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3 **Packaging-free shopping: when retailers and consumers (re/mis)appropriate packaging**
4 **functions**
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19 **Abstract**

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21 **Purpose** – Packaging-free shopping disrupts the usual retailing and consumption patterns in
22 which packaging usually plays a central role. When manufacturers no longer offer pre-
23 determined packaging, how do retailers and consumers ensure packaging functions?
24 Investigating the way actors appropriate packaging functions during use is particularly
25 important because they exert a new power over these functions, which can be challenging to
26 appropriate. The objective of this research is to contribute to a deeper understanding of why
27 packaging-free shopping can be perceived as constraining and therefore even be abandoned.
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31 **Methodology** – Drawing from the literature on packaging functions and adopting Miller's
32 conceptual framework of appropriation, this research uses a qualitative method with a variety
33 of discursive and visual data, including 54 interviews with experts from packaging-free product
34 stores and consumers, 190 Instagram consumer posts, and 428 in-store and at-home
35 photographs.
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39 **Findings** – This research (1) shows that actors jointly appropriate packaging functions through
40 two modes of appropriation (assimilation and accommodation) each encompassing distinct
41 strategies and (2) highlights the misappropriation that actors can experience, especially when
42 prioritizing one function over another.
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46 **Originality** – This research contributes to the literature on packaging-free shopping, an
47 emergent and growing trend that challenges conventional shopping models. The research
48 reveals dark sides of packaging-free shopping – namely, the damaging effects on health and the
49 environment and social exclusion. In particular, it discusses the ambivalence of the packaging-
50 free shopping environmental function. This research also deepens insight into how individual
51 acts of appropriation may lead to misappropriation.
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55 **Keywords** Packaging functions, Packaging-free shopping, Appropriation, Sustainability
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59 **Research type** Research paper
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1. Introduction

The average European produces 180 kilos of packaging waste every year¹, contributing to greenhouse gas emissions and environmental issues (Lembregts and Cadario, 2024). One way to tackle this problem is to adopt measures to prevent consumers from producing packaging waste at the source, such as selling products without packaging, in quantities chosen by the consumer and in reusable containers – that is, packaging-free shopping (Louis *et al.*, 2021). Overall, the packaging-free sector has gained attention in the past 5–10 years. Long-term forecasts, while speculative, present a mid-estimate EU market for bulk goods of €1.2 billion by 2030, with best-case potential being significantly greater (Zero Waste Europe, 2020). Despite this growth, adopting packaging-free shopping necessitates a shift from established routines and a relinquishment of the convenience associated with traditional packaged goods, a transition that presents significant challenges.

While the literature on packaging affirms the central role of this “silent salesperson” (Pilditch, 1957), it pays little attention to the effect of its disappearance (Magnier and Crié, 2015; Monnot *et al.*, 2015). Yet a real change is currently underway, as packaging-free shopping retailers and consumers must adapt to ensure the continuity of packaging’s functions: logistical, marketing, and environmental (Prendergast and Pitt, 1996; Underwood, 2003). According to Ağlargöz and Ağlargöz (2024, p. 137), “removing packaging from the practice of shopping is problematic because of the functions it performs. Packaging-free shopping can be criticized because it transfers the functions of the packaging to consumers as an extra burden.”

Packaging-free shopping represents a challenge for both consumers and retailers (Daniel *et al.*, 2022) as both actors need to cope with the loss of packaging and appropriate new ways of doing to replace the vanished packaging (Beitzen-Heineke *et al.*, 2017). Fuentes *et al.*’s (2019) work shows that the removal of packaging necessitates reinventing the shopping practice not only in-store but also at the consumer level.

Previous research on packaging-free shopping focuses on the adoption of this alternative shopping method and the barriers that limit it, such as product availability, perceived cost to bring own containers, or inconvenience in carrying containers (e.g., Beitzen-Heineke *et al.*, 2017; Louis *et al.*, 2021; Marken and Hörisch, 2019). Research also shows that consumers’ propensity to adopt packaging-free products depends on norms and values (Gordon-Wilson *et al.*, 2022). While research has examined the adoption of packaging-free shopping, it has not

¹ https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7155

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3 specifically address appropriation – a subsequent phase centered on the ‘use’ of this practice
4 necessary for its integration into daily routines (Warde, 2005). Studies on appropriation (e.g.
5 Rabiou and Jaeger-Erben, 2022; 2024; Carroll, 2004) suggest that adoption and appropriation
6 represent distinct stages of consumer behavior that require separate investigation.
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10 Investigating appropriation, which highlights the complex relationship (Sartre, 1943;
11 Miller, 2009) between an individual and an object (i.e., packaging), seems necessary as
12 packaging-free shopping implies new ways of doing (De Certeau, 1980). While manufacturers
13 traditionally offer packaging that ensures all functions, how do packaging-free shopping actors
14 take this responsibility and appropriate the packaging’s functions? We suggest that examining
15 the way actors appropriate packaging functions during use is particularly important as they exert
16 a new power over these functions. Packaging functions represents an object which can be
17 challenging to appropriate, due to their intangibility and multifaceted nature (Prendergast and
18 Pitt, 1996). Understanding the mechanisms involved in appropriating packaging functions
19 could help marketers develop effective strategies to engage over the long run both consumers
20 and retailers in this new consumption pattern and distribution method.
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29 We used Miller’s (1987) conceptual framework of appropriation considering that in
30 situations of appropriation, the interaction between a subject and an object is expressed through
31 processes of assimilation and/or accommodation. We conducted a qualitative study that
32 analyzes discursive and visual data, including 54 interviews with experts from packaging-free
33 product stores (N = 10) and consumers (N = 44), 190 Instagram consumer posts, 322 in-store
34 photographs, and 106 at-home photographs. This research adopts a multiple-stakeholder
35 perspective (De Temmerman *et al.*, 2023a).
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41 Our findings (1) show that consumers and retailers, who jointly appropriate packaging
42 functions, use two modes of appropriation (assimilation and accommodation) including
43 different strategies and (2) highlight the misappropriation that actors can experience, especially
44 when prioritizing one function over another. In addition, the research reveals dark sides of
45 packaging-free shopping – namely, the damaging effects on health and the environment and
46 social exclusion. Our research shows the ambivalence of the environmental value of packaging-
47 free shopping despite its promise. Thus, our research extends the literature on packaging-free
48 shopping (e.g., De Canio *et al.*, 2024; Louis *et al.*, 2021; Scharpenberg *et al.*, 2021) by adopting
49 an original angle – that of appropriating the functions of packaging from the point of view of
50 both consumers and retailers and revealing the ambivalent nature of packaging-free shopping.
51 By applying the concept of appropriation to a new specific case, this research also deepens
52 insight into how individual acts of appropriation may lead to misappropriation. While research
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3 has examined the modes of appropriation, our findings also emphasize its undesirable
4 outcomes. This aligns with Miller's invitation not to associate his work "entirely with a positive
5 ideal of appropriation" (Slater and Miller, 2007, p. 6).
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10 **2. Conceptual framework**

11 12 13 **2.1. Packaging functions**

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15 Marketing research has investigated packaging for many years (Stewart, 1995; Underwood,
16 2003), with some studies focusing on its attributes (e.g., size, shape, materials, images, colors).
17 According to Prendergast and Pitt (1996), packaging performs several functions on account of
18 its attributes.
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22 First, packaging performs a "logistical" function of preservation, protection, and storage
23 throughout the distribution supply chain, by limiting the impact of external harms, particularly
24 during transport. This involves choosing materials that preserve the product's physical integrity.
25 Packaging facilitates storage and its optimization in warehouses to avoid losses. At the interface
26 between logistics and marketing, it also provides convenience of handling, transport, and
27 storage for both sellers and consumers. Packaging can improve usage performance owing to its
28 ergonomics. The aim is to simplify access to the product, reassure consumers of its safety, make
29 safety precautions easy to understand, and facilitate handling (Holmes and Paswan, 2012),
30 dosing, and use (Folkes *et al.*, 1993; Wansink, 1996). Following Hoch and Deighton's (1989)
31 work on product use, some studies show the influence of product shape on perceptions of
32 functional performance, such as aerodynamics or durability (Hoegg and Alba, 2011).
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41 Second, packaging has a "marketing" function of recognition, attraction, information, and
42 positioning, as it is at the interface between products and consumers. A product's color and
43 shape, in particular, serve to attract consumers in stores. Packaging has an informational
44 function and conveys a certain image: it provides verbal information about the product, its
45 content, and the way it is manufactured or should be used (Rettie and Brewer, 2000). Packaging
46 also serves a strategic purpose of brand positioning and visual stimulus (Briand-Decré and
47 Cloonan, 2019; Chen, 2021; Underwood *et al.*, 2001) where decisions are made (on the shelf).
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53 Finally, packaging has an "environmental" function in response to consumer demands
54 and regulatory pressures (Ağlargöz and Ağlargöz, 2024; Murtas *et al.*, 2022). This function
55 entails the ecological efficiency or impact of packaging (Herbes *et al.*, 2020; Schwepker and
56 Cornwell, 1991) characterized by limiting the packaging size or overpackaging and reusing or
57 using recycled or recyclable materials (e.g., Aydinliyim and Pangburn, 2012; Magnier and Crié,
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3 2015; Monnot *et al.*, 2015). Packaging can also be a lever for action to limit waste by taking
4 better account of uses (e.g., better-sized or resealable packaging) (Wikström *et al.*, 2019). Thus,
5 the product's life cycle must be considered, giving priority to eco-design (Ketelsen *et al.*, 2020;
6 Zeng *et al.*, 2020). However, the environmental function raises the question of the trade-off
7 between the packaging's technical ability to protect the product and the limitation of its
8 ecological footprint.
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14 Actors are willing to adopt packaging that adequately fulfills all functions, including
15 environmental ones, without compromising others. A radical alternative for limiting the
16 ecological impact of packaging is therefore to eliminate it, through packaging-free shopping.
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20 21 **2.2. Packaging-free shopping**

