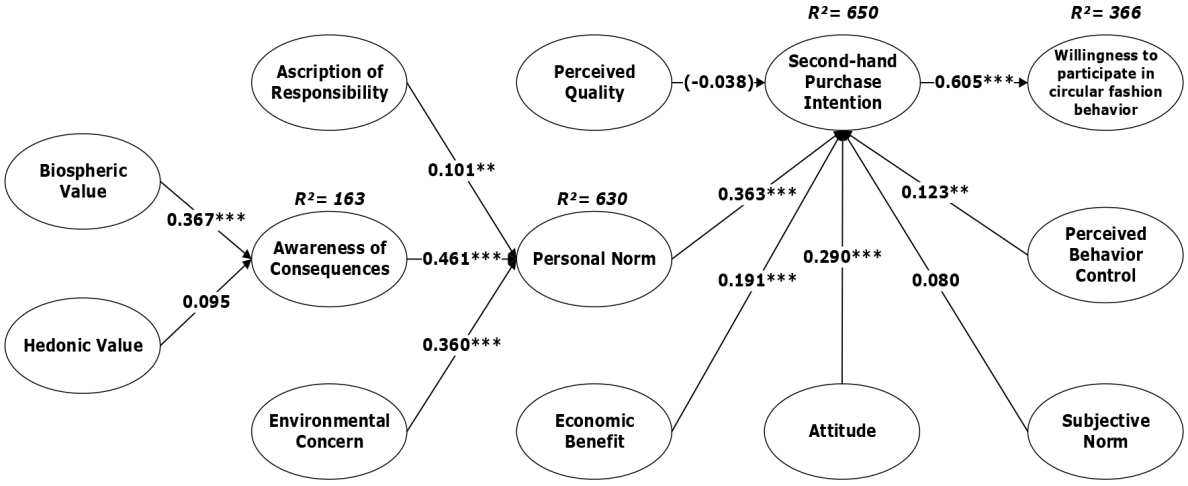

Figure 2. Result of Structural Model

Hypothesis	Path Coeff.	T Stat.	Description
H1a : Biospheric → Awareness of Consequences	0,367***	5,380	Supported
H1b : Hedonic → Awareness of Consequences	0,095ns	1,570	Not Supported
H2 : Ascription of Responsibility → Personal Norm	0,101**	3,067	Supported
H3 : Awareness of Consequences → Personal Norm	0,461***	8,029	Supported
H4: Environmental Concern → Personal Norm	0,360***	5,159	Supported
H5 : Perceived Quality → Intention	-0,038ns	1,257	Not Supported
H6 : Economic Benefit → Intention	0,191***	4,695	Supported
H7 : Personal Norm → Intention	0,363***	6,774	Supported
H8 : Attitude → Intention	0,290***	4,994	Supported
H9 : Subjective Norm → Intention	0,080ns	1,316	Not Supported
H10 : Perceived Behavior Control → Intention	0,123**	3,335	Supported
H11 : Intention → Circular Behavior	0,605***	16,927	Supported

Notes: p = significant probability, where ** p < 0.05; *** p < 0.001; ns: not significant

Table 4. Result of Hypothesis Testing

4.5. Heterogeneity

In subsection 4.5, unobserved heterogeneity and observed heterogeneity will be discussed. The purpose of discussing heterogeneity in a research model is to detect structural differences within the population, ensuring that the relationships between constructs do not vary significantly across different groups (Hair, Hult, Ringle & Sarstedt, 2022). Identifying heterogeneity is crucial to avoid biased or misleading conclusions, as assuming homogeneity when significant differences exist can lead to overgeneralizations. By examining heterogeneity, researchers can validate whether their model applies uniformly across all groups or whether it is only relevant to certain subgroups. Furthermore, addressing heterogeneity helps in identifying unique segments within the data, offering valuable insights for targeted interventions or strategies, particularly in fields like marketing, education, and public policy. Analyzing heterogeneity also enhances the quality of model interpretation by highlighting the contextual conditions under which relationships between variables strengthen or weaken (Henseler, Ringle & Sarstedt, 2016). Overall, testing for heterogeneity ensures more accurate, reliable, and generalizable research findings.

4.5.1. Unobserved Heterogeneity

When research only considers one group for parameter analysis and estimation, unobserved heterogeneity must also be verified, which can be done by PLS-SEM-based latent class methods (Hair et al., 2019; Marin-Garcia & Alfalla-Luque, 2019). The FIMIX (finite mixture PLS) procedure allows us to detect the number of non-homogeneous groups in the parameter estimates by using the fit index parameters AIC, BIC, CAIC, HQ, MDL5 and LNL. The fit indices results from fimix procedure is shown in Table 5.

	1 segmen	2 segmen	3 segmen	4 segmen	5 segmen
AIC (Akaike's information criterion)	3778,705	3361,267	3196,166	3025,179	2869,019
AIC3 (modified AIC with Factor 3)	3794,705	3394,267	3246,166	3092,179	2953,019
AIC4 (modified AIC with Factor 4)	3810,705	3427,267	3296,166	3159,179	3037,019
BIC (Bayesian information criterion)	3843,800	3495,525	3399,588	3297,764	3210,767
CAIC (consistent AIC)	3859,800	3528,525	3449,588	3364,764	3294,767
HQ (Hannan-Quinn criterion)	3804,404	3414,271	3276,476	3132,794	3003,940
MDL5 (minimum description length with factor 5)	4232,179	4296,557	4613,273	4924,102	5249,758
LnL (LogLikelihood)	-1873,353	-1647,633	-1548,083	-1445,590	-1350,510
EN (normed entropy statistic)	0,000	0,830	0,849	0,769	0,826
NFI (non-fuzzy index)	0,000	0,862	0,857	0,744	0,795
NEC (normalized entropy criterion)	0,000	73,497	65,174	99,988	74,957

Table 5. Unobserved Heterogeneity

The model fit was assessed using a variety of information criteria, including AIC, BIC, CAIC, HQ, and modified AIC values (AIC3, AIC4). As shown in Table 5, all fit indices consistently decreased as the number of segments increased from one to five, suggesting that models with more segments exhibit a better statistical fit.

However, model selection cannot rely solely on information criteria; interpretability and classification quality must also be considered. Entropy (EN), the normalized fuzzy index (NFI), and the normalized entropy criterion (NEC) were used to evaluate the clarity of segment classification. While the five-segment model achieved the lowest values in most fit indices, its classification quality, as indicated by EN (0.826) and NFI (0.795), was lower compared to the two- and three-segment models.

