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Nudging Sustainable Fashion Consumption: Segmenting Consumers by Propensity to Purchase Second-Hand Clothing

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KEYWORDS

consumer behavior, sustainability, segmentation, second-hand fashion, nudging, mindful consumption, circular economy.

ABSTRACT

Mindful consumption through the adoption of second-hand clothing can mitigate the environmental impact of the fast fashion industry. This study identified five distinct consumer segments based on psychographic variables, including environmental concern, sustainable consumption beliefs, attitudes toward fashion production, perceptions of second-hand fashion, and social influence. A primary survey was conducted using a U.S. adult sample recruited through Qualtrics, with participants selected based on predefined demographic criteria to ensure representativeness. Cluster analysis revealed meaningful differences across consumer groups, with the Eco-Conscious Moderates segment reporting the highest annual fashion consumption despite moderate sustainability attitudes. Significant variation in annual consumption patterns was confirmed through one-way ANOVA. Drawing on Nudge Theory, the findings suggest targeted interventions such as social norm messaging, identity-based appeals, and improved visibility of sustainable fashion options could encourage more sustainable purchasing behaviors, particularly among high-consuming but moderately eco-aware segments. These insights provide actionable strategies for the fashion industry and policymakers seeking to promote second-hand clothing as a sustainable alternative to fast fashion

1. INTRODUCTION

As concerns regarding climate change, pollution, resource depletion, and ethical labor practices escalate, an overwhelming urge exists to encourage sustainable consumption (Lundblad and Davies 2016; Sachdeva et al. 2015; White et al. 2019). This is most evident in the growing fast fashion industry which has quickly become emblematic of modern consumers' purchasing behavior. The fast fashion industry has plagued the environment and society with a myriad of challenges, such as excessive textile waste, labor exploitation, energy overconsumption, and more (Niinimäki et al. 2020). As a result, the pursuit of sustainable fashion alternatives, namely the second-hand clothing market, offers potential opportunities for consumers, the fashion industry, and policy makers. Likewise, adopting second-hand clothing purchases can actively contribute to ecological restoration through circular fashion models, restoration programs, upcycling, raising awareness, and more.

Research in the sustainable fashion market, particularly regarding Richard Thaler's nudging theory, is relatively limited. However, a study by Roozen et al. (2021) addressed Thaler's approach concerning sustainably produced garments; likewise, a similar research analysis by Gonçalves et al. (2021) utilized a social norm nudge in the context of healthier food choices. Nonetheless, although these articles, among others, have provided valuable insights into the broader issues of sustainability, there remains a critical gap in segmenting consumers for nudging interventions to encourage second-hand clothing adoption. As a result, the proposed study represents an advancement from prior research by centering its inquiry on applying nudging strategies through distinct consumer segmentation. The rationale for this project is firmly rooted in the urgency to address the environmental and ethical challenges directly caused by fast fashion. As industry operations further harm, the

global environment, an increasing shift in sustainable fashion choices is delineated. The second-hand clothing market is a promising alternative by reducing the demand for new production and extending the life of products. However, targeting amenable consumer segments requires an in-depth understanding of consumer behavior, attitudes, and preferences related to fashion choices. Furthermore, there is no antecedent research identifying consumer segments to apply the nudging theory in the context of sustainable fashion.

Therefore, this study holds the promise of extending Thaler's theory of nudging mindful consumption through the adoption of second-hand clothing. Similarly, it can provide practical insights for the development and implementation of marketing strategies aimed at encouraging mindful consumption choices. By segmenting consumers and customizing interventions, the study has the capacity to induce tangible shifts in societal behavior. The segmentation analysis conducted in this research sets a precedent for future researchers to adopt a similar methodology or build upon the initial findings. Moreover, the impact of the project extends beyond the academic realm. Policymakers, stakeholders, and the fashion industry can utilize the expected insights to design targeted interventions, marketing strategies, and policies that promote local thrift, the use of resale platforms, and other forms of second-hand clothing purchases. Ultimately, the proposed research has the potential to bridge the divide between theory and practice, addressing a crucial societal and environmental challenge.

2. STATEMENT OF THE PROBLEM

The fashion industry has long been associated with unsustainable practices due to rapid production, rampant consumerism, and excessive consumption that results in the exploitation of natural resources (Gabriella et al. 2021; Niinimäki et al. 2020). As societal and stakeholder concerns increase, there is a growing imperative to transition to sustainable alternatives. Although activists are raising awareness and offering plausible solutions, "[t]he fashion industry is currently responsible for more annual carbon emissions than all international flights and maritime shipping combined. If the industry maintains its course, an increase of 50% in greenhouse gas emissions is expected within a decade" (Le, 2020). This industry serves as a symbol of innovation, but fashion and its supply chain have contributed to environmental degradation, social inequities, and resource depletion (Niinimäki et al. 2020).

Behavioral economics offers a potential perspective on promoting ethical fashion choices through the lens of Thaler's theory of "nudging." Nudging, proposed by Richard Thaler and Cass Sustein, is "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any option or significantly changing their economic incentives" (2008, p. 89). In other words, nudging subtly guides individuals towards desired behavior or decisions without restricting their freedom of choice. Leveraging nudges to encourage the adoption of second-hand clothing and thrifting is one solution to slow the ramifications that fast fashion has constituted. Utilizing Thaler's theory of nudging in the context to promote sustainable fashion is limited, but nudging has been widely applied across numerous fields. For example, nudging has seen success in health, finance, public policy, and more. This instrument could guide second-hand clothing purchases through various tactics, one of which considers social "norms."

The role of societal "norms" encapsulates shared beliefs and expectations within a society, and social norms can act as both a barrier and an enabler to sustainable fashion choices. In other words, societal expectations create barriers through perceived stigmas, conformity pressure, consumerism culture, and pre-existing habits; on the other hand, peer influence, social media and public figures, emerging sustainable initiatives, and more promote conscious fashion purchases. Moreover, "[a]ccording to the idea of reasoned action, attitudes that influence behavioral intention are also shaped by subjective norms" (Fishbein & Ajzen, 1975, as cited in Zahid et al., 2022). Shifting societal norms towards increased alignment with sustainable values may facilitate mindful consumption for consumers.