22 Packaging-free shopping is a consumption pattern and distribution method that is receiving
23 increasing attention in the marketing literature. It is a response to the need to adopt more circular
24 practices (Rabiu and Jaeger-Erben, 2022) to avoid packaging waste and pollution, to reduce
25 resource consumption, and to decrease transport costs (e.g., Beitzen-Heineke *et al.*, 2017; Louis
26 *et al.*, 2021; Rapp *et al.*, 2017; Zeiss, 2018). This “alternative” shopping method (De
27 Temmerman *et al.*, 2023a) contrasts with traditional retail experiences, in which manufacturers
28 offer products with packaging. Packaging-free shopping requires consumers to break their
29 established routines and give up the convenience of packaged shopping. To replace
30 manufacturers' packaging, consumers must use either simplified store-provided packaging or
31 their own containers (Louis *et al.*, 2021). They need to weigh their empty containers, fill them
32 with products, and then weigh the full containers before paying (Gordon-Wilson *et al.*, 2022).
33 Consumers need to understand how this consumption works and be able to identify products,
34 choose the right containers, and know how to compensate for the lack of product information.
35 Packaging-free shopping also needs a change in the relationship to food in general and to
36 cooking in particular (Beitzen-Heineke *et al.*, 2017; Zeiss, 2018). Consumers no longer have
37 direct access to the food preparation or preservation advice originally appearing on the
38 packaging; instead, they have direct contact with the raw product, with no sanitary barrier.
39 Retailers also need to do things differently; they must ensure product hygiene and food safety,
40 because products are no longer protected, and also convey information in a different way (Louis
41 *et al.*, 2021). Packaging-free shopping represents a challenge for both consumers and retailers,
42 which goes against the dominant consumer culture (Lu, 2024).
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58 Previous studies on packaging-free shopping have addressed both its barriers and drivers
59 and the variables that may influence its adoption. First, regarding barriers to packaging-free
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3 shopping, research identifies a lack of awareness of and information on the existence of the
4 offer, a reduction of products' range, and the inconvenience associated with the need to plan
5 purchases, carry own containers, and increase shopping time (Louis *et al.*, 2021; Marken and
6 Hörisch, 2019). Some studies propose segmenting consumers by the barriers to and facilitators
7 of package-free shopping and identify three types of consumers: "proximity shoppers", "quality
8 and health seekers" and "minimal waste buyers" (De Temmerman *et al.*, 2023b). Nevertheless,
9 studies also note several advantages of packaging-free shopping, such as lower prices,
10 customization, reduced food waste, and support of local or sustainable suppliers (Ağlargoğ and
11 Ağlargoğ, 2024; Scharpenberg *et al.*, 2021). Second, some studies (De Canio *et al.*, 2024;
12 Fuentes *et al.*, 2019; Gordon-Wilson *et al.*, 2022), using different theoretical perspectives (e.g.,
13 theory of planned behavior, cognitive science model, socio-psychology model, practice theory)
14 (Romanillos *et al.*, 2024), show that consumers' propensity to buy packaging-free products
15 depends on social and personal norms, group conformity, green consumer values, or
16 conscientiousness.

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Studies on packaging-free shopping focus mainly on one actor (i.e., consumer/household
or retailer), though a few studies adopt a multiple-stakeholder perspective (e.g., De Temmerman
et al., 2023a). They also tend to focus either on retail stores implementing the packaging-free
business model (Daniel *et al.*, 2022; Fuentes *et al.*, 2019) or on general retail stores offering
both packaged and packaging-free products (Beitzen-Heineke *et al.*, 2017) to evaluate the
impact on brand image, brand trust, satisfaction, and customer loyalty (Barbosa *et al.*, 2023).

In summary, packaging-free shopping literature centers mainly on the adoption of this
alternative shopping method and on the factors that encourage or limit this adoption, but it does
not investigate how both retailers and consumers ensure the continuity of packaging's functions
when pre-determined packaging disappears. This dearth leads us to adopt the concept of
appropriation, as a (re)appropriation of packaging functions occurs in this context.

2.3. Appropriation: an enlightening framework

Appropriation, which deals with how individuals come into possession of something and make
it their own (Sartre, 1943), highlights the complex relationship between an individual and an
object. The field of research that initially investigated appropriation is environmental
psychology, which understands the interaction between people and either physical objects or
places, which includes the types of actions in the environment that result in possession
relationships (Fischer, 1981). Appropriation, which extends beyond mere acquisition, is an
inherent process within consumption, defined as "a process whereby agents engage in

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3 appropriation and appreciation” (Warde, 2005, p. 137). Appropriation is understood as a phase
4 following adoption, centered on usage. In their study on technology appropriation, Carroll *et*
5 *al.* (2002, p. 2) identify distinct stages within the appropriation process, wherein an object is
6 “adopted, shaped, and then used”. Possession without active use does not constitute
7 appropriation.
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11 To appropriate a consumption experience (Carù and Cova, 2006), individuals are guided
12 to make choices by following certain “paths” (Ladwein, 2003; De Certeau, 1980). The
13 development of a “pathway style”, and the manner in which they appropriate an object, emerges
14 through action (for instance for food: touching, preparing, tasting, and “reaccommodating”).
15 Thus, it becomes essential to examine the appropriative processes and particularly acts that
16 shape the consumption experience. Moreover, appropriation is a temporal process through
17 which the consumer experience evolves. Over time, appropriation grants consumers a degree
18 of expertise within the consumption context, allowing them to optimize the quality of their
19 experience progressively (Ladwein, 2003). Throughout the appropriation process, consumers
20 assess costs and benefits while identifying constraints that they navigate through various coping
21 strategies (Rabassa *et al.*, 2022; Carroll *et al.*, 2002).
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31 To build our research framework we used a general model of appropriation based on
32 Miller’s (1987) approach in his work on materiality. Miller considers that in situations of
33 appropriation, the interaction between a subject and an object is expressed through processes
34 of assimilation and/or accommodation. Assimilation is the modification of the object by the
35 knowledge schemas or structures available to the subject. For example, consumers may
36 assimilate a new product into a similar one they already use, enabling them to quickly
37 understand its functioning and incorporate it into daily routines without requiring major
38 changes. Accommodation refers to a more or less significant modification, or adjustment, of
39 the subject’s schemas in response to the resistance of objects to their assimilation. This implies
40 a transformation of cognitive schemas to better adapt to new realities. For example, consumers
41 may come across a new product or technology that requires a completely different
42 understanding and use. In this case, they must adjust their existing cognitive schemas to
43 accommodate this new reality. According to Miller’s (1987) theory of appropriation the
44 appropriation process enables consumers to assign personal meaning to objects and to distance
45 themselves from externally standardized and imposed meanings onto objects. Nevertheless,
46 appropriation can also lead to a form of alienation, as objects may become sources of
47 dependency, often resulting in overconsumption (Miller, 2001; Slater and Miller, 2007). Thus,
48 appropriation and alienation are intricately linked in a complex and dynamic relationship.
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3 Applied to the context of packaging-free shopping, the appropriation framework is
4 highly relevant because: First, beyond adoption, the appropriation process is fundamental to
5 understand how individuals learn, understand, and integrate new information and ways of doing
6 things into their daily lives. We want to study the acts of appropriation, the actions of
7 individuals. To do so, assimilation and accommodation are of particular interest because they
8 are often considered coping strategies in the appropriation process (Hanfstingl *et al.*, 2022).
9 Second, actors need to ensure the packaging functions and to exert power over the object of
10 appropriation. Miller's (1987) perspective is particularly relevant when consumers perceive
11 packaging-free shopping as a means of emancipation from conventional market practices.
12 Moreover, the appropriation of functions is intangible (functions are immaterial) and multiple
13 (several functions at once; Prendergast and Pitt, 1996). The appropriation studied here therefore
14 presents an original but also, and above all, complex case, which leads us to hypothesize a
15 possible difficulty in appropriation, from the point of view of the result of appropriation. This
16 aligns with the fact that appropriation, viewed as both a process and an outcome, can either
17 succeed or fail (Proshansky *et al.*, 1970) with the process sometimes resulting in
18 misappropriation.
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22 Finally, as appropriation highlights the relationship between consumers and objects, it
23 seems promising to apprehend the way consumers deal with the appropriation of packaging
24 functions when packaging is no longer provided by manufacturers. Using this framework, our
25 research objective is to understand the processes by which consumers and retailers connect the
26 absence of packaging with the appropriation of its functions so that they can reinvest in the
27 object and appropriate it properly.
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31 In light of the insights provided by the literature on appropriation, several questions
32 emerge regarding the appropriation of the object under investigation in this research: how do
33 packaging-free shopping actors appropriate the packaging's functions? What strategies do they
34 develop? Do they take on all the functions or only some? Do they succeed in appropriating and
35 maintaining control over this process of appropriation?
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3. Methodology

