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Do individuals make inconsistent sustainable choices…?

Do individuals make inconsistent and paradoxical choices concerning sustainable behavior?

By

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Introduction

Promoting individual sustainable behavior is highly important for achieving the United Nations' 17 Sustainable Development Goals (SDGs), as it directly impacts various aspects of environmental, social, and economic sustainability. Individual sustainable behavior consists of a wide range of actions, from individual choices in consumption and lifestyle. Individuals often struggle to maintain consistent behavior across different domains of sustainability, such as energy consumption, waste management, and transportation choices. Trudel (2019) summarized four areas of sustainable consumer behavior based on a comprehensive literature review, addressing the psychological, sociocultural, economic, and technological dimensions influencing sustainable consumption practices. Casalegno et al. (2022) found that different age groups exhibit varying levels of commitment and willingness to engage in environmentally friendly consumption behaviors. In the same vein, Ivanova et al. (2019) identified distinct differences in perceived consumer effectiveness and media exposure among generational cohorts, as well as their intentions to purchase environmentally responsible products. Furthermore, statistics reveal that individuals may be prone to adopting certain sustainable behaviors while refusing other types (DR, 2024). For example, about 70% of Danish households engage in energy-saving behaviors at home (Energistyrelsen, 2023), while only a small percentage are willing to reduce their air travel (DR, 2024).

Understanding inconsistent or partially sustainable behaviors is important for developing targeted interventions that encourage individuals to adopt more consistent sustainability practices. This research has two main objectives. The first objective is to explore the nuances of sustainable practices among individuals and across different generations. The second objective is to develop and validate a sustainable behavior scale. These insights can be valuable for policymakers looking to promote sustainable practices, and designing effective interventions, as they can tailor their

approaches to address the specific needs and preferences of different generations.

Method

Data was collected through convenience sampling. Invitations to participate in the study were disseminated by asking all undergraduate students in a quantitative data analysis class at the University of Southern Denmark to share a link to the online survey via mail and social media platforms. The questionnaire consists of questions concerning respondents' social demographic profiles, attitudes toward sustainability, and daily practices of sustainable behavior. 537 responses were usable for the present study. The sample is skewed toward female respondents (63.7% of the total sample). Most of our participants had or are taking a short/medium higher education (52.7%) in the 20-29 years range (55.6%), and with lower income (46.2% below 300.000 DDK). Questionnaires used to examine sustainable behavior were adopted from extant literature and the brainstorming among students.

Results

The descriptive statistics in Table 1 indicate that consumers generally engage in sustainable behaviors to a large extent. These behaviors include avoiding the purchase of plastic carrier bags when shopping, refraining from throwing batteries in unsorted trash, recycling used glass and metals, turning off lights in unused rooms, and filling washing machines or dishwashers fully before running them or using energy-saving programs. However, consumers exhibit a lower level of engagement with other behaviors, such as choosing products with the most environmentally friendly packaging, avoiding plastic packaging, driving less to protect the environment, and limiting air travel in the future.

A one-sample t-test was conducted to assess whether these behaviors were statistically significant. The results indicated that consumers are indeed practicing sustainable behaviors to a large extent, with the five practices mentioned above being found statistically significant.

Subsequently, an ANOVA test was performed to determine whether there were differences in sustainable behaviors among generational cohorts. The analysis revealed that three sustainable behaviors significantly differed across generations. Specifically, the younger generation (e.g., Generation Z) is more likely to reduce air travel in the future compared to older generations (e.g., Baby Boomers). However, reducing air travel generally has lower engagement. At the same time, Generation Z is more inclined to choose products with environmentally friendly packaging and those with minimal packaging.

