Article

Sustainable Consumer Behavior in Purchasing, Using and Disposing of Clothes

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Abstract: In this study we investigate how consumers in The Netherlands can be persuaded to adopt sustainable practices when purchasing, using and disposing of clothes. This study investigates the attitude-behavior gap for the sustainable choices for purchase, use and disposing of clothes. For each consumption phase we ran a two-step multiple regression. The findings showed that the importance of the factors vary in the three consumption phases. For purchasing and disposal decisions, the core motivator social motivation predicts sustainable practices best, while it has no role in the usage phase. The factor ability appeared to have a significant role in the disposal phase, but not in the other phases. Finally, the trigger appears to lower the consumers' ability in the purchasing phase, while it enhances the core motivator social evaluation in the disposal phase.

Keywords: sustainable consumption; fashion; purchasing; using; disposal; changing consumer behavior; attitude-behavior gap

1. Introduction

The fashion industry is regarded as one of the most polluting industries with its emission of 1.2 billion tons of CO_2 equivalent per year throughout its lifecycle [1]. The industry is a large consumer of water [2]. It is estimated that 73% of the clothes produced end up in a landfill or incinerator, and only 15% of the clothes are recycled into clothes or downcycled into cleaning cloths or insulation material [1]. In the period until 2024, fashion revenue is expected to show an annual growth rate of 8.4% [3], while at the same time prices of clothing have risen much slower, compared with those of other products [4]. This is only possible when costs of production are kept artificially low. These low prices come at the expense of high negative social and environmental impacts. Consequently, the fashion industry is associated with labor, gender and poverty issues, when serving consumers in their desire for fashion at low prices.

To increase sustainability of the fashion industry, changing consumer behavior towards greater sustainability is a pre-requisite [1]. Consumers influence the industry through their product choices, how much they buy, maintenance preferences and how and when they discard clothes. Although the environmental impact of consumers is present in buying, usage and disposal practices, relatively little is known about these behaviors beyond the point of purchase [5]. Nevertheless, buying practices will influence consumer usage and disposal behaviors. For instance, the growing consumption is encouraged by fast-fashion retailers by increasing the number of collections by year. Zara, for instance, offers 24 new collections per year, and H&M follows with 12 to 16 collections [6]. With its emphasis on fashion, rather than quality, items are discarded often before the end of their lifetime. After all, the wardrobe needs to make room for new garments, and the choice for specific fibers determines how clothes are washed [7], and how they are disposed of.

Most studies on sustainable consumer behavior have focused on sustainable purchasing. These studies primarily used the Theory of Planned Behavior [8] to research sustainable

purchasing, while little is known about changing sustainable usage and disposal practices. Promoting sustainable consumption behavior requires understanding consumption patterns in all consumption phases. However, except for a study by Gwozdz et al. [9], few studies have investigated all consumer phases of purchase, use and disposal. We aim to extend research on the three phases of consumption by addressing the question of how to persuade consumers to buy, use and dispose of clothes in a more sustainable manner. To investigate sustainable consumption behavior, we develop several hypotheses based combing insights from different behavioral models [8–11], focusing on human behavior that contend that behavioral change requires the synergistic operation of the factors of motivation, ability and triggers. At the same time, the investigation of what motivates or enables and triggers humans to change their behavior is not reported [12,13]. Hence, this study aims to investigate what factors promote the adoption of more sustainable practices by consumers with regards to buying, using and disposing of clothes. Moreover, we will investigate reported behavior as opposed to behavioral intend, which is common for studies grounded in the Theory of Planned Behavior [8]. In this study, we develop three questionnaires to investigate sustainable consumption practices concerning the phases of purchase, usage and disposal of clothes of Dutch consumers. By doing so, we provide new measures for each phase to investigate sustainable behavior patterns.

2. Literature Review

Sustainable consumption has been comprehensively defined in terms of using goods and services that improve the quality of life and minimize the negative effects in terms of resource usage, emissions of waste over the lifecycle of a product [14], or more general as in the procurement of products that possess social, economic and environment-friendly attributes [15]. In this study, definitions for sustainable purchasing, using and disposing of clothes are derived from the R-imperatives, more in particular the synthetization of Reike et al. [16] which point the way to a more circular economy. From most to least circular these R's are refuse, reduce, resell/reuse, repair, refurbish, remanufacture/refurbish, repurpose, recycle, recover and remine. Following these imperatives, sustainable purchasing involves rethinking what to buy by choosing environmentally friendly brands or choose clothes that are produced using environmentally friendly principles (plant-based materials, recycled material, little or no dye, low washing temperatures), reduce consumption by buying fewer but better-quality items, or by obtaining used clothes. Sustainable usage concerns retaining/maintaining and refurbishing clothes, while sustainable disposal involves behaviors such as reusing, repurposing or recycling. These definitions align with the need to transit to a circular economy that closes material loops with lower environmental impacts. Ultimately, the implementation by consumers of these imperatives promotes the longevity of garments, which is key to minimizing the emissions arising over the clothing life cycle [17].

2.1. Consumption Behavior When Buying, Using and Disposing of Clothes

Dutch consumers spend approximately 5.4% of their income on clothing [18], and buy 14 kg of clothes per capita per year, which is higher than fashion country France consuming 9 kg on average [19]. Of these purchases, 96% were new. Compared with some other European countries, the Dutch are the least interested in purchasing second-hand clothing [20]. Purchase decisions are influenced by product availability and the price of reasonable alternatives to non-sustainable clothes [11]. Consumers with a wish to protect the environment are willing to pay 20% more for a sustainable clothing item [21].