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54 This study focuses on the French context; packaging-free shopping has existed in France for
55 several years now, but it has also recently led to the opening of a variety of specialist and non-
56 specialist stores and will likely continue doing so in the coming years. Indeed, by 2030, French
57 law will require retailers to dedicate 20% of their sales floor space to packaging-free products.
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3 This context is therefore suitable to examine how actors deal with packaging-free shopping. To
4 answer our research question, we used a qualitative approach comprising complementary
5 methods: discursive and visual data from both retailers and consumers who participate together
6 in the appropriation process.
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10 We signed a research contract with a well-known organic French retailer, which
11 facilitated access to the field and especially interviews with experts from packaging-free
12 product stores. We interviewed department and store managers from 10 specialist packaging-
13 free stores (Appendix). We discussed the specific features of a packaging-free product
14 department compared with a conventional one, including organization, merchandising, and
15 customer relationships. The interviews were augmented by a store tour, which allowed us to
16 focus more on the material aspects of the practices and illustrate what was discussed during the
17 interview. During the tour, we took photographs (N = 322) to conserve illustrations of
18 materiality.
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25 To examine both retailers' and consumers' ways of appropriation, we carried out a
26 mirror analysis by conducting a series of interviews with consumers. We interviewed 44
27 consumers who buy packaging-free products, focusing on the following main themes:
28 packaging-free shopping meanings, consumer material organization and purchasing process
29 (e.g., choice, use of containers), and constraints and advantages of this type of shopping. We
30 recruited these consumers on a voluntary basis from our personal networks or our partner
31 retailer. The discussions constitute a whole discourse related to packaging functions and the
32 way the respondents appropriate them. As we did during the store visits, we also collected
33 photos (N = 106) of the hardware devices present in respondents' homes that they told us about
34 during the interviews; these enabled us to directly illustrate what they said. Photographs reflect
35 people's representations of the world. They are embodied in the society in which they are
36 produced and consumed, enabling us to understand consumers' behaviors and consider the
37 cultural meanings of their practices (Ndione and Remy, 2018).
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48 We also collected data on Instagram. Research is increasingly using this social
49 networking service given its popularity (Rokka and Canniford, 2016) and the privileged access
50 to consumers' practices embodied in their lifestyles (Baker and Walsh, 2018). This tool is
51 particularly relevant in our context because many consumers engaged in the zero-waste
52 movement are active on Instagram (Spiteri, 2021), on which they share their everyday practices.
53 More generally, people use Instagram to promote their lifestyles with photographs and written
54 texts (Spiteri, 2021). Thus, it is a valuable source to capture emerging practices and understand
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3 the material and physical packaging objects. We collected 250 Instagram posts using #vrac²
4 and then cleaned up the database by deleting posts that were irrelevant to the study (unrelated
5 to packaging-free shopping). Next, we carried out content analysis of the texts and photographs
6 of the 190 posts we finally selected. The texts associated with images and hashtags provided
7 access to meanings consumers gave to their choices. In particular, the images allowed us to
8 visualize which containers actors chose and their physical characteristics. We used a software
9 program to transform photographs into drawings to respect the copyright and preserve the
10 anonymity of data.

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12 We proceeded to a thematic analysis for both discursive textual and visual data. For the
13 Instagram data, we took care to associate pictures with texts. Indeed, this process was a
14 safeguard to avoid the overinterpretation of visual data, which can be a risk of this methodology.
15 First, the literature on packaging functions provided a preliminary framework for data analysis.
16 We assessed the data to identify the functions uncovered by previous researchers. Second, the
17 data also presented new marketing functions, such as aesthetic and decorative ones. This
18 inductive approach allowed us to identify strategies of appropriation.

30 **4. Findings**

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34 If packaging is no longer provided by manufacturers, both retailers and consumers must adopt
35 new ways to perform the packaging functions and appropriate them. The findings identify two
36 appropriation modes for both actors: assimilation and accommodation, and strategies to do so.
37 They also highlight a possible misappropriation and dark sides of packaging-free shopping –
38 namely, its damaging effects on health and the environment and social exclusion.

44 **4.1. Appropriation strategies of packaging functions: assimilation or accommodation**

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46 To ensure packaging functions, actors adopt a strategy of either assimilation or accommodation.
47 Assimilation focuses on imitating typical objects and their attributes, whereas accommodation
48 aims to imagine new objects and develop new skills. Assimilation is a way to rely on
49 manufacturer habits and knowledge, whereas accommodation transforms usage.



54 *4.1.1 Appropriation by assimilation: a focus on familiar packaging and its attributes*

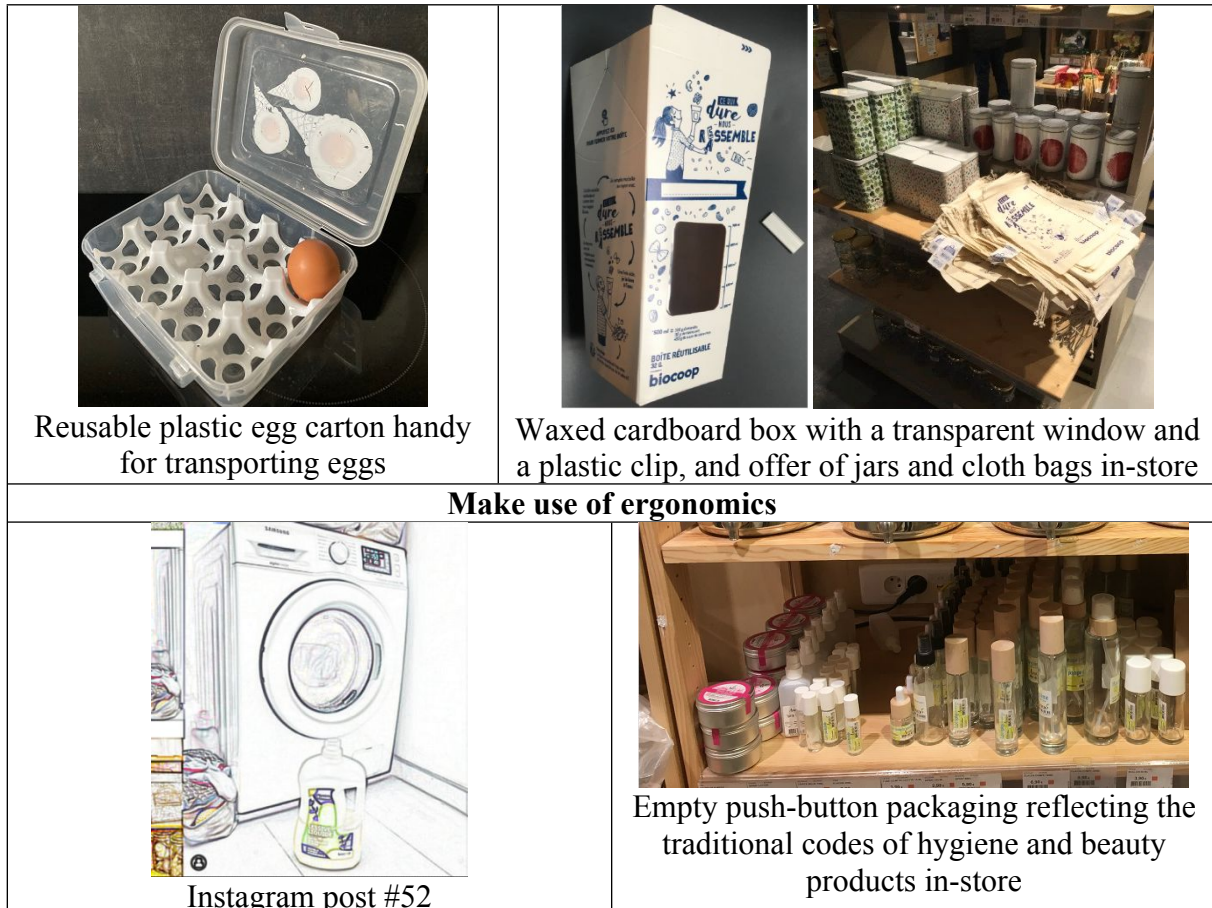
60 ² *Vrac* is the French word for packaging-free shopping.

Packaging-free actors can stick with the dominant model to appropriate the packaging functions. Our data reveal a large number of examples that show that actors imitate an industrial model to which they have been accustomed. To achieve the appropriation process, consumers use their familiarity with usual manufacturers' packaging and reproduce both traditional objects and gestures. They can imitate all or parts of traditional manufacturers' packaging for which they have identified attributes that ensure specific functions.

Assimilating to appropriate logistics functions. Both retailers and consumers must ensure the conservation and protection of packaging-free products. To do it, they reproduce habits. Some consumers reuse industrial packaging, such as egg cartons and dishwashing detergent cans, that has proved its worth for these functions, while avoiding waste as it is repurposed. Another example is retailers' use of opaque bottles to preserve the organoleptic qualities of specific products, such as oil. Packaging-free actors also imitate some traditional packaging to simplify transport because of its ease of handling (e.g., a handle) or weight (e.g., cardboard box). Retailers can offer consumers a variety of formats, as in traditional distribution (e.g., glass or cardboard containers, bags). Assimilating also aims to retain the ergonomic advantages. The laundry detergent can is an example in this respect, as the size of the neck makes it easy to fill when serving in-store or consuming at home. Figure 1 illustrates assimilation to facilitate logistics functions.

Figure 1 Assimilation of packaging attributes to appropriate logistic functions

Preserve the product	
 <p>Instagram post #23 “Packaging-free curry, a little bit of olive oil (which I’ll decant into my tinted bottle so as not to spoil it).”</p>	 <p>Opaque oil bottles displayed near the oil service device in-store</p>
Ease transport	



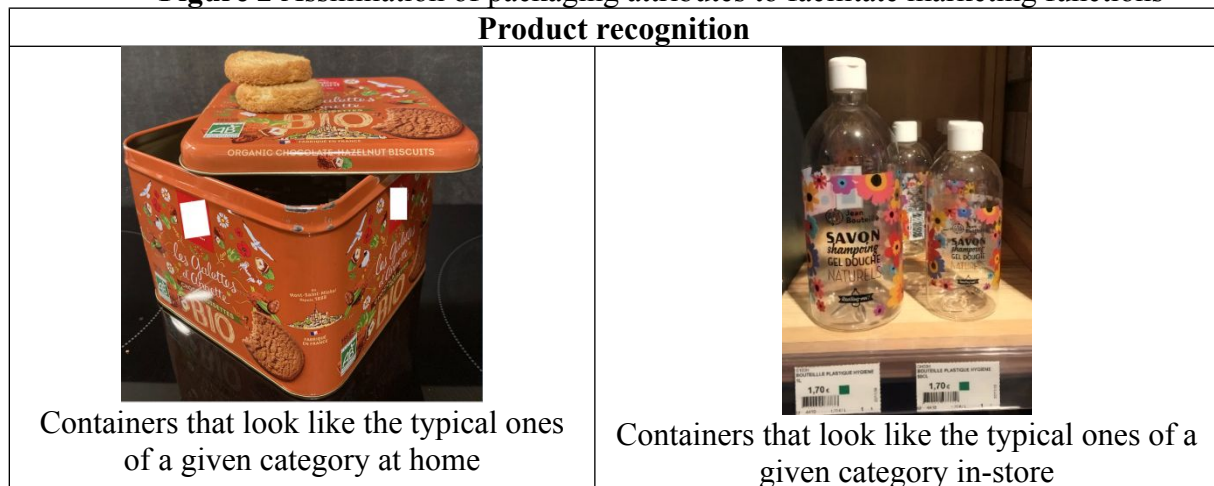
Assimilating to appropriate marketing functions. Regarding recognition, consumers are becoming accustomed to standardized packaging typical of a product category that they try to reproduce (e.g., laundry detergent with a handle). Retailers also provide customers with empty containers that are typical of the product category. Some even go so far as to offer pre-filled packaging close to packaging-free products' devices, so that customers have no doubts about the product category.

