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## Engaging consumers in reusable packaging systems: An exploration of factors influencing the adoption

Xueqing Miao<sup>(a)</sup>, Lise Magnier<sup>(a)</sup>, Ruth Mugge<sup>(a,b)</sup>

a) Delft University of Technology, Delft, The Netherlands

b) University of Amsterdam, Amsterdam, The Netherlands

**Keywords:** Consumer behaviour; Reuse; Packaging lifetime; Environmental impact.

**Abstract:** Reusable packaging systems (RPSs) show promise in replacing single-use packages by extending the packaging lifetime and significantly reducing waste. Yet, knowledge about consumer behaviour in the adoption of RPSs is scarce. We present in-depth insights into how consumers perceive RPSs as a new shopping pattern for fast-moving consumer goods (FMCGs). Our findings reveal that consumers' high willingness to adopt RPSs stems from their awareness of waste and their desire to reduce it. Nevertheless, various reasons can complicate the process of adoption. First, consumers perceive reduced behavioural control in this new shopping pattern and are reluctant to invest extra effort or alter routines. Next, consumers weigh economic benefits to compare alternatives at the point of purchase and are generally unwilling to pay a premium for RPSs. In addition, even though consumers trust the hygienic standard of the RPS, they raise contamination concerns when they notice spillage, other consumers' improper use and signs of usage generated on the packaging. In terms of environmental impact, consumers experience positive feelings about reducing packaging waste but also perceive the environmental impact as vague and doubt the effectiveness of their reuse behaviour. To encourage the adoption of RPSs, these barriers need to be addressed via design and marketing interventions.

### Introduction

Fast-moving consumer goods (FMCGs) have become an integral part of our daily lives. Most FMCGs are packed in packages with a short lifetime designed for single-use followed by disposal (Bocken et al., 2022). Consequently, the volume of packaging waste is staggering. In 2020, the EU generated around 177.2 kg of packaging waste per capita, amounting to a total of 87 million tonnes (Eurostat, 2022), which poses a significant environmental threat through littering, landfilling and incineration.

Prolonging the useful lifetime of FMCG packaging could reduce the detrimental effects of our daily consumption (Ertz et al., 2017). One way to achieve this is by implementing reusable packaging systems (RPSs) that consist of long-lasting packages designed for multiple uses in a closed-loop system. RPSs can be broadly divided into two types (Greenwood et al., 2021; Muranko et al., 2021): (1) returnable packaging systems, where the companies in the supply chain repeatedly clean and refill the packaging with products and (2) refillable packaging

systems, where consumers are responsible for the cleaning and refilling of the packaging. Some RPSs can integrate features of both types into one system (Coelho et al., 2020). For example, in the RPS we investigated in this study, consumers can either repeatedly refill and clean the same packaging or return the packaging to the company to be cleaned and then reused by another consumer.

Previous studies have focused on the logistics and material aspects of RPSs to improve their sustainability and economic viability (e.g. Blanca-Alcubilla et al., 2020; Cottafava et al., 2021; Kunamaneni et al., 2019). Our study contributes by understanding consumer adoption which is crucial for RPSs to have the desired positive impact.

### Theoretical background

Previous research has shown that consumers who perform reuse behaviour are influenced by knowledge of environmental issues (Barr et al., 2001). Consequently, individuals with greater environmental concerns are more likely to use

reusable packaging, as they perceive it as valuable for reducing packaging waste (Lofthouse et al., 2009; Magnier and Gil-Pérez, 2021). Refilling products from bulk enables consumers to control the product amount and be less restricted concerning packaging size, which also adds environmental value in terms of food waste reduction (Beitzen-Heineke et al., 2017). Furthermore, economic incentives such as rewards (e.g. loyalty points, discounts), deposit schemes (i.e. paying an up-front deposit to borrow the packaging) and subscriptions (e.g. scheduled deliveries for refill) can encourage consumers to continue using RPSs (Wastling et al., 2018). However, it remains unclear whether these factors are sufficient to make RPSs an attractive option for the majority of consumers.

RPSs are currently far from the norm. Consumer actions can be hindered by a lack of accessibility to the system and a sufficient range of product categories (Beitzen-Heineke et al., 2017; Greenwood et al., 2021). Moreover, most FMCGs are low-involvement products, for which consumers are unlikely to conduct extensive information searches and invest cognitive effort in reusable alternatives. Habits drive consumers to pick a product they usually buy (Kunamaneni et al., 2019). Changing these habits requires consumers to question the status quo and adapt their routines (Bocken et al., 2022). Yet, moral reasons for a sustainable choice are only likely to prevail when consumers do not have to compromise on other product characteristics, such as convenience and price (Olson, 2013). Using RPSs is perceived as inconvenient and costly, resulting in a shopping experience that consumes much time and effort (e.g. returning empty packaging or refilling products in-store); and potentially higher product costs or an upfront deposit for the packaging (Jiang et al., 2020; Zhu et al., 2022). Furthermore, the packaging is expected to ensure product hygiene (Lindh et al., 2016), whereas the wear and tear on reusable packaging due to frequent washing, transportation and refilling can act as a contamination cue, activating concerns about health and safety (White et al., 2016) and thus hindering acceptance. Some hygiene issues also emerge in the use context of RPSs, such as sharing the use of the system with unfamiliar users or seeing others touch the packaging (Long et al., 2022).

