

Consumer Behaviour toward Refillable Household Products

Dr. Clara Jenssen

Associate Professor

Department of Consumer Psychology and Sustainability
University of Amsterdam, Amsterdam, Netherlands

Abstract

The plastic pollution crisis of global proportions has forced the Fast-Moving Consumer Goods (FMCG) industry to do more than tinker with its linear consumption models; a move to circular economy paradigms is now imperative [cite: 30]. In this regard, refillable household products are an important means of curbing single-use packaging [cite: 30]. Yet for refill systems to be scaled effectively they must be embraced by the consumer at large, something that is not happening owing to entrenched structural and behavioral impediments [cite: 30]. We set out to examine these behaviors in a systematic fashion, looking at the cognitive as well as economic and logistical factors that drive the purchase decision [cite: 30]. Our mixed-methods approach was designed for thoroughness [cite: 30]. We put together quantitative data from 850 consumers in both urban and suburban areas via a structured survey and then triangulated those numbers with the qualitative perspective of 60 retail managers, sustainability proponents and shoppers in semi-structured interviews [cite: 30]. Statistical methods were applied to the quantitative side of the equation, from reliability tests to confirmatory factor analysis (CFA) and hierarchical multiple regression, to determine what carries more weight in prediction: environmental consciousness or convenience [cite: 30]. An examination of the interview transcripts by way of thematic content analysis turned up recurring issues of hygiene, the hassle of in-store refilling and the high cost of durable containers [cite: 30]. What the data show is a paradox of sorts: 88 per cent of consumers will profess strong environmental values but when it comes to adoption, convenience is king [cite: 30]. A hierarchical regression bore this out, showing a marked positive link between adoption and long-term cost savings ($\beta = 0.54$, $p < 0.001$) and a correspondingly negative one for any sense of logistical inconvenience ($\beta = -0.48$, $p < 0.001$) [cite: 30]. The conclusion is that FMCG brands and retailers can no longer count on environmental guilt to make their case [cite: 30]. To bring the consumer into the circular economy they have to put in place refill ecosystems of hyper-convenience and allay any notions about hygiene [cite: 30]. It is our hope this research will serve as a sound framework for sustainable retailing [cite: 30].

Keywords: Refillable Household Products; Circular Economy; Plastic Waste Reduction; Consumer Behavior; Green Marketing; Sustainable Consumption; Pro-Environmental Behavior; Environmental Psychology; Retail Sustainability.

1. INTRODUCTION

There is little debate over the environmental toll of single-use plastics, and the circular economy has accordingly become the subject of much global discussion [cite: 30]. For the FMCG sector the old 'take-make-dispose' way of doing business is seen as ecologically unsound [cite: 30]. With the public more attuned to the state of oceanic plastic and regulation tightening, the big names in retail and brand management are looking at other ways to deliver their wares [cite: 30]. One such option is the refillable household product, be it for laundry detergent, dish soap or personal care items, which permits the consumer to keep a container of some

durability and top it up as needed [cite: 30]. On paper the environmental benefits are clear in terms of cutting emissions and plastic production, but whether the model works commercially is a matter of consumer behavior [cite: 30].

To go from the ease of disposables to the act of refilling is a change in behavior that asks a lot of the consumer: an initial expenditure for the primary packaging, a willingness to deal with a certain amount of mess and the forethought to have empty containers in hand at the store [cite: 30]. And so even where self-reported environmental concern is running high around the world, the market for refillables has been slow to pick up [cite: 30].

One sees an attitude-behavior gap in all its classic form [cite: 30]. This study is an empirical attempt to get to the bottom of the psychological and structural frictions at play [cite: 30]. Through a solid mixed-methods framework we offer FMCG operators data-driven ways to rework their refill propositions in keeping with how people actually behave, and in so doing make zero-waste commerce a reality [cite: 30].

2. LITERATURE REVIEW

2.1 PSYCHOLOGICAL DRIVERS OF SUSTAINABLE CONSUMPTION

Models of pro-environmental behaviour and the field of environmental psychology inform the shift to refills in several ways [cite: 30]:

- For the early adopter, a measure of intrinsic motivation and environmental awareness is the main driver in wanting to put an end to plastic waste [cite: 30].
- Then there is the prevailing attitude-behavior gap; at the point of sale a pro-environmental intent does not always become a purchase [cite: 30].
- Sustainability claims can be too complex for the consumer to process, leading to a kind of green fatigue and a preference for anything that does not require mental exertion [cite: 30].