This paper seeks to synthesize and analyze existing research concerning Thaler and Sustein's nudging theory as a catalyst for consumer behavior in the fashion industry while considering the intricate influence of social norms. Furthermore, this review aims to discover insights into the ways in which nudging can effectively steer identified consumers' choices when purchasing second-hand clothing.

3. LITERATURE REVIEW

The following Literature Review will address and examine an overview of the fashion industry, consumer behavior concerning sustainable clothing, societal norms in relation to segmentation, and market segmentation. Following the examination of previous literature, the questionnaire given to segment consumers by psychographic constructs is explained. Lastly, recommendations, implications, and conclusions are drawn from the data collected in the previous step.

Overview of Fast Fashion Industry

The emergence of the fast fashion industry goes back to the late seventeenth century, as Britain's Industrial Revolution allowed for the introduction of ready-made garments; during this same period, "slop shops" acted as second-hand clothing stores located in urban areas for lower-class citizens who did not have time or income to produce clothes (Linden, 2016). However, modern fast fashion can be traced to "reclusive entrepreneur Amancio Oretga Gaona and his companies Zara and Inditex (Industria de Diseño Textil) in Galicia, Spain" (Crofton & Dopico, 2007). However, it was during the 1990s that fast fashion truly gained prominence. Retailers such as H&M and Forever 21 entered the market, and these companies offered

an extensive array of "trendy, cheaply-priced, poorly-made clothes on a weekly basis, intending to match the breakneck pace at which fashion trends move" (Wang, 2022). This shift was fueled by technological advancements, outsourcing of production to low-cost countries, just-in-time manufacturing techniques, and more.

Throughout its history, fast fashion can be characterized by several key features, namely rapid production, affordability, high volume coupled with low quality, and current trends. Due to supply-chain development, producing and designing new clothing collections can occur in weeks rather than traditional seasons. In fact, Stanton describes that "[n]owadays, fast fashion brands produce about 52 "micro-seasons" a year—or one new "collection" a week" (2023). Likewise, companies such as Zara, H&M, Shein, and others utilize pricing strategies aimed at accessibility to a broad market at low price points. The increased effort to occupy stock in stores and online has amassed tremendous waste. In fact, Segran states, "[i]n 2015, the fashion industry churned out 100 billion articles of clothing, doubling production from 2000, far outpacing global population growth" (2019). The same author also informs that "[e]very piece that ends up being burned produces greenhouse gases, too. Incinerating clothes releases 2,988 pounds of carbon dioxide per megawatt hour, which is even more than burning coal (2,249 pounds per megawatt hour) and natural gas" (Segran, 2019).

Likewise, numerous studies suggest that consumers have significantly decreased the longevity of their clothing utilization. In other words, society is increasingly discarding their clothes prematurely. One study found that "[w]orldwide, clothing utilisation – the average number of times a garment is worn before it ceases to be used – has decreased by 36% compared to 15 years ago" (Ellen MacArthur Foundation, 2017). The rate at which textile waste accumulates is alarming, and fast fashion continues to worsen global issues such as pollution, habitat degradation, the proliferation of harmful chemicals in water sources, anthropogenic greenhouse gas emissions, and more.

The concept of "slow fashion" is a promising development in the fashion industry to counter the onset of waste and increase longevity. Compared to fast fashion, which produces several collections annually, slow fashion emphasizes sustainable consumption and considers aspects of the supply chain to avoid compromising natural resources and environments. Moreover, retailers are mindful of their impact on people and animals, and additional time is allocated to deliver quality pieces that will endure for years (Marquis, 2022). Eileen Fisher, referred to as "The Queen of Slow Fashion," holds a renowned fashion brand that exemplifies the principles of the slow fashion movement through its ethical practices, circular initiatives, and environmental responsibility (Paton, 2022). This movement "aims to encourage consumers' self-awareness during their purchases by choosing to buy fewer items, driven by characteristics such as local production rather than globalized, and small and medium scale rather than mass production" (Gomes de Oliveira et al., 2022).

While the fashion industry's history is marked by its rapid ascent and global dominance, it is recently facing a pivotal moment as ethical and environmental concerns compel brands to reevaluate their practices. Continued efforts to promote authentic sustainable initiatives in combination with consumer education and policy implementation will be essential in reshaping the fast fashion industry. Fortunately, the inception of the slow fashion movement, second-hand clothing outlets, and similar pushes have indisputably denoted a necessary change in the garment industry.

Consumer Behavior towards Sustainable Fashion

As societal consciousness around sustainability grows, it is notable to acknowledge the growing awareness among consumers to reduce their ecological footprint. However, "research shows that despite consumers' increasingly conscious behavior, they have not adapted to sustainable consumption practices" (McNeill & Moore, 2015, as cited in Kilvet, 2022). As such, while there is a discernable trend wherein consumers express a heightened awareness of the environmental and ethical ramifications of fast fashion, there remains a gap in practice. Studies have detailed the emergence of this "green gap" in which consumers' positive attitudes surrounding sustainability are not reciprocated in empirical consumption behavior. Yet, decreasing this gap poses a substantial challenge for consumers, the fashion industry, and regulatory bodies. For example, several consumers express the intention to support sustainable fashion, but individuals often encounter barriers, namely affordability. The nudging theory is vital for reconciling this disparity between thought and practice by endorsing second-hand clothing as an accessible alternative. Likewise, the perception that sustainable fashion is a premium or niche market may deter price-sensitive consumers from constituting purchases, especially for lower-income demographics. Fast fashion brands such as Zara and H&M capitalize on low prices as a selling point to attract a broad consumer base.

