Does sustainability-consciousness affect consumers' responses to marketers' initiatives? Lessons from product design evaluation

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ABSTRACT

Research into sustainable consumption has focused on the understanding of consumers' responses to marketers' sustainable initiatives, with specific attention given to the effect of individual differences. This research takes things the other way round, and investigates whether individual differences in sustainability-consciousness affect consumers' responses to any form of marketing initiatives.

Key Words: Sustainability; product design evaluation

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Sustainability has become an issue of primary concern to most marketers and marketing research has consequently given increasing importance to sustainability (Golob et al, 2022). Most attention has been given to the understanding of consumers' responses to brands' sustainable initiatives (e.g. Hesse et al., 2022) and to whether individual differences may affect these responses (e.g. Love et al, 2022). In particular, sustainability-consciousness has been found to positively influence consumers' responses to brands' sustainable actions (Balderjahn et al, 2018). Sustainability-consciousness refers to the level of personal concern a consumer attaches to environmental, social and economic standards when making a purchase decision (Balderjahn et al., 2018). This research aims to investigate whether differences in sustainability-consciousness affect consumers' responses to marketers' initiatives, independently of whether these are positioned as sustainable. Answering this question is important because sustainable consumers evolve in an economic system where they are exposed to both sustainability-positioned and non-sustainability-positioned initiatives. Thus, marketers need to know how sustainable consumers react to any of their actions.

Theoretical development

This research is motivated by the view that sustainability-consciousness is driven by individual differences that may affect how consumers react to any branding initiative. We will more specifically focus on product design evaluation. As product design is the first element consumers see, it is key in generating first product and brand impressions (Belboula et al, 2018).

Sustainability-consciousness is driven by individual differences (Gustavsen and Hegnes, 2020; Song and Kim, 2018). We suggest, these individual differences may in turn affect product design evaluation, independently of whether the product is positioned as sustainable. Stated formally, we hypothesize that:

H1: Differences in sustainability-consciousness affect the way consumers evaluate product design.

We further suggest that individual differences, considered in terms of personality traits, explain this phenomenon. We specifically investigate three personality traits, within the Big Five taxonomy (John and Srivastava, 1999; Norman, 1967) which have been found to predict sustainable consumption (Gustavsen and Hegnes, 2020; Song and Kim, 2018): Conscientiousness, agreeableness and openness to experience.

Conscientiousness captures the propensity to be self-controlled, responsible to others, orderly and rule abiding (Roberts et al., 2014). Sustainable consumption involves valuing other people, the environment, and future generations, i.e. entities that are outside of the self (White et al., 2019). In addition, adoption a sustainable behavior implies adoption a set of specific norms and rules (Southerton et al., 2004). Thus, we hypothesize that:

H2-a: Consumers high on conscientiousness display higher sustainability-consciousness than others.

Agreeableness describes individual differences in the motivation to maintain positive relations with others (Graziano and Tobin, 2002). Sustainable consumption involves setting aside desires that are relevant to the self (White et al., 2019). Thus, we hypothesize that:

H2-b: Consumers high on agreeableness display higher sustainability-consciousness than others

Openness to experience refers to individual differences in the quest for new experiences and ideas (McCrae and Greenberg, 2014). Sustainable options and behaviors may also be

perceived to be more innovative than traditional options as they involve going beyond the status quo (White et al., 2019). Thus, we hypothesize that:
H2-c: Consumers high on openness to experience display higher sustainability-consciousness than others.
We further suggest that consumers high on conscientiousness, agreeableness and openness to experience are also more likely to answer positively to any marketing initiative, explaining why differences in sustainability-consciousness affect the way consumers evaluate product design, as hypothesized with H1.
First, individuals with a high level of conscientiousness are likely to carefully process and weight information they are exposed to (Roberts et al., 2014). Thus, they may put more efforts into exploring a product or a marketing initiative that is new to them. This would generate more positive evaluations than those made by individuals acting more spontaneously. Stated formally:
H3-a: Conscientiousness has a positive effect on product design evaluation.
Second, individuals high on agreeableness tend to be more appreciative, sympathetic and trusting than others (McCrae & John, 1992). These personal characteristics may transfer to objects, suggesting that individuals with a high level of agreeableness may also react more positively than others to a product or a marketing initiative they are exposed to. Stated formally:
H3-b: Agreeableness has a positive effect on product design evaluation.
Finally, individuals high on openness to experience display intellectual curiosity and variety preferences (McCrae & John, 1992), which may also predict that they will react more positively than others to a product or a marketing initiative that is new to them.
Stated formally:
H3-c: Openness to experience has a positive effect on product design evaluation.
In summary, we predict that the effect hypothesized with H1, i.e. sustainability-consciousness has a positive effect on product design evaluation, is explained by the fact that the personality traits predicting high sustainability-consciousness are also those predicting positive reactions to marketing initiatives.