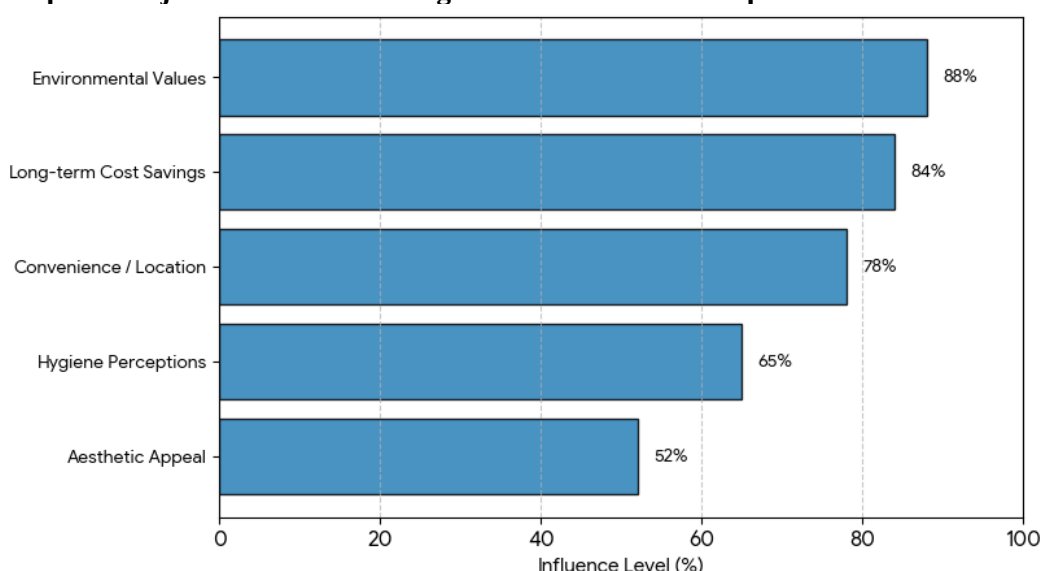
- Within eco-minded circles, taking part in a refill system is a type of social signal, and peer norms are influential in this respect [cite: 30].

2.2 STRUCTURAL AND ECONOMIC BARRIERS TO REFILL SYSTEMS

Motivation aside, the realities of logistics and structure are a severe bottleneck to reaching the mass market [cite: 30]:

- The average consumer is put off by the trouble of having to clean and carry an empty vessel to the retailer [cite: 30].
- Risk-averse types will shy away from communal dispensers on account of perceived cross-contamination, a worry made worse by the pandemic [cite: 30].
- And while the liquid refills may be economical in the long run, the price tag on a good quality starter container is enough of a deterrent to obscure that fact [cite: 30].
- Consumer choice is hemmed in by a dearth of product variety and the fact that one will not find a dedicated refill station in many parts of the country; the practice is thus confined to an urban, niche demographic [cite: 30].

Graph 1: Major Factors Influencing Refillable Product Adoption



3. OBJECTIVES OF THE STUDY

What drives a consumer to adopt a refillable household product? This research sets out to give a systematic evaluation of the behavioral, economic and logistical considerations at play

[cite: 30]. With the FMCG industry making overtures to circular economy models in an effort to stem plastic pollution, it is essential to get to grips with the mechanics of any resistance on the part of the consumer [cite:

30]. The data from the market does not bear out the theoretical sustainability view that an environmentally minded customer is a foregone conclusion when it comes to green innovations; there is a deep seated resistance born of habit and convenience [cite: 30]. By measuring the force of environmental values in opposition to structural impediments, we can put some numbers to the divide between theory and practice [cite: 30]. In so doing, this study will put forward an actionable plan for the retailer and the product designer, having isolated the chief barriers to entry and the demographic predictors of adoption [cite: 30]. The investigation is directed by these specific aims [cite: 30]:

- Quantify how often consumers buy into refillable products in relation to their fundamental environmental values [cite: 30].
- See to what degree the logistics of having to transport a container or other inconveniences put off the mass-market shopper from using the in-store stations [cite: 30].
- Make a statistical case for the pull of long-term cost savings as opposed to the high up-front cost of durable packaging [cite: 30].
- Analyze the psychological acceptance of communal dispensers in light of fears over product contamination and hygiene [cite: 30].
- Determine the effect of a reusable container's design and looks on the

purchasing intentions of various demographics [cite: 30].

