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Reviving the milk man: Consumers' evaluations of circular reusable packaging offers

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Keywords: packaging; reusable; returnable; consumers; evaluations.

Abstract: The question of prolonging the lifetime of food packages before they are disposed of has largely been overlooked. Yet, reusing packaging could bring interesting environmental benefits. In this research, we take a consumer perspective and test whether returnable packaging for fast-moving consumer goods (FMCG) has the potential to be adopted by consumers. The results of two experimental studies show that evaluations of returnable packaging are generally positive. Consumers perceive returnable packages as much more eco-friendly than their disposable counterparts, and the product inside as more qualitative even though the tested products were sensitive (i.e. yoghurt and ice-cream). In addition, they are more likely to recommend a product sold in a returnable packaging and high environmentally concerned individuals are more likely to repurchase it. However, when signs of usage resulting from multiple uses were introduced on the returnable packaging, attitudes were generally less positive and individuals were also less likely to recommend and repurchase the product. These results highlight the importance of downplaying the negative effects of signs of usage in the design of returnable packaging.

Introduction

Research on the topic of premature obsolescence has so far largely focussed on durable products, electronics or clothing. One particularly interesting topic has been overlooked in the literature on longevity: packaging. Yet, in this domain as well, waste prevention would be better than recycling, and would often lead to less detrimental consequences for the environment (Greenwood et al. 2021). In Europe, each citizen discards on average 174kg of packaging items per year (source: [Eurostat, 2018](#)). While recycling rates for glass (76%) and metal (74% for aluminium and 82% for steel) are high in Europe, the process requires a lot of energy and thus contribute to greenhouse gas emissions. When it comes to the recycling of plastics, 60% of all plastic packaging in Europe are either burnt or landfilled (source: [Eurostat, 2021](#)). In addition, many packaging items leak into the environment, which is a major issue for plastics as they dissolve into microplastics that contaminate the air and marine life.

One solution to limit this problem is to reuse packaging during multiple cycles of

consumption via returnable and refillable packaging (Ertz, Huang, Jo, Karakas, & Sarigöllü, 2017; Coelho, Corona, ten Klooster, & Worrel, 2020). Although return systems for packaging are not new, services with innovative business models are entering the market. However, these innovations also come with various challenges, related to logistics, economic viability or user-friendliness.

From a consumer perspective, literature on factors of acceptance of reusable food packaging is scarce. In addition, contamination represents an important barrier for consumers regarding reusable products (Baxter, Aurisicchio & Childs, 2017). As reusable packages go through multiple uses, signs of wear and tear may appear on their surface. Thus, consumers may perceive these packages differently compared to new packages made of virgin materials. For reusable packaging to succeed, it is therefore also central to understand how consumers respond to signs of use. First, this research contributes by offering a better understanding of consumers' responses to returnable packaging compared to disposable packaging. Second, this paper offers insights on

perceptions and attitudes towards reusable packaging after several cycles of consumption. Finally, this research provides insights on how individual characteristics influence the acceptance of reusable packaging.

Literature overview

Different types of reusable packaging systems

Different types of reusable packaging have been identified in the literature (Coelho et al., 2020; Lofthouse, Bhamra, & Trimmingham, 2009). When it comes to consumer packaging for food and beverages, reusable packaging can be classified in three main categories: refillable by bulk dispenser, refillable parent packaging and returnable packaging. Refillable by bulk dispensers packaging systems consist in using a container or a brand's refillable packaging in-store. Refillable parent packaging consists of a refill packaging that is made with less material than the parent packaging. In returnable packaging systems (RPS), consumers return their empty packaging which will be cleaned and refilled by the retailer/producer for future use. This system, used by companies such as [Loop - TerraCycle](#), is usually combined with a deposit system to provide a financial incentive.

In this research, we focussed on the latter system in an online context. This system (RPS) offers several advantages compared to refillable systems regarding user-centeredness (user-friendliness, convenience) and is close to commonly used disposable packaging, which are branded.