Methodological approach

This paper reports results from two empirical studies. In both studies, we used existing products to increase applicability of our research (Study 1: watches; Study 2: home equipment products). Study 1 aimed to test H1. Study 2 aimed to (1) corroborate Study 1 results with another sample and with other products, and (2) test H2 and H3.
In each study, we used four different products, and checked these were unknown to our participants. In study 1, we used four watches from the IWC brand. This brand, although well established, is not widely known by the general public, which reduces the likelihood that pre-existing brand and product knowledge could affect our results. To increase the generalizability of the results, we chose watches belonging to four different lines within the brand's portfolio. However, we also chose watches with similar price points so that design elements (e.g. perpetual calendar, date display, gold case, etc.) do not influence product evaluation. Study 2 used four new home equipment products presented at the Consumer Electronics Show (CES) in the year where data collection took place. The CES is a forum for introducing new breakthrough consumer technology products, thus increasing the likelihood the stimuli would be novel to the participants. We used home equipment products because these products are widely distributed and used, thus increasing the likelihood they would be of interest to our participants. We also were careful to avoid selecting products sold under well-known brands to avoid brand-knowledge effects.

Sustainability-consciousness (SC) was measured with Balderjahn et al.'s five-dimensional (2018) scale. Balderjahn et al.'s (2018) framework suggests, five dimensions – environmental, social, voluntary simplicity, debt-free consumption, collaborative consumption - underlie sustainability-consciousness. Environmental consciousness refers to consciousness of purchasing products that are produced, packaged or disposable in an environmentally friendly manner; social consciousness refers to concern for the workers treatment during the manufacturing process; voluntary simplicity refers to consumption based on personal needs; debt-free consumption refers to willingness to live within one's means; and collaborative consumption refers to search for consumption forms allowing the use of a product without purchasing it (Balderjahn et al, 2018). These five dimensions can be used to develop a sustainability-conscious consumer typology (Balderjahn et al, 2018). Product design evaluation (PDE) was measured with Homburg et al.'s (2015) three-dimensional scale. Homburg et al (2015) suggest, three dimensions - aesthetic, functional and symbolic - underpin product design evaluation: the aesthetic dimension corresponds to product appearance; the functional dimension reflects the perception of the product's ability to perform the function for which it was developed; and the symbolic dimension corresponds to the product's ability to express the consumer's self. All variables were measured using 7-point Likert scales.

Study 1

Study 1 is an exploratory study in which we develop a sustainability-consciousness consumers' typology based on Balderjahn et al.'s (2018) dimensions and investigate whether PDE significantly differs among the different consumer types. 337 (Female: 61,1%) students from a French Business School were randomly assigned to either of the four products ($N_{Product\#1}$=98; $N_{Product\#2}$=85; $N_{Product\#3}$=86; $N_{Product\#4}$=69). They were asked to report how familiar they were with IWC (α=.89). Results from a T-Test (M=1.92, t(336)=-27.73, p<.001) confirm our view that brand familiarity is limited. They were then required to evaluate product design on each of Homburg et al's (2015) scale dimensions: aesthetic (α=.80), functional (α=.80), symbolic (α=.82); and to answer questions capturing SC (Balderjahn et al, 2018): environmental consciousness (α=.88), social consciousness (α=.94), voluntary simplicity (α=.79), debt-free (α=.73), and collaborative consumption (α=.85).

We performed a k-means cluster analysis. By considering heterogeneity between clusters and the reasonability of the solution, we opted for a four-cluster solution. Second, we ran an ANOVA with a Scheffe post-hoc test to compare cluster differences in SC (See Table 1). We then compared PDE scores across the four consumer types: results in Table 1 show that significant differences exist among the four groups. As a robustness check, we conducted a series of ANCOVAs to check for the effect of the product line (i.e., Product#1/2/3/4). Results show that our results are not informed by the product to which participants were exposed ($F_{PDE\_aesthetic}(1,332)$=.034, ns; $F_{PDE\_functional}(1,332)$=.025, ns; $F_{PDE\_symbolic}(1,332)$=.097, ns). In other word, differences in SC affect the way consumers evaluate product design. Thus, H1 is supported.