The impact of use on the environment is considerable [17]. An extensive LCA study shows that the impact varies from 27% to 48% when looking at human health, ecological diversity and resources availability [22]. However, few studies investigated the use phase of consumption, and those that did, focused mainly on retaining or maintaining activities such as washing, drying, and ironing. These findings suggest that the impact varies with the fibers the clothes are made of, because these determine the way consumers maintain and use their clothes, but also that it depends on how long and how intense clothes are

worn [7]. For example, cotton requires washing at higher temperatures, while synthetic fibers get dirty easier. There are also geographic differences. Dutch consumers use their washing machine six times per week, compared with German consumers who report an average of 4.4 wash loads [20]. Research on sustainable usage practices such as repairing, refurbishing and repurposing is scarce. Gwilt [23] found that consumers associate poorly repaired clothes with poverty and therefore prefer invisible reparations, which requires repairing skills most consumers lack. Research also shows that extending the lifetime of a garment is key to lowering the emissions in the lifetime of a garment [17]. Nevertheless, on average clothes are thrown away after wearing them 7–8 times only [24].

Disposal in this study involves consumers discarding unwanted clothing articles, regardless of whether the article is disposed of as waste, for recycling or for reusing purposes [25]. There are various ways to dispose of clothes. Disposal for reuse consists of donating, taking back, selling or swapping clothes; disposal for recycling involves discarding clothes in recycling bins; disposal for incineration with or without energy recovery and disposal for landfilling involves throwing items away with the regular trash. Consumers discard their clothes because of wear and tear issues, size, fashion or need for change [25]. Estimates on disposal methods vary. A study by the Ellen MacArthur Foundation calculated that 2% of the textile items is recycled feedstock, 12% consists of downcycled textile products, while 73% of the textile is incinerated or landfilled [1]. In 2014, Dutch consumers threw away approximately 4.2 kg of clothing, which is lower than that of Italy, or Spain, but higher than Denmark, France, Germany and Belgium [20]. Methods that would extend the lifetime of a garment such as taking clothing back to store, selling or swapping clothes are much less used [26], except by consumers with a high fashion interest [27].

Research shows considerable differences in the importance consumers attach to sustainable consumption of fashion items, their knowledge on climate change and their willingness to change behavior. McNeil & Moore [28], distinguish between consumers who regard fashion as central to their individual expression and place emphasis on newness and associate sustainable fashion with musty smells and uncomfortable materials; consumers who care about their social image and are willing to incorporate sustainable practices, but not at all cost; and consumers who wish to reduce their ecological footprint and look actively for behavior that supports this goal. Thus, knowledge about climate change may not cause consumers to change their behavior [29,30]. Finally, contrary to current impressions, research shows that young respondents (18–29 years old) are typically more unaware and unwilling to change behavior when compared to older respondents [31]. As a result, younger individuals are more susceptible to influencers in sustainable decision making [32].

2.2. Models for Changing Behavior

The theory of planned behavior (TPB) by Ajzen [33] is one of the most frequently used models to investigate behavior change. The theory proposes that behavior change is mediated by the intention to change, which is predicted by a person's attitude, subjective norms and perceived behavioral control. Attitude concerns the individual's evaluation of performing particular behavior; subjective norms refer to the perception of the individual of the endorsement of the behavior to be performed, while perceived behavioral control reflects the idea of the individual to be able to exert control over that behavior [8].

A meta-analysis of this theory involving 187 empirical tests [34], supports the efficacy of the model. The results of this analysis show that attitude, subjective norms and perceived behavioral control explain 39% of the variance, while intentions explain 22% of the behavior displayed. Subjective norms appeared to be the weaker component in the model, however, when this aspect was operationalized along the lines of social identity, and important reference groups, group norms and intergroup perceptions are indeed important predictors of the intention to engage in sustainability [35].

The model has been primarily applied to investigate sustainable purchasing, showing that subjective norms are an important predictor [36]. Purchase intentions are influenced by product knowledge, the extent to which consumers believe that their sustainable behavior matters and the perceived personal relevance of sustainability [30]. Also, the availability and price of sustainable products influence purchase intentions [37].

Critique of the TPB focuses on four aspects. A major concern is the predictive value of intentions with regards to actual behavior. Second, most research uses self-reports, which may overrate individual behavior. Third, norms in this framework insufficiently address social influence [38,39]. Finally, with its focus on planned behavior, it excludes impulsive tendencies that are associated with purchasing of fashion items.

2.3. Hypotheses and Conceptual Framework

A model that addresses the third and the fourth shortcomings of the TPB is the behavior model by Fogg [11]. This model was developed within the context of online behavior and looks at specific aspects of behavior to establish potential for behavior change by determining which factors are necessary to develop or maintain specific behavior [40]. Fogg [11] states that attempts to change behavior are most effective when they are targeted. The constructs in this model are motivation, ability, and triggers.

Core motivators include pleasure/pain also referred to as sensation, hope/fear or the anticipation of an outcome and finally social acceptance/rejection, or social evaluation which is conjured to be the strongest motivator. The ability factors or simplicity factors support the desired behavior and consist of time, money, physical effort, brain cycles or mental effort, social deviance, and routine. According to the model, motivation and simplicity factors can be high or low and can even be compensated.

Motivation and ability are intuitively trade-offs. Individuals with low motivation would demonstrate target behavior only if it is easy to do and vice versa. The trigger elicits target behavior beyond the threshold line. There are three types of triggers, namely a spark to motivate certain behavior, a facilitator which makes the behavior look easier or a signal which acts as a reminder of the target behavior. Which type of trigger elicits the desired behavior depends on the individuals' motivation. A spark can compensate for lack of motivation by leveraging one of the motivating elements. A facilitator is effective as a trigger by making the behavior look easy and a signal works best when the individual is motivated and has the ability by reminding the target behavior. Even though the behavioral model developed by Fogg [11] has received considerable interest, and its role is acknowledged when designing for sustainable consumption [41] research on its applicability in the field of sustainable consumption practices is limited to the field of computerized sciences. For example, an agent-based computational modelling found support for the threshold line delineating non-target and target behavior [41]. This study extends previous research by investigating sustainable behavior practices concerning buying, using and disposing of clothes (target behavior).