Factors enhancing the acceptance of RPS

Returnable packaging systems (RPS) primarily aim at reducing the use of materials and energy in packaging. Unsurprisingly, waste reduction represents an important positive aspect of RPS for consumers who feel ethically better when buying products sold in this type of packaging (Lofthouse et al. 2009). Furthermore, reusable packaging systems consisting of an original packaging swapped for a new product were also perceived as being easy to use, which in turn may promote their acceptance and adoption by consumers (especially compared

to other types of reusable packaging systems such as refillable packaging, which were deemed as unfit to modern life) (Lofthouse et al. 2009). In addition, the convenience that RPS may bring due to the unnecessary sorting and recycling of the containers has been evoked as a positive aspect of RPS (Lofthouse et al. 2009). Consumers of milk delivery services in reusable packaging have also mentioned the convenience of waste collection as one of the major advantage of this system (Vaughan, Cook, & Trawick, 2007). Although rarely seen in practice, positive pricing implications related to the reuse of containers have been mentioned by consumers, who expect that the fact that the packaging is reusable should lead to a price discount.

Next to responses related to specific elements of the reusable packaging systems, individual characteristics of consumers are likely to influence the acceptance of RPS. As motivation plays an important role in the adoption of reusable containers (Ertz, Huang, Jo, Karakas, & Sarigollu, 2017), we can expect that environmental concern, which is defined as the intensity of positive or negative affect towards environmental topics (Cruz & Manata, 2020), can be a potential predictor of the acceptance of RPS by consumers. Specifically, we can expect that the more environmentally conscious individuals are, the more likely they will be to adopt RPS for their environmental benefits and to accept the potential negative implications that their use may involve.

Factors hindering the acceptance of RPS

Literature has also pointed out to some factors that may have a negative influence on the acceptance of RPS. First, literature has linked RPS to negative pricing implications (Lofthouse et al. 2009), which can for example be related to the small scale of their logistic systems. The negative pricing implications inevitably have detrimental consequences on the acceptance of RPS by consumers. In addition, the difficulty for consumers to engage with the system has been recognised as a potential hindrance to the adoption of RPS. Literature has highlighted other factors of hindrance such as the inconvenience of storing the empty containers (especially as these systems do not completely replace current systems of recycling in the households).

In addition, product hygiene concern was reported as a potential factor of rejection for sensitive products (e.g., dairy products or other products at risk of spoilage or contamination) (Coelho et al. 2020). This concern could be related to a lack of trust in the cleaning process of the containers between uses. Furthermore, research has demonstrated that individuals can experience contamination concerns about shared objects in the context of access-based services (Baxter, et al. 2017), especially when the objects are used in proximity to their bodies (Hazée, van Vaerenbergh, Delcourt & Warlop, 2019). These contamination concerns could be emphasized by perceived contamination due to the presence of signs of usage. This specific aspect of reusable packaging has so far been overlooked. Yet, research on disposable packaging has shown that superficial imperfections on packaging surface can cause negative reactions that shape negative attitudes towards and avoidance of the products (White, Lin, Dahl, & Ritchie, 2016). The authors also demonstrated that these negative reactions even emerged in conditions under which the damages did not directly convey health or safety threats from the product. By extension, we can expect that signs of usage on reusable packaging can lead to the same negative reactions for users who receive such packages, and in turn hinder their long-term adoption.

Finally, the role of disgust sensitivity, which can be defined as a personal sensitivity to contamination by interpersonal contacts (Rozin, Haddad, Nemeroff, & Slovic, 2015), might influence the acceptance of RPS. We can expect that the more individuals are sensitive to disgust, the more they will be likely to negatively evaluate RPS.

In order to investigate evaluations of RPS by consumers, we created two experimental studies. In study 1, we compared evaluations of reusable packaging (in comparison to disposable packaging). In addition, we tested the influence of individual variables such as environmental concern and disgust sensitivity on these evaluations. In study 2, we tested how signs of usage on a reusable package affect evaluations compared to an as new package appearance.

