Sustainable Consumption Patterns in Different Settings

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The purpose of this study is to identify sustainable consumption patterns of Lithuanian consumers based on their sustainable consumption behaviour in two settings: at home and at work. The study also attempts to describe the segments and highlight their differences in terms of consumer engagement into sustainable consumption, which in the present study reflects the psychological state of consumers, determining their actual behaviour. The study sample consisted of 498 Lithuanian consumers. A two-step cluster analysis was performed on sustainable consumption behaviour scores at three consumption phases: acquisition, use, and disposal at home and at work. The differences among the clusters were examined according to five dimensions of consumer engagement, namely, enthusiasm, attention, interaction, absorption, and identification. Cluster analysis identified two clusters based on consumer behaviour at home "convenience-based sustainability" and "true followers" as well as two clusters based on consumer behaviour at work "environment-independent sustainability" and "followers of basic principles". Clusters in each life domain differed significantly in terms of consumer engagement into sustainable consumption. Segments with high level of sustainable consumption behaviour at home and at work were more highly engaged into sustainable consumption as well.

Keywords: *Sustainable Consumption Patterns; Sustainable Consumption Behaviour; Behaviour at Home and at Work, Different Settings; Consumer Engagement; Two-Step Cluster Analysis.*

Introduction

Sustainable consumption remains a relevant topic for academic and practice-oriented research. The European Sustainable Development Report, published in December 2020, further calls for research in the area. Four out of six priorities set out in the Report, focus on sustainable consumption and sustainable production, emphasizing the need to find ways to reduce the environmental damage caused by European industry and consumers. Therefore, the scientific literature is abundant of research focusing on factors that influence sustainable consumption behaviour (Dong *et al.*, 2018; Kadic-Maglajlic *et al.*, 2019; Whitburn *et al.*, 2019; Liobikiene & Poskus, 2019; Alcock *et al.*, 2020; Piwowar-Sulej, 2020; Hosta & Zabkar, 2020), exploring the possible ways to promote sustainable consumption behaviour in different settings and life aspects (Muster & Schrader, 2011; Gadeikiene *et al.*, 2019; Banyte *et al.*, 2020; Piwowar-Sulej, 2020). Recent research also involves consumer segmentation based on values closely related to sustainable consumption, looking for the "new type" of consumers (Szakaly *et al.*, 2017). Research in this field mostly focus on the specific aspects of sustainable consumption, such as purchase decisions of eco, green or fair-trade products (Peyer *et al.*, 2017; Sarti *et al.*, 2018; Calderon-Monde *et al.*, 2020), context or product-specific consumption (energy, food, mobility, fashion, etc.) (Verain *et al.*, 2015; Van Loo *et al.*, 2017; Kastenholz *et al.*, 2018; Funk *et al.*, 2021), or describe segments of sustainable consumption according to the lifestyle of health and sustainability (Szakaly *et al.*, 2017),

consumer environmental consciousness (Albayrak *et al.*, 2010; Balderjahn *et al.*, 2018) or values/attitude/motives (Burke *et al.*, 2014).

Verain *et al.* (2015), while analysing sustainable food consumption segments, indicate that domain-specific factors could play a significant role in framing consumption-related habits. They emphasize the necessity to compare sustainable consumption behaviour patterns in different domains and indicate the distinct and overlapping elements of them. Verain *et al.* (2015) study provides four food consumption clusters: un-sustainers, curtailers, product-oriented, and sustainers. Their findings demonstrate that higher-level sustainable consumption is typical for consumers of younger age and higher income and education level. Similar findings can be observed in the study of Van Loo *et al.* (2017), in which authors present consumer segmentation based on involvement in healthy and sustainable eating. Additionally to Verain *et al.* (2015) results, Van Loo *et al.* (2017) indicate that sustainable and healthy eating is more common to women than men. Burke *et al.* (2014) segment consumers according to their indicated reasons for and against ethical consumption. After the segmentation, the authors present how these segments differ in behavioural characteristics (particularly, different products purchasing). Burke *et al.* (2014) confirm that representatives from positively oriented cluster buy more ethically, and vice versa. Peyer *et al.* (2017) choose the different approach to segmentation. They identify five segments of consumers according to their consumption behaviour (poor-consumers, less well-off consumers, well-

off consumers, voluntary simplifiers, over-consumption consumers). Peyer *et al*. (2017) characterize one segment – "voluntary simplifiers" – in detail, giving the sustainability profile of this segment according to their preferences, attitudes, consciousness, etc. In their study, Poortinga & Darnton (2016) claim to develop a comprehensive sustainability segmentation model, which includes economic, social, and environmental aspects of sustainability. The sustainability segmentation model, suggested by Poortinga & Darnton (2016), consists of a wide list of variables, ranging from consumer's personality and values to consumption behaviour in different contexts (energy, food, and others). Authors distinguish six consumer segments (enthusiasts, pragmatists, aspirers, community focused, commentators, and self-reliant) and call for their usage in public policy while fostering public sustainability.

Although there are quite many attempts to segment consumers and characterize them according to theirs sustainability related personal and behavioural characteristics, however, there is still a lack of research exploring the different groups of consumers based on their actual sustainable consumption behaviour, involving the acquisition of products/services, their usage and disposal. Moreover, the existing research evidence the need to take into consideration different life domains when looking for behavioural patterns. Two domains are extremely important with regard to sustainable consumption behaviour: personal life and work environment. It relates to so called spill-over mechanism, which enables the transfer of knowledge, practices, and habits from one domain to another (Muster, 2011; Gadeikiene *et al*., 2019). Therefore, *the aim of this study* is to examine the sustainable consumption patterns in different life domains and to define the Lithuanian consumers based on their actual sustainable consumption behaviour at home and at workplace. Additionally, the identified segments were described according to the engagement into sustainable consumption, which in the present study reflected the psychological state, determining the behaviour.