The elimination of packaging as an information medium means that information must be conveyed in a different way. For retailers, the containers encompass the information required by law (e.g., origin, composition) and sometimes other potentially value-creating information (e.g., recipes, information on the supplier): "Information is key: origin, certification, organic, ingredients, allergens, cooking tips. But the question is, how do we convey this information without packaging? The power of brands is necessarily weaker in packaging-free practice. Labeling really needs to be homogenized" (expert, store 4). Retailers tend to imitate how information is usually provided by packaging by placing it in service containers.

Some retailers also partly reproduce the positioning function of packaging when they offer branded packaging-free products. In particular, they display the logos of these brands on

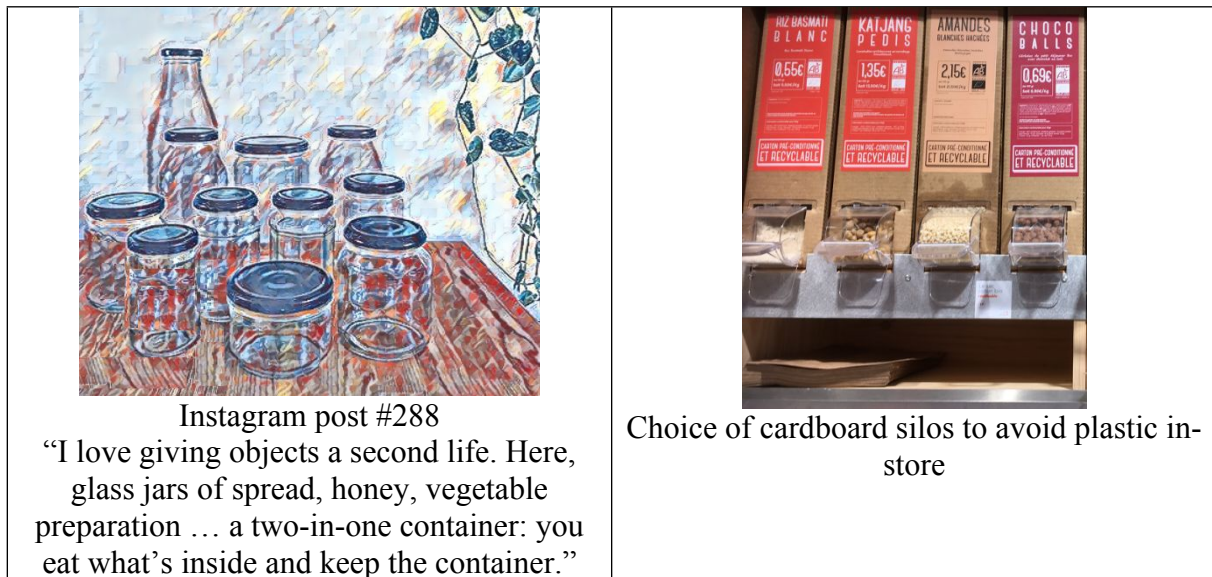
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3 silos. However, the specific universe of these brands, generally conveyed on the industrial
4 packaging through own brand graphic design and identity, is not reproduced in an elaborate
5 way on service containers, which all look the same. No longer is a brand's positioning
6 conveyed, but rather the retailer's, depending on the choice of containers and furniture.
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8 Consumers also appropriate this positioning function by assimilating industrial packaging that
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10 conveys a specific positioning for the product, such as an iron box for biscuits (Figure 2).
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15 **Figure 2** Assimilation of packaging attributes to facilitate marketing functions



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33 *Assimilating to appropriate environmental functions.* Actors choose to adopt containers they
34 view as having the least impact on the environment when this function is important for them
35 (Figure 3). They tend to think in terms of packaging material, such as glass or cardboard rather
36 than plastic, and associate reduced environmental impact with other aspects such as packaging
37 reduction, reuse and deposit. “For product conservation, glass is an alternative to plastic that
38 doesn't pollute, so why not put everything in glass ... when you want to buy yoghurt, it's made
39 of plastic, but it could be made of glass... It's called a deposit. In Germany, all glass bottles are
40 returnable” (Régis).
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51 **Figure 3** Assimilation of packaging attributes to reduce environmental impact



4.1.2. Appropriation by accommodation: a focus on new objects, practices and skills

Beyond assimilation, our data reveal an appropriation that deviates from the dominant model and norms.

Accommodating to appropriate logistic functions. Actors can choose to do things differently by adopting specific logistic practices. To ensure products' preservation, they adapt the storage by keeping them away from light and moisture. It is not the packaging that ensures preservation, but the storage practice. To ensure handling and transport, consumers adapt their transport mode to the containers. For example, Maïté equips her bike with a basket: "It [packaging-free store] is less than a kilometer from my house, so I walk or cycle. I've actually got two baskets from an old auntie that I've fitted to my bike." Another practice that is moving away from standard industrial packaging is the adaptation of containers' organization to facilitate storage. Actors ensure an ergonomic use by using complementary objects (Figure 4).

Figure 4 Accommodation from packaging attributes to appropriate logistic functions

Preserve, protect, and store the product

 <p>Instagram post #169 Square containers to avoid losing any storage space</p>	 <p>Tea presented in a special box with drawers that include closed stainless-steel cases in-store</p>
Facilitate product use	
 <p>Use of specific tools, such as this spaghetti measurer, to evaluate the product quantity</p>	 <p>Provision of funnels in-store to help consumers fill their jars</p>

Accommodating to appropriate marketing functions. Some actors appropriate the marketing functions by creating new practices (Figure 5), such as arranging containers to appropriate the recognition function. Marthe explained: “When I open my drawer, I can see everything on the top, it’s all written down. I don’t have to lift the jars to find out what’s inside. There is also the strategy of turning them upside down to see through the glass.” The recognition function can be enhanced by actors’ skills in dealing with raw products, which is facilitated by the silo transparency. The merchandising strategy brings products more or less to the fore.

Some retailers also emancipate from information that is traditionally conveyed by packaging by limiting it to what is actually essential for customers. For example, one retailer only indicates on the jars’ cap the name of the spice, the composition of its blend, the price per kilo, and the origin. On the consumer side, the product name only serves to ensure recognition. Other retailers provide extra information (e.g., recipes, product cooking times) by displaying leaflets directly under the silos or using specific devices. The seller’s advice also plays a key role, as the experts testified.

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3 The positioning function is most often an aesthetic function that implies complete
4 redesign to reflect one's image. While packaging is no longer a reflection of a brand, it is
5 undeniably a reflection of its owner's identity. Containers are sometimes chosen with care, in
6 an "ecolo chic" approach. Some materials are also chosen because of their cultural affinities,
7 such as African fabric, also called wax. Containers are a means of self-expression and allow
8 consumers to appropriate the practice when they are homemade and perfectly adapted to their
9 specific tastes.

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15 Retailers' positioning is also affected. Indeed, some supply containers, from recycled
16 versions to branded ones, to take brands' place. However, many retailers have stopped offering
17 self-service containers, in line with their zero-waste positioning: "Our aim is to eliminate
18 packaging, so we encourage consumers to bring their own containers. This is consistent with
19 our positioning. As soon as a product exists in bulk, we remove the packaged product reference"
20 (expert, store 3). While packaging-free product retailers have yet to develop standardized
21 merchandising practices, they often break with the tradition of using aisle after aisle and
22 reinvent the sales space to showcase products differently. The containers they choose are an
23 important source of differentiation. While silos are common for dry goods, they coexist with
24 other, more original artisanal or even "homestyle" merchandising. Featured are jars of all
25 shapes and sizes, recycled bottles, containers for liquids in different shapes and materials,
26 baskets for toilet paper, and clothesline wire for sanitary towels, to name a few.

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36 To appropriate the marketing function, actors use their decorative abilities. This trend is
37 embodied in the use of hashtags (e.g., #homedeco, #insidedecoration, #sweeti). Many posts
38 show decoration in kitchens. The packaging, which consumers choose to be perfectly suited to
39 the locations in which they put it and to sublimate the products it contains, does not end up
40 throw away or hidden. It is displayed like works of art on shelves or in cupboards that become
41 real showcases. Consumers are therefore creative: assortment of jars, use of vintage handwritten
42 labels, noble materials, and original shapes (e.g., test tubes for spices, a wrought-iron hen for
43 eggs). The transparency of the containers also contributes to this aesthetic function, enhancing
44 the natural colors of the products.