Furthermore, Schmitt suggests that "consumers have "learned" to arbitrate their purchase decisions using many criteria (i.e., price, brand image, or performance) quite removed from sustainability concerns" (2022). As a result, visual marketing cues are a crucial component of decision-purchasing. However, the role of "greenwashing" has further contributed to skepticism among sustainable purchases. Richard Dahl suggests this tactic is "not a recent phenomenon; since the mid-1980s[,] the term has gained broad recognition and acceptance to describe the practice of making unwarranted or overblown claims of sustainability or environmental friendliness in an attempt to gain market share" (2010). The impact of greenwashing has played a pivotal role in consumer behavior when delineating sustainable choices, and one study involving Canadian consumers reported that greenwashing has contributed to a lack of trust in sustainable brands (McKenzie-Sutter, 2023).

Consequently, consumers highly value traceability and transparency, and another study concluded that "[f]or consumers to make sustainable purchasing decisions, they need to have access to actionable and reliable information about sustainable products" (Gossen et al., 2022). Thaler's theory of nudging shines is a direct accompaniment to visual cues involving

veracity. One prominent study by Bhattacharya & Gulas indicates that consumers exposed to environmental impact labels are more likely to make eco-friendly purchases (2003). In other words, labeling garments with information concerning its origins, materials, and sustainable benefits can influence consumers and educate environmental practices (Joung, 2014). The shift towards sustainable fashion is still in its nascent stages, but early predictions and the existing literature suggests that nudging can play an imperative role in transforming consumer behavior.

Societal Norms

Beyond economic considerations, psychological facets and societal norms contribute to the "green gap." Individuals may grapple with cognitive dissonance where the allure of a new collection outweighs their rational desire for sustainable choices. Additionally, the social stigma of occupying trending clothing is a significant component in explaining consumption behavior (The impact of fashion on consumer behavior: Socio-psychological influences, 2023). Social media has also acted as a driving force that pressures individuals to don the latest clothing styles. Consumers may desire social acceptance and expression, and applications such as Instagram and TikTok act as platforms to amplify these inclinations by emphasizing trendy clothing. [Note: Discuss personal identity tied to fashion]

Moreover, the social implications of thrifting, the primary focus of the prospective research, are far-reaching. Second-hand clothing is undergoing a perceptual shift as social norms surrounding thrifted fashion are gradually transforming from a stigma to a solution. Historical perceptions of thrifting associate second-hand clothing with economic constraints, but recent discernments redefine the practice as conscientious. Prior to the 2008 recession, thrifting was often viewed through a classist lens in which sociodemographic groups stigmatized second-hand clothing (Loveland, 2021). However, the recession caused a societal shift in perspective since purchasing used garments could relieve financial constraints. In addition, the rise in popularity of retro and vintage fashion fueled online and local businesses. Millennials and Generation Z are the primary consumers indulging in resale outlets, and one article suggests that these cohorts "will account for nearly two-thirds of incremental secondhand spend as their purchasing power increases" (Benissan, 2023).

Most importantly, "a considerable amount of marketing research has reported that consumers are more saliently influenced by friends (strong social ties) than by acquaintances and strangers (weak social ties)" (Luan et al., 2017). The influence of reference groups on consumers has a profound impact on the decision-making process. Thaler and Sustein's nudging theory is particularly interconnected with this facet by subtlety invoking peer groups' influence on consumer purchasing decisions. For example, if a consumer's family occupies an affinity towards thrifting, the individual will likely perceive second-hand clothing with increased consideration. Similarly, consumer decisions are heavily dependent on online recommendations in the absence of empirical purchases or reference group input. In fact, "research shows that 93% of consumers say online reviews will affect shopping choices, indicating that most consumers have the habit of reading online reviews regularly and rely on the comments for their purchasing decisions (Vimaladevi & Dhanabhakaym, 2012, as cited in Chen et al., 2022).

Ethical Considerations

However, ethical concerns exist as second-hand clothing purchases are normalized and encouraged widely. For instance, critics argue that the rise in thrifting will further reduce pre-existing limited options for lower-income demographics and eliminate quality pieces for those in need (Nair, 2019). Similarly, consumers report an increasing number of fast-fashion brands such as Shein, Forever 21, H&M, and more lining the shelves (McMillen, 2023). As mentioned previously, these brands are notorious for their poor quality and transient duration; consequently, low-income consumers are experiencing difficulty securing durable pieces to be worn multiple times. Concerns of fashion gentrification have emerged as resellers drive second-hand clothing prices, further contributing to the ethical ambiguity. Similar key concerns include the exploitation of labor, the quality and safety of used garments, and the environmental impact of collecting, processing, and transporting these items (Hawley, 2006).

Moreover, challenges surrounding the nudging theory arise despite its promising approach to advocating for sustainable fashion. Ethical discussions have ensued concerning the manipulation of consumer choice, particularly the transparency of nudges. Critics argue that nudges might constitute a dependency on external cues for delineating sustainable choices, rather than internalizing these values (Sustein, 2016). Furthermore, the effectiveness of nudges in creating long-term behavior change remains an underexplored area. This isn't to imply the nonexistence of such research, but increased studies will be helpful in determining the effectiveness of prolonged nudging effects. Caraban, Karapanos, Gonçalves, and Campos detail one method in countering critics' claims by suggesting the importance of reinforcement in establishing long-term behavior changes when nudging (2019).

Consumer Segmentation

Consumer segmentation is a potent tool in marketing, and its contributions can be invaluable to targeting specific groups of consumers more effectively. This marketing technique is described by "*partitioning customers into segments, within which customers of similar needs are likely to exhibit similar behavior and hence to respond alike to the marketing mix* (Weinstein, 2004, p. 4, as cited in Jadczaková, 2013). By dividing the market into distinct segments based on demographics, psychographics, geographic location, behavioral patterns, and more, marketers can tailor to the specific needs of each group. In the context of second-hand clothing, segmentation often focuses on behavioral and psychographic dimensions, which

include consumers' attitudes toward sustainability, purchasing behaviors, and personal values related to environmental consciousness (Bhardwaj & Fairhurst, 2010). In fact, psychographic and behavioral segmentation act as a cornerstone for the following methodology.