Study 1

Method

This study aimed to assess consumers' evaluations of reusable packaging. Ninety-one people (54 women) participated in this investigation. Their mean age was 44.2 years with a standard deviation of 12.61 years.

All participants read a scenario where they had ordered online a pot of Greek-style yogurt that was sold either in disposable or reusable packaging and were presented with a photorealistic rendering of the product. The disposable package consisted of a plastic-looking pot, and the reusable container consisted of the same pot with a metallic appearance (Figure 1). Both stimuli were identical in all their characteristics except for the appearance of their material. The experiment followed a between-subjects design, in which each participant was randomly presented with one of the two scenarios.



Figure 1. Disposable (left) and reusable (right) packages shown in Study 1.

The participants had to rate the depicted packaging on several 7-point scales, in which Pearson's correlation coefficient (r) was used to estimate the reliability of scales that consisted of two items and Cronbach's α was used to estimate the reliability of scales composed of more than two items. Specifically, the participants were asked to rate their attitude towards the product ($\alpha=0.92$), the perceived healthiness, the perceived quality ($\alpha=0.92$), the packaging eco-friendliness ($r=0.93$), the contamination perception of the packaging ($\alpha=0.74$), their safety concerns ($r=0.70$) and the attractiveness of the packaging ($\alpha=0.95$). The participants were also asked to rate their intention to repurchase the product ($\alpha=0.99$) and their intention to recommend it ($\alpha=0.91$).

In addition, some participants' characteristics considered relevant were assessed. We asked the participants to rate their disgust sensitivity

($\alpha=0.70$), their environmental concern ($\alpha=0.92$), their involvement in the product category ($\alpha=0.94$), their attitude towards reusable packaging ($\alpha=0.97$) and to indicate to what extent were they familiar with the concept of reusable packaging.

Results

The results of an independent t-test (Table 1) show that the participants reported a better attitude towards the reusable packaging than towards the disposable packaging ($t(89)=-2.80$, $p=.006$). In addition, the reusable package enhanced the evaluations of the healthiness ($t(89)=-2.29$, $p=.024$) and quality ($t(89)=-2.94$, $p=.004$) of the yogurt, and the packaging itself was evaluated as being more environmentally friendly than the disposable one ($t(89)=-7.84$, $p<.001$). Although contamination was perceived as low for both packages, the reusable pot was considered more contaminated ($t(89)=-2.37$, $p=.020$). Overall, the participants showed a greater intention to recommend the purchase of the reusable pot ($t(89)=-3.24$, $p=.002$), although they did not express a greater predisposition to repurchase it ($t(89)=-1.23$, $p=.223$). However, this predisposition to repurchase became significant, when looking more specifically at specific groups of consumers.

	Disposable packaging	Returnable packaging
Attitude	4.82 (1.32)	5.56 (1.19) **
Healthiness	4.72 (1.51)	5.40 (1.32) *
Quality	4.45 (1.31)	5.13 (0.85) **
Packaging eco-friendliness	3.76 (1.66)	6.08 (1.11) ***
Contamination perception	2.23 (0.86)	2.76 (1.23) *
Safety concerns	5.85 (1.16)	5.66 (1.17)
Packaging attractiveness	4.66 (1.36)	5.11 (1.27)
Repurchase intention	4.43 (1.84)	4.89 (1.75)
Intention to recommend	4.10 (1.37)	5.06 (1.45) **
*** $p<.001$; ** $p<.01$; * $p<.05$		

Table 1. Descriptive statistics study 1.

Regarding the interaction effects of the individual characteristics of the participants on their assessment of the packages, the results of a moderation analysis (5000 samples) show that those with high disgust sensitivity tended to rate the reusable packaging as more

contaminated than the disposable one (Johnson-Neyman point at $M>4.37$; 59% of the participants). In addition, participants with a high level of environmental concern were more likely to repurchase (Johnson-Neyman point at $M>5.62$; 45% of the participants) and recommend (Johnson-Neyman point at $M>4.77$; 75% of the participants) the reusable packaging, whereas those with a low level of environmental consciousness were less likely to repurchase (Johnson-Neyman point at $M<3.05$; 5% of the participants) and recommend it (Johnson-Neyman point at $M<1.22$; 3% of the participants).

