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Package-free products: How to improve pro-environmental buying behaviors among consumers

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ABSTRACT

The packaging of consumer goods is considered a main cause of household waste. Worldwide institutions are pressing companies to realize solutions that minimize packaging and comply with sustainable development goals (SDGs). Similarly, emerging EU Directives are prompting countries and operators to cut off the packaging of fast-moving consumer goods. The offer of package-free products – alternatively named bulk products – represents an effective solution. Applying a mixed method approach to data collected during and after the pandemic, this paper explores consumers' propensity for bulk products, identifying potential benefits and barriers consumers face when buying package-free products. We find that consumers are keen to buy bulk products not to conform to society but as they perceive it as a personal contribution to environmental protection. However, greater familiarity with package-free products is necessary for adopting this emerging pro-environmental behavior. Thus, we encourage i) manufacturers to develop and propose new package-free lines, ii) retailers to provide package-free assortment options to attract new consumer targets, iii) institutions and policymakers to promote sustainable behavior among citizens favoring familiarity with this shopping option.

1. Introduction

The consumer market is under the lens due to packaging waste. A recent study conducted by the European Commission showed that any EU citizen produces 177.2 kg of packaging waste yearly (Eurostat, 2022). This amount of waste will rise by 46 % by 2030 (European Commission, 2022). Plastic is preferred among other materials (e.g., glass, paper, aluminum) by operators in the food industry due to its mechanical properties and low cost (Marken and Hörisch, 2019). As underlined by Walsh et al. (2020), the Sustainable Development Goals (SDGs) are prompting industry operators to develop products packaging recyclable and in line with social, economic, and environmental concerns. At the European level, there is a call for a drastic reduction of single-use packaging toward reusable materials by 2030 (Cater, 2022). The EU Commission, through its Packaging and Packaging Waste Directive (PPWD – Directive 94/62/EC), is going to ban single-use packaging – widespread in the consumer market – promoting the development of sustainable alternatives able to minimize household waste (European Commission, 2020).

Within the fast-moving consumer goods (FMCG) sector, package-free products may solve packaging's negativities on the environment and provide an actionable response to SDG goals and EU Directive. Bulk products fulfill the need to reduce, reuse and recycle resources in the production system. Package-free products – also called bulk products – are unpackaged products requiring consumers to bring their containers from home. In this way, the same container – normally made with a long-lasting material – can be used repeatedly, reducing single-use packaging usage, with a major impact on waste containment (Chang and Hung, 2023), particularly plastic (Sokolova et al., 2023). There is an increasing number of FMCGs consumers can buy unpackaged, such as detergents, soaps, cosmetics, beverages, as well as pasta, flour, rice, cereals, and biscuits, to name a few (Rapp et al., 2017).

To this end, manufacturers and retailers have a propulsive role in directly influencing consumers' pro-environmental buying intentions (De Canio et al., 2021) and expanding the package-free offer to prevent excessive packaging waste (Beitzen-Heineke et al., 2017). Particularly, retailers are key in the package-free product spread, being the gatekeepers in the manufacturers-consumer relationship and able to induct

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consumer behavioral change (Beitzen-Heineke et al., 2017).

Although the relevance of bulk products as a solution to waste production is theoretically established, operationally, more is needed. Describing an emerging phenomenon, i.e., the consumer's intention to buy package-free products, may be more complex than expected, as no previous conclusive evidence exists. For this reason, through two studies, this paper i) describes the state-of-art of bulk products and sheds some light on this emerging phenomenon; ii) explores consumer perception and derives drivers and barriers to the purchase of package-free products; iii) analyzes the motivations behind the complex decision to buy bulk products. To first explore consumers' perceptions of the impact FMCGs packaging has on environmental damage and if consumers are open to considering bulk products and why, we conducted a focus group. The study includes French and Italian consumers familiar with the package-free phenomenon (Cosmeticobs, 2022). Second, the study analyzes potential configurations of motivations leading to the intention to buy bulk products using a qualitative comparative analysis. The second study focuses on French consumers, as 63 % of French use to buy package-free products (DIGI, 2022). The second study adopts an asymmetric technique able to identify "a set of casual variables with a synergetic nature" – usually called "configurations" – equally leading consumers to buy package-free products (Pappas and Woodside, 2021, p. 1). We identify alternative motivations toward package-free products by applying the Complexity Theory to buying bulk products. Accordingly, we investigate the following research questions:

RQ1: Are consumers ready to adopt behaviors that can reduce the impact of their FMCG purchasing and consumption on the environment, such as buying bulk products?

RQ2: How can variables be combined to engage consumers to buy package-free products?