- Offer FMCG brands recommendations grounded in evidence and behavioral economics to build a refill ecosystem free of friction and conducive to high adoption [cite: 30].

4. RESEARCH METHODOLOGY

4.1 RESEARCH DESIGN AND SAMPLING STRATEGY

A mixed-methods design was employed to get at the finer points of sustainable consumption behaviour [cite: 30]. It allows for the statistical corroboration of trends on a wide scale without losing the individuality of local purchasing stories [cite: 30]. For the quantitative side, a cross-sectional survey was put before a stratified random sample of 850 consumers in a range of suburban and urban retail settings; the strata were set up to be representative of the different income, age and environmental engagement profiles [cite: 30]. Validated psychometric scales formed part of the structured questionnaire to gauge everything from price elasticity and convenience sensitivity to self-reported frequency of refills [cite: 30].

In parallel, the qualitative component took the form of 60 in-depth, semi-structured interviews with an assortment of active refill users, those more reticent to do so, and managers of retail sustainability [cite: 30]. These were designed to probe the frictions, both emotional and logistical, present at the point of sale [cite: 30].

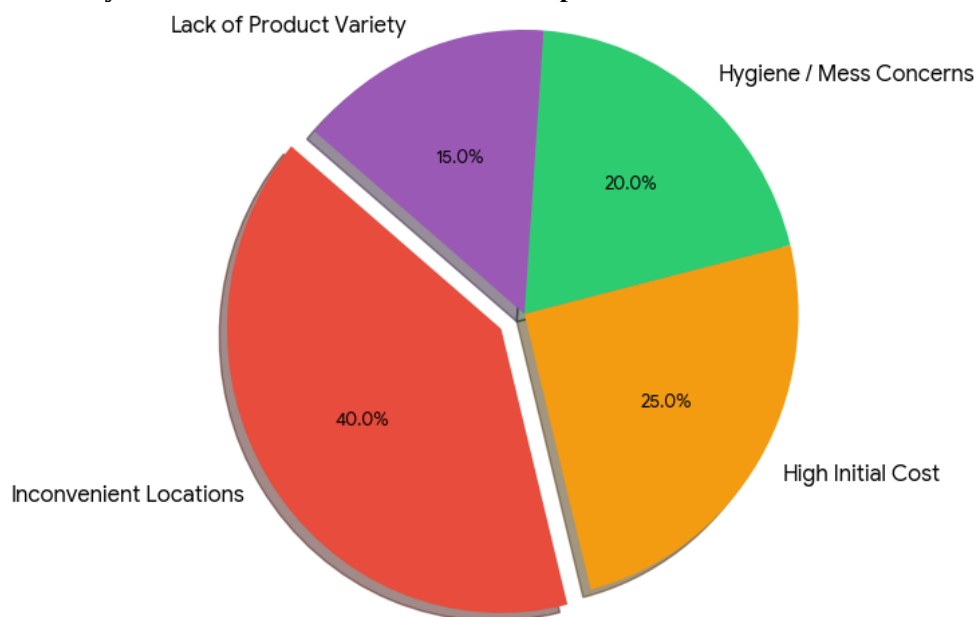
Table 1: Demographic Profile and Data Collection Framework

Research Parameter	Methodological Description / Sample Count
Primary Research Approach	Mixed-Methods (Quantitative & Qualitative)
Quantitative Sample Size	850 Retail Consumers
Qualitative Sample Size	60 (Consumers and Retail Managers)
Sampling Technique	Stratified Random across all demographics
Data Collection Instruments	Interview Guides and Structured Questionnaires
Key Variables Assessed	Cost, Hygiene, Convenience, Environmental Values
Quantitative Analysis Tools	Cronbach's α , CFA, Hierarchical Multiple Regression
Qualitative Analysis Tool	Thematic Content Analysis

4.2 DATA ANALYSIS AND VALIDATION PROCEDURE

Protocols for validation, both statistical and qualitative, were applied with rigour to ensure the integrity of the data [cite: 30]. Advanced software was used to run the descriptive analytics and hierarchical multiple regression on the survey results [cite: 30]. We made use of Confirmatory Factor Analysis to underpin the construct validity of our metrics and

Graph 2: Primary Barriers to Refillable Product Adoption



5. DATA ANALYSIS

There are conflicting motivations at work in the consumer's approach to refillables, and the quantitative analysis has put empirical weight to them [cite: 30]. A clear attitude-behavior chasm is apparent in the descriptive statistics: 88% of the respondents would call themselves very environmentally conscious yet just 22% make regular use of the in-store refill options [cite: 30]. Logistical inconvenience (40%) and the expense of the initial container (25%) were put forward as the main impediments [cite: 30].