We now describe each consumer group based on the SC scores and discuss differences in PDE across the different groups:

1. **Self-Centered sustainable consumers (#1):** This typology group is characterized by the least concern with social consciousness among all groups, and is neutral concerning collaborative consumption (t(75)=-.46, p=ns). When it comes to PDE, these consumers react less positively than consumers from other groups on each dimension, especially on the symbolic dimension. This is suggesting an absence of concern for others, be it from the perspective of social consciousness or a product's ability to make a good impression on other people.

2. **Sustainable, non-collaborative consumers (#2):** Sustainable consumption is of great importance to these consumers, at the exception of collaborative consumption on which this group has the lowest score. Balderjahn et al (2018) had identified a similar group, and we name this group accordingly. These consumers react very positively to each aspect of product design.
3. **Global sustainable consumers (#3):** These consumers score at the highest on each SC dimension and exhibit the highest level of collaborative consciousness. Balderjahn et al (2018) had also identified a similar group, that they had named "Sustainable consumer". Like sustainable, non-collaborative consumers, these consumers react very positively to each aspect of product design.
4. **Detached consumers (#4):** These consumers are the least concerned with sustainability among the four groups. They display slightly positive levels of environmental consciousness ($t(73)=12.94$, $p<.001$) and social consciousness ($t(73)=3.91$, $p<.001$), are neutral concerning voluntary simplicity and living within one's means, and are even negative regarding collaborative consumption ($t(73)=-3.31$, $p<.001$). They react less positively than consumers from groups #2 and #3 on each PDE dimension. However, they show more concern for product design symbolic dimension than self-centered sustainable consumers. This group is also the most masculine among the four groups, providing further support for the well-documented existence of a gender-gap when it comes to sustainable behaviors (Borau et al, 2020).

Study 1 results support our view that differences in sustainability-consciousness influence consumers responses to companies' initiatives, even though those initiatives - in our case, watches – are not positioned in sustainability terms.

Study 2

Study 2 aims to (1) corroborate Study 1 results with another sample and with other products, and (2) investigate whether conscientiousness, agreeableness and openness explain the phenomenon observed in Study 1. 561 (Female: 48%) students from a French Business School were randomly assigned to either of the four products ($N_{Product\#1}=135$; $N_{Product\#2}=143$; $N_{Product\#3}=134$; $N_{Product\#4}=149$). They were then required to evaluate product design on each of Homburg et al's (2015) scale dimensions: aesthetic (α=.84), functional (α=.85), and symbolic (α=.78); to answer questions capturing SC (Balderjahn et al, 2018): environmental consciousness (α=.89), social consciousness (α=.95), voluntary simplicity (α=.79), debt-free (α=.70), and collaborative consumption (α=.80); and to answer the conscientiousness(α=.77), agreeableness(α=.77), and openness (α=.78) items of John and Srivastava's (1999) Big Five inventory.

First, results from a k-means cluster analysis provide further support for the typology found in Study 1. SC differences among the four groups are also significant and broadly similar to those observed in Study 1 (See Table 1). We then compared PDE scores across the four consumer types: results in Table 1 show that significant differences exist among the four groups. As a robustness check, we conducted a series of ANCOVAs to check for the effect of the product (i.e., Product#1/2/3/4). Results show that our results are not informed by the product to which participants were exposed when PDE functional and symbolic dimensions are considered ($F_{functional}(1, 556)=2.647$, ns; $F_{symbolic}(1, 556)=1.506$, ns). In contrast, differences in $PDE_{aesthetic}$ are informed by the product ($F(1,556)=19.741$, $p<.001$). However, these differences among the four consumer types remains significant ($F(3,556)=21.184$, $p<.001$) whilst controlling for product effect. In summary, Study 2 provides further support for H1.

Second, results from a multinomial logistic regression show that agreeableness ($\chi2$ (3, $N=561)=30.03$, $p<.001$) and openness ($\chi2$ (3, $N=561)=23.19$, $p<.001$) significantly predict membership in the four groups. The effect of conscientiousness is only marginally significant