RQ3: Are there necessary conditions that institutions and operators (i.e., FMCG manufacturers and retailers) should leverage to facilitate the spread of package-free product sales among consumers?

In the first study, we explore consumers' perspectives on packaging's impact on the environment and their propensity and motivations in shopping for bulk products as a solution to reduce waste. Expanding the main results that emerged in Study 1, the second study analyzes the casual asymmetry among the main variables identified in the literature and relevant for consumers (see results of Study 1), shedding some light on contrary findings. Our findings provide insights into the expansion of pro-environmental consumer behaviors in the form of proneness to buy package-free products and to patronize store formats offering this purchase option. Managerially, the findings support bulk product manufacturers and package-free retailers in defining market strategies that dually embrace SDG goals, the recent EU Directive, and consumers' innovative buying paths. We also support institutions and policymakers involved in pro-environmental changes.

This study is organized as follows. Section 2 summarizes the theoretical framework behind consumers' intention to buy bulk products, followed by a description of the methodology and a discussion of the main results of Study 1 in Section 3. Section 4 offers an overview of the Complexity Theory paving the way to Study 2, developed in Section 5. Section 6 presents discussions and implications, while future research directions are drawn up in Section 7.

2. Theoretical background

2.1. Consumers' perspective on FMCG's packaging impact on pollution

Packaging plays a fundamental role and adds several benefits in the retailing sector, being an informative driver, protecting products from contamination and spoilage, providing easier handling, prolonging the shelf-life, and facilitating the logistics and product presentation, among others. However, companies hardly shift toward sustainable packages due to higher costs and for logistics and shelf-life-related reasons (De Canio et al., 2021).

Packaging is one of the first causes of pollution emission and waste production, and today operators are called to implement innovative solutions to encounter environmental and societal requests (Kazancoglu et al., 2021). The sector of FMCG packaging is under pressure, due to the high impact packaging waste generates on the environment (Marken and Hörisch, 2019). Food packaging is the main household waste, and citizens hardly manage it due to the need to properly separate and recycle materials (Klaiman et al., 2017). While >80 % of paper bags are recycled, the recycling rate collapses to 29.1 % if we consider PET bottles and jars (EPA, 2022 – data 2018). Accordingly, removing packaging may represent a big opportunity for manufacturers and retailers.

From the consumer perspective, the packaging is useful when the product is bought, but when it finishes, it is considered waste (Lindh et al., 2016). So, although useful to preserve the product and its properties, packaging is only sometimes considered positive. Most consumers consider packaging design the main cause of waste and its material is the vehicle for spreading pollution (Zeng et al., 2021). Nevertheless, although consumers consider the packaging problematic and negatively impacting the environment, this "does not automatically lead them to commit to package-free shopping" (Fuentes et al., 2019, p.261).

2.2. Drivers to buy package-free products

The phenomenon of package-free products has recently entered the pro-environmental and retail literature and still few studies have explored this new purchasing trend. Although the topic has yet to be explored (Louis et al., 2021), some initial studies highlighted the existence of possible drivers and barriers to the diffusion of bulk products. Thus, personal and social norms – two concepts strictly connected – have been identified among the main predictors of pro-environmental purchasing behaviors (Moser, 2015). Chen and Chai confirmed that personal norm is a "motivator of environmental behavior" (2010, p.30). Similarly, Marken and Hörisch (2019) showed that consumers' pro-environmental personal norms positively affect their purchasing behavior. Further, the authors identified several potential barriers that may reduce the purchase of package-free products, among which insufficient awareness about the offer, product availability, and perceived cost emerge as the main ones (Marken and Hörisch, 2019). Beitzen-Heineke et al. (2017) highlight that how consumers purchase bulk products requires retailers to select assortments and customers to plan purchases carefully. Indeed, customers must bring the container from home, excluding a priori possible impulse purchases and impacting the convenience perception. Louis et al. (2021) show that package-free shopping involves a range of consumers' goals and normativized emotions and moods, such as sustainable buying paths. Price and waste sensitivities and socially responsible consumption are considered positive drivers. At the same time, the lack of information about the store and the product are included among potential barriers to package-free shopping (Louis et al., 2021). Environmental concern's relevance has also been presented in the study conducted by Fuentes et al. (2019). Similarly, the need to conform to others' expectations has been demonstrated to predict pro-environmental product buying (Qi and Ploeger, 2019). Qi and Ploeger (2019) also show how people tend to conform to the reference group during their buying choice.