Study 2

Method

The second study aimed to determine consumers' evaluations of reusable packaging showing signs of use. Eighty-eight participants (53 women) took part in this investigation. Their mean age was 39.8 years with a standard deviation of 12.99 years.

All participants read a scenario where they had ordered online a pot of vanilla ice cream sold in a reusable packaging, which was either in perfect condition or showing signs of usage, and were presented with a picture of the product. Both stimuli were identical in everything except the signs of wear and tear (Figure 2). The experiment followed a between-subjects design, in which each participant was randomly presented with one of the two scenarios.



Figure 2. Neat (left) and dented (right) packages shown in Study 2.

The scales, measurements and reliability tests were the same as those used in study 1. Thus, the participants were asked to rate their attitude towards the product ($\alpha=0.97$), the perceived

healthiness, the perceived quality ($\alpha=0.92$), the packaging eco-friendliness ($r=0.74$), the contamination perception of the packaging ($\alpha=0.74$), their safety concerns ($r=0.86$) and the attractiveness of the packaging ($\alpha=0.97$). The participants were also asked to rate their intention to repurchase the product ($\alpha=0.98$) and their intention to recommend it ($\alpha=0.97$).

Additionally, the same individual characteristics were also assessed: disgust sensitivity ($\alpha=0.81$), environmental consciousness ($\alpha=0.93$), involvement ($\alpha=0.93$), attitude towards reusable packaging ($\alpha=0.99$) and familiarity with reusable packaging.

Results

The results of an ANCOVA analysis using attitude towards reusable packaging as a covariate (Table 2) show that participants showed less positive attitude towards the dented packaging ($F(1,85)=14.67$, $p<.001$). Products in the dented packaging were considered less qualitative ($F(1,85)=12.88$, $p<.001$), and the dented package was perceived as more contaminated ($F(1,85)=14.21$, $p<.001$), less safe ($F(1,85)=5.86$, $p=.018$) and less attractive ($F(1,85)=36.42$, $p<.001$) than the neat one. Overall, the results suggest that the participants are less inclined to repurchase ($F(1,85)=2.91$, $p=.091$) and recommend ($F(1,85)=5.53$, $p=.021$) a reusable packaging when it shows signs of wear and tear.

	Neat packaging	Dented packaging
Attitude	5.36 (1.70)	4.29 (1.63) ***
Healthiness	4.21 (1.09)	3.83 (0.80)
Quality	5.21 (1.04)	4.53 (1.03) ***
Packaging eco-friendliness	5.77 (1.26)	5.70 (1.16)
Contamination perception	2.84 (1.25)	3.67 (1.16) ***
Safety concerns	5.38 (1.55)	4.73 (1.52) *
Packaging attractiveness	5.40 (1.37)	3.78 (1.37) ***
Repurchase intention	4.85 (1.86)	4.41 (1.79) †
Intention to recommend	4.99 (1.74)	4.38 (1.75) *
*** $p<.001$; ** $p<.01$; * $p<.05$; † $p<.10$		

Table 2. Descriptive statistics study 2.

Conclusions

This paper contributes by showing that while consumers are very positive about the concept of reusable packaging, in practice some aspects of its use (such as the presence of signs of usage) may hinder its acceptance. Results also show that when there is no sign of usage on the package, consumers do not seem to evaluate sensitive products (i.e. dairy products) more negatively when proposed in a returnable packaging, which contradicts the initial views of Coelho et al. (2020). However, it should be noted that our results are based on a study conducted in an online experimental setting. A field study with real packaging could further enhance the ecological validity of our findings. In addition, this study focusses on returnable packaging, which is one specific type of reusable packaging. Future research could examine whether signs of usage on other types of reusable packaging systems (such as refillable packaging) are perceived as negatively and hinder the evaluations and reuse of such packages. Finally, further research is needed to understand how the design of the packaging system can counteract the negative associations to reusable packaging.

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