Based on the literature review, we have formulated the following hypotheses (see Figure 1):

Hypothesis 1 (H1). *Motivation type sensation/anticipation (SA), has a positive effect on sustainable behavior.*

Hypothesis 2 (H2). *Motivation type social evaluation (SE) has a positive effect on sustainable behavior.*

Hypothesis 3 (H3). *Ability has a positive effect on sustainable behavior.*

Hypothesis 4 (H4a). *A trigger moderates the relationship between ability and motivation with sustainable behavior.*

Hypothesis 4 (H4b). *A trigger moderates the relationship between motivation SA and sustainable behavior.*

Hypothesis 4 (H4c). *A trigger moderates the relationship between motivation SE and sustainable behavior.*

Hypothesis 4 (H4d). *A trigger moderates the relationship between ability and sustainable behavior.*
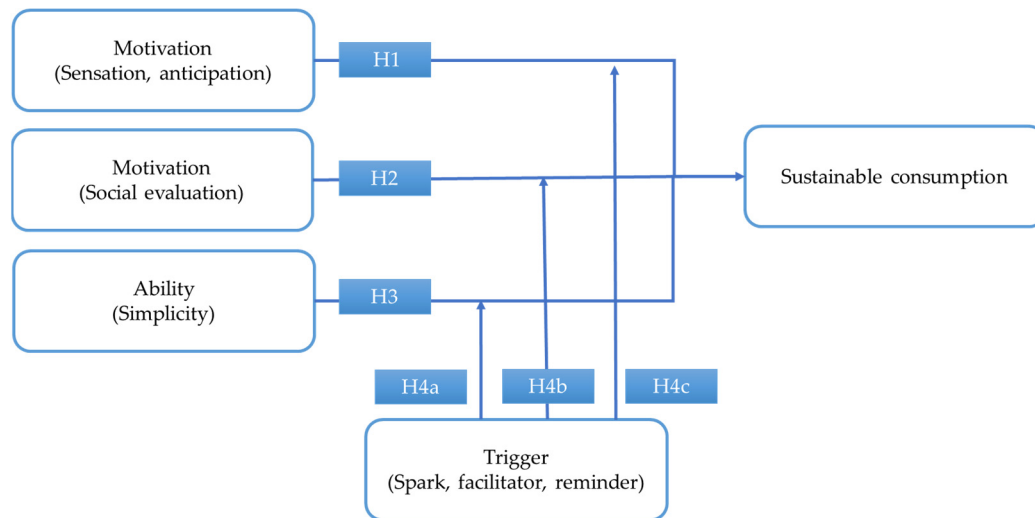

Figure 1. Conceptual model sustainable consumption.

3. Data and Methods

3.1. Sampling

Data was gathered by a team of assistant researchers who surveyed respondents at publicly accessible places, such as in shopping malls, or by telephone. The sampling is primarily based on self-selection of the participating respondents, which makes the sample non-random. Data was collected in October 2019 in The Netherlands. The assistant researchers were carefully instructed and supervised and there was no indication of measurement errors. This sampling technique enabled as to survey many respondents, and resulted in a sample, of 2898 respondents, on which our empirical analysis is based. After eliminating incomplete questionnaires, 2573 relevant responses were retained (attrition rate 11%). Sample descriptors (see Table A1 in Appendix A) included gender (47% male, 53% female), age-group (91% < 40 years), household composition (32% still living with parents), level of education and employment status (about 56% is a student with a job).

3.2. Procedure and Instruments

Three questionnaires for three different samples of respondents were developed to survey the consumption phases of purchasing, using and disposing of clothes. All questionnaires were similar in structure: sample descriptors, current practices, sustainable practices, and changing consumer behavior, with items reflecting the nature of consumer behavior in the three phases. The items were tested in an extensive pilot in October 2018, based on which some items were dropped while others were rephrased. The sample descriptors for gender, age group, level of education, household composition, and status of employment were the same for all three questionnaires. The items describing current and sustainable practices were adapted from the items in the questionnaire used by Gwozdz et al. [9], and Kim & Damhorst [42].

The definitions for the R-imperatives were used to develop sustainable practices per consumer phase, while the items were derived from Zhang [43]. For the development of the sustainable purchasing scale, items focused on rethinking buying decisions, reducing the number of items bought, and reusing clothes from second-hand stores, swapping platforms or clothing libraries. We used Cronbach's alpha (α) to estimate the internal validity and the

reliability of the scales. Because we used the R-Imperatives to operationalize sustainable consumer practices, we also report the reliability statistics of the subscales in Table A2 in the Appendix A. However, to limit the complexity of the analysis model, we only include the main sustainable consumer practices. After deleting three items, the sustainable purchasing scale consists of 13 items (α = 0.86); after deleting one item, the sustainable usage scale consists of 9 items (α = 0.65) and the sustainable disposing scale of 11 items, after deleting one item (α = 0.81). See for the items and statistics in Table A2 in the Appendix A.

3.3. Measurement

The measures of consumer behavior change are based on Fogg [11], which are applied in a different context than in the original study. To our knowledge, this is a novel research approach, though we base our measurement scales on previous research. Items for the concepts in the motivational scale were adapted from Joshi and Rahman [44]; for the ability and trigger scale items were derived from Young et al. [45]. Where possible, we used similarly phrased items in all three questionnaires. The concepts time, physical effort, brain cycles and non-routine are integrated in a construct labelled 'convenience'. We dropped the concept of 'social deviance' because of its conceptual similarity with 'social evaluation'. All items measuring sustainable practices and changing consumer behavior used a 7-point Likert scale (motivator: not at all like me—exactly like me; ability/trigger: not at all important—extremely important).