Although a recent ferment in the literature involved in understanding drivers and barriers of package-free sales, the first results are scattered and not univocal. Furthermore, some variables relevant in the pro-environmental and retail literature - such as social norms or group conformity - have never been analyzed in bulk products. That is why a first qualitative study is required to understand consumers' perspectives and explore their leading motivations and willingness to buy package-free products.

3. Study 1: Qualitative research on consumer propensity to buy package-free products

Qualitative research is useful for exploring emerging phenomena, connecting theory and reality, and deriving compelling insights (Bouncken et al., 2021). The aim of Study 1 is to shed light on actual and future social change toward pro-environmental buying behaviors by exploring consumers' perceptions concerning packaging are and if they are open to considering bulk products and why. We adopted a qualitative approach drawing on the focus group method (Fern, 2001) as an effective means of exploratory data collection. The focus group enabled us to observe group interaction, which is the hallmark of this method (Belzile and Öberg, 2012).

3.1. Data collection, study design, and procedure

Twelve subjects participated in an online focus group, 6 people from France (Fr) and 6 people from Italy (It), two European countries where consumers are more sensitive to the package-free phenomenon (Cosmeticobs, 2022). The provenance of the participant is specified at the end of each quote below.

The focus-group technique is a qualitative technique that relies on small and non-probability samples, with diversity in terms of age, gender, education, socioeconomic level, or any relevant variables (Ritchie et al., 2013). As the purpose of a qualitative methodology is not to provide statements of the prevalence of some profiles but to explore diversity, we recruited participants, through referrals (Aiello et al., 2020), according to different sociodemographic criteria, familiar with the package-free phenomenon, to shed light about our research.

Focus groups provide access to participants' own language, concepts, and concerns, as individual interviews, but the dynamic of the group encourages "the production of more fully articulated accounts and offers an opportunity to observe the process of collective sense-making in action" (Wilkinson, 1998, p181). More precisely, online focus groups are validated research protocols with a common discussion protocol prepared by the research team (Cyr, 2019).

This focus group aims to investigate: i) how consumers believe that it is possible to deal with household waste due to packaging; ii) consumers' perceptions toward bulk products; iii) drivers and barriers linked to the purchase and consumption of bulk products. Thus, before the focus group began, the moderator explained the procedure and the purposes of the session.

The session lasted 2 h and was transcribed into a word processing package to allow for NVivo content analysis (Bazeley and Jackson, 2013). The transcripts were independently read, analyzed, and compared, leading to interrater reliability measured with Cohen's kappa coefficient (0.82). Using a categorization process suggested by Brocato et al. (2012), recurring themes in the data were identified by listing items that reflected similar characteristics. We first open-coded all the data, which provided the basis for developing the coding framework. Our codes became more specific as we progressed through the data analysis.

3.2. Results

Overall, the qualitative findings reveal that consumers see packaging as a major issue for pollution and are open to considering bulk products. Nonetheless, there were cross-cultural differences and different reasons behind the possible use of bulk products.

Consumers are concerned about the environmental impact of packaging: *"Sometimes I buy a small product that comes with a large plastic or paper package. This is often unneeded" (PB - It)*. Accordingly, the participants are open to the use of bulk products. Indeed, as one participant reported, "*Using bulk products can certainly be an option to reduce pollution" (LV - Fr)*.

Interestingly, the findings show that personal norms are essential to define predispositions. Some participants are guided by a rule-oriented mindset while others by an outcome-oriented mindset (Cornelissen et al., 2013) *"We should do this to help the environment. Every conscientious person should do that too. Less or no packaging means less waste" (KF - Fr); "I don't like being forced to do something. For me, the adoption or not of bulk products depends on my own benefit" (SG - Fr)*. Moreover, consumers make clear cost-benefit evaluations: *"I am happy to help reduce pollution by adopting bulk products, but I would also like to see an incentive for making it cost-effective. For instance, historically, reusable bags have been a great incentive" (MM - It)*.

However, concerning the specific contexts where to adopt bulk products, the participants see some boundary conditions *"it depends on the product. If I know that product and I feel I can handle it package free that is much better!" (SM - Fr)*; similarly, *"Let's be realistic here. It depends on the product. I can buy powder in bulk. However, when I buy a tomato sauce, it would be difficult to buy it in bulk*" (LR – It); additionally, *"it is an interesting concept, but it is not a common trend in the stores of my country. Therefore, for me, it is not a priority" (FP - It)*. Thus, consumers are aware of the negative impact of packaging; however, at the same time, they are concerned about specific issues before adopting bulk products.