Thaler and Sustein's theory can directly influence segmentation since nudges are utilized to influence consumer behavior in a manner that is both subtle and effective, aligning product offerings with the psychological triggers of the target segment (Sustein, 2016). The second-hand clothing market provides an opportunity for applying Nudging Theory due to its alignment with sustainable consumption. For instance, nudges can be implemented through marketing messages that highlight the environmental benefits of second-hand clothing or through store layouts that place sustainable fashion at the forefront. These nudges can help overcome biases or misconceptions about second-hand clothing, subtly shifting consumer preferences towards more sustainable fashion choices.

The role of consumer segmentation is critical in research aimed at ascertaining the most effective methods to target various groups. This technique allows for the approach of different nudges or insights into the identified segments and does not assume a universal solution; rather, it recognizes the diversity within consumer bases (Weinstein, 2013). When combined with nudging theory, consumer segmentation not only enhances the effectiveness of marketing campaigns but also supports the promotion of sustainable consumer behavior. Continued research in this area should continue to explore innovative ways to integrate nudging into segmentation strategies, with a focus on long-term engagement and the sustainability of consumer behaviors in the second-hand clothing market.

4. RESEARCH OBJECTIVE

This research explores the following research question: "Which consumer segments can be identified in the United States population which are distinct in

Beliefs about reducing consumption of new fashion products,

their general concern for the environment,

attitudes about fashion production and consumption,

perception of second-hand fashion items vs new,

and social influence in fashion ?"

Past studies indicate that psychographic variables play a more significant role in influencing consumer behavior compared to socio-demographics (Aschemann-Witzel and Zielke, 2017). Consistent with this perspective, the authors concentrate their cluster analysis on a selection of psychographic variables considered relevant to the subject of fashion consumption behavior. The ensuing clusters will be further characterized by additional socio-demographic and psychographic variables, identified as valuable for crafting targeted marketing and policy campaigns.

5. METHODOLOGY

Sample and Data Collection

Data for this study were collected through an online survey administered via Qualtrics to a nationally representative sample of U.S. adults aged 18 to 77 years. The final sample included 365 respondents after removing incomplete responses and cases with missing data on key psychographic variables. A panel provider was used to recruit participants, with quotas set to ensure balanced representation across age, gender, income, and geographic region. All participants provided informed consent prior to participation, and the study followed ethical guidelines for human subjects research.

Participants ranged in age from 18 to 77 years old, with the age distribution fairly balanced across categories: 18% were ages 18 to 28, 27% were ages 29 to 43, 29% were ages 44 to 58, and 26% were ages 59 and older. In terms of gender, the sample was predominantly female (63%), with 34% identifying as male, and a small proportion identifying as non-binary or preferring not to disclose their gender. Educational attainment varied across the sample, with 31% holding a bachelor's degree, 23% reporting some college education, 16% holding a postgraduate degree, and 11% having a high school diploma.

The sample represented a broad range of household income levels, with 27% reporting annual household incomes between $50,000 and $100,000, while 16% reported incomes below $35,000. Approximately 12% of participants reported household incomes above $150,000.

Racial and ethnic diversity was present, with 77% identifying as White, 10% as Black or African American, 6% as Hispanic or Latino/a, and smaller proportions identifying as Asian, American Indian, or multiracial. The sample also reflected a diverse range of employment statuses, with 46% employed full-time, 15% retired, and smaller proportions identifying as self-employed, students, homemakers, unemployed, or disabled. Marital status also varied across the sample, with 51% indicating they were married, 19% never married, and the remainder either divorced, widowed, or separated.

Overall, the sample provided a diverse cross-section of U.S. adults in terms of age, gender, education, income, and household composition, providing a robust basis for examining psychographic segmentation related to sustainable fashion attitudes and behaviors.

[Insert Table 1]

Table 1. Sample Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Select the age category that represents your current age.	365	4	1	5	3.06	1.037
Select your gender	365	1	1	2	1.64	.481
What is the highest degree or level of school you have completed	365	5	1	6	3.74	1.485
What is your marital status?	365	5	1	6	2.48	1.688
Which best describes your race or ethnicity?	365	5	1	6	1.38	.926
What is your approximate annual household income?	365	8	1	9	4.11	1.952
Which describes your current employment or work status?	365	8	1	9	4.13	2.468
Valid N (listwise)	365					

Measures

For the identification of consumer segments, six psychographic constructs were selected as the basis for the cluster analysis (Table 2).

Table 2. Measurement items presented in survey questionnaire

Measure	Items	Alpha
Environmental concern	• It is important to me that the products I use do not harm the environment. • My purchase habits are affected by my concern for our environment. • I would describe myself as environmentally responsible. • I am willing to be inconvenienced in order to take actions that are more environmentally friendly.	α=.872
Beliefs about reducing consumption of new fashion products.	• My personal consumption of new fashion products does not harm the environment. I believe purchasing second-hand fashion products will reduce harmful environmental effects caused by fashion production. • Reducing consumption of new fashion products is beneficial for the climate. • Reducing consumption of new fashion products items reduces harm to environment.	α=.723
Attitudes about fashion production and consumption	• I follow fashion trends and regularly purchase new fashion products to add to my wardrobe. • Wearing newly purchased fashion products makes me feel good. • Production of fashion products can be done in an environmentally friendly way. • Production of fashion products has a minimal impact on the environment.	α=.642
Perception of second-hand fashion items vs new	• I perceive second-hand fashion items as being out of style. • Finding trendy fashion styles is easier when purchasing new fashion products. • New fashion products are better quality than second-hand. • Consumption of second-hand fashion items can reduce harmful effects on the climate. +	

	• I prefer to shop for second-hand fashion items whenever possible.	α=.610
Social influence in fashion	• I consider myself to be fashionable. • My friends and co-workers regularly complement my fashion choices. • I complement my co-workers and friends on their fashion choices. • Social media influences my fashion choices towards new fashion products.	α=.813
Self-identified annual fashion consumption	I spend less than $100 annually on personal fashion products. I spend between $100-$200 annually on personal fashion products. I spend between $200-$300 annually on personal fashion products. I spend between $300-$400 annually on personal fashion products. I spend between $400-$500 annually on personal fashion products. I spend between $500-$750 annually on personal fashion products. I spend between $750-$1,000 annually on personal fashion products. I spend more than $1,000 annually on personal fashion products.	