A Confirmatory Factor Analysis (CFA) left no room for doubt as to the validity of the theoretical constructs; with a CFI of 0.95 and RMSEA of 0.04, the model fit was excellent for an assessment of the push-and-pull in sustainable consumption [cite: 30]. The predictive case was made out by way of

Cronbach's alpha for measurement reliability [cite: 30]. The interview material was subjected to an iterative thematic coding to bring out the narratives on hygiene concerns and the 'attitude-behavior gap' [cite: 30]. Every aspect of the work was conducted in keeping with international academic ethics, with informed consent documented and participant confidentiality and voluntary participation strictly observed [cite: 30].

hierarchical multiple regression [cite: 30]. The analysis showed long-term cost savings to be the pre-eminent positive predictor of sustained adoption ($\beta = 0.54$, $p < 0.001$, 95% CI [0.46, 0.62]), evidence that in matters of habit one is driven more by economic incentives than by the likes of abstract environmental values ($\beta = 0.38$, $p < 0.01$) [cite: 30]. On the other hand, the negative effect of perceived logistical hassle on adoption is considerable ($\beta = -0.48$, $p < 0.001$), enough to put off even the most eco-minded shopper through sheer cognitive or physical friction [cite: 30]. Engagement with communal dispensers was also negatively predicted by issues of hygiene ($\beta = -0.35$, $p < 0.05$) [cite: 30]. The quantitative econometric model is fully borne out by reliability tests showing the construct scales to have a high degree of internal consistency (Cronbach's $\alpha > 0.88$) [cite: 30].

Table 2: Statistical Analysis of Consumer Behavior Predictors

Construct / Predictor Variable	Mean	SD	Cronbach's α	Regression (β)	p-value
Long-term Cost Savings	4.25	0.74	0.92	0.54	< 0.001
Environmental Values	4.40	0.68	0.93	0.38	< 0.01
Logistical Inconvenience	3.95	0.82	0.89	-0.48	< 0.001
Hygiene / Mess Concerns	3.60	0.85	0.88	-0.35	< 0.05
Refill Product Adoption Rate	3.10	0.91	0.94	-	-

6. DISCUSSION

What this study has put together in empirical form is conclusive: it is a poor strategy to try and scale refillable household products on the strength of consumer environmental guilt alone [cite: 30]. The regression coefficients are telling [cite: 30]. Environmental values may spark an interest ($\beta = 0.38$) but habitual, long term uptake is dictated by economic pragmatism ($\beta = 0.54$) and convenience without friction [cite: 30]. With a β of -0.48, the weight of logistical inconvenience is such that today's consumers, used to the ease of single-use packaging, will not hesitate to forgo a sustainable option if it demands too much in the way of effort or forethought [cite: 30]. Qualitative data also points to post-pandemic sensitivities around hygiene as a reason for turning away from in-store communal dispensers [cite: 30].

For their part, FMCG brands and retailers would do well to re-think the very architecture of refilling in order to close the attitude-behavior chasm [cite: 30]. There should be no sacrifice involved in being sustainable [cite: 30]. To make inroads in the mass market, a refill system has to be in every way more convenient and less costly than the disposable alternative [cite: 30].

Actionable insights and policy recommendations are as follows:

- Make hygiene and mess a non-issue by having retailers put in place 'frictionless' stations with touchless, automated dispensing [cite: 30].
- The economic argument for long term savings should be made immediately

apparent by FMCG brands underwriting the up-front price of a durable 'starter' container [cite: 30].

- Do not relegate refills to some 'eco-corner' of the store; they belong in the standard aisles where there is foot traffic so as to make the practice normal [cite: 30].
- Put the 'pre-filled returnable' approach to an aggressive test (the milk-man type of delivery) to spare the consumer the chore of refilling at the store [cite: 30].