Notably, the three-segment model achieved a strong balance between statistical fit (AIC = 3196.166, BIC = 3399.588) and classification accuracy (EN = 0.849, NFI = 0.857), making it both parsimonious and interpretable. Therefore, the three-segment solution is considered the most appropriate model, offering an optimal trade-off between model complexity, goodness-of-fit, and meaningful segmentation.

According to Sarstedt, Ringle and Hair (2017), the commonly used minimum number of cases per segment in approaches such as FIMIX-PLS is around 30 respondents, in order for the parameter estimation results in each segment to remain stable and reliable. The table 6 shows the number of respondents in each segment for the three respondent segments.

	Segment1	Segment2	Segment3
%	0,612	0,264	0,123
Number of respondents	265	114	53

Table 6. Number of Respondents Three Segment

The table below presents the SmartPLS results showing the path coefficients for each path within the respondent segments. These results help identify the characteristics of respondents in each segment. Table 7 shows path coefficient from each segment.

	Segment 1	Segment 2	Segment 3
Ascription of Responsibility -> Personal Norm	-0,024	0,250	0,255
Attitude -> Purchase _Intention	0,161	0,094	0,429
Awareness of _Consequences -> Personal Norm	0,689	0,120	0,278
Biospheric _Value -> Awareness of _Consequences	-0,180	0,446	0,961
Economic _Benefit -> Purchase _Intention	0,120	0,034	0,333
Environmental -> Personal Norm	0,036	0,688	0,627
Hedonic_Value -> Awareness of _Consequences	0,139	0,495	-0,167
Perceived Behavioral _Control -> Purchase _Intention	0,411	0,020	-0,059
Perceived Quality -> Purchase _Intention	-0,012	0,156	0,107
Personal Norm -> Purchase _Intention	0,228	0,591	0,363
Purchase _Intention -> Willingness to Participate _in Circular Behavior	0,211	0,976	0,935
Subjective _Norm -> Purchase _Intention	0,140	0,154	-0,088

Table 7. Path Coefficient Each Segment

Segment 1

High path coefficients:

- Awareness of Consequences → Personal Norm
- Perceived Behavioral Control → Purchase Intention
- Personal Norm → Purchase Intention

Low path coefficients:

- Biospheric Value → Awareness of Consequences
- Ascription of Responsibility → Personal Norm

Respondents in this segment tend to be rational and self-control oriented. They will take action if they are aware of the consequences and feel capable, not because they feel morally responsible or have strong environmental values.

Segment 2

High path coefficients:

- Purchase Intention → Willingness to Participate in Circular Behavior
- Environmental → Personal Norm
- Personal Norm → Purchase Intention

Low path coefficients:

- Economic Benefit → Purchase Intention
- Perceived Behavioral Control → Purchase Intention

These respondents are morally driven and environmentally conscious. Personal norms and environmental concern are their main behavioral drivers. They don't consider economic benefit or ease of action much in decision-making. Purchase intention is the key, as it leads them to engage in real actions like circular behavior.

Segment 3

High path coefficients:

- Biospheric Value → Awareness of Consequences
- Purchase Intention → Willingness to Participate in Circular Behavior
- Environmental → Personal Norm

Low path coefficients:

- Hedonic Value → Awareness of Consequences
- Subjective Norm → Purchase Intention

Respondents in this segment are idealistic and independent, strongly influenced by ecological values and personal awareness, not by social environment or trends. They act based on internal values (biospheric values) and a sense of personal responsibility. Social pressure or trends do not influence their decisions. They are not driven by personal pleasure but by the meaning and environmental impact of their actions.

IPMA (Importance-Performance Map Analysis) testing in SmartPLS is used to determine the importance and performance levels of each variable for each segment. By knowing this, researchers can set priorities for which variables need to be the focus for improvement. Table 8 will show the importance and performance from every variable in segment 1, 2 and 3.

Variable	Segment 1		Segment 2		Segment 3	
	Willingness to Participate _in Circular Behavior	Performance	Willingness to Participate _in Circular Behavior	Performance	Willingness to Participate _in Circular Behavior	Performance
Ascription of Responsibility	-0,001	64,272	0,144	70,199	0,087	48,044
Attitude	0,034	76,103	0,092	70,1	**0,402**	**62,764**
Awareness of _Consequences	0,033	75,81	0,069	73,806	0,094	75,443
Biospheric _Value	-0,006	74,252	0,031	76,247	0,091	76,056
Economic _Benefit	0,025	80,2	0,033	72,762	0,311	67,596
Environmental	0,002	67,295	**0,397**	**69,633**	0,213	54,258
Hedonic_Value	0,005	84,452	0,034	81,854	-0,016	81,477
Perceived Behavioral _Control	**0,087**	**74,507**	0,019	78,345	-0,055	81,278
Perceived Quality	-0,003	62,724	0,152	69,601	0,1	61,114
Personal Norm	**0,048**	**63,005**	**0,576**	**69,452**	**0,34**	**60,331**
Purchase _Intention	**0,211**	**73**	**0,976**	**72,728**	**0,935**	**59,37**
Subjective _Norm	0,03	74,487	0,15	67,899	-0,082	72,818

Table 8. Construct Total Effects and Performances from Each Segment

Top 3 important variables from segment 1 are Purchase Intention, Perceived Behavioral Control and Personal Norm. Since purchase intention and perceived behavioral control already have performance values above 70, we should focus on the third important variable: Personal Norm. Improving Personal Norms can enhance circular participation because, although not as strong as Purchase Intention, its contribution is evident and its performance is still relatively low. You can refer to the IPMA chart from segment 1 in Figure 1 of Appendix C.

Top 3 important variables from segment 2 are Purchase Intention, Personal Norm, Environmental. Since Purchase Intention already has a performance above 70, the focus should be on Personal Norm and Environmental. Improving these two variables will be highly effective in increasing participation in circular behavior. You can refer to the IPMA chart from segment 2 in Figure 2 of Appendix C.

Top 3 important variables from segment 3 are Purchase Intention, Attitude, Personal Norm. All three variables have low performance values, ranging from 59–62. Therefore, improvements should target all three variables, which will be highly effective in boosting circular participation. You can refer to the IPMA chart from segment 3 in Figure 3 of Appendix C.

4.5.2. Observed Heterogeneity

Observed heterogeneity refers to differences in the model that arise due to respondent characteristics that can be directly observed, such as gender, age, education, or income (Hair et al., 2022). In studies using PLS-SEM (Partial Least Squares Structural Equation Modeling), this concept is important for understanding whether the relationships between variables in the model differ across respondent groups. For example, does the relationship between attitude and purchase intention appear stronger in males than in females? To address such questions, researchers typically conduct Multi-Group Analysis (MGA), which enables the comparison of path coefficients across different groups (Hair et al., 2022). However, before making these comparisons, it is essential to ensure that the constructs are interpreted and measured in the same way across groups. This is where the assessment of measurement invariance using the MICOM (Measurement Invariance of Composite Models) approach becomes crucial (Henseler et al., 2016). If invariance, at least partial is established, then comparisons between groups can be considered valid. In this way, observed heterogeneity analysis helps researchers gain deeper insights into how certain demographic or group characteristics influence respondent's reactions to the variables being studied.