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53 **Figure 5** Accommodation from packaging attributes to appropriate marketing functions

54 **Facilitate recognition**

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Instagram post #218

“When you open your drawer and tell yourself that you don’t regret a single moment of going zero waste”



Shelf labeling in-store

Limit information



Instagram post #121 (at home)

“This morning, I open my cupboards to you. They’re not perfect, but now, for me, zero waste is almost a non-issue.”



Instagram post #1 (in-store)

“This ‘boutique-café’ is THE definition of packaging-free product consumption as I see it: choice, advice, quality, organic, local and short-distance as much as possible, surprises and discoveries.”

Create an aesthetic homestyle and decorations



Instagram post #19

“Buying packaging-free products, cooking seasonal products. It’s a new pleasure to be in the kitchen!”



Instagram post #1

“I went to Rosheim today to meet Marie-Ange and her dreamy packaging-free product store!”



New ways of merchandising products in-store

Accommodating to appropriate the environmental function. To meet the definition of packaging-free shopping, which consists of using reusable containers, actors emancipate from traditional packaging to reduce environmental impact (Figure 6). They first reuse and limit the amount of packaging. Consumers take the packaging provided for free by retailers: “We often take the cardboard boxes in which they [retailers] receive the products; they make them available to the customer at the store entrance.... Once home, we store in our jars” (Régis). This desire to reuse packaging can also lead consumers to disentangle the transport container (e.g., a reusable bag) from the storage container (e.g., a reusable jar). Doing so also satisfies the transport function, by limiting the weight to carry, and the preservation function, by avoiding loss or breakage.

Packaging-free shopping may generate new uses for which traditional containers cannot simply be copied. Retailers and consumers choose containers to fit the content according to product shape and/or quantity. Doing so avoids taking up too much space with half-empty containers (e.g., small ones for spices) or wasting, which matches meanings of packaging-free practice: “I have the biggest jars for rice, pasta, couscous, and smaller jars for small chocolates, dried fruit [and so on]” (Julia). This container optimization helps limit the environmental impact of transport. In Instagram post #61, a home-delivery packaging-free product retailer sends containers adapted to the products they contain and their quantity; no space is wasted, and a strap is used to ensure that the jars do not open during transport. Table 1 describes how packaging-free actors ensure the packaging functions for both appropriation strategies.

Figure 6 Accommodation by an optimization of packaging to reduce the impact



	
<p>Instagram post #107</p> <p>“Packaging-free shopping and storing in glass jars of different size reduces the amount of packaging, allows you to choose exactly the quantities you need and all this helps you reduce the amount of waste.”</p>	<p>Instagram post #61</p> <p>“The return slip for the package and its containers is ready and I have two months to send everything back. Under each of the boxes, there’s a small label indicating the name of the product and the cooking time, for example.”</p>

Table 1 Appropriation strategies to ensure packaging functions

Source: Authors own work

Functions		Appropriation strategies	
		Assimilation	Accommodation
Logistic functions	Conservation	Shape, opacity	Storage choices
	Handling, transport	Shape, weight	Transport mode and adaptation with accessories
	Use	Shape, resealability	Use of complementary accessories
Marketing functions	Recognition	Typical shape	Labeling, transparency of containers
	Information	Traditional labeling	Personal skills (only essential information on packaging and extra information on specific devices)
	Positioning	Brand logos display, traditional merchandising	Do-it-yourself, homemade and personalization, ambience, and design of containers
Environmental functions	Reducing impact	Materials, reuse and deposit, resealability	Reusage, containers' optimization

4.1.3. The interdependence of actors' appropriation strategies

Our findings show that the choice of a mode of appropriation depends on the actors themselves and their meanings but also on the other interdependent actors. The mode of appropriation adopted by one actor often influences the mode of appropriation adopted by another actor, and vice versa.

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3 Thus, retailers can indirectly impose a way of appropriating things on consumers. For
4 example, they can favor appropriation by assimilation (e.g., regulation creates an obligation to
5 offer containers for cleaning products that indicate their composition) and encourage customers
6 also to appropriate by assimilation, as they can opt for specific containers retailers offer: “We
7 only accept laundry detergent container of the brand that is sold and bought here. It’s a
8 constraint for consumers but it makes the process easier” (expert, store 4). In addition, when
9 retailers try to emancipate and prioritize the environmental function, they can encourage their
10 customers to follow them in their desire to reappropriate the packaging functions differently:
11 “We assume not to meet all consumers’ needs by imposing our sustainable product model that
12 generates the least waste.... Disposable kraft bags are also no longer available for consumers.
13 This leads them to bring their own reusable containers” (expert, store 3).
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22 Conversely, consumers’ appropriation can drive retailers’ appropriation. For example,
23 if consumers have problems with handling (e.g., misunderstand how a honey machine works),
24 retailers can adapt their strategy to facilitate appropriation: “We’ve reconstituted jars of ready-
25 to-sell honey in the traditional way and we’ve placed them near the packaging-free product
26 shelves. It’s packaging-free honey, consumers didn’t understand how to use the self-service
27 machine.... Now all they have to do is take the full jar. It makes the service easier” (expert,
28 store 5). Sometimes consumers do not know how to regulate a silo’s flow and take too much
29 product. To overcome this problem, retailers tend to accommodate by implementing
30 technological devices (e.g., a digital screen) that serve the exact quantity customers wish to buy.
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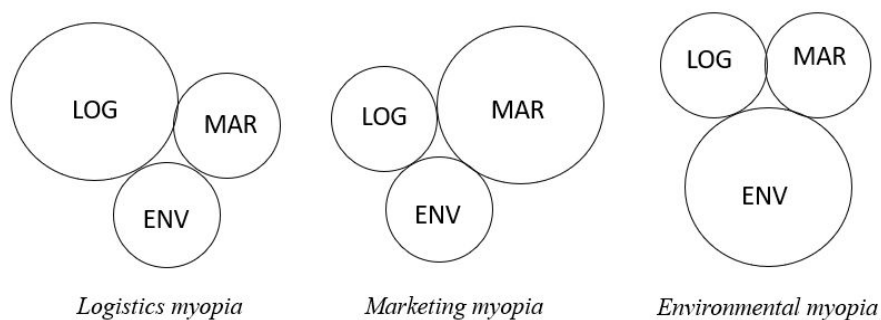
39 **4.2. Misappropriation and its dark sides**

40 *4.2.1. Toward misappropriation*

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43 An appropriation of all the packaging functions is not so easy: one function can be prioritized
44 over another, which thus generates partial appropriation and even misappropriation.
45 Appropriation strategies vary depending on the function actors primarily target (logistic,
46 marketing, or environmental). Favoring one over another can lead to packaging function
47 myopia (Figure 7). Logistics myopia refers to prioritization given to the logistics function,
48 marketing myopia to prioritization of the marketing function, and environmental myopia to
49 prioritization of the environmental function. Within the same broad function, sub-functions can
50 cannibalize each other.
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Figure 7 Packaging functions myopia leading to partial appropriations

Source: Authors own work



However, when actors realize their partial appropriation, they can reappropriate things differently by changing their practices. In some cases, appropriation can be an evolving experience, in a logic of trial and error (continue appropriation). Many consumers, such as Elodie, mentioned examples of modifications in the way of doing things. Appropriation can also generate difficulties that lead to stop packaging-free shopping. An expert explained: “Flour was a real hassle to sell in bulk, it’s volatile, consumers put it everywhere when they helped themselves. As a result, we spent a lot of time cleaning, and we didn’t always do it immediately, so in terms of hygiene it wasn’t great. We decided to stop.” The same thing happens with consumers: Anne-Laure disclosed that she found moths in her kraft bags twice; she reported this to the store manager, who told her that she should not keep the products in her kraft bags but rather place them in airtight containers. She agreed with that but regarded this multi-container logic as an additional constraint to packaging-free shopping, so decided to stop it.

4.2.2. Dark sides of misappropriation: packaging-free shopping as not responsible

Packaging-free shopping is at first sight considered a sustainable consumption pattern and distribution method. However, an in-depth assessment enabled us to identify negative aspects and even abuses, leading us to deem packaging-free shopping as not always responsible. In particular, according to the way actors appropriate packaging functions and prioritize one function over another, three major dark effects emerged: health risks, adverse environmental effects, and lack of social inclusion.

Health risks. Many consumers associate packaging-free products with healthy products (Daniel *et al.*, 2022). However, our study on how actors appropriate packaging functions in this context reveals potential health risks.

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3 The way retailers appropriate the logistic function of conservation can have
4 consequences on hygiene, when consumers touch products during service, as is the case with
5 boxes. According to Alex, “we have to be careful about hygiene, so that not everyone puts their
6 hands [on the products].” In general, consumers do not trust the hygiene of others, which can
7 present health risks for them. Other issues are in-store container cleaning and product expiry.
8 Danielle, for example, discussed a possible lack of product turnover: “At first, I wondered how
9 long these products had been in these big pots. If there’s not a big turnover, you say to yourself,
10 ‘Okay, but my rice has been in there for six months, it’s not very good.’” The life span of
11 products in silos depends not only on turnover but also on the filling method. When a silo is
12 filled from the top, the first-in, first-out principle applies, but for jars or similar containers, sales
13 staff fill above what is left. As containers brought in by customers can be dirty and therefore
14 present health risks, some stores have stopped “free jar operations” (expert, store 1). Several
15 experts also stressed the need to educate consumers on product preservation.
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25 Finally, product misuse can be linked to a misappropriation of the information function,
26 precisely a lack of information. While manufacturers are subject to strict regulations, consumers
27 often put no information on their packaging according to our visual data. Worse still, when they
28 reuse old packaging (assimilation), they leave out-of-date information that could jeopardize
29 their health. Reused packaging can lead to product misuse when information is lacking. For
30 example, one consumer uses old apple juice bottles, with the original labels, to hold laundry
31 detergent, which could present a risk of confusion during consumption (Figure 8).
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40 **Figure 8** Reused packaging