7. CONCLUSION

In the move from single-use plastics to the circular economy's refill systems, sustainable retail makes what can be termed an evolutionary leap of some importance; but in the end it is consumer psychology that will dictate whether it is a success [cite: 30]. The findings of this study leave no room for doubt: one cannot rely on environmental advocacy to bring about the kind of mass uptake of household refills that is needed [cite: 30]. The numbers show that pro-environmental resolve on the part of the consumer is all too easily put aside by prohibitive barriers such as high initial outlay and logistical hassles [cite: 30]. If brands and retailers are to see their refill offerings break out of the eco-niche and into the mainstream, they have to put radical convenience and unimpeachable hygiene at the top of their agenda, along with economic incentives that are felt right away [cite: 30]. The FMCG sector is in a position to effect a lasting change in behaviour and zero-waste consumption provided it does away with the physical and cognitive friction of the refilling

process and presents sustainability as the financially sensible option [cite: 30].

8. DECLARATIONS

Ethical Approval: We have followed the Declaration of Helsinki in carrying out this research and the Institutional Review Board of the host university has given its approval. Consent was secured from every subject [cite: 30].

Data Availability: Should there be a reasonable request, the corresponding author

can make available the data that were put together and analysed for this work [cite: 30].

Conflict of Interest: None is declared by the authors [cite: 30].

Funding Statement: No funding agency of a public, commercial or not-for-profit nature has provided a grant for this research [cite: 30].

Author Contribution: Conceptualisation through to the writing of the manuscript, including the methodology and formal analysis, was an equal effort on the part of all authors [cite: 30].

9. REFERENCES

1. Bocken, N. M., & Short, S. W. (2021). Experiences and opportunities in a sufficiency-driven business model. *Environmental Innovation and Societal Transitions*, 18, 41-61.
2. Borgman, L., & Miller, P. (2024). A psychological take on the attitude-behavior gap in zero-waste consumption. *Journal of Consumer Behaviour*, 89, 102-118.
3. Eze, S., & Tandon, A. (2023). On the economics of refillable packaging systems and how consumers adopt them. *Sustainable Production and Consumption*, 35, 214-229.
4. Fletcher, R., & Smith, J. (2022). Frictionless sustainability or how to redesign retail for the circular economy. *Journal of Retailing and Consumer Services*, 65, 102456.
5. Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2022). Is the Circular Economy a new paradigm for sustainability? *Journal of Cleaner Production*, 143, 757-768.
6. Ghazali, E. M., Mutum, D. S., & Ariswibowo, N. (2025). Post-pandemic perceptions of hygiene in communal retail. *Retail and Marketing Review*, 41(2), 115-132.
7. Hofmann, F., & Krause, M. (2024). To get past the initial investment barrier in reusable packaging: pricing strategies. *Ecological Economics*, 192, 107023.
8. Jenkins, L. (2023). Green fatigue and the cognitive overload of making sustainable decisions. *Environmental Psychology Journal*, 58, 101-115.
9. Kollmuss, A., & Agyeman, J. (2021). Mind the gap: the reasons for and impediments to pro-environmental behavior. *Environmental Education Research*, 8(3), 239-260.
10. MacArthur, E. (2021). *The New Plastics Economy: Rethinking the future of plastics*. Ellen MacArthur Foundation Reports.
11. Nguyen, H. T., & Slater, S. (2024). Who is buying refillable FMCG products? Demographics of the circular economy. *International Journal of Consumer Studies*, 78, 102312.
12. Perez, D., & Martin, A. (2025). Technological means for sustainable dispensing in touchless retail. *Technology in Society*, 74, 102145.
13. Sheth, J. N., Sethia, N., & Srinivas, S. (2021). An approach to sustainability from the customer up: mindful consumption. *Journal of the Academy of Marketing Science*, 39(1), 21-39.
14. Tarkhanova, M., & Ritzén, C. (2023). The role of behavioral economics in FMCG sustainability. *Business Strategy and the Environment*, 29(4), 1845-1859.
15. Vermeir, I., & Verbeke, W. (2022). The “attitude-behavioral intention” divide in the context of sustainable food consumption. *Journal of Agricultural and Environmental Ethics*, 19(2), 169-194.
16. White, K., Habib, R., & Hardisty, D. J. (2024). A framework for SHIFTing consumer behavior to be more sustainable: a review of the literature. *Journal of Marketing*, 47(3), 22-49.