In this study, respondents will be divided into two groups across four categories. Table 9 presents the distribution of respondents into two groups across four categories.

Category	Group 1	Group 2
Gender	female	male
Age	25 and under	above 25
Income	2M IDR or less	More than 2M IDR
Education	diploma or less	bachelor or higher

Table 9. Groups of Respondent for Observed Heterogeneity

Based on Henseler et al. (2016) and Hair et al. (2019) in the interpretation of MICOM results, steps 1 and 2 must be fulfilled before proceeding to Step 3. As a result, three possible decisions arise based on the MICOM outcomes, which will be presented in the table 10. Table 11 presents the MICOM test results for the groups.

Steps Fulfilled	Invariance Conclusion	Implication
Step 1 only, step 2 only, step 3 only	No Invariance	Group comparisons cannot be performed
Step 1 & 2	Partial Invariance	Multi-Group Analysis (MGA) can be conducted to compare the relationships between constructs
Step 1, 2 & 3	Full Invariance	MGA can be conducted, and the means and variances of constructs across groups can also be compared

Table 10. MICOM Interpretation

Variable	Group												Conclusion
	Gender (Female vs Male)			Age (25 and under vs above 25)			Income (2M IDR or less vs more than 2M IDR)			Education (Diploma or less vs Bachelor or higher)			
	2	3a	3b	2	3a	3b	2	3a	3b	2	3a	3b	
AR	0,954	0,658	0,692	0,965	0,055	0,924	0,511	0,388	0,970	0,572	0,631	0,865	Full Invariance for all groups. so we may perform MGA across groups.
AT	0,571	0,828	0,352	0,748	0,165	0,852	**0,033**	**0,016**	0,117	0,889	0,630	0,614	Full invariance in group gender, age and education. In group income, measurement invariance cannot be established.
AC	0,459	0,195	0,598	0,075	0,690	0,834	0,463	**0,007**	0,071	0,073	0,443	0,367	Full invariance in group gender, age and education. In group income, measurement invariance cannot be established.
BV	0,946	0,138	0,285	0,896	**0,003**	0,326	0,482	**0,002**	0,347	0,233	**0,004**	**0,015**	Full invariance in group gender. In group age, income, and education measurement invariance cannot be established.
EB	0,327	0,328	0,513	0,572	0,337	**0,024**	0,098	**0,023**	0,166	0,578	0,800	0,904	In group gender and education are full invariance. In group age is partial invariance. In group income, measurement invariance cannot be established.
EV	0,348	0,843	0,658	0,964	0,674	0,657	0,354	**0,038**	0,284	0,774	0,933	0,143	Full invariance in group gender, age and education. In group income, measurement invariance cannot be established.
HV	0,730	0,648	0,740	0,071	0,316	0,330	0,648	0,098	0,563	0,082	0,577	0,242	Full Invariance. We may perform MGA across groups.
PBC	0,090	0,564	0,525	0,067	0,991	0,939	0,571	1,000	0,936	0,675	0,862	0,157	Full Invariance. We may perform MGA across groups.

Variable	Group												Conclusion
	Gender (Female vs Male)			Age (25 and under vs above 25)			Income (2M IDR or less vs more than 2M IDR)			Education (Diploma or less vs Bachelor or higher)			
	2	3a	3b	2	3a	3b	2	3a	3b	2	3a	3b	
PQ	0,265	0,203	0,295	0,671	0,558	0,488	0,938	**0,031**	0,061	0,722	0,724	0,956	Full invariance in group gender, age and education. In group income, measurement invariance cannot be established.
PN	0,721	0,665	0,278	0,592	0,498	0,677	0,075	**0,047**	0,138	0,157	0,340	0,137	Full invariance in group gender, age and education. In group income, measurement invariance cannot be established.
PI	0,612	0,707	0,258	0,903	0,575	0,351	0,820	**0,001**	0,119	0,815	0,254	0,419	Full invariance in group gender, age and education. In group income, measurement invariance cannot be established.
SN	0,095	0,291	0,090	0,141	0,554	0,611	0,949	0,123	0,243	0,307	0,592	0,491	Full Invariance. We may perform MGA across groups.
WPC	0,846	0,632	0,759	0,123	0,826	0,672	0,685	0,370	0,238	0,976	0,710	0,465	Full Invariance. We may perform MGA across groups.

Table 11. MICOM Groups of Respondent for Observed Heterogeneity

After conducting the MICOM test, we can proceed with the MGA analysis for variables that have at least achieved partial invariance. The MGA test results are presented in Table 12.

From table 12 we can see that gender influences the paths AR → PN, AT → PI, and EB → PI. For the paths AR → PN and AT → PI, the female group shows a stronger influence compared to the male group. In contrast, for the path EB → PI, the male group shows a stronger influence compared to the female group. Age influences the path SN → PI, with the group aged above 25 showing a stronger influence. Income and education do not show any significant differences across any of the paths.

This study identified the presence of heterogeneity, both in the form of unobserved heterogeneity and observed heterogeneity, which significantly impacts the analysis and implications of the research. Based on the FIMIX-PLS test, respondents were classified into three main segments with distinct behavioral characteristics: (1) a rational segment oriented towards consequence awareness and self-control, (2) a segment driven by personal norms and environmental concern, and (3) an idealistic segment strongly influenced by biospheric values and independent of social pressure. Meanwhile, the Multi-Group Analysis (MGA) for observed heterogeneity revealed that there were differences in the relationship paths between variables based on gender and age, but no significant differences were found based on income and education. Gender moderated the relationships between ascription of responsibility and personal norm, attitude and purchase intention, and economic benefit and purchase intention, while age moderated the relationship between subjective norm and purchase intention.