We used Principal Component Analysis to test the internal consistency of the three scales associated with the consumption phases of buying, using and disposing of clothes. The reliability of these scales is respectively α = 0.86, α = 0.65 and α = 0.87. Because Fogg [11] assumes that these factors are correlated, we applied the Oblimin method with Kaiser Normalization. The adequacy of the samples of the three measures was assessed using the Kaiser-Meyer-Olkin (KMO) test. These ratios ranged from 0.837 to 0.856, which is considered meritorious [46]. Bartlett's tests of Sphericity for the three measures confirms that the correlations between variables are large enough. Tables A3–A5 in the Appendix A present the results of the PCA analyses. The findings show that these factors and its underlying concepts vary across consumption phases, collapsing concepts in some phases while disintegrating them in others. For example, the factor motivation consists of the variable sensation/anticipation (SA) and social evaluation (SE), while the concepts of ability integrate into a single scale for all phases.

3.4. Data Analysis

For each consumption phase, we ran a two-step multiple regression. In line with previous research [11], we used sustainable consumption as the dependent variable; SA, SE and ability as the independent variables, and the trigger as the moderating variable. The first step tested the main effects, while the second step involved the interactions with the trigger. To avoid the problem of multicollinearity in the interaction terms, we mean-centered the predictors [47]. We then checked the assumption of non-multicollinearity and found that the Variable Inflation Factors (VIF) varied between 1.099 and 1.551 and are thus well below ten [48]. Also, all non-tolerance statistics were below 0.02 [49]. Based on these outcomes, we assume that multicollinearity is not an issue. We assessed the assumption that the errors are independent with the Durban Watson test. The outcomes for all three analyses hover around 1.6, which is below the threshold value of two [50]. Because the K-S test is sensitive in large samples, we inspected the histograms and the skewness and kurtosis of the variables involved. Since for none of the variables the absolute skewness value is below two, and for absolute kurtosis below seven [51], we concluded that the distributions of the variables involved are acceptable for the analysis.

4. Results
4.1. Current Practices for Purchasing, Using and Disposing of Clothes

Respondents purchased about seven clothing items in the past three months, of which 40% were from price-conscious brands such as Zara, H&M and Primark. Most

purchases are via traditional chain stores (40%), and web-shop-only stores (28%). On average, respondents wore their jeans for five days before washing them, and a blouse or t-shirt for two days. Typically, clothes are washed on 40 degrees Celsius (49%) and dried on a washing line (59%). While considering the season, 31% of the respondents wear less than 25–50% of the clothes in their wardrobe. Jeans or blouses are generally discarded after wearing them for 1.5 years. In the past three months, 29% of the respondents disposed of five or more items, with the majority being from price-conscious brands (59%). Respondents primarily dispose of clothes because they no longer fit, or because it has a defect that they cannot repair themselves. Respondents seldom threw items in the trash bin, instead they preferred to discard clothes in a container for donation purposes.

4.2. Sustainable Practices for Purchasing, Using and Disposing of Clothes

Overall, the mean scores for sustainable purchasing (M = 3.27), using (M = 3.55) and disposal (M = 2.83) of clothes indicate that the respondents do not generally engage in sustainable consumption practices (see Table 1 for descriptive statistics, and Tables A1 and A2 in the Appendix A for the sample description and information at item level).

Table 1. Descriptive statistics.

| Variables	N	Mean	SD	Skewness	Kurtosis	Cronbach α
Sustainable purchasing	811	3.27	1.13	0.30	−0.34	0.86
Motivation SA	821	4.88	1.39	−0.57	−0.17	0.86
Motivation SE	836	3.18	1.55	0.37	−0.65	0.56
Ability	827	4.72	1.09	−0.39	0.37	0.70
Trigger	829	3.32	1.47	0.02	−0.88	0.60
Sustainable use	690	3.55	0.97	0.30	0.34	0.65
Motivation SA	687	5.36	1.26	−0.19	0.35	0.75
Motivation SE	-	-	-	-	-	-
Ability	-	-	-	-	-	-
Trigger	685	4.84	1.00	−0.27	0.54	0.84
Sustainable disposal	1007	2.83	1.02	0.77	0.55	0.81
Motivation SA	1027	4.84	1.36	−0.49	−0.29	0.90
Motivation SE	1030	3.46	1.44	0.15	−0.54	0.84
Ability	1029	4.51	1.58	−0.46	−0.48	0.58
Trigger	1032	4.38	1.37	−0.13	−0.26	0.57

The sustainable purchasing practice most used, involves buying quality clothes because they last longer (M = 5.13) while reusing strategies such as swapping clothes (M = 1.83), or buying second-hand clothes are least favored (Mean = 2.55).

In the usage phase, respondents carefully wash items to extend the lifetime of clothes (M = 4.44), while updating clothes to make them fashionable again is least used (M = 2.71). Sustainable disposal practices have the lowest mean score (M = 2.83). Respondents are least keen on swapping or selling clothes. They rather prefer giving away redundant clothes (M = 4.90) or donating these to a good cause (M = 4.78).

The regression results are presented in Table 2 and graphically depicted in Figures 2–4. Overall, the motivation factors, ability and trigger explain the variance in sustainable purchasing best (47.2%), and those of sustainable using the least (14.9%). The additional explained variance of the interaction effect is only significant for sustainable purchasing.

Table 2. Regression results for the three consumption phases.