The present study will contribute to a deeper understanding of sustainability-based segmentation in several ways. First, segmenting consumers based on their actual sustainable consumption behaviour at different stages of consumption provides a basis for further segmentation research, enabling marketers to distinguish between "sustainable" and "less sustainable" consumers, considering not only the acquisition of products/services but also the use and disposal. That allows designing effective social marketing programs while targeting these segments and promoting segment-specific aspects of sustainable consumption behaviour. Second, identifying and describing segments in two domains – at home and at work – may enhance understanding underlying behaviour patterns and suggest the specific practices for promoting sustainable consumption behaviour in each life domain. Third, describing the segments with consumer engagement provides insights about the attitude-behaviour relation, which could be further used for creating effective marketing programs, fostering the desired consumer behaviour.

Theoretical Background

Sustainable consumption. Sustainable consumption is analysed differently in the scientific literature. In conceptual papers, researchers emphasize the importance of an integrated approach to sustainable consumption (Geiger *et al*., 2018), distinguishing between ecological, social, and economic components. These three aspects of sustainable consumption are also emphasized in the definition of sustainable consumption provided by EUROSTAT (2016). However, empirical research has focused on the ecological component, emphasizing the need to promote sustainable consumption and reduce consumption in general (Jackson, 2005; Gupta & Agrawal, 2018; Geng *et al.,* 2017; Ellabban & Abu-Rub, 2016). In addition, scholars differ on approaches to research into sustainable consumption behaviour. The authors of the present paper hold the approach proposed by Geiger *et al.* (2018) and Geng *et al.* (2017), where sustainable consumption behaviour is understood as a three-stage process involving the acquisition, use, and disposal of various goods/services. Although more detailed stages of sustainable consumption behaviour could be found in the literature. For example, Gupta & Agrawal (2018) treated sustainable consumption as environmentally responsible consumption. They developed the ERC scale, consisting of 38 variables, covering 10 different consumption activities/stages. However, analysis of those 10 activities allows seeing that they can be meaningfully combined into three stages mentioned above. Meanwhile, Sharma & Jha (2017) analysed consumption levels rather than consumption stages, distinguishing between low, medium, and high. Integrating these two different approaches could provide a more detailed picture of a consumer who is involved in sustainable consumption, describing his behaviour both in terms of different levels of consumption and in detail, distinguishing between sustainable consumption behavioural characteristics according to individual consumption stages.

Sustainable consumption behaviour at home and at work. Sustainable consumption behaviour depends not only on the consumer's own choices but also on the opinions and behaviours of those around him (Jackson, 2005). This view is also supported by Muster (2011), who argues that various organizations play an important role in a person's life. They decide on a daily routine, "assigning" a person to a certain social group. Muster (2011) sees here opportunities for promoting sustainable consumption behaviour, as people who spend almost a third of their lives in these organizations (i.e., at work), can learn there some sustainable consumption behaviour practices and acquire certain habits, which can be transferred to their personal environment. Blok *et al.* (2015) examined the expression of sustainable consumption behaviour in the work environment at different stages of consumption (purchasing, using, and disposing of waste) and in different areas (food, heating, lighting, computer use, paper saving, etc.). They identified the importance of ensuring a sustainable environment for sustainable consumption, while examining internal and external factors influencing employee engagement in sustainable consumption. Klade *et al.* (2013) and Littleford *et al.* (2014) provided similar results in their research. Salciuviene *et al.*(2019) further developed this idea by investigating the importance of personal factors and entrepreneurial traits of

an employer for engaging in sustainable development by creating appropriate conditions (corresponding to situational factors singled out by Blok *et al.* (2015)) for sustainable use in the work environment. The importance of an appropriate pro-environmental organizational culture was also emphasized in the study by Piwowar-Sulej (2020). Littleford *et al.* (2014) compared sustainable consumption behaviour at home and work environments but examined only one area of sustainable consumption – energy-saving consumption behaviour, and their questionnaire covered only one stage of consumption – use. When researching sustainable consumption behaviour of office empoyees at work and at home, they found that the presence/absence of suitable conditions for such behaviour in different environments played the biggest role, but the authors did not identify the possibility of the juxtaposition of sustainable consumption behaviour in different environments. Meanwhile, Banyte *et al.* (2020) examined the UK respondents' sustainable consumption behaviour in home and work environments at the usage stage of SCB by age and gender. They found statistically significant differences in sustainable consumption behaviour among older and younger consumers and these differences manifested themselves differently in different environments (work and home). At the same time, examining the respondents' behaviour by gender, the above-mentioned authors found that women tend to use more sustainably both at home and at work. Earlier, Tudor *et al.* (2007), in their research, also confirmed a strong relationship between behaviours in work and home settings. Thus, there is evidence that companies can contribute to sustainable consumption behaviour in employees' personal environment by involving employees in sustainable consumption initiatives in the work environment. On the other hand, people who are more involved in sustainable consumption at home may strive for sustainable consumption at work as well. Different research results in different contexts do not allow an unequivocal statement about the spill-over effect of sustainable consumption behaviour at home and at the workplace, but understanding the expression of sustainable behaviour in different environments would help create a clearer picture of the consumer who is engaged into sustainable consumption.

Consumer engagement into sustainable consumption as a factor, determining the behaviour. There is a consensus among researchers that consumer engagement is related to the corresponding consumption behaviour and its expression (Kumar *et al.*, 2010; Vivek *et al.*, 2014). Thus, in order to influence consumer behaviour, it is appropriate to know the phenomenon of consumer engagement. According to Cheung *et al.* (2011), consumer engagement can be viewed as a process, as an expression of behaviour, or as a psychological state. In addition, consumer engagement is recognized as a context-dependent phenomenon (Brodie *et al.*, 2013). It varies depending on the subject of engagement and the object of engagement. The authors, who analysed sustainable consumption, often viewed consumer engagement as a certain desired outcome of consumer behaviour, i.e., as an expression of sustainable consumption behaviour rather than as a psychological state. Studies of this type could be found in the works of Bly *et al.* (2015), Armstrong *et al.* (2016), Gangale *et al.* (2013), Miao & Wei (2016), etc. Several studies that treated engagement

into sustainable consumption as a psychological state explored its links with sustainable consumption behaviour at different stages of consumption, answering the question of how sustainable consumption depends on consumer engagement (Banyte *et al.*, 2020; Piligrimiene *et al.*, 2020). The authors of the present study maintain the idea that consumer engagement in the context of sustainable consumption should be treated as a psychological state that can explain a certain behaviour in different stages (acquisition, use, and disposal) and different environments (at home and at work).