Path	Gender (Female vs Male)		Age (25 and under vs above 25)		Income (2M IDR or less vs more than 2M IDR)		Education (Diploma or less vs Bachelor or higher)	
	Pvalue	Original diff.	Pvalue	Original diff.	Pvalue	Original diff.	Pvalue	Original diff.
AR -> PN	**0,034**	0,149	0,341	-0,074	0,541	-0,043	0,166	-0,096
AT -> PI	**0,009**	0,340	0,534	0,089			0,911	0,014
AC -> PN	0,061	-0,240	0,593	0,083			0,549	0,080
BV -> AC	0,417	0,120						
EB -> PI	**0,006**	-0,219	0,248	0,125			0,362	0,078
EV -> PN	0,128	0,197	0,406	-0,128			0,525	-0,087
HV -> AC	0,596	-0,071	0,977	0,002	0,298	0,129	0,060	0,228
PBC -> PI	0,300	-0,080	0,745	-0,035	0,374	0,069	0,561	0,047
PQ -> PI	0,841	-0,014	0,089	0,134			0,771	0,018
PN -> PI	0,211	-0,135	0,571	0,075			0,926	0,008
PI -> WPC	0,444	0,057	0,963	0,004			0,342	-0,071
SN -> PI	0,534	0,079	**0,045**	-0,307	0,733	0,044	0,339	-0,119

Table 12. MGA Result for Observed Heterogeneity

4.6. Discussion

This study was designed to expand the TPB and VBN models to gain a better understanding of consumers' purchase intentions towards second-hand clothing and their willingness to participate in circular fashion behavior.

The results show that H1a, which examines the effect of biospheric value on awareness of consequences, is supported. Previous research has shown that consumers with a strong biospheric value orientation have a high awareness of environmental consequences (Hiratsuka et al., 2018; Ghazali et al., 2019). Individuals who value the biosphere are more likely to consider the environmental benefits of engaging in circular fashion practices, such as using clothing for a longer time, buying second-hand clothing, repairing garments, recycling clothing, and rental clothing. However, H1b, which investigates the impact of hedonic value on awareness of consequences, is not supported. Research by Hiratsuka et al. (2018) has shown that the hedonic value orientation does not significantly influence awareness of consequences. This finding suggests that in the context of circular fashion in Indonesia, hedonic value has less influence on consumers' choices.

The results also support H2, which states that ascription of responsibility has a positive and significant effect on personal norms. Research by Joanes (2019) has shown that ascription of responsibility influences personal norms towards reducing clothing consumption. This study demonstrates that the factor of ascription of responsibility effectively influences personal norms, indicating that higher levels of individual responsibility increase personal norms.

Hypothesis H3, which examines the effect of awareness of consequences on personal norm, also has a significant positive effect. This finding is consistent with Hein (Hein, 2022), who states that awareness of consequences positively influences consumers' personal norms towards buying recycled products. Thus, awareness of environmental consequences reflects the extent to which Indonesian society is aware of the environmental issues associated with fast fashion. Increased awareness ultimately strengthens individuals' belief that reducing fast fashion consumption can help address the problems caused by industry.

H4 shows that environmental concern has a significant positive effect on personal norm. Individuals who are environmentally concerned recognize that the entire lifecycle of a product has negative impacts on the environment. Research by Al-Mamun et al. (2022) has found that environmental concern from an ecological perspective influences personal norms towards the environment. Environmental concern regarding the use of

second-hand clothing is one way to protect the environment by reducing production and reducing non-biodegradable waste, such as textile dye pollutants that contaminate water.

However, H5, which examines the effect of perceived quality on purchase intention of second-hand clothing, is not supported. This suggests that in this study, Indonesian consumers may still have a negative perception of the quality of second-hand clothing. Often, individuals focus on the identity of second-hand clothing, as in many cases, second-hand clothing is acquired in a dirty condition, leading to negative perceptions.

H6 supports the positive and significant effect of economic benefit on purchase intention of second-hand clothing. This implies that the perceived economic savings influence consumers' intentions to purchase second-hand clothing. Lou et al. (2022) found that economic benefits influence consumers' intentions to buy second-hand luxury products. H7 demonstrates that personal norm has a significant positive effect on purchase intention of second-hand clothing. Other studies have also shown that personal norms influence intentions to purchase second-hand clothing and recycled clothing (Borusiak et al., 2020; Chaturvedi et al., 2020).

H8 supports the positive and significant effect of attitude on purchase intention of second-hand clothing. This is consistent with research by Becker-Leifhold (Becker-Leifhold, 2018), which supports the notion that a more positive attitude towards clothing rental strengthens individuals' intentions to engage in clothing rental in the future. Other studies have also found that attitudes influence intentions to purchase second-hand and luxury fashion products (Jain et al., 2017; Borusiak et al., 2020). Many individuals have a positive attitude towards the use of second-hand clothing due to its affordability and perceived environmental benefits (Koay et al., 2022).

H9, which examines the effect of subjective norm on purchase intention of second-hand clothing, is not supported. The findings are consistent with Borusiak et al. (Borusiak et al., 2020), who found that subjective norm does not have a significant effect on intentions to purchase second-hand products. This finding suggests that in the context of circular fashion in Indonesia, social pressures have less influence on consumer choices, even from close acquaintances. Moreover, education and practices related to second-hand clothing from influential individuals such as influencers are still limited. Therefore, it is necessary to persuade others about the benefits of using second-hand clothing by sharing previous purchasing experiences. For example, sharing experiences that highlight the economic advantages of buying second-hand clothing, such as affordable prices and good quality, unique and diverse second-hand clothing options, the widespread adoption of second-hand clothing purchases, including by influencers, and the indirect sustainability benefits to the environment.

H10 shows that perceived behavioral control (PBC) has a positive and significant effect on second-hand clothing purchase intention. This study demonstrates that PBC plays a greater role in predicting consumers' intentions to purchase second-hand clothing compared to subjective norm. Seo and Kim (2019) found that PBC, operationalized as consumers' perceptions of the ease or difficulty of buying second-hand products, has a positive and significant influence on consumers' intentions to purchase second-hand clothing and environmentally friendly organic clothing (Zhang et al., 2019; Koay et al., 2022). PBC indicates that consumers know where to buy second-hand clothing, have time to select second-hand products, and have various options available through both offline and online platforms.

Lastly, H11 demonstrates that purchase intention of second-hand clothing has a positive and significant effect on consumers' willingness to engage in circular fashion behavior. Intention strongly motivates individuals to engage in desired behaviors (Ajzen, 1991).