Notes. n = 365. If not indicated otherwise, the variable is measured on a 7-point likert agree-disagree scale following the question "To which extent do you agree or disagree with these statements?"

Psychographic constructs were chosen due to their importance as predictors of consumption behaviors, particularly within the fashion sector. All items, unless otherwise noted, were measured using 7-point Likert scales ranging from 1 = strongly disagree to 7 = strongly agree.

Environmental concern was assessed using four items adapted from Haws et al. (2013), evaluating personal responsibility and willingness to act in environmentally friendly ways (e.g., "It is important to me that the products I use do not harm the environment"). This scale demonstrated high internal consistency (α = .872).

Beliefs about reducing consumption of new fashion products were measured with four items reflecting respondents' perceptions of how reducing new fashion purchases impacts the climate and environmental harm. Statements included variations such as "Reducing consumption of new fashion products is beneficial for the climate," adapted from previous sustainability literature. This measure showed acceptable reliability (α = .723).

Attitudes about fashion production and consumption were captured with four items assessing beliefs about fashion industry practices and personal fashion-related behaviors (e.g., "Production of fashion products can be done in an environmentally friendly way"). Internal consistency for this scale was somewhat lower (α = .642). However, as Pallant (2020) notes, scales with fewer than 10 items often yield lower Cronbach's alpha values.

Perceptions of second-hand fashion items versus new fashion items were measured through five items addressing perceived quality, style, and environmental benefit of second-hand consumption (e.g., "I perceive second-hand fashion items as being out of style" and "Consumption of second-hand fashion items can reduce harmful effects on the climate"). This scale yielded a reliability of (α = .610), which is acceptable given the small number of items.

Social influence in fashion consumption was evaluated using four items describing social feedback and social media's role in shaping fashion choices (e.g., "My friends and co-workers regularly complement my fashion choices" and "Social media influences my fashion choices towards new fashion products"). Internal consistency for this scale was strong (α = .813). These five items paralleled aspects explored in prior literature, particularly in relation to meat consumption and climate impact (e.g., Aschemann-Witzel and Zielke, 2017).

Lastly, self-identified annual fashion consumption was captured through a single-item ordinal question asking participants to indicate their approximate annual expenditure on personal fashion products, with eight spending categories ranging from "Less than $100" to "More than $1,000." This variable was used to contextualize consumption behaviors across identified clusters. An overview of these items used in the survey is provided in Table 2

Participants also provided demographic information, including age, gender, educational attainment, marital status, race/ethnicity, household income, and employment status. These variables were used to describe and profile each psychographic segment, providing additional context for interpreting the segmentation results.

[Insert Table 2]

Analytical Procedures

Data analysis was conducted using SPSS Version 29.0. Descriptive statistics were first calculated to summarize the demographic and psychographic characteristics of the sample. Means, standard deviations, and frequency distributions were generated for key variables to provide an overall portrait of the participants.

The primary analytical approach for consumer segmentation involved a combination of hierarchical cluster analysis and k-means cluster analysis. Hierarchical cluster analysis, using Ward's method and squared Euclidean distance, was initially performed to explore the underlying structure of the data and suggest an appropriate number of clusters. A visual inspection of the dendrogram and the agglomeration schedule was conducted to determine the optimal cluster solution, identifying the point at which adding additional clusters yielded diminishing explanatory returns. Based on this analysis, a five-cluster solution was selected for further refinement. Following hierarchical clustering, k-means cluster analysis was conducted to finalize cluster membership assignments. No standardization of variables was necessary, as all psychographic constructs were measured using consistent 7-point Likert scales.

To assess the internal validity of the cluster solution, between-group differences were tested using one-way ANOVAs across the psychographic variables used in segmentation. Significant F-tests ($p < .001$) confirmed that the clusters differed meaningfully across the key psychographic dimensions, providing support for the distinctiveness of the final cluster solution. Post-hoc comparisons using Bonferroni adjustments were performed to identify specific differences between clusters on individual psychographic measures.

Reliability testing was conducted for each psychographic scale using Cronbach's alpha coefficients to assess internal consistency. In accordance with Pallant's (2020) guidelines, scales with fewer than 10 items were expected to exhibit slightly lower alpha values, and mean inter-item correlations were examined as an additional measure of reliability when needed.

To further characterize the clusters, a one-way ANOVA was performed to examine differences in self-reported annual fashion consumption across the five segments. Results of the ANOVA indicated significant differences in annual fashion spending between clusters ($p < .001$), providing additional validation of the meaningful behavioral distinctions among consumer groups. This analytical approach—combining psychographic segmentation, internal validation, and behavioral characterization—allowed for a comprehensive understanding of how sustainable fashion attitudes, social influences, and consumption behaviors varied across distinct consumer segments.

Table 3. ANOVA

	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
Environment Concern	98.809	4	.702	360	140.748	<.001
Second Hand	40.296	4	.626	360	64.380	<.001
Consumption beliefs	66.048	4	.617	360	107.067	<.001
Fashion production attitudes	21.250	4	.397	360	53.573	<.001
Social influence in fashion	113.574	4	.691	360	164.392	<.001

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Table 4. Final Cluster Centers

	Cluster				
	1	2	3	4	5
Social influence in fashion	5.12	4.93	4.29	5.34	4.15
Fashion production attitudes	3.45	3.24	3.23	4.38	2.90
Consumption beliefs	2.46	5.65	4.26	5.17	4.01
Environment concern	2.87	5.30	4.61	6.11	2.94
Second-hand fashion perceptions	2.99	5.48	3.95	3.84	5.01

6. RESULTS

Identification of Clusters

The cluster analysis resulted in a five-segment solution, each reflecting distinct patterns of sustainable fashion attitudes, beliefs, and behaviors. Significant differences were observed across the psychographic variables used for segmentation, including environmental concern, beliefs about consumption, attitudes toward sustainable fashion production, second-hand shopping behavior, and social influence. Table 4 presents the psychographic and demographic characteristics of each cluster. Figure 1 illustrates the distribution of clusters across two key psychographic dimensions: environmental concern and second-hand fashion consumption. The following section provides detailed descriptions of each segment, emphasizing the key differences and similarities across groups.