Sustainability-based (Green) segmentation. Segmentation helps to identify the different subset of customers with similar needs, wants, characteristics, or behaviours and then to propose unique offerings for individual target segments. First attempts to segment the market based on sustainable consumption usually employed sociodemographic segmentation criteria, such as gender, age, income, or education. However, according to Coskun & Ozbuk (2019), such segmentation lacks explanatory power and fails to provide more precise insights into underlying factors of so-called "green" consumers. Therefore, research on sustainability-based segmentation shifted its focus from demographic and geographic to psychographic and behavioural segmentation. There are many attempts over the past decade to segment the green market in terms of various segmentation variables such as environmental knowledge, values, concern, lifestyle, attitudes, and behaviour (Burke *et al.*, 2014; Verain *et al.*, 2015; Peyer *et al.*, 2017; Szakaly *et al.*, 2017; Sarti *et al.*, 2018; Balderjahn *et al.*, 2018; Coskun and Ozbuk, 2019; etc.). According to Verain *et al.* (2015), it is important to consider the heterogeneity of consumers while studying sustainable behaviours, since consumers differ in many aspects, being it the importance they attach to sustainability or the type of sustainable behaviours they perform. So far, there are little or no attempts to segment the consumers based on their sustainable consumption behaviour in different life settings, comprising behaviour at work and in personal life, through a three-stage consumption process involving the acquisition, use, and disposal of various goods/services, as proposed by Geiger *et al.* (2018). Identifying consumer segments with common needs and characteristics is essential for developing effective communication strategies about sustainable consumption. The second important step after segmenting the market is a description of the segments for a thorough understanding of their characteristics. Many sustainability-based segmentation studies use various descriptor variables such as sociodemographics, perceived consumer effectiveness, concerns, and values (Balderjahn *et al.*, 2018), happiness (Coskun & Ozbuk, 2019), etc. However, consumer engagement into sustainable consumption still has not been empirically investigated as a descriptor variable even though several studies (Banyte *et al.*, 2020; Piligrimiene *et al.*, 2020) suggest an association between engagement and sustainable behaviour.

Research Design

Method and sample. Quantitative online survey using the *SurveyMonkey* tool was used for data collection. Considering the different settings (home and workplace) of

sustainable consumption behavior involved, the research population was described as consisting of adult Lithuanian consumers who currently are employed or had been employed in the last six months. It is worth noting that the data were collected before the COVID-19 pandemic. The nonprobability sampling method was used, which resulted in sample size of 498. The sociodemographic characteristics of the sample are provided in Table 1. It should be noted that a substantial part of the respondents did not give their sociodemographics (although the survey assured anonymity), which is not uncommon in social science research (Fulton, 2018; Hendra & Hill, 2019). However, those cases were not eliminated from the further research since the information on the main research questions was collected and analyzed.

Women (88 %) predominated the sample. Regarding marital status, 21.5 % lived alone, 32 % lived in a couple or as a family without children, 43 % indicated having children, and less than 4% chose the answer "other" (I live with a roommate, a pet, with an adult child or with parents, etc.). The average age of the respondents was 37 years (median 35.0), the youngest respondent was 18 years old, and the oldest was 67 years old. Of the respondents, 61 % worked in the private sector and about 39 % – in the public sector; approximately 25 % worked in international companies, and 75 % – in Lithuanian-based companies.

Table 1

Sociodemographic Characteristics of Respondents (N = 498)

	N (%)
Gender	
Male	49 (11.6)
Female	372 (88.4)
Age	
≥25 years	74 (17.7)
26-35 years	148 (35.4)
36-45 years	102 (24.4)
>45 years	94 (22.5)
Family status	
Single/living alone	90 (21.5)
Living with a partner/family without children	133 (31.8)
Living with a partner/family with children	181 (43.3)
Other	14 (3.3)
Employment sector	
Private	252 (61.2)
Public	160 (38.8)
Company type	
International	100 (24.6)
LT-based	306 (75.4)

Measures. Since social phenomena usually do not have unambiguously valid and reliable measures, the new original measurement scales for research constructs were composed, based on previous studies.

Consumer engagement in sustainable consumption (CESC). The construct of engagement was considered to be five-dimensional, comprising enthusiasm, attention, absorption, interaction, and identification, as proposed by So *et al.* (2014). *Enthusiasm* is understood as a strong excitement of an individual and an interest in the object of engagement. *Attention* reflects the user's attention and concentration on the object of engagement. *Absorption* represents complete concentration, immersion in a favourite activity, losing the perception of time. *Interaction* involves

the exchange of ideas, thoughts, and feelings about the object of engagement. *Identification* is somewhat less common in consumer engagement studies. However, according to So *et al.* (2014), it is an essential dimension in terms of employee engagement. Identification represents an individual's perception of him/herself as a member of an organization or brand community; i.e., the identification of the individual with the object of engagement. Based on this approach, the construct of CESC consisted of 5 dimensions, each was measured with 4 or 5 items (22 items in total), adapted from previous studies (Calder *et al.*, 2009; Hollebeek *et al.*, 2014; So *et al.*, 2014). All items were adapted to the context of this study, treating sustainable consumption as an object of engagement.

Sustainable consumption behavior at home (SCBH) and at work (SCBW) was analyzed separately. SCBH was measured with 33 items and SCBW – with 20 items. Analysis of the scientific literature suggests that sustainable consumption behavior should be examined through three main phases: acquisition, use, and disposal (Geng *et al.*, 2017; Geiger *et al.*, 2018). Gupta and Agrawal (2018) elaborated on sustainable consumption behavior in even more detail, distinguishing its 10 phases, but in terms of meaning, these phases can be combined into the three main phases of sustainable consumption identified above. According to Geiger *et al.* (2018), the *acquisition* is understood not only as a purchase based on sustainability principles but also as avoidance of accumulation. The *usage* phase reflects the use, demonstration, or even waste of items. Meanwhile, the *disposal* phase includes discard, transfer, surrender, sale of things, and so on.