Based on the findings of these nine hypotheses, purchase intention has a strong influence on consumers' willingness to participate in circular fashion using second-hand clothing. Purchase intention is significantly influenced by personal norm, followed by attitude, economic benefit, and perceived behavioral control. Personal norms are significantly influenced by awareness of consequences, environmental concern, and ascription of responsibility. Among these variables, awareness has the strongest influence on personal norms, and awareness of consequences is significantly influenced by biospheric value. Based on the relationships explored between these variables, business owners of second-hand clothing can develop marketing strategies that encourage consumers to use second-hand clothing. Strategies that can be implemented include implementing omni-channel strategies based on previous studies (Hur, 2020). For example, providing detailed product information (materials used, sizes, etc.),

ensuring better inventory management due to the limited availability and varied quality of second-hand clothing, and limited product information. Secondly, reconsidering the pricing of second-hand clothing, such as selling at lower prices to ensure affordability for low-income consumers and offering discounts to customers. Thirdly, ensuring quality control, such as setting standards for second-hand clothing that are free from defects, improving hygiene, ensuring garments are not torn, colors are still vibrant or not faded, and ensuring they are still suitable for use. Fourthly, implementing sustainable marketing practices as suggested by (Hur, 2020). For example, thrift/preloved business owners actively promote the negative consequences of fast fashion's environmental pollution and the positive impacts of using second-hand clothing through various marketing channels.

The presence of heterogeneity in this study can be explained by several theoretical and empirical factors. First, variations in personal values and behavioral motivations are a major cause. In the context of circular fashion, some consumers are more motivated by biospheric values and environmental concern, while others prioritize economic benefits and ease of behavior (Koay et al., 2022; Gomes et al., 2022). This is consistent with Stern (2000) Value-Belief-Norm (VBN) theory, which states that individuals differ in their sensitivity to environmental values and sense of moral obligation. Second, demographic factors, such as gender and age, also play a crucial role. A study by Davidson and Freudenburg (1996) showed that women generally have higher sensitivity to environmental issues compared to men, while older age is associated with greater attention to social norms and sustainability (Borusiak et al., 2020). The MGA results in this study confirm that gender and age influence the differences in the relationship paths among constructs, highlighting the importance of considering observed heterogeneity. According to Henseler et al. (2016) and Sarstedt, Becker, Ringle & Schwaiger (2011), neglecting unobserved heterogeneity can result in biased or misleading estimates of construct relationships. Therefore, the emergence of heterogeneity in this study is theoretically, empirically, and methodologically justified, and it is crucial to account for it to ensure a more accurate and contextual interpretation of the research findings.

Third, heterogeneity also arises from differences in consumer experiences and perceptions toward second-hand products. Consumers with positive past experiences tend to develop stronger personal norms and more positive attitudes, while those with less experience are more influenced by perceived behavioral control or economic factors. This aligns with the experiential learning approach in consumer behavior (Ajzen, 1991; Shirvanimoghaddam et al. 2020). Fourth, from a methodological perspective, the complexity of the Extended TPB-VBN model, which integrates psychological, social, and economic factors, further increases the potential for unobserved heterogeneity to emerge. According to Hair et al. (2019) and Sarstedt et al. (2017), the more complex a behavioral model becomes, with multiple constructs and pathways, the greater the likelihood that hidden segments exist within the population.

4.7. Theoretical and Managerial Implications

4.7.1. Theoretical Implications

This research has several theoretical implications. First, this model expands the TPB model by integrating it with the VBNT variable and other variables so that it will be able to accommodate other variables outside the TPB that influence intentions. This research shows that economic benefits have a positive and significant effect on intention (β=0.191, $p<0.001$), more substantial than subjective norms and perceived behaviour control, which are TPB variables.

This research contributes to the understanding of the importance of investigating personal norm predictor variables because personal norms provide the most decisive influence on intentions compared to other TPB variables. The VBNT variables can explain variations in the personal norm variable (R2=0.63), which is almost close to the substantial category.

Finally, this research fills the gap in understanding pro-environmental behaviour regarding secondhand fashion in Indonesia. Although many studies focus on pro-environmental behaviour Wu, Wang, Tao, Shao and Yu (2024), Akhter, Rather and Zargar (2024) and Wang, Tang, Kaspar and Li (2024), primarily related to secondhand products Borusiak et al. (2020), Koay et al. (2022) and Rodrigues, Proença and Macedo (2023) but efforts to investigate management behaviour second hand in Indonesia is still limited, Switzerland. Therefore, this research enriches the literature on secondhand fashion by providing insights from different countries and backgrounds.

The theoretical implications of the finding that heterogeneity exists within this study indicate that the Extended TPB-VBN model cannot be fully regarded as uniform across the entire population. The detected heterogeneity underscores the importance of considering individual differences in pro-environmental behavior research, particularly within the context of developing countries such as Indonesia. This study enriches the literature by integrating latent class-based segmentation analysis, which has previously been rarely applied in studies of circular fashion behavior. Moreover, the study reinforces those personal values, perceived behavioral control, and personal norms play different roles across various consumer groups, thereby extending the application of the theory beyond the homogeneous models that have traditionally been more widely adopted.

4.7.2. Managerial Implications

Based on the findings of these nine hypotheses, purchase intention has a strong influence on consumers' willingness to participate in circular fashion using second-hand clothing. Purchase intention is significantly influenced by personal norm, followed by attitude, economic benefit, and perceived behavioral control. Personal norms are significantly influenced by awareness of consequences, environmental concern, and ascription of responsibility. Among these variables, awareness has the strongest influence on personal norms, and awareness of consequences is significantly influenced by biospheric value. Based on the explored relationships between these variables, business owners of second-hand clothing can develop marketing strategies that encourage consumers to use second-hand clothing. Strategies that can be implemented include implementing omni-channel strategies based on previous studies (Hur, 2020). For example, providing detailed product information (materials used, sizes, etc.), ensuring better inventory management due to the limited availability and varied quality of second-hand clothing, and limited product information. Secondly, reconsidering the pricing of second-hand clothing, such as selling at lower prices to ensure affordability for low-income consumers and offering discounts to customers. Thirdly, ensuring quality control, such as setting standards for second-hand clothing that are free from defects, improving hygiene, ensuring garments are not torn, colors are still vibrant or not faded, and ensuring they are still suitable for use. Fourthly, implementing sustainable marketing practices as suggested by (Hur, 2020). For example, thrift/preloved business owners actively promote the negative consequences of fast fashion's environmental pollution and the positive impacts of using second-hand clothing through various marketing channels.

The identification of heterogeneity in this study highlights the need for segmented marketing strategies in the circular fashion industry. Rational consumers should be targeted through strategies that enhance environmental consequence awareness and strengthen perceived behavioral control. For value-driven consumers, campaigns emphasizing social responsibility and sustainability values are more effective, while for idealistic consumers, offering authentic, high-sustainability products is key. Strategies should also be tailored demographically, with moral and attitudinal appeals for women and economic benefits emphasized for men. For consumers over 25 years old, reinforcing social norms and building supportive communities is essential. Understanding these heterogeneity dynamics enables stakeholders to design more targeted communication, product development, and service delivery to boost sustainable consumption participation.