Cluster 1: Passive Consumers (n = 36)

This cluster displays moderate social influence (M = 5.12) but generally low engagement in sustainable fashion practices. Members have low environmental concern (M = 2.87), limited second-hand shopping behaviors (M = 2.99), and weak beliefs about sustainable consumption (M = 2.46). Demographically, this group predominantly includes older adults aged 59–77 (38.9%), largely female (63.9%), primarily White or Caucasian (88.9%), with most having some college education (30.6%). They often have moderate incomes ($50,000–$74,999; 25%) and show mixed marital statuses, notably married (38.9%) or never married (27.8%). Employment is evenly split between retired (27.8%) and employed full-time (27.8%).

Cluster 2: Committed Sustainable Shoppers (n = 131)

This segment exhibits strong sustainable consumption beliefs (M = 5.65), significant environmental concern (M = 5.30), and frequent second-hand shopping (M = 5.48). Their moderate attitudes toward sustainable fashion production (M = 3.24) suggest practical rather than ideological motivations. Demographically diverse, this cluster is primarily female (65.6%), aged 59–77 (35.9%) or 29–43 (25.2%), and predominantly White (80.2%) with notable Black or African American representation (13%). Educational levels commonly peak at high school graduation (35.1%). Nearly half are married (48.1%), and income tends to be moderate ($50,000–$74,999; 20.6%). A significant number are retired (35.1%) or employed full-time (29.8%).

Cluster 3: Eco-Conscious Moderates (n = 79)

Members of this cluster have balanced psychographic profiles, with moderate environmental concerns (M = 4.61), consumption beliefs (M = 4.26), and second-hand shopping behavior (M = 3.95). Social influence (M = 4.29) and attitudes towards sustainable fashion production (M = 3.23) are similarly moderate. Demographically younger, primarily aged 29–43 years (36.7%) and balanced by gender (male, 49.4%; female, 50.6%), this group exhibits the highest diversity, including White (65.8%), Black (16.5%), and Hispanic (11.4%) individuals. Educationally advanced, many hold bachelor's (32.9%) or postgraduate degrees (21.5%). Most are married (62%) and have higher household incomes ($100,000–$149,999; 22.8%), predominantly working full-time (55.7%).

Cluster 4: Green Advocates (n = 79)

These consumers exhibit high environmental concern (M = 6.11), strong sustainable consumption beliefs (M = 5.17), positive attitudes towards sustainable fashion production (M = 4.38), and high social influence (M = 5.34). However, their second-hand shopping behavior is moderate (M = 3.86). Demographically, predominantly female (74.7%), aged between 59–77 (41.8%), and primarily White or Caucasian (88.6%). Education levels skew higher, with many holding bachelor's (29.1%) or postgraduate degrees (15.2%). Marital statuses show a significant proportion married (44.3%) or divorced (22.8%). Their income levels center around mid-tier ($50,000–$74,999; 22.8%), with employment status frequently retired (31.6%) or employed full-time (34.2%).

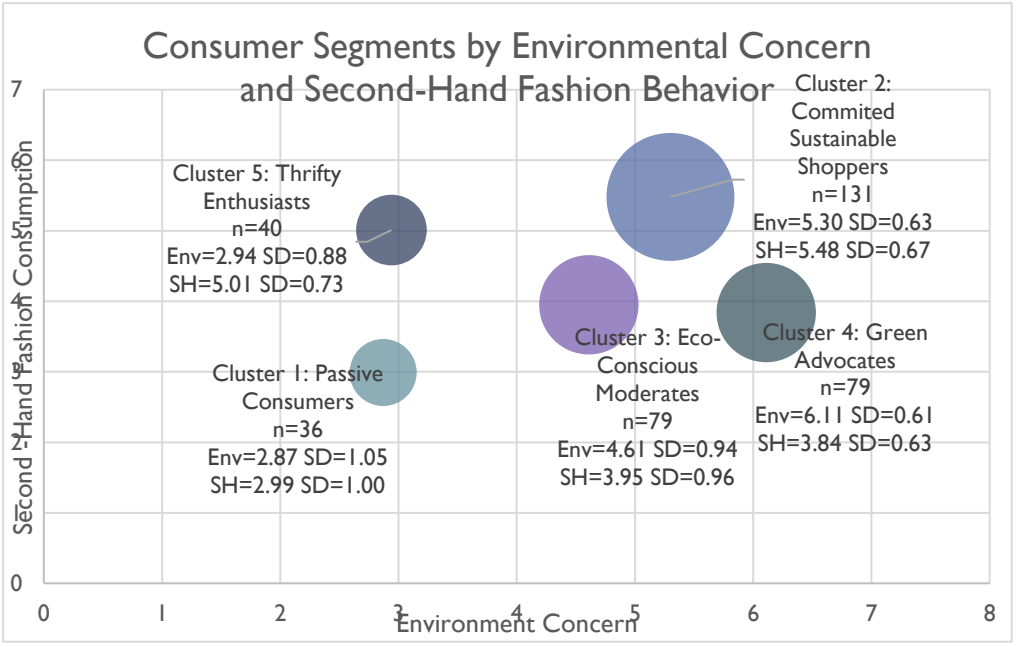
Cluster 5: Thrifty Enthusiasts (n = 40)

Characterized by very high second-hand shopping behavior (M = 5.01), this cluster demonstrates practical consumption beliefs (M = 4.01) despite relatively low environmental concerns (M = 2.84) and the lowest attitudes toward sustainable fashion production (M = 2.90). Social influence is moderate (M = 4.15). Demographically younger (29–43 years, 37.5%) and older adults (59–77, 30%), primarily female (62.5%), and largely White or Caucasian (82.5%). Educational attainment typically stops at high school graduation (40%), and marital status varies, with notable portions married (45%) or never married (32.5%). This cluster faces significant economic challenges, with a large portion earning less than $15,000 annually (22.5%). Employment status includes full-time workers (35%), retirees (27.5%), and a notable proportion unemployed or temporarily laid off (12.5%).