The construction of sustainable consumption behavior scales also reflects different areas of sustainable consumption. In this respect, sustainable consumption is understood as a multifaceted construct. According to Geiger *et al.* (2018), sustainable consumption can take place in a variety of areas: consumption of appropriate foods, conservation of natural resources, preparation, choice of means of transport, and so on. Sustainable consumption scales are harmonized as far as possible in order to be able to compare sustainable consumption behavior in personal life and the work environment. After adapting the SCBH construct items accordingly, a scale was constructed to measure sustainable consumption behaviour in the work environment. Items for measuring SCBW were constructed with reference to Blok *et al.* (2015) and Littleford *et al.* (2014), who studied sustainable consumption in the workplace in particular.

The items of each construct were measured by 7-point Likert scale, where respondents were asked to indicate the extent to which they agreed with each statement, from 1 (completely disagree) to 7 (completely agree).

Statistical analysis. The quality of the psychometric properties of the constructs was assessed with the criteria of reliability and validity. The reliability of measurement scales was assessed using the Cronbach's alpha coefficient. The possibility theoretically interpret the obtained results is considered as one of the arguments for the construct validity. Exploratory Factor Analysis (EFA) was performed (Principal component analysis with Varimax rotation) to test whether empirical data's structure reflects the theoretically assumed dimensions of the research constructs. Factor

analysis through the values of the weights of the extracted factors allows seeing the internal consistency of the scales and to find the latent factors uniting different aspects of the research constructs. The latent factors extracted from factor analysis were saved as new higher-order aggregated variables for further Cluster analysis.

Cluster analysis was performed for segmentation of Lithuanian consumers based on their actual sustainable consumption behaviour at home and at work. The Two-Step cluster analysis method was used after comparing different clustering methods. Although the most commonly used clustering methods adopted in previous studies involving consumer segmentation were either hierarchical (Kastenholz *et al.*, 2018; Balderjahn *et al.*, 2018) or K-means clustering (Szakaly *et al.*, 2017; Sarti *et al.*, 2018), the Two-Step cluster analysis has several advantages. It allows using categorical and continuous variables simultaneously; the number of clusters is based on a statistical measure of fit (AIC or BIC) and not by a choice of the researcher; it is appropriate for large datasets. Two-Step clustering is a hybrid approach that first uses a distance measure to separate groups and then employs a probabilistic approach to choose the optimal subgroup model (Benassi *et al.*, 2020). Recent studies regarded Two-Step cluster analysis as one of the most reliable in terms of the number of subgroups detected and profiling efficiency (Rundle-Thiele *et al.*, 2015; Coskun & Ozbuk, 2019; Benassi *et al.*, 2020).

Clusters were characterized according to sociodemographic characteristics with cross-tabulation analysis and Chi-Square tests and according to engagement into sustainable consumption with t-tests.

Statistical data analysis was performed using IBM SPSS (version 23.0).

Results

Results of Factor Analysis. Firstly, as mentioned above, the structure of the constructs was tested with Exploratory Factor Analysis (EFA) in order to extract the factors as inputs for Cluster analysis. Although there were theoretically established phases of SCB at home and at work, and dimensions of consumer's engagement, EFA allowed seeing if empirical structure conforms to the ones theoretically assumed, since the measures were originally developed for this research.

The construct of consumer engagement in sustainable consumption retained a 5-dimensional structure. Still, the internal composition of the factors showed differences from the theoretically constructed ones, since the items mixed between the components. Five extracted factors accounted for 67 % of the variability of the original 22 items. Internal consistency of sub-scales and the overall scale was tested, and Cronbach's alpha coefficients showed high reliability levels (*see Appendix 1, Table A1*).

The construct of sustainable consumption behavior at home was tested according to the stages of behavior: acquisition, usage, and disposal. EFA in the acquisition stage resulted in three factors. After interpretative analysis, those factors were named "Environment friendly products/package" (5 items), "Moderate purchase" (4 items), and "Eco/bio food products" (4 items). Three

extracted factors accounted for 62.8 % of the variability in the original 13 items. EFA in the usage stage also resulted in three factors, namely: "Moderate usage" (5 items), "Resource saving" (3 items), and "Saving things" (2 items). Those three factors explained 60.2 % of the variability of the original 10 items. Finally, the EFA in the disposal stage resulted in three factors as well. The first one reflected "Recycling habits" (4 items), the second – "Transfer of things" (donating, selling, sharing the things you don't need) (4 items), and the third – "Repair and secondary use" (2 items). Three factors explained almost 69 % of the variance in 10 original items. Cronbach's alpha coefficients showed sufficient reliability levels of both sub-scales and higher-order scales (*see Appendix 2, Tables A2a-c*).

The construct of sustainable consumption behaviour at work was also tested according to behavioural stages. The results of EFA showed that sustainable consumption behaviour at work in the acquisition stage is unidimensional, and one higher-order factor "Acquisition at work" can be used for further analysis, which accounted for 51.3 % of the variability of the original 6 items. Two factors were extracted in the usage stage, explaining 54.3 % of the variance. The analysis revealed that the first factor represented moderate use of things and sharing work means with the colleagues; therefore, it was labelled "Moderate use & sharing" (7 items). The second factor "Recourse saving" involved saving of electricity and water while at work (3 items). Analysis of consumption behaviour at the disposal stage revealed that the scale has a one-dimensional structure and one aggregated variable "Disposal at work", which accounted for 63.5 % of the variability in 4 original items, could be used for further analysis (*see Appendix 3, Tables A3a-c*).

Results of Cluster Analysis. The Two-Step cluster analysis was performed with nine factors identified in acquisition, use, and disposal stages of sustainable consumption behavior at home. Cluster analysis resulted in two clusters of similar size. The silhouette measure of cluster cohesion and separation (Average Silhouette = 0.4) showed fair evidence of cluster structure (the silhouette measure of cohesion and separation must be above the required level of 0.0 to suggest that the within-cluster distance and the between-cluster distance is valid) (Norusis, 2011). The most important predictor for clustering (importance = 1.0) was "Moderate usage of things/products" in the usage stage. Two other – dimensions in acquisition stage: "Environmentally friendly package" (0.83) and "Eco/bio food products" (0.72). The centroids of the clusters are shown in Table 2.