4.8. Limitations and Future Research

This research makes a significant contribution. However, it has several limitations that need to be resolved in future research. For example, it only focused on purchasing secondhand products. Therefore, future research should expand the findings of this paper to other efforts such as fashion recycling, fashion upcycling, and other types of sustainable fashion. Object expansion can also be done so that it is not limited to one product type.

In addition, the percentage of influence of the independent variable on the dependent variable in research needs to be increased so that other variables can be included in future research, such as frugality, brand consciousness, environmental knowledge, past experience, openness to change, awareness, and social norms and moral. These factors can be added to the model to comprehensively analyze intentions and willingness to participate in circular fashion behaviour. Research related to the study of obstacles in the management of secondhand products is also an interesting area for further study.

The observed heterogeneity test shows that the data is homogeneous, but the results of the unobserved heterogeneity test show that the respondents are divided into two segments. We cannot generalize the results, so for further research can classify the data into several groups based on prediction-oriented segmentation (POS).

5. Conclusion

This study concludes that purchase intention positively and significantly influences consumers' willingness to participate in circular fashion behaviour. Purchase intention is positively and significantly influenced by four variables: personal norm, attitude, economic benefit, and perceived behaviour control. Among these variables, the personal norm has the strongest influence and is significantly affected by awareness of consequences, environmental concern, and ascription of responsibility. The variable biospheric value positively and significantly affects awareness of consequences. The suggested strategies include implementing omnichannel strategies, reevaluating the pricing of second-hand clothing, ensuring quality control, and adopting sustainable marketing practices through continuous promotion.

The findings of this study reveal the presence of both observed and unobserved heterogeneity among consumers of second-hand clothing. This heterogeneity indicates that consumer behavior is not uniform across the population, but instead varies according to personal values, behavioral motivations, and demographic factors such as gender and age. Recognizing these differences is essential for ensuring more accurate theoretical interpretations and for designing more targeted managerial strategies. Overall, accounting for heterogeneity enhances the relevance, precision, and practical impact of research on sustainable consumer behavior in developing country contexts like Indonesia.

Future research should expand the findings of this paper to other efforts such as fashion recycling, fashion upcycling, and other types of sustainable fashion. Object expansion can also be done so that it is not limited to one product type. Future research can add other variables such as frugality, brand consciousness, environmental knowledge, past experience, openness to change, awareness, and social norms and morals to make the model more comprehensive. Research related to studying obstacles in managing secondhand products is also an exciting area for further study. Further research can classify the data into several groups based on prediction-oriented segmentation (POS).

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Authors Contribution

Diana Puspita Sari (D.P.S.), Purnawan Adi Wicaksono (P.A.W.), Nuraini Rahmadi (N.R), Mirwan Surya Perdhana (M.S.P.), Ovy Ayuning Nareswari (O.A.N.)

Conceptualization: D.P.S., P.A.W. and M.S.P.; methodology: D.P.S., P.A.W. and N.R.; software: D.P.S., N.R. and O.A.N.; validation and analysis: D.P.S., P.A.W. and N.R..; data curation: D.P.S. and M.S.P.; writing—original draft preparation: D.P.S., P.A.W. and N.R.; writing—review and editing: D.P.S. and O.A.N.; visualization: P.A.W. and O.A.N.; supervision: D.P.S. All authors have read and agreed to the published version of the manuscript.

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Appendix A. Indicators of Each Variable

Variables	Items
Biospheric value (Gomes et al., 2022)	Fashion production contributes to increased pollution, making the choice to use second-hand clothing one of the efforts to reduce environmental misuse by helping to reduce clothing production, which in turn prevents pollution (BV1).
	Using second-hand clothing can reduce fashion waste, thereby fostering respect for the Earth (BV2).
	Using second-hand clothing can protect the environment and preserve nature (BV3).
	Using second-hand clothing can slow down the rate of fast fashion production, reducing the excessive use of natural resources (BV4).
Hedonic value (Quoquab et al., 2020)	I feel happy when buying second-hand clothing (HV1).
	Buying second-hand clothing makes me feel comfortable and enjoy wearing them (HV2).
	Buying second-hand clothing satisfies my desires and makes me feel content (HV3).
	Buying second-hand clothing is exciting and brings enthusiasm within me (HV4).
Ascription of Responsibility (Al-Mamun et al., 2022; Hein, 2022)	Not only the government and the industry are responsible for environmental pollution, but consumers as well (AR1).
	Every customer should take responsibility for the increasing environmental damage caused by excessive clothing consumption (AR2).
	After learning that textile waste causes the death of marine life, I feel accountable for the death of marine animals due to the accumulation of clothing waste in the ocean (AR3).
	I feel responsible for the depletion of natural resources after realizing that clothing production contributes to the depletion of natural resources (AR4).
	After learning that the fashion industry is one of the largest contributors to waste, I feel accountable for the ecological damage caused by purchasing unnecessary clothing (waste) (AR5).

Variables	Items
Awarenes of Consequences (Gomes et al., 2022)	After learning about the environmental impact of the fashion industry, I believe that one of the main contributors to environmental problems is fast fashion production (AC1).
	The destruction of nature caused by human actions often has the potential to bring natural disasters (AC2).
	After understanding the benefits of circular (sustainable) fashion for the environment and nature, I now believe that purchasing second-hand clothing can slow down the depletion of natural resources, allowing them to be enjoyed by future generations (AC3).
	The quality of the environment will improve if people choose to buy sustainable products (AC4).
	Protecting the environment will create a better world for me and my family (AC5).
Environmental concern (Sari et al., 2021; Zhang et al., 2019)	After learning about the negative impact of fast fashion, I feel concerned about the environmental consequences caused by the fashion industry (EN1).
	I will continue to use the second-hand clothing I have purchased for as long as possible (EN2).
	After understanding the negative impact of fast fashion, I feel saddened by the state of the global environment (EN3).
	I am emotionally invested in environmental protection issues (EN4).
	I believe that participating in using second-hand clothing is an environmentally friendly behavior (EN5).
Perceived Quality (Lou et al., 2022)	The quality of second-hand clothing is quite good (PQ1).
	The quality of second-hand clothing is the main reason for purchasing it (PQ2).
	I can buy high-quality second-hand clothing at a low price (PQ3).
	I am not concerned about the cleanliness of second-hand clothing (PQ4).
	Second-hand clothing that meets quality standards will be considered in my purchase decision (PQ5).
Economic Benefit (Kim & Hyun, 2022; Lin et al., 2022)	I get a lower price while getting the desired brand when buying second-hand clothing (EB1).
	Paying less is my main goal when buying second-hand clothing (EB2).
	I can save money by buying second-hand clothing (EB3).
	Buying second-hand clothing helps improve my economic situation (EB4).
Personal Norm (Gomes et al., 2022)	I feel morally compelled to act in preventing the environmental damage caused by fast fashion consumption (PN1).
	I feel morally obligated to buy second-hand clothing instead of buying new clothes (PN2).
	I feel obligated to reduce personal clothing consumption (PN3).
	Everyone should share the responsibility of buying second-hand clothing to reduce clothing production (PN4).
Attitude (Borusiak et al., 2020; Koay et al., 2022)	I believe that buying second-hand clothing will help improve the environmental condition (AT1).
	I think buying second-hand clothing is a positive thing (AT2).
	I believe buying second-hand clothing can reduce clothing production and environmental pollution (AT3).
	I think buying second-hand clothing is a wise choice (AT4).
	I believe that buying second-hand clothing has a positive impact on the environment by extending the lifespan of clothing (AT5).
Subjective norm (Borusiak et al., 2020; Zhang et al., 2019)	Friends influence my buying behavior to purchase second-hand clothing instead of buying new clothing (SN1).
	Those who have a significant influence on me believe that I should buy second-hand clothing instead of buying new clothes (SN2).
	Family members influence my behavior in buying second-hand clothing (SN3).
	Influential people will affect my behavior in buying second-hand clothing (SN4).
	I can participate in the decision-making process to buy second-hand clothing (PBC1).