M	Variables	Sustainable Purchasing		Sustainable Using		Sustainable Disposing	
		B	**β**	**B**	**β**	**B**	**β**
1	Constant	3.270	-	3.550	-	2.834	-
	Motivation SE	0.248	0.423 **	-	-	0.363	0.508 **
	Motivation SA	0.310	0.302 **	0.268	0.352 **	0.024	0.032
	Ability	0.008	0.008	-	-	0.077	0.120 **
	Trigger	0.108	0.141 **	0.077	0.079 *	0.009	0.011
2	Constant	3.272	-	3.538	-	2.840	-
	Motivation SE	0.302	0.413 **	-	-	0.357	0.500 **
	Motivation SA	0.254	0.310 **	0.267	0.350 **	0.017	0.023
	Ability	−0.015	−0.015	-	-	0.082	0.127 **
	Trigger	0.119	0.156 **	0.083	0.085 *	0.015	0.021
	Trigger × Motivation SE	0.025	0.053	-	-	0.038	0.080 *
	Trigger × Motivation SA	−0.003	−0.006	0.026	0.039	−0.005	−0.011
	Triggers × Ability	−0.057	−0.087	-	-	−0.015	−0.034
	F step 1	175.176 **		59.171 **		122.333 **	
	Df1/Df2	4/775		2/663		4/978	
	R^2	0.475		0.151		0.333	
	R^2 Adjusted	0.472		0.149		0.331	
	F step 2	3.830 *		1.154		2.370	
	Df1/Df2	3/772		1/662		3/975	
	ΔR^2 for step 2	0.008 *		0.001		0.005	

* $p < 0.05$; ** $p < 0.001$.
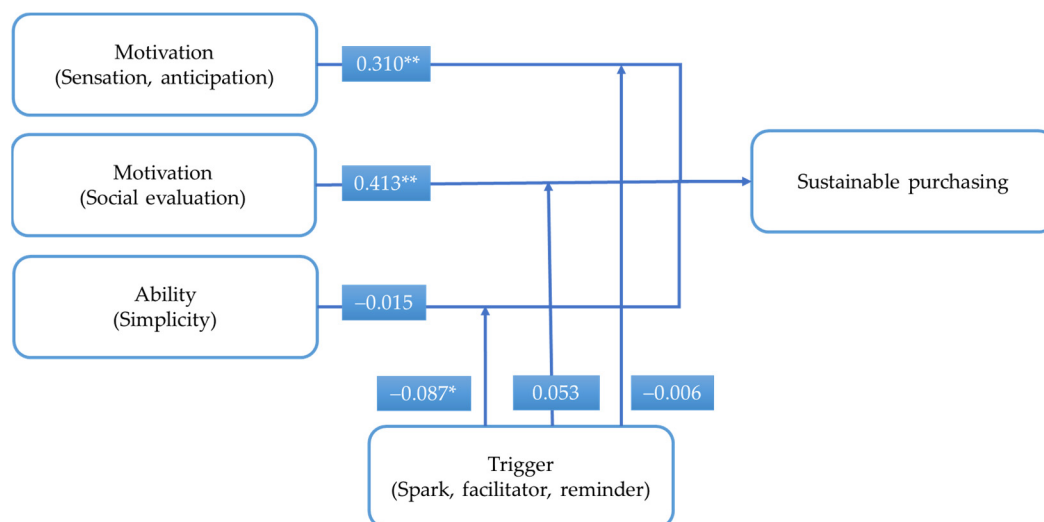
Figure 2. Regression model sustainable purchasing (* $p < 0.05$; ** $p < 0.001$).
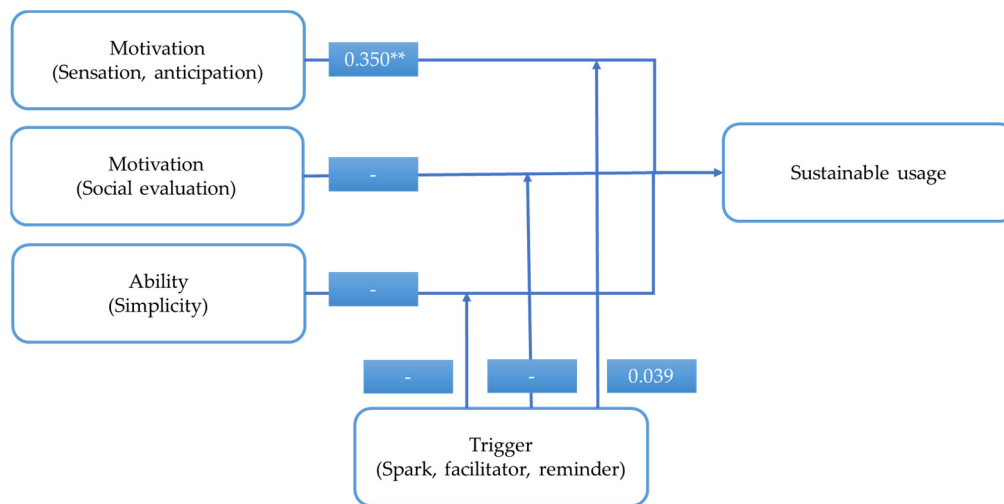
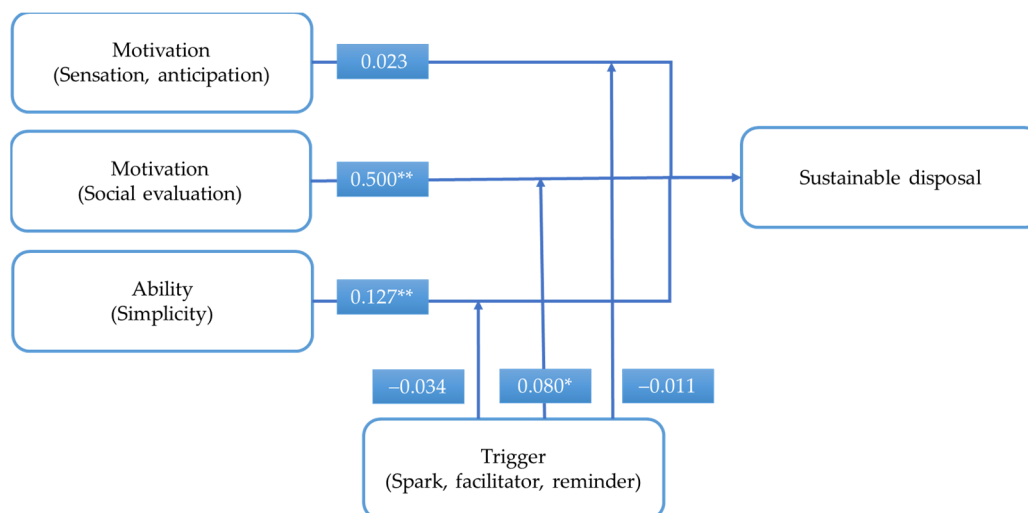**Figure 3.** Regression model sustainable usage (** $p < 0.001$).