($\chi 2$ (3, N=561)=7.01, p=.071). If conscientiousness, agreeableness and openness scores were to be increased by one point, the multinomial log-odds of being a detached consumer rather than a global sustainable consumer would decrease by, respectively, .444 (p=.049), 1.094 (p<.001) and .548 (p=.027) unit. If agreeableness was to be increased by one point, the multinomial log-odds of being a self-centered sustainable rather than a global sustainable consumer would decrease by .410 (p=.030). Thus, H2-a, H2-b and H2-c are supported.
Finally, as expected, personality traits inform consumers' reactions to marketing initiatives: agreeableness and openness have a positive effect on $PDE_{aesthetic}$ ($\beta_{agreeableness}$=.346, t=4.701, p<.001; $\beta_{openness}$=.229, t=2.600, p=0.010) and $PDE_{functional}$ ($\beta_{agreeableness}$=.380, t=5.940, p<.001; $\beta_{openness}$=.268, t=3.499, p<.001) while conscientiousness only informs $PDE_{functional}$ (β=.162, t=2.367, p=.018). $PDE_{symbolic}$, however, is informed by none of the personality traits. Thus, H3-a, H3-b and H3-c are partially supported.

Conclusion

A great deal of previous research into sustainable marketing has focused on the understanding of consumers' responses to marketers' sustainable initiatives, with specific attention given to how individual differences affect these reactions. In this research, we take things the other way round, and investigate whether individual differences in sustainability-consciousness also affect consumers' responses to non-sustainably positioned product initiatives.
First, we develop a consumer typology built on different dimensions of sustainability-consciousness (environmental consciousness, social consciousness, voluntary simplicity, debt-free, and collaborative consumption), and we show that differences in sustainability-consciousness affect the way consumers evaluate the design of products new to them. Second, we show that differences in personality traits may explain this phenomenon: consumers high on traits predicting sustainability-consciousness, i.e., conscientiousness, agreeableness and openness, are also likely to develop more positive product design evaluations than other individuals. It is important to note that we do not consider sustainability-consciousness as mediating between conscientiousness, agreeableness and openness and product design evaluation. In other words, we do not suggest that individuals high on conscientiousness, agreeableness and openness react positively to marketing initiatives because they are sustainability-conscious. Rather, we suggest that conscientiousness, agreeableness and openness explain sustainability-consciousness along with a tendency to react positively to marketing initiatives.
In doing so, we first contribute to the academic debate about sustainable consumption by enriching knowledge of sustainability-conscious consumers. Second, our research also encourages marketers to investigate whether - and how - different groups of sustainability-conscious consumers react to their initiatives, thereby enabling them to implement targeting strategies that are not based on the assumption of homogeneity.
As with any research, several limitations are worth noting and should encourage future research. First, although data were collected for different types of products (watches and home equipment), and our results over the two studies converge, we recognize that generalizability of our results could be limited by narrow demographic and cultural sampling. Thus, future research could consider different consumer populations to provide further support for external validity. Second, we explored only one consumer response, i.e. product design evaluation. Future research may go beyond evaluation of product design and explore whether differences in sustainability-consciousness affect other consumers' responses, such as attitudes, consumption value, purchase intention and word of mouth.

References

Balderjahn, I., Peyer, M., Seegebarth, B., Wiedmann, K. P., & Weber, A. (2018). The many faces of sustainability-conscious consumers: A category-independent typology. *Journal of Business Research*, *91*, 83-93.

Belboula, I., Ackermann, C. L., & Mathieu, J. P. (2018). Product design and hierarchized persuasion process: An application to three household electrical products. *Recherche et Applications en Marketing (English Edition)*, *33*(4), 2-23.

Borau, S., Elgaaied-Gambier, L., & Barbarossa, C. (2021). The green mate appeal: Men's pro-environmental consumption is an honest signal of commitment to their partner. *Psychology & Marketing*, *38*(2), 266-285.

Graziano, W. G., & Tobin, R. M. (2002). Agreeableness: Dimension of personality or social desirability artifact?. *Journal of Personality*, *70*(5), 695-728.

Golob, U., Burghausen, M., Kernstock, J., & Davies, M. A. (2022). Brand management and sustainability: exploring potential for the transformative power of brands. *Journal of Brand Management*, *29*(6), 513-519.

Gustavsen, G. W., & Hegnes, A. W. (2020). Individuals' personality and consumption of organic food. *Journal of Cleaner Production*, *245*, 118772.

Hesse, A., Bündgen, K., Claren, S. and Frank, S. (2022). Practices of brand extensions and how consumers respond to FMCG giants' greening attempts. *Journal of Brand Management*, *29*(6), 520-537.

Homburg, C., Schwemmle, M., & Kuehnl, C. (2015). New product design: Concept, measurement, and consequences. *Journal of Marketing*, *79*(3), 41-56.

John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In *Handbook of personality: Theory and research*, 2nd ed., L. Pervin and O.P. John (Eds.) New York: Guilford.