Variables	Items
Perceived Behavior Control (Borusiak et al., 2020; Koay et al., 2022)	The decision entirely depends on me whether I will buy second-hand clothing or not (PBC2).
	I can easily afford to buy second-hand clothing for consumption (PBC3).
	I have the time and opportunity to buy second-hand clothing (PBC4).
	I have the knowledge to buy second-hand clothing (PBC5).
Purchase intention (Lou et al., 2022; Syahrivar et al., 2022)	I am willing to use second-hand clothing (INT1).
	I am likely to buy second-hand clothing for future consumption (INT2).
	I will actively seek out second-hand clothing to purchase (INT3).
	I will recommend my family and friends to buy sustainable second-hand clothing (INT4).
Willingness to participate in circular fashion behavior (Mohammad et al., 2020)	I intend to avoid wasting my clothes (BHV1).
	I do not make impulsive purchases when shopping for clothes (BHV2)
	I will replace my clothes only when they are worn out (BHV3).
	I always strive to reduce clothing waste by consuming second-hand clothing (BHV4).

Appendix B. Descriptive Statistics

Variable	Indicators	Mean	Standard Deviation	Min	Max	Skewness	Kurtosis
BV	BV1	4,074	0,853	1	5	-0,773	0,421
	BV2	3,958	0,962	1	5	-0,795	0,163
	BV3	4,028	0,842	1	5	-0,825	0,815
	BV4	4,053	0,921	1	5	-1,286	2,064
HV	HV1	3,993	0,863	1	5	-0,531	-0,303
	HV2	3,928	0,912	1	5	-0,576	-0,182
	HV3	4,340	0,868	1	5	-1,338	1,229
	HV4	4,292	0,890	1	5	-1,341	1,443
AC	AC1	4,331	0,701	2	5	-0,846	0,530
	AC2	4,021	0,871	2	5	-0,697	-0,097
	AC3	4,100	0,841	2	5	-0,637	-0,275
	AC4	3,942	0,893	2	5	-0,495	-0,521
	AC5	4,361	0,746	2	5	-0,967	0,369
AR	AR1	4,215	0,827	2	5	-0,790	-0,122
	AR2	3,792	0,933	1	5	-0,590	0,083
	AR3	4,236	0,806	2	5	-0,828	0,062
	AR4	3,940	0,971	1	5	-0,719	0,173
	AR5	4,250	0,816	1	5	-1,261	2,044
EN	EN1	3,590	1,114	1	5	-0,456	-0,528
	EN2	3,493	1,160	1	5	-0,368	-0,745

Variable	Indicators	Mean	Standard Deviation	Min	Max	Skewness	Kurtosis
	EN3	3,569	1,073	1	5	-0,470	-0,461
	EN4	3,794	0,986	1	5	-0,542	-0,203
	EN5	3,748	1,139	1	5	-0,675	-0,308
PQ	PQ1	4,387	0,756	2	5	-1,357	1,913
	PQ2	4,148	0,838	1	5	-1,022	1,128
	PQ3	3,813	0,944	2	5	-0,367	-0,771
	PQ4	4,023	0,926	2	5	-0,680	-0,393
	PQ5	3,951	0,872	1	5	-0,727	0,425
AT	AT1	3,887	0,970	1	5	-0,783	0,171
	AT2	3,931	0,831	1	5	-0,867	1,017
	AT3	4,171	0,785	2	5	-0,746	0,187
	AT4	3,558	0,922	1	5	-0,189	-0,717
	AT5	4,134	0,904	1	5	-1,271	1,792
EB	EB1	4,287	0,765	1	5	-1,163	2,144
	EB2	4,220	0,792	2	5	-0,723	-0,152
	EB3	4,280	0,833	2	5	-0,902	-0,049
	EB4	3,970	0,922	1	5	-0,653	-0,125
PN	PN1	3,613	1,073	1	5	-0,630	-0,089
	PN2	3,461	1,106	1	5	-0,417	-0,528
	PN3	3,910	1,028	1	5	-0,977	0,637
	PN4	3,417	1,231	1	5	-0,294	-0,886
SN	SN1	4,039	0,929	1	5	-1,089	1,054
	SN2	4,361	0,714	2	5	-1,078	1,253
	SN3	4,093	0,891	2	5	-0,677	-0,393
	SN4	4,153	0,817	2	5	-0,698	-0,125
PBC	PBC1	4,153	0,904	1	5	-1,178	1,427
	PBC2	4,167	0,904	1	5	-1,036	0,815
	PBC3	3,979	1,045	1	5	-0,987	0,476
	PBC4	4,088	0,940	1	5	-1,086	0,955
	PBC5	3,822	1,023	1	5	-0,747	0,073
INT	INT1	4,208	0,916	1	5	-1,427	2,339
	INT2	3,789	1,026	1	5	-0,721	0,106
	INT3	3,590	1,018	1	5	-0,518	-0,002
	INT4	3,789	1,051	1	5	-0,740	0,216
	BHV1	3,880	0,859	1	5	-0,385	-0,398
	BHV2	3,521	0,992	1	5	-0,460	-0,004

Variable	Indicators	Mean	Standard Deviation	Min	Max	Skewness	Kurtosis
BHV	BHV3	4,088	0,897	1	5	-1,085	1,634
	BHV4	3,664	0,969	1	5	-0,579	0,036