Figure 4. Regression model sustainable disposal (* $p < 0.05$; ** $p < 0.001$).

The factor motivation SA is significant in the purchasing and the usage phase, but not in the disposal phase. Therefore, H1 is only supported for sustainable purchasing and sustainable usage. The core motivator SE has a significant and positive relationship with sustainable purchasing and sustainable disposal practices and is absent in the usage phase. Social influence is not relevant when caring for clothes or repairing them, probably because they take place in the privacy of home. In other words, H2 is confirmed in the sustainable purchasing and the disposal phase.

The role of ability is limited to the disposal phase and mainly pertains to the convenience with which clothes can be discarded. H3 is only confirmed in the sustainable disposal phase. The moderating effect of the trigger is significant with regards to the relationship between ability and sustainable purchasing and with regards to the relationship between social evaluation and sustainable disposal. When purchasing clothes, the trigger lowers the ability of consumers to include sustainability criteria when acquiring clothes, though the effect size is small ($\beta = -0.087$, $p < 0.05$).

The trigger has a positive effect on the relationship between social evaluation and sustainable disposal, supporting the conclusion that consumers can be stimulated to dispose of their unwanted clothes in a more sustainable fashion when people they admire are doing so, when they are fined, or when others would see how many items are disposed

of. To summarize, H4a is rejected, H4b is accepted only for sustainable disposal, and H4c is accepted only for sustainable purchasing.

5. Discussion

From our empirical analysis, we found evidence to support that sensation/anticipation, social evaluation and ability are important to predict sustainable behavior [8,10,11], but we also found that the effect varies in the three consumption phases [9]. Our empirical analysis showed that for purchasing and disposal decisions, social evaluation predicts sustainable practices best, while this motivation type plays no role in the usage phase. An explanation could be that social evaluation relates to real or imagined responses of others to visible consumers' behavior. Our analysis showed that ability aspects of time, money and effort are important for sustainable consumption, hence they require a facilitating trigger to demonstrate the sustainable target behavior. Sustainable target behavior for purchasing can be elicited by low prices of second-hand items or when the items are from designers, come in large variety, are warranted to be hygienically treated.

Sensation/anticipation, on the other hand, has a strong effect in the purchasing and the usage phase, but not in the disposal phase. The factor ability appeared to have a significant role in the disposal phase, but not in other phases. Finally, the trigger appears to lower the consumers' ability in the purchasing phase, while it enhances the core motivator social evaluation in the disposal phase. For sustainable usage, the trigger focuses on price and ease of repairs and maintenance, while for disposal cost-efficiency and a possible incentive might prompt sustainable behavior.

We found that overall, consumers engage in few sustainable purchasing, using and disposal practices. Consumers do feel concerned about climate change and pollution and do believe that their behaviors have a positive impact, but this knowledge does not help them making more sustainable decisions. Hence, we demonstrated a clear attitude-behavior gap [31,52,53]. Consumers know that their consumption behavior has impact on sustainability, yet they do not act upon this knowledge.

6. Conclusions

In this study we investigated how consumers can be persuaded to adopt sustainable practices when purchasing, using and disposing of clothes. We developed a questionnaire for each consumption phase to investigate how individuals currently consume clothing products, gauged the sustainability of these practices, and asked consumers what motivates their consumption behavior, what enables it and what would trigger them to include more sustainability criteria. The empirical analysis of the synergistic operation of the factors of motivation, ability and triggers and their effect on green purchasing behavior provides a valuable contribution to the discourse on sustainable consumerism.

Our contribution is threefold. First, most research studying sustainability of the fashion industry focuses on improving sustainability of the supply chain, while we assume a consumer perspective on sustainability. Second, we apply the R-imperative on consumer behavior which entails a novel and insightful research approach. This application led to the development of three measures to assess sustainable consumption practices when purchasing, using and disposing of clothes. Third, the study operationalized motivations, ability factors and triggers in the field of sustainable consumption. By doing so, it provided measures that invite validation in future research.

6.1. Theoretical Implications

The results of this study have implications for the theoretical discourse on sustainable behavior. First, most studies on sustainable consumer behavior have focused on sustainable purchasing alone. This study investigated all three consumption stages, whereby we combined insights from different behavioral models [8–11]. To our knowledge only few studies investigate behavior in all three stages of consumption, which indicates a gap in current literature we have attempted to fill [9,54].