54 Instagram post #27

55 “Until now, I’d done my washing liquid with ashes. The house being heated exclusively with
56 wood, it was the most cost-effective here ... 38 euros a gray can, so yes necessarily more
57 expensive than the price of ash but frankly I adhere to [this practice] 100%.”
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3 New packaging choices (accommodation) can therefore be a source of health risks due to
4 a lack of hygiene and product information, whether in-store or at home. The freer actors are to
5 repackage products and the greater the number of manipulations, the greater are the risks.
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10 *Harmful effects on the environment: waste and over-consumption.* Packaging-free shopping
11 represents “an eco-responsible approach to improve the world” (Alex), whose “principle is still
12 to avoid waste” (Dorothée). However, the packaging that actors choose can have harmful
13 effects on the environment, such as waste and over-consumption.
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17 Most consumers recognize significant in-store wastage or losses associated with logistic
18 functions. For example, “all the cornflakes that are crushed at the bottom of the container” do
19 not appeal to Eva because they have become “dust.” In jars, a product can also lose its
20 organoleptic properties because “when you lift the lid, it gets air. It won’t stay crisp for a very
21 long time” (Danielle). Waste can be a consequence of a loss of reference to the expiry date of
22 products: “Preservation is a bit scary.... I associate waste with that, and in the end, I’m
23 generating more” (Fabienne). As they are unsealed, containers used for packaging-free products
24 can be a source of waste in-store and in consumers’ homes because of a misappropriation of
25 the logistics or marketing functions.
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32 Packaging-free shopping can also lead to over-consumption. While such consumption
33 is intended to do away with single-use packaging, the reality is sometimes quite the opposite.
34 Retailers keep working with old habits (assimilation). In stores, behind well-stocked silos, is
35 the “hidden face” of packaging-free shopping: “It’s ridiculous, we have little packaging of stuff
36 that we pour back in. For example, the dried fruit mix comes in one kilo packets; there are six
37 per box, I open five a day. I’d rather have a 12 kilos packet.... I don’t think customers imagine
38 there’s so much plastic in the packaging I use” (expert, store 7).
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45 It is not just retailers that overuse packaging though; consumers can also buy more than
46 they need for at least two reasons. First, retailers sometimes refuse the containers consumers
47 bring in. Camille found herself in this situation: “I was a bit disgusted when [employee] told
48 me, ‘Ah well, you have to buy the basic plastic thing.’ Even if afterwards it’s not single use,
49 but in fact I already had one at home, so I didn’t need a second one.” Second, some consumers
50 repurchase containers when they can reclaim them and do so purely for aesthetic considerations,
51 such as beauty or harmony: “You have a somewhat perverse [desire for] lots of things that are
52 going to be developed to encourage you to buy packaging-free products’ bags, Le Parfait jars....
53 So yes, it’s all good, but you have a somewhat paradoxical side.... For certain retailers it’s really
54 a sales argument ... you always have this business side and perhaps of over-consumption”
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3 (Arthur). The Instagram posts also illustrate that these purchases are sometimes made in
4 discount chains that do not respect the social dimension of CSR, which have a reputation for
5 encouraging over-consumption. Consumers who buy their containers from these retailers tend
6 to put greater emphasis on positioning functions through a search for aesthetics, to the detriment
7 of the environmental function. Thus, although packaging-free shopping is supposed to have
8 positive externalities for the environment, perverse effects hinder these positive effects.
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15 *Social problems: lack of social inclusion.* Packaging-free shopping can be non-inclusive, not
16 only because of its perceived high price but also because of the way products are made available
17 in-store. According to our respondents, it can be inaccessible to two types of groups for
18 merchandising reasons or a lack of physical and/or cognitive resources, which limits or prevents
19 appropriation: people with reduced mobility and the elderly.
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Reproducing shelves of mass distribution (assimilation) with an aim for economic performance (marketing function) has led retailers to optimize store space, multiply the number of products sold, and place as many silos as possible on the walls, even if this means hanging them at great heights. However, “if it’s too high for persons with reduced mobility, they won’t be able to access the silo” (Anne-Laure). Amandine agreed: “Even for wheelchair users, for example, I imagine it’s too high.” For Fabienne, not just the disabled are penalized but also short people like her. Unlike conventional aisles with pre-filled boxes, consumers cannot just grab a product; they have to identify it and be able to help themselves: “I think that when [a product is] high like that, as much as in stores with conventional aisles, you have to climb or ask someone to take them down for you. Here, you don’t even know what it is” (Fabienne).

In addition, some customers lack the physical and/or cognitive resources to manage packaging-free shopping and can be “excluded” (Elodie) in shelves with different codes from the classic ones (accommodation). The opening mechanism may be difficult (“I can’t imagine elderly persons pressing a silo on their own,” Elodie) or the technology too complex (“an older person who isn’t used to digital touchscreen [would be excluded],” Anne-Laure). Handling linked to packaging-free shopping, with its various manipulations (e.g., carrying containers, filling them, putting products in jars at home), is also physical by nature, which makes appropriation particularly laborious. Thus, beyond the classic dimensions of accessibility, such as price or product availability, some sources of exclusion are specific to packaging and the in-store availability system and have socially harmful effects.

These deviations may be due to misappropriation of functions. Table 2 summarizes the links between the predominant function and the potential dark sides in terms of health, environmental, or social criteria.

Table 2 Dark sides of misappropriation

Source: Authors own work

Functions misappropriation		Examples of dark sides
Environmental myopia	Appropriation of the environmental function to the detriment of the marketing function (health risks)	Excessive reuse of packaging without updating original information
	Appropriation of the environmental function to the detriment of the logistic function (exclusion)	Consumption of products placed in simple bags directly on the floor, for which service requires bending down, which can be unsuitable for handling by elderly people or those with back problems
Logistic myopia	Appropriation of the logistic function to the detriment of another logistic function (food waste)	Use of packaging adapted to storage but not necessarily to service handling (opening, flow), therefore generating losses
	Appropriation of the logistic function to the detriment of the environmental function (waste)	Use of unique packaging for each product use (transport and storage) without reusing
	Appropriation of the logistic function to the detriment of the marketing function (exclusion)	Complexity of usage for some people of packaging that manufactures and preserves the product, such as spreads
Marketing myopia	Appropriation of the marketing function to the detriment of another marketing function (health risks)	Absence of information about health safety (e.g., product nature, expiration date) for aesthetic reasons
	Appropriation of the marketing function to the detriment of the logistic function (food waste and exclusion)	Use of aesthetic packaging that is not convenient for preservation Choice of an attractive merchandising packaging, but inaccessible for handling by people with reduced mobility
	Appropriation of the marketing function to the detriment of the environmental function (over-consumption)	Replacement of existing packaging with more aesthetical packaging that generates additional expense and footprint

5. Discussion

5.1. Overview of findings

Previous marketing studies on packaging have examined consumers' reactions to packaging and analyzed the attributes that enable them to perform its functions (e.g., Underwood *et al.*, 2001; Wansink, 1996). Drawing on Miller's (1987) conceptual framework of appropriation, in

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3 this research we investigate how actors actively appropriate the packaging functions when usual
4 frameworks are turned upside down from the absence of pre-determined packaging.
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6 Our findings show that actors implement appropriation strategies through assimilation
7 and accommodation to fulfill the packaging functions in the context of packaging-free
8 shopping. For some actors, appropriation means assimilating the dominant model of packaged
9 products, while for others, accommodation is the most transformative mode of appropriation.
10 Echoing the appropriation literature, we find that assimilation relies on knowledge
11 appropriation gained from past packaged product consumption experiences with storing,
12 handling, and consuming products in a logic of familiarity with traditional ways of doing.
13 Accommodation covers the need for creation and personalization, in which the goal is to free
14 oneself from constraints to best adapt consumption to one's needs. Appropriation is not limited
15 to the mere implementation of know-how acquired through past learning but also includes
16 deviations from prescribed uses, which transform actors into designers of new uses.
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25 Our findings also show that appropriation can be difficult or partial. This research
26 investigates the potential difficulties actors encounter and the coping strategies they develop
27 that can limit appropriability (Dehling and Vernet, 2020) – that is, the potential of packaging
28 choices to become the full and complete property of the possessor and even misappropriation
29 that is not free of potentially harmful consequences. Misappropriation sometimes leads to an
30 evolving appropriation that relies on a trial-and-error approach to better ensure packaging
31 functions. Otherwise, appropriation can lead to negative consequences when it fails and
32 individuals can persist in this way.
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41 **5.2. Research contributions**

42 Our research mainly contributes to the literature on packaging-free shopping. In addition, by
43 adopting the appropriation framework, it further enhances the understanding of this process, as
44 well as the notion of misappropriation along with its underlying implications.
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48 Our research extends the literature on packaging-free shopping (Beitzen-Heineke *et al.*,
49 2017; Louis *et al.*, 2021), uncovering the ambivalent nature of packaging-free shopping, as its
50 inherent environmental function is not always fulfilled. Packaging-free shopping can thus
51 represent a non-responsible consumption pattern and distribution method, as illustrated by the
52 dark sides we highlight. Indeed, it can have negative health, environmental, and social impacts.
53 As soon as one function takes precedence over another, dark sides can emerge. The packaging
54 artifact can, de facto, call into question the sustainability approach that is inherent in packaging-
55 free shopping. Therefore, actors' freedom in terms of packaging can have counterproductive
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3 effects. A balance of functions could limit such excesses: shifting the focus from one function
4 to all dimensions simultaneously could help alleviate the dark sides.