Table 2

Consumer Clusters based on their Sustainable Consumption behavior at Home

		Cluster		
		1	**2**	**Com-bined**
SBCH A Environment friendly products/package	Mean	4.74	5.83	5.23
	SD	0.87	0.56	0.93
SCBH A Moderate purchase	Mean	5.42	6.34	5.83
	SD	0.89	0.56	0.89
SCBH A Eco/bio food products	Mean	5.04	6.12	5.53
	SD	0.94	0.60	0.97

		Cluster		
		1	**2**	**Com-bined**
SCBH U Moderate use	Mean	4.95	6.11	5.47
	SD	0.81	0.55	0.91
SCBH U Resource saving	Mean	5.52	6.44	5.93
	SD	1.09	0.60	1.01
SCBH U Saving things	Mean	5.48	6.28	5.83
	SD	0.88	0.59	0.86
SCBH D Recycling habits	Mean	5.63	6.61	6.07
	SD	1.08	0.51	1.00
SCBH D Transfer of things	Mean	4.24	5.52	4.82
	SD	1.07	1.03	1.23
SCBH D Repair and secondary use	Mean	5.30	6.31	5.75
	SD	1.24	0.72	1.16

Cluster 1 – Moderate SCBH or "Convenience based Sustainability"

The size of this cluster is 55.2 % (275 respondents). The group shows somewhat moderate SCB at home as compared with cluster 2. People in this group understand sustainable consumption as "consuming less" and avoid purchasing more than they need. They preserve electricity and water at home, paying attention to resource-saving. They also tend to take a due care to use all things in a proper manner and try to fix them before disposal. Disposal/recycling habits in this group are similar to respondents in cluster 2. However, they do not pay much attention to products and their packages while shopping and do not put an emphasis on eco/bio food products as people in cluster 2 do. Another obvious difference could be found in the willingness to borrow, share things with others or sell, exchange things they do not need; people in this cluster do not consider it an appropriate way for them to behave or even do not understand those options as a part of sustainable consumption. In general, the relative description of this group could be "I care, but don't share".

Women (83.4 %) dominate this cluster. On the other hand, women comprise 88.4 % of the whole sample. However, when looking at the distribution within gender, 75.5 % of males fall within this group. Unequal distribution of women and men within gender does not allow for the reliable description of the clusters based on demographics. Still, the data shows the existence of possible assumptions for future research directions. This group can also be best described as consisting of respondents living with a partner/family and having children (46.8 %). Regarding the age, consumers of 26–35 years make the largest proportion in this group (33.0 %). However, all other age groups are also almost equally represented in this segment (25 and under: 20.6 %, 35–45: 24.9 %, over 45: 21.5 %). Distribution within age groups shows some tendencies that the biggest proportion (58 %) of young consumers (≥ 25) fall into this cluster, as well as people in the age group of 26–35 years (53 %).

Cluster 2 – High SCBH or "Real Followers of Sustainability Idea"

The size of this cluster is a little bit smaller – 44.8 % (223 respondents). Respondents in this group demonstrate stronger SCB habits at home, referring to most of the dimensions at different stages. Considering the three stages in sustainable consumption behaviour: acquisition, usage, and disposal, respondents rank high on all of them. The calculated response means are close to or above six (on a 7-point scale) on all dimensions. People in this group avoid excessive purchasing, consider product package (being eco-friendly and recyclable) and the products themselves (locally produced, organic, etc.) when doing shopping; in using the products they try to reduce waste, avoid using one-off dishes and cutlery; they preserve the consumption of electricity and water. The principle of using things in moderation is very common in this cluster. Therefore, they opt for the possibility to share or borrow things and sell, donate, or just give the things they do not need for others. Compared to cluster 1, sharing, exchange, or donation is much more obvious in this cluster, and it demonstrates stronger habits of recycling and appropriate disposal of waste.

Again, women (94.6 %) almost entirely represent this group, with only 5.4 % left for men. This cluster is mostly comprised of respondents living with a partner or family with children (38.9 %) and without children (35.7 %). Respondents of age 26–35 years make the largest proportion there (38.4 %). The youngest respondents (≥ 25) make the smallest proportion (14.1 %) in this cluster, compared to all other age groups. Distribution within age groups shows the tendency that the biggest proportion (52 %) of older consumers (over 45) fall into this cluster.

Another Two-Step cluster analysis was performed on the four factors identified in the acquisition, usage, and disposal stages of sustainable consumption behaviour at work. This resulted in two clusters, showing good evidence of cluster structure (average silhouette = 0.5). The most important predictor for clustering (importance = 1.0) was sustainable consumption behaviour at the disposal stage. However, the other three were also of considerable importance (the least important being "Resource saving" at the usage stage – 0.58). The centroids of the clusters are shown in Table 3.

Table 3

Consumer Clusters based on their Sustainable Consumption behavior at Work

		Cluster		
		1	**2**	**Combined**
SCBW Acquisition	Mean	5.94	4.66	5.46
	SD	0.61	0.90	0.96
SCBW U Moderate use & sharing	Mean	6.29	5.23	5.90
	SD	0.54	0.81	0.83
SCBW U Resource saving	Mean	6.36	5.14	5.90
	SD	0.67	1.18	1.08
SCBW Disposal	Mean	5.82	3.88	5.09
	SD	0.91	1.14	1.37

Cluster 1 – High SCBW or "Environment-Independent Sustainability"

The size of cluster 1 is 62.7 % (312 respondents). People in this cluster demonstrate strong SCB habits at work, ranking high on all three stages (acquisition, usage, and disposal) of sustainable consumption behaviour. The calculated response means are close to or above six on all components on the 7-point scale. People in this group consider sustainable consumption principles when choosing

things/means for the workplace; they try to use things in moderation and do not accumulate unnecessary things; therefore, they try to reduce waste and share things with colleagues. They care for their meal options, bring their own food from home, or look for locally made or bio food products. Preservation of paper, water, electricity is a matter of course. Appropriate disposal of things at work, recycling habits are strongly in line with sustainable consumption principles.