Table 1. Descriptive statistics of consumers' sustainable lifestyle practice

	Whole Sample		Baby Boomers		Generation X		Generation Y		Generation Z	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Choose products packed in the most environmentally friendly packaging.	2.27	1.02	2.09	1.02	2.21	1.06	2.30	0.99	2.56	0.91
Choose products with the least packaging possible.	2.38	1.03	2.17	1.00	2.34	1.17	2.44	0.92	2.92	1.04
Repair old/used items instead of buying new ones.	2.97	1.07	2.82	1.10	3.01	.99	3.10	0.90	3.14	1.14
Repair old/used items instead of throwing them away.	3.02	1.07	2.92	1.08	3.09	1.04	3.11	1.03	3.03	1.16
Avoid buying plastic carrier bags when shopping.	**4.15**	1.17	4.03	1.25	3.85	1.35	4.30	1.02	4.42	1.04
Buying items that can be recycled, e.g., second-hand clothes and or furniture.	2.82	1.21	2.90	1.24	2.96	1.20	2.71	1.19	2.71	1.18
Avoid throwing batteries in unsorted trash.	**4.63**	0.91	4.46	1.07	4.51	1.06	4.8	0.61	4.83	0.70
Sort waste.	4.01	1.08	3.57	1.14	3.91	1.16	4.42	0.81	4.49	0.84
Try to recycle used glass and metals.	**4.13**	1.16	3.59	1.30	4.11	1.17	4.66	0.65	4.56	0.84
Drive as little as possible to help save the environment.	2.38	1.19	2.49	1.34	2.45	1.16	2.16	1.03	2.51	1.02
Use public transportation or bicycles instead of driving a car.	2.6	1.47	3.12	1.50	2.40	1.39	2.05	1.24	2.44	1.42
Prefer electric cars over fossil-fuel-driven alternatives.	2.62	1.39	2.76	1.32	2.83	1.32	2.51	1.50	2.29	1.31
Turns off the light in the rooms I'm not using.	**4.32**	0.89	4.27	0.91	4.34	1.03	4.36	0.83	4.37	0.87
Fill the washing machine and/or dishwasher fully before running them, or use energy-saving programs.	**4.20**	0.87	4.19	0.89	4.23	0.87	4.20	0.85	4.20	0.87
Turn off or adjust the radiator valve when windows open for better ventilation.	3.43	1.40	3.58	1.44	3.21	1.40	3.38	1.38	3.29	1.34
Limit my clothing consumption by purchasing clothes that can be used in multiple contexts and/or for longer periods.	3.56	1.23	3.49	1.26	3.68	1.30	3.55	1.22	3.69	1.13
Avoid using one-time service.	3.55	1.25	3.39	1.38	3.53	1.35	3.62	1.03	3.86	1.15
Take a train, bus, or car instead of flying.	2.50	1.33	2.49	1.35	2.57	1.36	2.47	1.3	2.53	1.31
I will limit my air travel in the future.	2.49	1.27	2.28	1.22	2.55	1.28	2.63	1.26	2.71	1.37

Note: For each statement, consumers are asked to indicate to what extent 1 = not at all to 5= to a very high extent.

We further use exploratory factor analysis with Varimax rotation to refine the underlying dimensions from the above sustainable behavior questions and create an internally consistent scale. The Bartellet's Test of Sphericity *p*-value = 0.00, KMO statistic =.78, indicating that it was appropriate to run the analysis (Hair et al., 2006). Evaluation of the Eigenvalues suggested a six-factor solution, which explains about 67.9% of the total variance in the data: (1) sort wastes and recycle, (2) repair and reuse, (3) reduce air travel, (4) choose sustainable packaging, (5) choose sustainable transport mode, and (6) practice energy-saving behavior. Factor loadings for each sustainable behavior question were .60 or above, indicating strong relationships between the items and their respective factors. We then use confirmatory factor analysis to validate the six constructs. The goodness of fit indices (GFI = .948, AGFI =.922, TLI = .947, CFI = .908, and RMSEA = .049) indicated that the unidimensionality of the four measurements was reasonable (Brown, 2006; Hair et al., 2006).