Appendix C. IPMA Chart

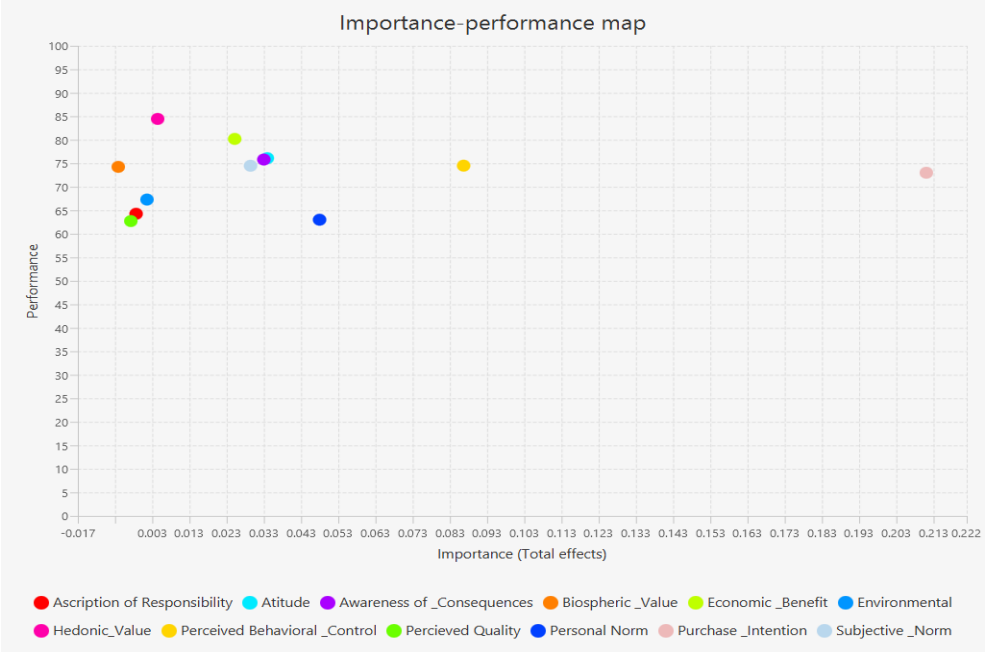

Figure 1. IPMA Chart Segment 1

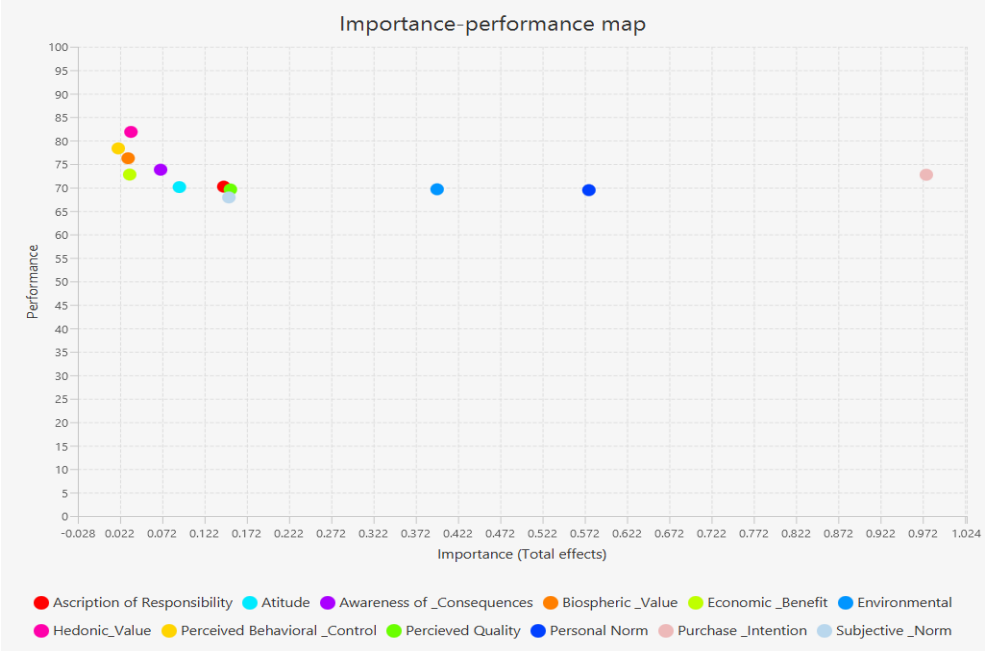

Figure 2. IPMA Chart Segment 2

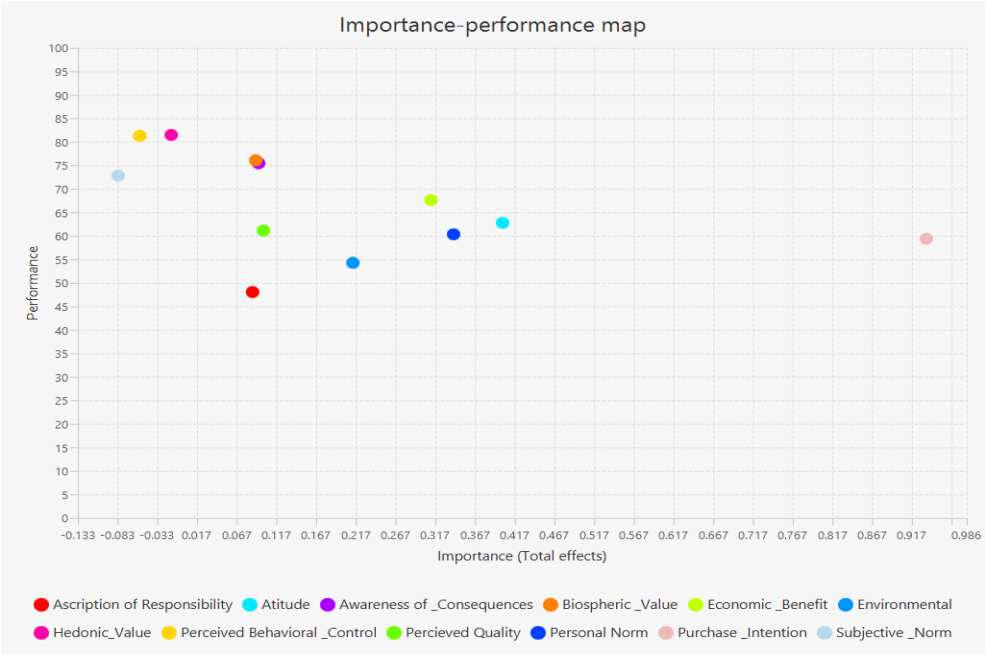

Figure 3. IPMA Chart Segment 3