Women dominate in this cluster, comprising 92 %; families with children (42.3 %) and people in the age group of 26–35 years (35.5 %) fall into this cluster; 60.5 % of respondents work in the private sector, and 75.9 % of them were LT-based companies.

Cluster 2 – Moderate SCBW or "Followers of basic Principles"

The proportion of this group is 37.3 % (186 respondents). Respondents in this cluster demonstrate lower consideration for SCB at work, referring to all of the aspects. It is evident that this group also shares the idea of sustainable consumption and tries to behave according to understanding, but it is not intrinsic for them. They claim to take a due care to use all things properly in the workplace, try not to accumulate unnecessary things, and follow the rules for appropriate use of paper, electricity, and water. However, the choice of environmentally friendly or "eco" products is not essential consideration to them when selecting the means for work. An exclusive feature of this cluster is also the careless approach to the disposal of things at work. Segregation of waste before disposing of waste, use of recycling bins are not the everyday activities there.

The description of this cluster according to sociodemographics does not differ significantly from the description of cluster 1. Women comprise 82 %, families with children have the biggest part 45.1 %, and employees in the age group of 26–35 years - 35.3 %; 62.3 % of respondents work in the private sector, 74.5 % in LT-based companies.

Description of Clusters According to Engagement in Sustainable Consumption

Finally, the four clusters (two in each of the life domains) were characterised according to consumer engagement into sustainable consumption. Independent sample t-test analysis showed that two clusters by SCB at home significantly differed in all five dimensions of consumer engagement. Similar results were found concerning SCB at work. The mean values on each dimension of engagement across four clusters are shown in Table 4.

Table 4

Description of Clusters based on Engagement Dimensions

	Moderate SCBH	High SCBH	Moderate SCBW	High SCBW
Enthusiasm	4.78	5.84	4.75	5.56
Attention	5.24	6.16	5.23	5.90
Interaction	4.12	5.14	4.11	4.85
Absorption	3.04	3.94	3.00	3.70
Identification	4.70	5.34	4.63	5.20

As we can see, the results in clusters with moderate sustainable consumption behaviour both at home and at work are almost identical. Those clusters contain people who "know the idea of SC, try to behave accordingly, but it's not the most important thing in their life". People in those groups demonstrate moderate to low engagement into sustainable consumption. They perform quite well on the "attention" and "enthusiasm" engagement dimensions showing that the idea of sustainable consumption is familiar to them. They like to feel that with their consumption habits, they can contribute to environmental conservation and feel a "better person", being able to contribute to environmental sustainability. However, they do not fully identify themselves with the idea of sustainable consumption, admitting they do not pay a lot of attention to it. People in those groups do not actively interact with others regarding sustainable consumption and do not participate in public activities promoting SC. Consequently, they do not feel absorbed with the idea and do not spend much time thinking it over.

Meanwhile, clusters with high sustainable consumption behaviour at home and at work can be defined as containing highly engaged consumers, who "not only know and behave according to the idea of SC but trying to educate others as well". People in those groups demonstrate high engagement into SC, referring to most of the dimensions. They are enthusiastic about the idea of sustainable consumption and are happy to feel that their consumption habits contribute to environmental conservation. They also highly identify themselves as being those who actively care about sustainability. Respondents in those clusters pay strong attention to SC and enjoy interacting with like-minded others. They demonstrate a willingness to participate in public activities promoting sustainable consumption. However, although being highly engaged through all other dimensions, respondents do not show a complete absorption with the idea of SC. They are happy to contribute with their own choices, but SC is not something they think about constantly.

Discussion & Conclusions

The present study aimed to segment Lithuanian consumers with respect to their sustainable consumption behaviour at home and at work and to profile them according to consumer engagement into sustainable consumption through five dimensions: enthusiasm, attention, interaction, absorption, and identification. The findings showed that consumers comprise two distinct segments based on different scores on consumption behaviour at home. Similarly, the results revealed two segments based on consumption habits at work. The captured distinction between sustainable consumption behaviour patterns in two domains – private life and workplace – corresponds to the Verain *et al.* (2015) call for such research.

Consumer engagement scores provided additional explanatory characteristics of each segment, which could provide a better understanding of Lithuanian consumers. The results give new evidence on the "sustainability-based" segmentation and profiling of the segments. Consumption behaviour at home and at work successfully differentiated consumers into two groups in each setting, with a moderate

and high level of behavioural expression. It is interesting to note that the scores on behaviour did not allow distinguishing "low" and "high" SCB, "green" and "non-green", or "sustainable" and "unsustainable" consumers as many other studies did before. For example, Coskun & Ozbuk (2019), in their research of young millennials, distinguished three segments: non-greens, reluctant greens, and true greens; Verain *et al*. (2015) in their analysis of food consumption habits distinguished un-sustainers, and sustainers (among others). The present study showed that sustainability is widely spread among Lithuanian consumers, and there are not many people who do not follow the principles of sustainable consumption. For one or another reason, being it economic (e.g., the cost), social (e.g., social influence), or just legal (e.g., requirements for recycling), respondents in the sample demonstrate at least a moderate level of attention to sustainable consumption behaviour.

Consumer engagement extended the understanding of the characteristics of identified segments. Both segments with high expression of sustainable consumption behaviour at home and at work were more highly engaged into sustainable consumption than those with moderate expression of SCB. The only obvious similarity was low scores on absorption dimension in all four segments. Sustainable consumption idea is not something consumers think about constantly, although it is well known and in practice. The findings broadly support the results of studies, reporting the relation between consumer engagement and their actual behaviour (Kumar *et al*., 2010; Vivek *et al*., 2014; Banyte *et al*., 2020; Piligrimiene *et al*., 2020). The higher engagement rates are clearly related to higher SCB both at home and at work.

Cross tabulation among segments of SCB at work and at home clearly showed that those with stronger SCB habits at home demonstrated stronger SCB habits at work as well. This is in line with the results of previous research (Banyte *et al*., 2020) and advocates the idea of the spill-over mechanism (Muster, 2011; Verain *et al*., 2015; Gadeikiene *et al*., 2019). The findings provide some managerial implications for policy-makers, social marketers, and executives of companies on how to foster positive spill-over effects from one sustainable consumption behaviour pattern to another. Notable aspect here, also mentioned by Verain *et al*. (2015), that this spill-over could also be negative. Therefore, there is a need for longitudinal studies in this area that would explore both positive and negative transitions between the indicated sustainable consumption behaviour patterns both in private life and at the workplace.