Table 2. The sustainable behavior scale

	Factor loading	Variance Explained	Construct Reliability
Sort waste and recycle		27.30%	.780
Avoid throwing batteries in unspecified trash can	.74		
Sort waste	.75		
Try to recycle used glass and metals	.83		
Repair and reuse		11.70%	.806
Repair old/used items instead of throwing them out	.87		
Repair old/used items instead of buying new	.89		
Buy items that can be recycled, e.g., second-hand clothes and or furniture	.63		
Reduce air travel		9.01%	.804
Take a train, bus, or car instead of fly	.79		
I will limit my air travel in the future	.79		
Choose sustainable packaging		7.67%	.902
Choose products packed in the most environmentally friendly package	.80		
Choose products with the least possible packaging	.87		
Avoid plastic packaging	.82		
Choose sustainable transport mode		6.45%	.658
Driving the least amount possible in the car to help save the environment	.67		
Use public transportation or bicycles instead of driving a car	.82		
Prefer electric cars to fossil-fuel-driven alternatives	.65		
Practice energy-saving behavior		5.85%	.601
Turns off the light in the rooms I'm not in	.68		
Fill the washing machine and/or dishwasher fully before running them, or opt for energy-saving programs when using them	.65		
Turn off or adjust the radiator valve when windows open for better ventilation	.61		

Discussion and conclusion

This study aimed to provide a nuanced understanding of individual sustainable behaviors and to develop and validate a scale for measuring sustainable behavior. The results indicate that individuals are not engaging in sustainable behavior across all aspects. While they generally practice behaviors such as avoiding the purchase of plastic carrier bags, refraining from disposing of batteries in unsorted trash, recycling glass and metal, turning off lights in unused rooms, and fully filling washing machines or dishwashers before using or selecting energy-saving programs, they engage in other sustainable behaviors to a lesser extent. These behaviors include choosing products with environmentally friendly packaging, avoiding plastic packaging, driving less to reduce environmental impact, and limiting air travel in the future.

Unfortunately, some of the less frequent behaviors, such as limiting air travel, have a significant impact on the environment. The inconsistency in sustainable behavior can be explained by the fact that high-engagement behaviors, such as recycling and waste sorting, have been strongly promoted through long-term, nationwide campaigns. These campaigns, alongside policies such as the fee for plastic carrier bags (Dansk Erhverv, 2020), advices for energy saving (Energistyrelsen SparEnergi, 2025), sort of waste (Miljøstyrelsen, 2025), have helped citizens form habits around these actions. However, citizens tend to engage less in high-impact behaviors, such as reducing air travel and driving less. Several factors may explain this discrepancy. First, citizens may view air travel as having an irreplaceable value beyond its negative environmental effects. Second, the societal carbon lock-in effect of existing infrastructure (Lorenzen, 2018; Seto et al., 2016) plays a role, as public transportation options are often inconvenient or unavailable for certain destinations, making driving or flying the more viable option.

The sustainable behavior scale developed in this study consists of six constructs: (1) waste sorting and recycling, (2) repair and reuse, (3) reducing air travel, (4) choosing sustainable packaging, (5) opting for sustainable transport modes, and (6) practicing energy-saving behaviors. The six constructs identified in the scale encompass a wide range of daily activities and choices that can significantly impact the environment. Waste sorting and recycling focus on proper disposal and material recovery, while repair and reuse emphasize extending product lifecycles and reducing consumption. Reducing air travel addresses the substantial carbon footprint associated with aviation, encouraging individuals to consider other alternative modes of transportation when possible. The scale further explores consumer choices related to sustainable packaging, prompting individuals to consider the environmental impact of product packaging and opt for more eco-friendly alternatives. The construct of choosing sustainable transport modes encourages the use of public transportation, and driving electric vehicles, thereby reducing emissions and congestion. Lastly, practicing energy-saving behaviors targets household and personal energy consumption, including actions such as turning off lights when a room is unoccupied, using energy-saving programs, and adjusting thermostat settings. Together, these six constructs provide a holistic approach to measuring and promoting sustainable behaviors across various aspects of daily life, offering valuable insights for researchers and policymakers seeking to assess and promote sustainable behavior.

In conclusion, the inconsistency in sustainable behavior underscores the inherent complexity of sustainability, as some actions are easier to adopt than others. The differences in

sustainable behavior among generations could be attributed to different factors such as lifestyle, culture and education, and varying perceptions of the impact of their actions. These observations create opportunities for further research.

The major limitation of this study is its representativeness. The lack of representativeness can significantly impact the generalizability of the findings, as the results may not apply to other groups, settings, or situations beyond those specifically examined in the study. To address this limitation, future research should focus on a representative sample.

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