Love, E, Sekhon, T. and Salinas, T.C. (2022). Do well, do good, and know your audience: the double-edged sword of values-based CSR communication. *Journal of Brand Management*, *29*(6), 598-614

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, *60*(2), 175-215.

McCrae, R. R., & Greenberg, D. M. (2014). *The Wiley Handbook of Genius*, 222-243.

Norman, W. T. (1967). 2800 personality trait descriptors: Normative operating characteristics for a university population. Ann Arbor: Department of Psychology, University of Michigan.

Roberts, B. W., Lejuez, C., Krueger, R. F., Richards, J. M., & Hill, P. L. (2014). What is conscientiousness and how can it be assessed?. *Developmental psychology*, *50*(5), 1315.

Song, S. Y., & Kim, Y. K. (2018). Theory of virtue ethics: do consumers' good traits predict their socially responsible consumption?. *Journal of Business Ethics*, *152*, 1159-1175..

Southerton, D., Warde, A., & Hand, M. (2004). The limited autonomy of the consumer: implications for sustainable consumption. In Southerton, D., Chappells, H., & Van Vliet, B. (Eds.) *Sustainable consumption: The implications of changing infrastructures of provision*, 32-48. Edward Elgar Publishing.

White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing*, *83*(3), 22-49.

Table 1: Sustainability-consciousness profiles of the four groups and ANOVA results.

Type	Self-Centered sustainable consumer		Sustainable, non-collaborative consumer		Global sustainable consumer		Detached consumer					
Cluster no.	#1		#2		#3		#4					
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1		Study 2	
N	76	94	99	121	88	179	74	167	total 337		total 561	
%	22.55%	16.76%	29.38%	21.57%	26.11%	31.91%	21.96%	29.77%				
									overall mean	F	overall mean	F
Sustainability-consciousness												
Environmental consciousness	5.46$^{1/4}$	4.63$^{\times}$	6.32$^{2/3}$	5.76$^{2/3}$	6.12$^{2/3}$	5.77$^{2/3}$	5.47$^{1/4}$	4.08$^{\times}$	5.88	25.44**	5.07	125.99**
Social consciousness	2.88$^{\times}$	5.51$^{\times}$	4.87$^{2/3}$	6.34$^{2/3}$	5.19$^{2/3}$	6.20$^{2/3}$	4.42$^{\times}$	4.18$^{\times}$	4.40$^{\times}$	88.97**	5.51	175.83**
Voluntary simplicity	5,88$^{1/2/3}$	6.48$^{\times}$	6,05$^{1/2/3}$	4.89$^{\times}$	6,07$^{1/2/3}$	5.98$^{\times}$	3,81$^{\times}$	3.72$^{\times}$	5.52	104.81**	5.16	245.35**
Debt-free	5,28$^{\times}$	6.17$^{\times}$	5,93$^{2/3}$	4.81$^{\times}$	5,82$^{2/3}$	5.,68$^{\times}$	3,82$^{\times}$	3.86$^{\times}$	5.29	81.91**	5.03	174.82**
Collaborative consumption	3,93$^{1/4}$	2.89$^{1/2}$	1,84$^{\times}$	2.70$^{1/2}$	4,97$^{\times}$	5.29$^{\times}$	3,56$^{1/4}$	3.88$^{\times}$	3.51	163.05**	3.91	217.60**
Design evaluation												
Aesthetic	4,76 $^{1/4}$	5.17$^{/2//3}$	5,58$^{2/3}$	5.16$^{/2//3}$	5,64$^{2/3}$	5.36$^{1/2//3}$	4,97$^{1/4}$	4.49$^{\times}$	5.28	17.80**	5.03	19.66**
Functional	5,46$^{1/4}$	5.37$^{1/2//3}$	6,32$^{2/3}$	5.51$^{1/2//3}$	6,12$^{2/3}$	5.57$^{1/2//3}$	5,47$^{1/4}$	4.58$^{\times}$	5.88	23.44**	5.23	36.83**
Symbolic	2,88^{x}	3.77$^{1/2//4}$	4,87$^{2/3}$	3.89$^{1/2//4}$	5,19$^{2/3}$	4.41$^{\times}$	4,42 ^{x}	4.01$^{1/2//4}$	4.40	88/97**	4.07	6.88**

Note: Significance values for one-way ANOVA: **p < .001, *p < .01; post hoc Scheffé tests (p < .05): $^{1/2/3/4}$ no mean differences between groups no. 1/2/3/4; $^{\times}$different from all other segments; underlined scores: greater than the overall mean; All variables are measured using 7-point scales