Second, we have analyzed actual behavior in purchasing, use and disposal of clothes as opposed to intended consumer behavior [8]. The results of our study clearly point to a gap between attitude or intention and actual behavior, which is an indication that studies based on the Theory of Planned Behavior [8,33] may lead to wrong assumptions on sustainable consumer behavior in practice.

Third, our analysis uncovered several issues complicating validation of the Fogg Behavior Model [11]. Theory proposes that the trigger operates in tandem with motivation or ability, which results in a high correlation between trigger and ability or motivational aspects. Consequentially, the ability factor and the trigger are combined in the sustainable usage study. More in-depth research into the underlying concepts of the trigger and ability factors might give insight how these factors operate in the context of sustainable consumption of clothes.

6.2. Practical Implications

With our research, we also provide practical recommendations for the fashion retail industry. Especially, analyzing the triggers gives direction for changing current marketing and sales strategies and the development of new sustainable business models. The findings show that sustainable behavior needs to be simple. In other words, retailers need to provide consumers with a broad range of options, self-explanatory labels, and clarity of hygienic measures implemented for used clothes. Moreover, since current marketing and sales strategies do not trigger sustainable practices in young adults, we see an important role for the fashion industry. If upstream in the fashion supply chain manufacturing, coloring, cleaning and other aspects of the production process, such as labor, gender and poverty issues, become more sustainable, then, by default, consumers will have increased ability to make sustainable choices. Given that wages of laborers in South-East Asia are not paid during the outbreak of COVID-19, it has become clear that the transition to sustainable fashion requires governments to set the terms for producing fashion on an international level. In the meantime, the current sustainable-minded manufacturers can take steps in refusing virgin cotton, silk and angora, and look for alternative materials such as hemp and flax [55]. These materials have a lower climate footprint, while costs of the materials for large scale production are similar. Offering sustainably produced fashion will have a much greater effect on changing consumer behavior than current marketing and sales policies.

6.3. Limitations and Further Research

The limitations of this research are as follows. First, the findings of this research are limited by age group of the respondents, since most respondents are millennials and generation Z. Future research should validate the model in a broader group of consumers of different ages and income classes. We propose to use consumer profiles or personas in a follow-up study to distinguish different types of consumers, demonstrating different behaviors in each of the three consumption phases. In addition, the data was collected in The Netherlands with associated cultural values and norms, which may not reflect those of other countries. Further research should, therefore, also focus on other geographies to ascertain whether the outcomes of this research indicate a local, regional or global problem. If it turns out there is a global problem, this will help convince fashion industry to develop with global solutions.

Second, further research should also focus on how we can trigger the upstream supply chain in making more sustainable choices in means of production, labor, and material input. With this study we demonstrate the value to investigate how motivation, ability and triggers can help speed up the transition of the fashion industry to a climate neutral production system. Our findings help indicate how the supply chain can address the different types of motivation, ability and triggers in each phase of consumption.

Appendix A

Table A1. Sample description.

Descriptor	Categories	Overall Count	% Purchasing	% Using	% Disposing
Gender	Male	1161	48.2	47.0	51.6
	Female	1288	51.3	52.4	58.9
	Other	15	0.5	0.6	0.8
	Total	2464			
Age group	<18	101	3.7	4.7	3.6
	18–22	1433	46.1	63.6	58.1
	23–40	820	37.4	24.9	32.1
	>40	210	12.8	6	5.9
	Do not want to disclose	8	0	0.7	0.3
	Total	2572			
Living situation	I live with my parents	819	25.9	38.6	32.2
	I live alone	542	19.0	28.6	17.8
	I share a house with friends	63	25.3	18.4	28.2
	With my partner	282	15.8	6.3	10.2
	With partner and children	173	9.7	4.6	5.8
	With my children	50	1.6	1.4	2.6
	Other	70	2.6	2.1	3.2
	Total	2568			
Completed level of education	None	7	0	0.4	0.4
	Primary education	78	3.7	2.0	3.2
	Secondary education	1246	44.7	49.8	50.8
	Vocational studies	372	11.4	17.6	14.9
	Bachelor's degree	582	27.2	22.4	19.2
	Master's degree	170	9.0	4.2	6.4
	PhD	22	0.8	0.9	0.9
	Other	90	3.2	2.7	4.3
	Total	2567			

Table A1. *Cont.*

Descriptor	Categories	Overall Count	% Purchasing	% Using	% Disposing
	Student working ≤ 16 h	954	33.8	41.9	36.5
	Student working > 16 h	483	17.4	20.6	18.6
	Full-time job	454	21.5	13.9	17.1
	Part-time job	210	8.7	5.6	9.5
Employment status	Unemployed	274	9.1	10.9	11.8
	Independent–self employed	63	3.0	2.3	2.1
	Entrepreneur with company	56	2.1	1.7	2.5
	Retired	32	1.9	1.1	0.8
	Other	47	2.5	2.1	1.1
	Total	2573			

Table A2. Measures used for sustainable consumption.