Table 5. Descriptives by cluster (N=365)						
Variable	**Cluster 1 n=36**	**Cluster 2 n=131**	**Cluster 3 n=79**	**Cluster 4 n=79**	**Cluster 5 n=40**	
Age Category						
18–28 years	5.6%	5.3%	12.7%	3.8%	0%	
29–43 years	16.7%	25.2%	36.7%	20.3%	37.5%	
44–58 years	36.1%	26.0%	24.1%	31.6%	25.0%	
59–77 years	38.9%	35.9%	20.3%	41.8%	30.0%	
78 or older	2.8%	7.6%	6.3%	2.5%	7.5%	
Gender						
Male	36.1%	34.4%	49.4%	25.3%	37.5%	
Female	63.9%	65.6%	50.6%	74.7%	62.5%	
Education level						
Did not complete high school	2.8%	2.3%	—	5.1%	5.0%	
High school graduate	19.4%	35.1%	17.7%	15.2%	40.0%	
Some college	30.6%	18.3%	12.7%	19.0%	17.5%	
Associate's degree	11.1%	12.2%	15.2%	16.5%	12.5%	
Bachelor's degree	25.0%	21.4%	32.9%	29.1%	20.0%	
Graduate degree	11.1%	10.7%	21.5%	15.2%	5.0%	
Marital Status						
Married	38.9%	48.1%	62.0%	44.3%	45.0%	
Widowed	16.7%	9.9%	1.3%	6.3%	10.0%	
Divorced	13.9%	16.0%	11.4%	22.8%	10.0%	
Separated	2.8%	2.3%	1.3%	1.3%	—	
Never married	27.8%	23.7%	22.8%	25.3%	32.5%	
Prefer not to say	—	—	1.3%	—	2.5%	
Race/Ethnicity						
White or Caucasian	88.9%	80.2%	65.8%	88.6%	82.5%	
Black or African American	5.6%	13.0%	16.5%	2.5%	7.5%	
Hispanic or Latino/a	5.6%	3.8%	11.4%	2.5%	2.5%	
Asian	—	0.8%	2.5%	3.8%	5.0%	
American Indian	—	0.8%	2.5%	1.3%	2.5%	
Other	—	1.5%	1.3%	1.3%	—	
Household Income						
Less than $15,000	2.8%	9.2%	6.3%	10.1%	22.5%	
$15,000–$34,999	13.9%	18.3%	7.6%	19.0%	15.0%	
$35,000–$49,999	11.1%	18.3%	6.3%	12.7%	15.0%	
$50,000–$74,999	25.0%	20.6%	22.8%	22.8%	15.0%	
$75,000–$99,999	19.4%	12.2%	17.7%	16.5%	5.0%	
$100,000–$149,999	13.9%	11.5%	22.8%	11.4%	15.0%	
$150,000–$199,999	2.8%	6.1%	12.7%	1.3%	10.0%	
$200,000 or more	5.6%	3.1%	2.5%	6.3%	2.5%	
Prefer not to say	5.6%	0.8%	1.3%	—	—	
Employment Status						
Self-employed	16.7%	12.2%	5.1%	6.3%	10.0%	
Work full-time for employer	27.8%	29.8%	55.7%	34.2%	35.0%	
Work part-time for employer	5.6%	6.1%	6.3%	8.9%	2.5%	
Full-time student	5.6%	—	2.5%	—	2.5%	
Homemaker	—	7.6%	3.8%	5.1%	7.5%	

Unemployed/temporarily laid off	5.6%	5.3%	5.1%	6.3%	12.5%	
Retired	27.8%	35.1%	20.3%	31.6%	27.5%	
Disabled/unable to work	11.1%	3.8%	—	7.6%	2.5%	
Prefer not to say	—	—	1.3%	—	—	

Figure 1. Consumer segments by environmental concern and second-hand fashion



Differences in Annual Fashion Consumption Across Clusters

A one-way analysis of variance (ANOVA) was conducted to examine differences in annual fashion consumption across the five consumer clusters. The results revealed a significant effect of cluster membership on annual fashion consumption, $F(4, 360) = 14.83$, $p < .001$, $\eta^2 = .141$, indicating that consumption patterns varied meaningfully across groups.

Post-hoc comparisons using the Bonferroni correction indicated that Eco-Conscious Moderates (Cluster 3) reported significantly higher annual consumption of fashion items compared to Committed Sustainable Shoppers (Cluster 2), Green Advocates (Cluster 4), and Thrifty Enthusiasts (Cluster 5) (all p-values < .001). No significant difference was observed between Eco-Conscious Moderates and Passive Consumers (Cluster 1). Thrifty Enthusiasts (Cluster 5) also reported significantly lower annual fashion consumption compared to Passive Consumers (Cluster 1) ($p = .031$). These results highlight distinct consumption behaviors across consumer segments.