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6 Our research especially contributes to studies on the environmental function and eco-
7 friendliness of packaging (e.g., Ketelsen *et al.*, 2020; Zeng *et al.*, 2020), as it questions its
8 sustainability. According to the literature, by eliminating packaging, actors limit their
9 environmental footprint (Herbes *et al.*, 2020). By contrast, our research nuances this perspective
10 by concluding that packaging-free shopping is not always environmentally friendly. While
11 packaging-free shopping is a way to tackle the environmental function of packaging, it also has
12 a “hidden face”. That is, people may view packaging-free shopping as a new type of fashionable
13 and aesthetic consumption that enables them to satisfy their hedonic needs. Their priority is
14 thus not to reuse old packaging but rather to buy new options, some of which are produced on
15 the other side of the world, that will not always be consumed in full and to equip kitchens with
16 a multitude of materials for decorative purposes only. The result is massive waste that is the
17 opposite of what packaging-free shopping is supposed to represent. Our research shows that
18 rather than reducing the environmental impact of consumption, packaging-free shopping can
19 serve consumers’ quest for identity.

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21 This research also highlights the need to consider the responsible function of packaging,
22 including both the environmental and social dimensions. In general, the literature ignores the
23 social function – that is, the ability to improve stakeholders’ well-being by making products
24 more accessible and by reducing health risks. In the quest for appropriation, misappropriation
25 may arise because actors can do things wrong. The dark sides we present herein thus constitute
26 limits to packaging-free shopping that actors must unquestionably consider and show how
27 sustainability can backfire (Acuti *et al.*, 2022).

28
29 Regarding appropriation, our research aligns with studies that examine appropriation
30 processes, particularly the modes of appropriation (i.e., assimilation and accommodation) and
31 the associated strategies. Moreover, our findings show that, regardless of these modes, they can
32 potentially lead to misappropriation and associated negative consequences. In this context, we
33 reveal the valence of appropriation. While existing research has primarily concentrated on
34 modes of appropriation, our study also emphasizes its outcomes, demonstrating that different
35 approaches to appropriation can result in misappropriation (Prohansky *et al.*, 1970). The case
36 of appropriation studied here highlights a specific feature: that of using appropriation as part of
37 a performance approach, with the goal of ensuring that functions are carried out correctly. In
38 2007, Miller raised concerns that his work was being interpreted too positively, positioning
39 appropriation as an idealized form (Slater and Miller, 2007). By highlighting the dark sides of
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3 appropriation, we reveal the inherent ambiguity of this complex process. Indeed, while
4 appropriation enables consumers to distance themselves from the meanings imposed on objects
5 by manufacturers, it does not fully liberate them. When appropriation leads to undesirable
6 outcomes such as waste or health risks, consumers may feel compelled to revert to previous
7 behaviors. Consequently, their initial creativity may be constrained by a temptation to imitate
8 manufacturers' practices in order to alleviate the negative consequences they encounter.
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13 Individuals often make appropriation errors due to their autonomous decision-making,
14 which leads them to favor certain functions over others. In addition, their lack of awareness
15 regarding potential risks – stemming from the absence of guidance and reliance on personal
16 scripts – contributes to these errors. Furthermore, individuals may adhere too rigidly to
17 established habits or, conversely, stray too far from them. While existing literature suggests that
18 individual expertise increases over time as the appropriation process advances, our research
19 challenges this notion (Ladwein, 2003). We find that individuals may continue to make the
20 same errors without recognizing them, resulting in a stagnation of expertise. However, this is
21 not a definitive state. Hahn (2004), drawing on Miller's work, discusses a “work of
22 appropriation” that unfolds over time. In the context of packaging-free shopping, consumers
23 engage in this consumption pattern and distribution method by experimenting with alternatives
24 to traditional packaging. Their choices are not permanent and can evolve as they gain new
25 insights and encounter new opportunities. The appropriation of packaging functions in the
26 context of packaging-free shopping enables consumers to transform a mundane object (e.g., a
27 recycled jar) into a temporary package imbued with a meaning (e.g., the choice of glass to
28 reduce plastic waste), which embodies certain functions that capture consumers' attention (e.g.,
29 such as environmental and logistical considerations). Without this appropriation effort, which
30 manifests as tensions between individual practices and consumer society, packaging-free
31 shopping may struggle to endure over time. Thus, appropriation emerges as a necessary
32 condition for the sustenance of this consumption pattern and distribution method.
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48 Moreover, this research identifies a conjoint appropriation process. In previous research
49 indicating that appropriation is the result of co-production (Bonnin, 2006), the consumer is free
50 to enjoy the environment and is not just a passive subject. In our case, we go further by showing
51 that consumers and retailers “co-appropriate.” An interlocking collective appropriation then
52 occurs because the appropriation of one actor often depends on the appropriation of others.
53 This, in turn, can constrain or, conversely, facilitate the respective appropriation. Appropriation
54 is not simply an individual experience; it is also social (Lave and Wenger, 1991). Packaging-
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3 free shopping may be considered co-constitutive, as it relies on retailers, consumers, and other
4 stakeholders (e.g., device suppliers).
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8 **5.3. Managerial implications and directions for further research**

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10 From a managerial perspective, the identification of strategies to appropriate packaging
11 functions suggests opportunities to encourage packaging-free shopping and its integration into
12 daily practices. The managerial question naturally arising is which strategy to encourage to
13 facilitate this integration. Assuming that assimilation is better than accommodation or vice
14 versa would not be relevant. Assimilation helps reassure actors, but it does not change their
15 habits; accommodation is more aligned with new ways of consuming, but it can be riskier.
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20 The ideal appropriation is one in which packaging functions are balanced and coexist. It
21 then (1) facilitates use, product recognition, and preservation and, in doing so, consumer health
22 and well-being (logistics function); (2) is sustainable (i.e., can be reused), avoids waste, and
23 has a positive or neutral impact on the environment (environmental function); and (3) meets the
24 hedonic needs of attractiveness and personalization, in addition to information and recognition
25 (marketing function). Thus, retailers could work to support consumers with a “hybrid”
26 appropriation approach, taking up the usual packaging codes used to ensure the logistics
27 function and adjusting certain attributes from an environmental perspective, while not
28 neglecting the marketing function. However, we recognize the difficulty for actors to reconcile
29 all functions in the same packaging. Actors must together be reflective by being aware of the
30 health, environmental, and social consequences of packaging-free shopping. This distribution
31 method is not virtuous in itself; it depends on the packaging, which could be a more or less
32 responsible artifact. Marketers need to educate and upskill the general populace, which has not
33 learned to recognize raw products, preserve them, and reuse packaging, as they have learned to
34 consume the artifact of packaging. More generally, this research suggests that stakeholders need
35 to take responsibility for packaging functions to ensure sustainable packaging-free shopping.
36 This calls for a systemic approach, so that stakeholders can assume their new role in packaging.
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50 One avenue for extending this research pertains to the appropriation process. First, little
51 is known about how appropriation and assimilation strategies evolve over time. There is a need
52 to better understand how they are continually influenced by experience, learning, and
53 interactions with products and consumer environments. A longitudinal study would be
54 particularly relevant to examine how the dynamics emerge, evolve, or disappear (Shove *et al.*,
55 2012). Second, appropriation and assimilation can vary considerably from one individual to
56 another, depending on personal or contextual factors. Future research could explore how these
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3 differences may influence appropriation strategies. Another research avenue is to focus more
4 on the interweaving of the consumer's appropriation process, on the one hand, and that of the
5 retailer, on the other hand. In the context of packaging-free shopping, products are not
6 standardized but are made available without the artifact of packaging. To seize this opportunity,
7 actors need to reinvent themselves by contributing with their own resources.
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11 By revealing the dark sides of packaging-free shopping, we invite researchers to explore
12 more key topics in consumer research. With regard to health risks, our findings echo research
13 on the law of contagion that shows that consumers evaluate a product negatively when it has
14 been touched by others (Argo *et al.*, 2006). Upcycling practice (i.e., repurposing products for
15 uses other than those they were originally intended for; Wilson, 2016) is another example that
16 could present such risks. The issue of conservation in consumption, which has an impact on
17 hygiene and consumer health (Moorman, 2002), could thus be further explored. Regarding the
18 waste generated through packaging (Brennan *et al.*, 2021) and over-consumption, further
19 research could examine the boomerang effects of sustainable consumption.
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Appendix. Informants

Stores	Number and status of informants
1	2; store manager, packaging-free product department manager
2	1; store manager
3	2; network sales manager, network packaging-free product referent
4	2; store manager, packaging-free product department manager
5	2; store manager, packaging-free product department manager
6	3; store manager, packaging-free product department manager, packaging-free product department assistant
7	4; store owner, store managers, packaging-free product department manager
8	2; store manager, packaging-free product department manager
9	1; store manager
10	1; store manager

Consumers	Age	Job	Housing	Household size	Area
Albane	45	Teacher	House	3	Urban
Alex	33	Operations manager	Flat	1	Urban
Aline	21	Student	Flat	1	Urban
Amandine	38	Dentist	Flat	4	Urban
Annabelle	25	Accountant	Flat	2	Urban
Anne-Laure	38	Nurse	Flat	4	Urban
Arthur	36	Project manager	Flat	4	Urban
Bérangère	34	Manager	Flat	1	Urban
Camille	24	Graphic designer	Flat	2	Urban

Clothilde	35	Bank project manager	House	3	Urban
Colette	61	Store manager	House	2	Rural
Danielle	66	Retired	Flat	2	Urban
Dorothee	42	Project manager	House	3	Urban
Elodie	37	Teacher	House	4	Urban
Eva	63	Retired	Flat	2	Urban
Fabienne	39	Teacher	House	4	Urban
Germaine	59	Financial manager	Flat	1	Rural
Hortense	43	Teacher	House	4	Urban
Isaure	46	Chief financial officer	Flat	4	Urban
Judith	24	Doctoral student	Flat	1	Urban
Julia	22	Student	Flat	2	Urban
Lara	34	Bank manager	Flat	1	Urban
Léonore	34	Osteopath	Flat	2	Urban
Madeleine	36	Doctoral student	House	3	Rural
Maëlle	55	Accountant	House	2	Rural
Maïté	43	Head of innovation	House	4	Urban
Manuela	32	Trainer	House	2	Urban
Marjorie	62	Retired	House	2	Rural
Marthe	34	Consultant	Flat	3	Urban
Marylou	20	Student	Flat	1	Urban
Mathias	26	Unemployed	Flat	2	Urban
Maya	24	Merch manager	Flat	1	Urban