Following, the ***managerial implications* for each segment** are provided.

When analysing the segments of consumers at home setting, the segment of "real followers of sustainability" ranked high on all three phases of consumption – acquisition, usage, and disposal. They were found to have very strong recycling habits, resource-saving (electricity, water) as well as saving things they own. They also showed a strong inclination to repair the things or find the appropriate secondary use of them instead of throwing them away. In this group, consumers try to purchase less, avoiding purchasing things they do not need and care about purchasing bio/eco food products or products in a recycled or recyclable package. This segment also keeps in mind the possibility of transferring

things (selling, donating, and sharing) they do not need anymore. Those people are entirely devoted to the principles of sustainable consumption and understand the importance of individual behaviour. Marketers and policymakers should treat people from this segment as advocates of sustainable consumption and try to employ them as influencers to promote a certain behaviour, especially considering the description of this segment on consumer engagement. It showed that this group tend to interact actively with other like-minded people and participate in various activities promoting sustainable behaviour.

The segment of "convenience based sustainability" ranked lower on each consumption phase in comparison to "real followers", but the scores vary somewhat moderate. The biggest difference here was due to the use of things, including borrowing from others and sharing things with others (in the usage phase) and transfer of things (in the disposal phase). People in this cluster do not understand the "sharing economy" as a part of sustainable consumption. In addition, they do not care so much for environmentally friendly products or their packages while purchasing. Thus, it might be useful to increase their knowledge about the sharing economy, emphasizing economic value for the consumer along with social and environmental benefits. Persuasive messages and rewards could also help to overcome the barriers to act in an environmentally friendly manner while making purchase choices, paying more attention to less harmful materials and packages.

Analysis of consumer segments at work setting revealed that segment of "environment independent sustainability" ranked very high on usage phase, considering the use of work means in moderation, sharing them with colleagues and resource (electricity, water, paper) saving. They also were found to have high scores on the acquisition, in relation to their choices for work means and food options as well as on disposal habits at work. Companies might use this group as educators for other employees, organising the experience sharing / good practice seminars or events. Executives of organisations should put efforts in identifying these true followers of the SC idea and encourage them to become opinion leaders by rewarding them.

The segment of the "followers of basic principles" demonstrated lower consideration for sustainability. Although they do follow the principles of resource (electricity, water, paper) saving and try to maintain all things properly, their behaviour at acquisition and disposal stages is more or less careless. It is obvious that people in this segment think that those areas are of organisational concern rather than one of the employees. Therefore, companies should pay more attention to those consumption stages by implementing practices, which would stimulate a more careful employees' consideration when choosing things/means for work, deciding about food choices, disposing of unnecessary things, or recycling waste. Since people in this segment know the sustainable consumption principles, the little incentive to behave accordingly would be enough. Executives of companies should try to understand which internal (such as values, awareness, or social norms) or external factors (such as availability, the existence of clear procedures, and infrastructure for recycling) cause lesser attention to behaviour at acquisition and disposal stages and design interventions to change the situation.

Limitations and Directions for Future Research

The present study has several limitations. The sample is limited to a convenience sample; therefore, the findings might not be transferable beyond the current sample. Moreover, women dominated the sample, not covering the proportions by gender in the population. Future research with a representative sample using random sampling could shed more light on segmenting Lithuanian consumers based on their sustainable consumption behaviour.

Second, Lithuanian consumers were segmented based on their sustainable consumption behaviour at home and at work, describing them by consumer engagement into sustainable consumption. It would be interesting to include other variables for profiling (e.g., sustainable or healthy lifestyle) or describing (e.g., attitudes, values, beliefs,) the segments. Future research also might consider the role of social variables, such as belonging to groups/communities, family, opinion leaders and the media in sustainable consumption behaviour. The timeliness of this insight is argued by the development of the idea of community consumption. The integration of personal and social consumer behaviour variables would provide a comprehensive description of sustainable consumption behaviour segments.

Further, sustainability-based segmentation research would be significantly supplemented from both scientific and practical point of view by linking sustainable consumption behaviour patterns to a spill-over mechanism. Although the results of the present research demonstrate the inherent nature of sustainable consumption behaviour patterns in home and work environments, they do not reveal the mechanism of transferring sustainable consumption practices from one environment to another, including its positive and negative effects.

Finally, this study approached sustainable consumption behaviour without specifying a particular consumption area. For future research, it would be interesting to select one specific consumption area, e.g., food, housing, mobility, or clothing, This might reveal some significantly different behavioural patterns as sustainable consumption behaviour could differ not only in different settings (home or work), phases (acquisition, use and disposal), but also in different consumption area.

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Annexes
Appendix 1.

Table A1

Results of EFA and reliability of CESC

Items	Components					% of variance	Cronbach α
	1 Enthu-siasm	2 Atten-tion	3 Interac-tion	4 Absorp-tion	5 Identifi-cation		
I follow sustainable consumption principles passionately	0.807						
My life without sustainable consumption principles would not be the same as it is now	0.735						
When I talk about sustainable consumption, I usually say "now" rather than "at some point"	0.665					15.2%	0.840
Sustainable consumption successes are my successes	0.547						
I spend a lot of time thinking how much damage excessive consumption makes to the environment that surrounds us	0.519						
I like to learn more about sustainable consumption practices		0.677					
I pay attention to any message about consequences of excessive consumption		0.676					
Anything related to sustainable consumption grabs my attention		0.651					
I feel happy when I can contribute to the promotion of sustainable consumption with my own consumption choices		0.577				14.2%	0.872
I pay a lot of attention to the idea of sustainable consumption		0.506					
I like to feel that with my consumption habits I can contribute to the environmental conservation		0.490					
In general, I thoroughly enjoy interacting with other people about preservation of the environment, exchanging ideas about sustainable consumption and listening to their advice			0.748				
In general, I like to get involved in community discussions on sustainable consumption / environment preservation			0.740			13.3%	0.836
I am someone who enjoys interacting with like-minded others about sustainable consumption			0.735				
I often participate in public activities promoting sustainable consumption / communities			0.606				
When I am thinking about sustainable consumption principles/activities, I forget everything else around me				0.796			
Time flies when I am thinking how I can contribute to the preservation of the environment				0.705		12.7%	0.816
I find it hard to stop thinking how I can contribute to creating a more sustainable world / preserve the environment				0.672			
When someone criticizes the idea of sustainable consumption, it feels like a personal insult					0.732		
Being able to contribute to environmental sustainability, I feel "a better person"					0.682		
When someone praises activities/habits of sustainable consumption, it feels like a personal compliment					0.622	11.6%	0.749
I am very interested in what others think about sustainable consumption					0.491		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Total Variance Explained – 67%, Cronbach α – 0.939; N = 498.