Although previous studies are valuable for understanding consumer behaviour towards RPSs, most insights were gathered from hypothetical usage scenarios and did not capture what it would mean for consumers to use an RPS in real life. This paper contributes by exploring consumer responses to the actual usage of an RPS in a lab setting and packaging usage at home. We identify influencing factors in consumers' adoption of RPSs as a new shopping pattern.

## Method

We conducted semi-structured interviews with 27 participants. All participants were selected from a university-based research panel and were selected to show variety in age (18-74 years, mean: 50.6 years), gender (44% male; 56% female; 0% other), monthly income and education level. Each interview session consisted of two parts. First, in-person interviews took place in a university lab facility, where an RPS was installed (see Figure.1).



**Figure 1. Research set-up.**

Each participant was asked to use the RPS to dispense products in three different packages: two reusable packaging of different sizes and one private container brought by the participant. Subsequently, participants described their general feelings about operating the RPS, packaging preferences, what would motivate or hinder their adoption, and the perceived environmental impact of RPSs. After the interviews, participants took one of the reusable packages they had filled and used it at home. The second part consisted of follow-up phone interviews to understand consumers' usage of reusable packages at home.

All interviews were audio-recorded and fully transcribed. The data was analyzed and coded using Atlas.ti software.

## Results and discussion

Our study found that participants were generally aware of the packaging waste issue. Most participants expressed a desire to buy products with less packaging and had a positive attitude about eliminating packaging waste through using RPSs. Yet, only a few participants believed that they would adopt RPSs in their shopping practice due to the perceived challenges of starting and sticking to them in a long term. More in-depth insights revealed that several aspects influence consumers' adoption of RPSs, including behavioural control, economic incentives, contamination concerns and environmental impact.

### *Behavioural control is challenged*

Our study revealed that consumers faced difficulties controlling their behaviour when they used the RPS as a new shopping pattern. Perceived behavioural control, as defined by Ajzen (1991), refers to a person's perception of the ease or difficulty of performing the behaviour of interest. Our insights showed that behavioural control of RPSs referred to two aspects: operating the system and altering the shopping routine.

Participants reported that using an RPS was initially challenging. Understanding the digital instructions to operate the system and reading product information separated from the packaging increased consumers' cognitive load and resulted in time costs. Manually controlling the product flow could cause spillage and decrease consumers' perceived ability to use the RPS. Participants also expressed anxiety about occupying the system for a long time in a busy supermarket. To avoid these negative emotions, some participants preferred to get products from the shelf for a higher level of behavioural control.

*'I think this is quite difficult to understand. Perhaps there are people waiting behind you. I will do it another time and I try to follow the procedure when there's nobody waiting for me because that makes you a little bit nervous.'* (P6)

In comparison to the convenience of single-use packaging's disposal after usage, participants

perceived RPSs as requiring extra effort in packaging management (e.g. cleaning and bringing it back for reuse). Participants stated that altering shopping routines to fit this new shopping pattern was also challenging. For example, they may easily forget to bring the packaging while doing spontaneous shopping.

*'You have to remind yourself to bring this before you go. It's difficult when you do spontaneous shopping.'* (P13)

### *Economic incentives are often expected*

Our results reveal that economic incentives may act as an enabler for consumers to adopt RPSs. Participants recognised that RPSs enabled them to spend less money on small portions of the product rather than being restricted by predetermined (large) packages, as well as save cost in waste collection charges due to less packaging waste generated in their household.

Yet, participants noted they only evaluated these incidental economic benefits afterwards, while most decisions were triggered by tangible incentives such as discounts and promotions at the point of purchase. While some participants showed explicit reluctance to pay a premium for RPSs and claimed that reuse behaviour should be rewarded, others expressed a willingness to pay a small premium considering the manufacturing and operating costs of the system.

*'Buying food from this dispenser system should bring you some profits in the price. The system rewards you because you bring your own container. I think it's important that buying in this way will save you some money because you have to do more.'* (P10)

### *Contamination concerns emerge during the usage*

The adoption of RPSs requires consumers to share access to the system with other consumers and repetitively use the packaging. Nevertheless, these may raise contamination concerns that hinder consumer adoption of RPSs or trigger early replacement of reusable packaging. Contamination is usually driven by three mechanisms, namely hygiene, utility and territory (Baxter et al., 2016). Our findings suggest that all three contamination mechanisms may occur for RPSs.