Constructs and Items		Mean	SD	Cronbach α
Sustainable purchasing				0.86
Rethinking	I choose clothes from environmentally friendly brands	3.23	1.76	0.89
	I read the clothing label to check of what materials the product is made of	3.48	2.05	
	I choose clothes that are made of biological cotton, bamboo, flax, Lyocell, Tencel	2.98	1.85	
	I choose clothes that are kept as natural as possible	3.46	1.84	
	I buy clothes made from recycled material	2.76	1.72	
	I purposely select fibers that require cooler washing temperature, shorter drying time or less ironing	2.87	1.87	
	I refuse buying clothes that are harmful to the environment	3.36	1.87	
	I consider sustainability aspects of the clothes that I buy, rent or swap	3.12	1.91	
	I refuse clothes when I know that the people who made the clothes work in unsafe conditions	3.86	2.02	
Reusing	I buy second-hand clothes	2.5	1.91	0.63
	I use a swapping platform or clothing library to get clothes	1.83	1.52	
Reducing	I buy clothes that do not follow fashion trends	3.92	1.91	0.25
	I buy quality clothes because they last longer	5.13	1.77	
Sustainable usage				0.65
Retain	I continue wearing garments with a small defect (such as a hole in the fabric or a missing button)	3.67	1.90	0.52
	I continue wearing garments that do not fit well (too large or too small)	3.01	1.73	
	I continue wearing garments that are out of fashion	4.26	1.85	
	I wash garments carefully to extend the lifetime of it	4.44	1.84	
	I use eco-friendly products to wash my garments	3.26	1.70	
Repair	I repair small defects in garments myself	3.76	2.08	0.32
	I update, or have someone else update old clothes to make them fit or fashionable again	2.80	1.91	
Refurbish	When a garment is damaged, I use it for a different purpose (cleaning cloth for instance)	4.04	2.01	0.50
	I use good parts of old garments to make a different product out of it (for instance, jeans becoming a skirt or pillow) before discarding them.	2.71	1.96	
Sustainable disposal				0.81
Reuse	Giving clothes away to friends or family	4.90	1.85	0.75
	Donating clothes to a good cause	4.78	1.90	
	Bringing it back to the store in return for a purchase voucher	2.46	1.87	
	Selling garments via second-hand stores (online and offline)	2.51	1.87	
	Selling garments to friends or family	2.22	1.84	
	Swapping clothes via a platform	2.03	1.70	
	Swapping clothes with friends or family	2.82	2.06	
Recycle	Donating garments in recycling bins (purpose is recycling	3.90	2.15	0.45
	Taking it back to the store to be recycled without receiving an incentive	2.32	1.83	
Repurpose	Before discarding clothes, I remove items such as labels, buttons and zippers with the intention to use these again.	2.23	1.81	0.57
	Use it as rags for cleaning purposes	3.46	2.05	

Table A3. Principal Component Analysis Sustainable Purchasing (N = 807).

Items	Motivation-Sensation & Anticipation	Ability	Trigger	Motivation-Social Evaluation
It feels good to buy sustainable clothes	0.677			
I prefer clothes that are made by people who are paid decently	0.695			
It hurts to buy clothes for which animals had to suffer.	0.663			
I worry about climate change	0.809			
I worry about the pollution of our environment.	0.829			
I believe that buying sustainable clothes has a positive effect on our planet.	0.751			
That you can buy the clothes online		0.578		
That sustainable clothes are just as expensive or cheap as other clothes		0.709		
That the garment is cheap		0.583		
That the store where you can buy clothes is easy to reach		0.673		
That I can easily determine if the garment is made using sustainable principles		0.498		
I only buy second-hand clothes when it is really cheap			0.793	
I only buy second-hand vintage or designer clothes			0.602	
It helps when there is a wide range second-hand clothes that I can choose from			0.794	
I need assurance that clothes that I buy second-hand, rent or swap are clean and hygienic			0.565	
I feel ashamed when I purchase new clothes at a very low price				0.682
My friends consider sustainability when buying clothes				0.682
Eigenvalue	5.09	1.91	1.76	1.19
Explained variance	23.3%	10.6%	9.8%	6.6%
Cronbach α	0.86	0.70	0.60	0.56

Table A4. Principal Component Analysis Sustainable Using (N = 678).

Items	Trigger	Motivation-Anticipation	Motivation-Sensation
That repairs are inexpensive	0.814		
That clothes are easy to repair	0.790		
Inexpensive maintenance (no dry cleaning for instance)	0.751		
I find it important that it is easy to maintain my clothes	0.739		
I find it important that it is easy to have my clothes repaired	0.639		
That it is easy to care for my clothes	0.636		
I worry about climate change		0.879	
I worry about pollution of our industries on our environment		0.866	
I believe that looking after my clothes has a positive effect on the environment		0.766	
My friends find it important to be sustainable		0.612	
I enjoy it when clothes are well repaired			0.767
It feels good to care for my clothes			0.724
It hurts to dispose of my clothes			0.675
Eigenvalue	4.35	1.86	1.34
Explained variance	933.5%	114.3%	910.4%
Cronbach α	0.84	0.80	0.64

Table A5. Principal Component Analysis Sustainable Disposing (N = 1007).

Items	Ability	Motivation-Sensation Anticipation	Trigger	Motivation-Social Evaluation
It is important that it is easy to sell my clothes	0.837			
It is important that I know where I can sell my clothes	0.824			
It is important that it is easy to swap my clothes	0.816			
It is important that I know where I can swap my clothes	0.808			
It is important to know which swapping or selling platform can be trusted	0.733			
It is important that the selling process of clothes is convenient	0.715			
It is important that the process of swapping clothes is convenient	0.697			
I worry about the pollution of our environment		0.848		
I worry about climate change		0.804		
It is important to know how much proper disposal positively impacts the environment		0.727		
It is important to know which method is most sustainable for disposing of my clothes		0.714		
I believe that swapping, selling or donating clothes is better for the environment		0.702		
It is important that it takes me little time to discard unwanted clothes			0.819	
It is important that it costs me little or no money			0.810	
It is important that I get money or a voucher for returning clothes			0.403	
I feel ashamed of the number of good clothes that I dispose of every year				0.823
People I admire sell or swap their clothes				0.692
It is important to pay a fine when unwanted clothes are thrown in a trash bin				0.512
Eigenvalue	5.70	2.73	1.44	1.18
Explained variance	531.7%	215.2%	38.0%	76.6%
Cronbach α	0.90	0.84	0.58	0.57

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