Melchior	27	IT project manager	Flat	2	Urban
Nadège	28	Civil servant	Flat	2	Urban
Nadine	66	Retired	House	2	Urban
Régis	26	Student	Flat	2	Urban
Roxane	21	Student	Flat	1	Urban
Sabine	40	Jewelry designer	House	4	Urban
Salomé	50	Educator	Flat	1	Urban
Samantha	27	Doctoral student	Flat	2	Urban
Sigmund	22	Student	Flat	1	Urban
Solène	34	IT project manager	Flat	2	Urban
Vanessa	40	Head of program	Flat	4	Rural
Zoé	20	Student	Flat	2	Urban

Figure 1 Assimilation of packaging attributes to appropriate logistic functions






Preserve the product	
 <p>Instagram post #23 “Packaging-free curry, a little bit of olive oil (which I’ll decant into my tinted bottle so as not to spoil it).”</p>	 <p>Opaque oil bottles displayed near the oil service device in-store</p>
Ease transport	
 <p>Reusable plastic egg carton handy for transporting eggs</p>	 <p>Waxed cardboard box with a transparent window and a plastic clip, and offer of jars and cloth bags in-store</p>
Make use of ergonomics	
 <p>Instagram post #52</p>	 <p>Empty push-button packaging reflecting the traditional codes of hygiene and beauty products in-store</p>

Figure 2 Assimilation of packaging attributes to facilitate marketing functions

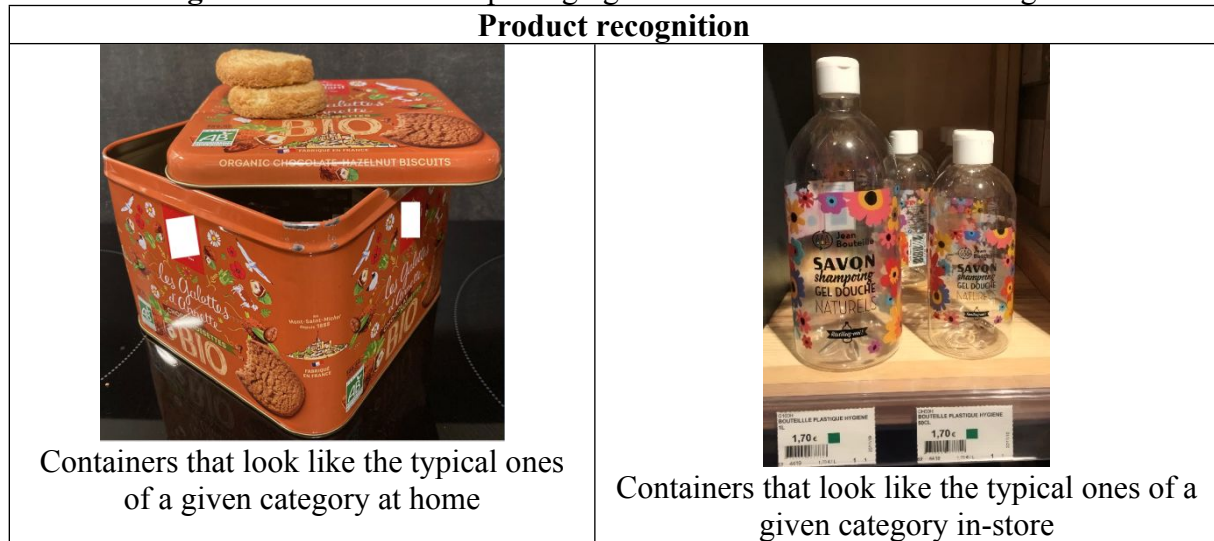


Figure 3 Assimilation of packaging attributes to reduce environmental impact

Instagram post #288

“I love giving objects a second life. Here, glass jars of spread, honey, vegetable preparation ... a two-in-one container: you eat what’s inside and keep the container.”



Choice of cardboard silos to avoid plastic in-store

Figure 4 Accommodation from packaging attributes to appropriate logistic functions**Preserve, protect, and store the product**

Instagram post #169

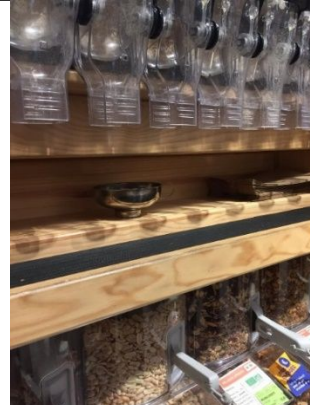
Square containers to avoid losing any storage space



Tea presented in a special box with drawers that include closed stainless-steel cases in-store







Facilitate product use

Use of specific tools, such as this spaghetti measurer, to evaluate the product quantity



Provision of funnels in-store to help consumers fill their jars

Figure 5 Accommodation from packaging attributes to appropriate marketing functions

Facilitate recognition	
 <p>Instagram post #218 “When you open your drawer and tell yourself that you don’t regret a single moment of going zero waste”</p>	 <p>Shelf labeling in-store</p>
Limit information	
 <p>Instagram post #121 (at home) “This morning, I open my cupboards to you. They’re not perfect, but now, for me, zero waste is almost a non-issue.”</p>	 <p>Instagram post #1 (in-store) “This ‘boutique-café’ is THE definition of packaging-free product consumption as I see it: choice, advice, quality, organic, local and short-distance as much as possible, surprises and discoveries.”</p>
Create an aesthetic homestyle and decorations	
 <p>Instagram post #19 “Buying packaging-free products, cooking seasonal products. It’s a new pleasure to be in the kitchen!”</p>	 <p>Instagram post #1 “I went to Rosheim today to meet Marie-Ange and her dreamy packaging-free product store!”</p>

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Figure 6 Accommodation by an optimization of packaging to reduce the impact



Instagram post #107

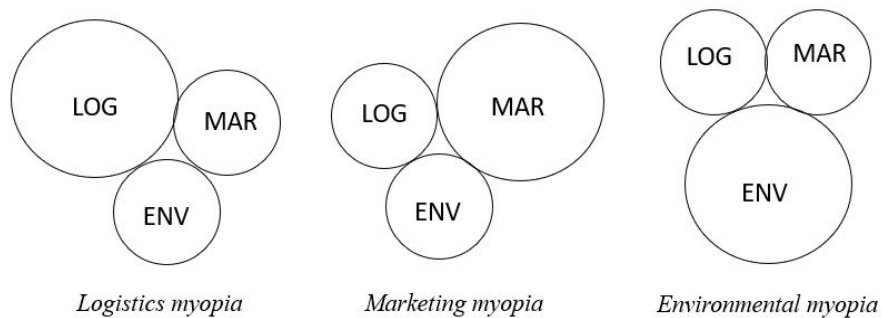
“Packaging-free shopping and storing in glass jars of different size reduces the amount of packaging, allows you to choose exactly the quantities you need and all this helps you reduce the amount of waste.”



Instagram post #61

“The return slip for the package and its containers is ready and I have two months to send everything back. Under each of the boxes, there’s a small label indicating the name of the product and the cooking time, for example.”

Figure 7 Packaging functions myopia leading to partial appropriations



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3 **Figure 8** Reused packaging
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18 Instagram post #27

19 “Until now, I’d done my washing liquid with ashes. The house being heated exclusively with
20 wood, it was the most cost-effective here ... 38 euros a gray can, so yes necessarily more
21 expensive than the price of ash but frankly I adhere to [this practice] 100%.”
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Table 1 Appropriation strategies to ensure packaging functions

Functions		Appropriation strategies	
		Assimilation	Accommodation
Logistic functions	Conservation	Shape, opacity	Storage choices
	Handling, transport	Shape, weight	Transport mode and adaptation with accessories
	Use	Shape, resealability	Use of complementary accessories
Marketing functions	Recognition	Typical shape	Labeling, transparency of containers
	Information	Traditional labeling	Personal skills (only essential information on packaging and extra information on specific devices)
	Positioning	Brand logos display, traditional merchandising	Do-it-yourself, homemade and personalization, ambience, and design of containers
Environmental functions	Reducing impact	Materials, reuse and deposit, resealability	Reusage, containers' optimization

Table 2 Dark sides of misappropriation

	Functions misappropriation	Examples of dark sides
Environmental myopia	Appropriation of the environmental function to the detriment of the marketing function (health risks)	Excessive reuse of packaging without updating original information
	Appropriation of the environmental function to the detriment of the logistic function (exclusion)	Consumption of products placed in simple bags directly on the floor, for which service requires bending down, which can be unsuitable for handling by elderly people or those with back problems
Logistic myopia	Appropriation of the logistic function to the detriment of another logistic function (food waste)	Use of packaging adapted to storage but not necessarily to service handling (opening, flow), therefore generating losses
	Appropriation of the logistic function to the detriment of the environmental function (waste)	Use of unique packaging for each product use (transport and storage) without reusing
	Appropriation of the logistic function to the detriment of the marketing function (exclusion)	Complexity of usage for some people of packaging that manufactures and preserves the product, such as spreads
Marketing myopia	Appropriation of the marketing function to the detriment of another marketing function (health risks)	Absence of information about health safety (e.g., product nature, expiration date) for aesthetic reasons
	Appropriation of the marketing function to the detriment of the logistic function (food waste and exclusion)	Use of aesthetic packaging that is not convenient for preservation Choice of an attractive merchandising packaging, but inaccessible for handling by people with reduced mobility
	Appropriation of the marketing function to the detriment of the environmental function (over-consumption)	Replacement of existing packaging with more aesthetical packaging that generates additional expense and footprint