First, participants generally trusted the hygienic standards of RPSs when products were stored in airtight bags, the dispensing process was contactless and reusable packages were professionally cleaned and (re)sealed. Yet, some participants reported that observing spillage around dispensers and improper reuse behaviours of other consumers activated their hygiene concerns.

*'People bring their own containers and they are not clean. Their containers are touching the machines and get some cross-contamination as well.'* (P2)

Next, participants associated the signs of wear and tear on the packaging that may appear over multiple reuses with bacteria. Some participants stated external scratches were more acceptable than internal scratches in contact with the (food) products which represented contaminants and posed a threat to their health. Participants would swap the packaging or switch to their private containers.

*'There are scratches. It may cause a hygiene issue because if there are scratches, there may be bacteria in the scratches.'* (P6)

In addition, participants deemed the packages with severe scratches or damages less acceptable because they perceived a decreased functionality (e.g. unable to see through the packaging) that triggered concerns about utility contamination (Baxter et al., 2017; Wallner et al., 2022). Participants also associated damages with prior usage by strangers and inferred how these damages occurred. This evoked territorial contamination concerns that resulted from an object perceived as belonging to someone else (Baxter et., 2016).

*'If you see it is a little bit damaged, I would not be happy about it. Even though you do know that it is reusable and therefore it has been used by someone else, you think how can this have happened?'* (P20)

### **Environmental impact is vague**

While most participants recognised the relation between FMCGs consumption and single-use packaging waste, they perceived the

environmental impact of RPSs as vague. Drawing from the construal level theory (Trope and Liberman, 2010), positive environmental impacts are often distant in time and space from where the consumption takes place, which makes it difficult to assess the actual impact (White et al., 2019). Some participants distinguished the impact by observing a near-future phenomenon, such as having less packaging waste in their trash bin, because it made their actions more concrete and vivid than assessing the impact on the environment.

*'I think we would notice the reduction of waste. And you also see that your bin isn't filled that quickly with all those extra plastics. I would feel really good for myself.'* (P4)

Although most participants exhibited a positive feeling about seeing waste reduction at an individual level, they remained uncertain about whether using RPSs would save natural resources at a systematic level. Some participants believed that the raw materials and energy involved in manufacturing and maintaining reusable containers and systems would probably be as detrimental as single-use packaging. This lack of knowledge contributed to their uncertainty about the consequences. Therefore, some participants desired to receive transparent information about the environmental impact of RPSs.

*'I'm not sure whether this is more environmentally friendly than just producing a new container that isn't reusable. You can also make the packaging cheap and not use so many raw materials.'* (P23)

Furthermore, participants reflected that individual reuse had a limited effect and that only when most consumers participated in collective actions can RPSs make a real difference. Participants also questioned how many cycles a reusable container should complete in its lifetime, although most of them did not estimate the packaging's lifetime and would just use it *'until it is broken'*. It is worth noting the importance of ensuring reusable packages complete a certain number of cycles before consumers consider them unacceptable and be environmentally better than an equivalent single-use package (Baird et al., 2022).

## Conclusion

This study contributes to understanding consumer perception and adoption of RPSs and provides valuable insights for future implementation. Our findings highlight the importance of design and marketing interventions that can engage more consumers in RPSs.

First, to activate reuse behaviour, it is crucial to increase the exposure of RPSs in the market by expanding the availability and compatibility of RPSs to facilitate refill or return behaviour in different stores. Previous studies suggested minimising the complexity of the system and providing consumers with a smooth experience (Mahmoudi and Parviziomran, 2020). We further indicated that clear instructions and sufficient product information could enhance consumers' control over their behaviour.

At the point of purchase, although economic incentives may act as an enabler for consumers to adopt RPSs (Muranko et al., 2021), our study shows they need to be explicitly communicated and assist consumers in comparing the economic benefits of alternatives with low cognitive load.

In addition, we enrich the understanding of contamination concerns. We demonstrate that although consumers have a high level of trust in the hygienic standards of RPSs, contamination concerns that emerge in their usage can hinder adoption. To address this issue, a well-designed RPS should minimise the risk of spillage and provide reusable packaging resistant to severe wear and tear. Regular maintenance and an indication of a hygienic condition for reuse can also prevent consumers' negative associations.

Furthermore, our study adds consumer perception regarding the environmental impact of RPSs in the literature. We observed a desire among participants to understand and associate their behaviour with the environmental impact of RPSs. Uncertainty about the consequence of RPSs can evoke consumer scepticism. Thus, we suggest that RPSs could provide tailored feedback about personal reuse behaviours at regular intervals, allowing consumers to compare their environmental impact and keep track of their progress over time. Alternatively, providing information about the collective environmental

impact of all consumers at the store can communicate the power of collective action (Ran et al., 2022).

We encourage future research to build upon these findings to engage consumers in RPSs and contribute to a more sustainable society.

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