Table 6. ANOVA

Annual Consumption of Fashion Items

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	115.218	4	28.804	14.830	<.001
Within Groups	699.232	360	1.942		
Total	814.449	364			

Table 7. Multiple Comparisons

Dependent Variable: Annual Consumption of Fashion Items

Bonferroni

(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound
1	2	.795*	.262	.026	.05
	3	-.536	.280	.568	-1.33
	4	.718	.280	.109	-.07
	5	.953*	.320	.031	.05
2	1	-.795*	.262	.026	-1.54
	3	-1.330*	.199	<.001	-1.89
	4	-.077	.199	1.000	-.64
	5	.158	.252	1.000	-.55
3	1	.536	.280	.568	-.26
	2	1.330*	.199	<.001	.77
	4	1.253*	.222	<.001	.63
	5	1.488*	.270	<.001	.72
4	1	-.718	.280	.109	-1.51
	2	.077	.199	1.000	-.48
	3	-1.253*	.222	<.001	-1.88
	5	.235	.270	1.000	-.53
5	1	-.953*	.320	.031	-1.86
	2	-.158	.252	1.000	-.87
	3	-1.488*	.270	<.001	-2.25
	4	-.235	.270	1.000	-1.00

*. The mean difference is significant at the 0.05 level

Implications

The results of this study provide meaningful insights into consumer heterogeneity regarding sustainable fashion attitudes and behaviors, offering important implications for marketers, sustainability advocates, and policymakers. Although all five clusters showed distinct psychographic and behavioral patterns, Cluster 3—the Eco-Conscious Moderates—emerged as a particularly strategic target for intervention. Despite reporting moderate levels of environmental concern and sustainable consumption beliefs, members of this segment had the highest reported annual fashion consumption, suggesting a substantial gap between values and behaviors.

Drawing on Thaler and Sunstein's (2008) Nudge Theory, tailored interventions can be designed to guide this group toward more sustainable purchasing behaviors without restricting consumer choice. Subtle modifications to retail environments, such as placing sustainable fashion items at eye-level, using sustainability as a default online shopping filter, or offering curated "eco-friendly collections," can shift purchasing habits without requiring conscious effort from consumers. Additionally, incorporating social norm messaging—such as emphasizing that a majority of local shoppers prefer sustainable or second-hand fashion—could leverage the social identity of Eco-Conscious Moderates to encourage behavioral alignment with their stated values.

Commitment devices present another promising avenue. For instance, retailers could introduce loyalty programs that reward consumers for purchasing second-hand or eco-certified products, or offer opportunities for shoppers to pledge a portion of their wardrobe purchases toward sustainable alternatives. Messaging strategies that emphasize identity reinforcement, such as "Support your values—choose sustainable fashion," are also likely to be particularly effective with this cluster. These strategies appeal to self-perception rather than relying on guilt-based appeals, creating positive reinforcement loops that encourage sustained behavior change.

Beyond the Eco-Conscious Moderates, implications can also be drawn for other consumer segments identified in this study. Green Advocates (Cluster 4), who already exhibit strong sustainable behaviors and attitudes, represent an important base for advocacy efforts, early adoption of new sustainable innovations, and brand ambassadorship programs. Thrifty Enthusiasts (Cluster 5), characterized by strong second-hand shopping behaviors but lower environmental concern, could be further

engaged by reframing second-hand consumption not just as a cost-saving measure, but also as an environmentally impactful behavior. Passive Consumers (Cluster 1) and Committed Sustainable Shoppers (Cluster 2) offer additional opportunities for differentiated messaging and targeted program development based on their unique profiles.

At a broader level, the findings suggest that industry-wide strategies should move beyond purely informational campaigns and incorporate behavioral design principles to create choice architectures that make sustainable fashion choices easier, more attractive, and socially desirable. Retailers, policymakers, and sustainability advocates should consider interventions that simultaneously target convenience, cost competitiveness, and social signaling to shift mainstream consumption patterns toward sustainability.

Ultimately, the findings underscore that while eco-conscious attitudes are a necessary foundation, they are insufficient on their own to drive sustainable behavior change. Strategic application of behavioral insights, tailored to the unique motivations and barriers of different consumer segments, represents a promising pathway to fostering meaningful reductions in the environmental impact of fashion consumption.

7. CONCLUSION

This study demonstrates that psychographic factors related to sustainable fashion—such as environmental concern, beliefs about consumption practices, attitudes toward fashion production, perceptions of second-hand shopping, and social influences—can be used to meaningfully segment consumers into distinct behavioral groups. The identification of five clusters highlights the critical role that psychographic variables play in understanding not only consumers' values and attitudes, but also the inconsistencies between expressed beliefs and actual purchasing behavior. Segmenting consumers based on psychographic patterns provides a more nuanced and actionable understanding of fashion consumption behaviors than demographic characteristics alone.

Moreover, the distinct profiles of the clusters, when combined with demographic characteristics such as age, income, and education, reveal important opportunities for targeted intervention. Certain clusters, such as the Eco-Conscious Moderates, exhibit relatively high awareness of environmental issues but engage in higher levels of fashion consumption, suggesting that interventions designed around these discrepancies may be particularly effective. The findings reinforce the need for audience segmentation in sustainability marketing strategies, supporting the idea that tailored approaches—not one-size-fits-all campaigns—are essential for promoting behavioral change.

Building on the profiles of these consumer segments, and informed by theories of behavioral economics and social marketing, it can be concluded that interventions leveraging mechanisms such as social norms, peer influence, and identity reinforcement hold considerable promise. For example, emphasizing that sustainable fashion consumption is both a mainstream and aspirational behavior may shift perceptions among moderate consumers. Nudging strategies that make sustainable choices more visible, easier to access, and socially desirable are well-aligned with the characteristics of several identified segments. This suggests that behavioral design principles, rather than information-heavy or guilt-based campaigns, may be more successful in fostering widespread adoption of sustainable fashion practices.

Finally, future research should focus on testing the effectiveness of segment-specific nudging interventions in real-world retail and online shopping environments. Experimental studies could explore which mechanisms—such as default options, commitment pledges, or identity-based appeals—most successfully encourage sustainable purchasing across different consumer profiles. Longitudinal research examining whether small nudges produce lasting changes in fashion consumption habits would further contribute to the growing understanding of how to bridge the gap between environmental attitudes and everyday behaviors. Overall, the findings of this study offer a strong foundation for developing targeted, evidence-based strategies to reduce the environmental footprint of consumer fashion consumption

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