Appendix 2.

Results of EFA and reliability of SCBH at acquisition stage

Items	Components			% of variance	Cronbach α
	1 Package	2 Moderate purchase	3 Eco/bio food		
I choose products packaged in recycled materials.	0.799			24.5	0.822
I choose products packaged in recyclable materials.	0.789				
I choose environmentally friendly / non-polluting products.	0.758				
I shop considering sustainable consumption principles (responsibility, prudence, honesty).	0.747				
I choose products that come in refill packaging (e.g., hand soap, pens).	0.488				
I avoid purchasing things that I do not need.		0.858		20.4	0.812
I only purchase things that I need.		0.850			
I do not purchase things that I do not need even if they are on discount.		0.779			
I take care that my purchases do not lead to accumulation of unnecessary things.		0.594			
I buy organic /bio food products.			0.755	17.8	0.726
If I have an opportunity, I choose products that carry eco-label.			0.711		
If I have an opportunity, I choose my own/relatives'/acquaintances' grown or made food products.			0.690		
I prefer locally made food products.			0.656		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Total Variance Explained – 62.8%, Cronbach α – 0.855; N = 498.

Results of EFA and reliability of SCBH at usage stage

Items	Components			% of variance	Cronbach α
	1 Moderate usage	2 Resource saving	3 Saving things		
Whenever possible, I share things /means with others.	0.830			24.1	0.742
Whenever possible, I borrow things /means from others.	0.805				
I follow an idea that sustainable consumption is using things in moderation.	0.605				
When using things/products, I try to reduce waste.	0.597				
I take due care to avoid using one-off dishes and cutlery.	0.491				
I turn off light when leaving the room to reduce electricity consumption.		0.855		19.3	0.662
I switch off my computer when leaving it for a considerable period.		0.740			
I conserve water at home (e.g., showering, making food, cleaning).		0.690			
I send things for regular service and maintenance.			0.818	16.7	0.632
I take due care to use all things in a proper manner.			0.796		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Total Variance Explained – 60.2%, Cronbach α – 0.775; N = 498.

Results of EFA and reliability of SCBH at disposal stage

Items	Components			% of variance	Cronbach α
	1 Recycling	2 Transfer	3 Repair		
I take due care to throw garbage in the assigned bins only.	0.893			27.5	0.835
I segregate my household waste before disposing it.	0.864				
I put all recyclable waste in recycle bins or sell it to the scrap dealers.	0.864				
I dispose of all hazardous waste (chemical, medical, and other harmful waste) in the manner prescribed.	0.581				
I exchange things that I do not need or use for things I need.		0.806		22.5	0.742
I sell off things that I do not need or use.		0.799			
I donate things that I do not need or use to charity.		0.705			
I give things that I do not need or use to others.		0.580			
I avoid discarding things that can be repaired.			0.906	18.7	0.865
I avoid discarding things that can be used differently or for other purposes.			0.884		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Total Variance Explained – 68.7%, Cronbach α – 0.812; N = 498.

Appendix 3.

Results of EFA and reliability of SCBW at acquisition stage

Items	Component 1
If I have an opportunity, I choose environmentally friendly / non-polluting products (e.g., paper bags instead of plastic ones, a real towel instead of an one-off, ecological dish washer).	0.850
If I have an opportunity, I consider sustainable consumption principles (responsibility, prudence, honesty) when choosing things/means for my workplace.	0.805
I take care that my choices do not lead to accumulation of unnecessary things.	0.793
I choose "eco" / bio food products if only they are available at stores or/and a cafeteria in my workplace (near my workplace).	0.696
I prefer local country of origin/locally made food products.	0.652
If I have an opportunity, I bring in my own made food for my lunch in my workplace.	0.413

Extraction Method: Principal Component Analysis. 1 components extracted.
Total Variance Explained – 51.3%, Cronbach α – 0.776; N = 498.

Results of EFA and reliability of SCBW at usage stage

Items	Components 1 Moderate use & sharing	2 Resource saving	% of variability	Cronbach α
I prioritize borrowing things /means from others instead of buying them.	0.829			
I happily share things /means with others.	0.812			
I take due care to use all things in a proper manner in my workplace.	0.641			
In the workplace, I follow an idea that sustainable consumption means using things in moderation.	0.591		30.4	0.824
When using things/products in the workplace, I try to reduce waste as much as I can.	0.583			
I take due care to print/copy double sided to save paper.	0.521			
I take due care to avoid using one-off dishes and cutlery in the workplace.	0.508			
I turn off light when leaving the room to reduce electricity consumption.		0.769		
I conserve water in the workplace.		0.726	23.9	0.661
I switch off my computer when leaving it for a considerable period of time.		0.680		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Total Variance Explained – 54.3%, Cronbach α – 0.835; N = 498.

Results of EFA and reliability of SCBW at disposal stage

Items	Component 1
I put all recyclable waste in recycle bins.	0.898
At my workplace, I segregate my household waste before disposing it.	0.894
I dispose of all hazardous waste (chemical, medical, and other harmful waste) in the manner prescribed.	0.799
I give things that I do not need or use to others (e.g., to colleagues, other organizations, etc.).	0.543

Extraction Method: Principal Component Analysis. 1 components extracted.
Total Variance Explained – 63.5%, Cronbach α – 0.802; N = 498.