3.3. Discussion

Concerning the first research question, Study 1 shows that consumers are willing to adopt bulk products to reduce the use of packaging. The focus group results align with the previous literature (e.g., Louis et al., 2021), suggesting that consumers have nothing against using bulk products if favorable contextual conditions exist. Results confirm recent findings, showing that 65 % of French consumers buy package-free products to reduce package waste production (DIGI, 2022).

Interestingly, the exploratory approach offers new insights regarding the category of products and the norm at the familiar store. While the number of products sold in bulk is increasing (Rapp et al., 2017), some product categories still need to be perceived as easier to manage with traditional packaging. Similarly, the focus group confirms that store familiarity may reduce barriers to package-free sales. Second, personal norms are at play that depends on the consumer's ethical mindset, either outcome-oriented or rule-oriented. In general, participants are concerned about the environmental impact of packaging but are making careful cost-benefit evaluations. The purchasing cost of long-term containers, their care, transport, and management in the store can make the propensity toward bulk products onerous, confirming Beitzen-Heineke et al.'s findings (2017). Social pressure and the need to conform to the group (i.e., what peers are doing) do not seem to be a predominant issue here, in contrast with previous research (e.g., Qi and Ploeger, 2019). Finally, we need to consider that manufacturers and retailers play a key role in influencing consumer proneness to buy pro-environmental products and to patronize zero-packaging stores (Beitzen-Heineke et al., 2017; De Canio et al., 2021).

4. Complexity theory to deepen emerging phenomena

The results of Study 1 show the complexity behind the emerging phenomenon of package-free products and how different aspects jointly work to spread the phenomenon. Combining the results emerging in the literature with the results of Study 1 highlights how it is not possible to clearly define the aspects supporting bulk FMCG products sales, and which are the barriers or irrelevant elements. Product and store familiarity, personal and social norms, possible pressure due to group conformity, environmental concerns, and cost-benefit evaluations are relevant in the purchasing process of bulk products. However, the determination of the exact conditions is a moot point.

4.1. Complexity theory and fuzzy-set qualitative comparative analysis

The theory of chaos and the complexity theory embrace the idea that

daily phenomena require a complex approach defined by a multitude of characteristics and configurations to be described (Pappas and Woodside, 2021). Configurations of multi-element patterns may describe better than linear models the complexity behind phenomena (Pappas, 2017), also emerging ones, allowing the identification of configurations and necessary conditions behind heterogeneous phenomena (Roger-Monzó et al., 2023). In line with this idea, there is not a unique combination of variables that may describe phenomena. In contrast, alternative combinations of elements may bring the same result, leaving the scenario of the results open to any possible combination of solutions.

While variance-based analyses consider only the linear relationship between causes and the effect, non-linear analyses, such as qualitative comparative analyses (QCA), without considering the potential complexity behind a specific phenomenon, address multi-dimensional solutions, offering a broader understanding. Usually, linear analysis leads to a single best solution, limiting the results' readability (Woodside, 2016). Hence, the application of linear analysis lacks a clear understanding of the phenomenon under investigation and does not lead to the identification of actionable solutions. It considers only the main positive or negative effects between Xs ➔ Y, which is not always sufficient (Woodside, 2014). This is why, in certain cases, accurate research results do not find an application on the market.

Among several QCA methods, the fuzzy-set qualitative comparative analysis (fsQCA) allows the identification of configurations' sets leading to the same results. Indeed, the fsQCA identifies multi-attribute solutions equally effective in explaining the phenomenon investigated, the so-called equifinality principle (Gligor et al., 2019). Developing the complexity theory and configuration theories, the fsQCA method assumes that X may relate to Y positively combined with a certain mix of variables, while negatively when combined with a different mix of variables or does not relate at all with Y. "Configuration theories are based on the principle of causal asymmetry, based on which a condition (or a combination of conditions) that explains the presence of an outcome can be different from the conditions that lead to the absence of the same outcome" (Pappas and Woodside, 2021, p. 5).

4.2. Study tenets

This study intends to understand better the emerging phenomenon of consumers' intention to buy package-free products by analyzing casual asymmetry among variables (potentially affecting it) "adding eventually", thus contributing to/expanding extant retailing literature. The application of configuration theories allows us to provide a comprehensive view of the multiple configurations of drivers behind the consumer's intention to buy package-free products, providing quantitative evidence for the findings of Study 1. Thus, the study operationalizes that alternative attributes can lead equally to the intention to buy package-free products (*equifinality*). The presence or absence of variables – so-called binary states' combinations – and the "do not care situation" – a variable may be present or absent in a configuration without playing a specific role in identifying the configuration – were studied, leading to the following tenets:

T1. Alternative configurations can lead equally to the intention to buy package-free products (equifinality principle).

T2. Consumer intention to buy package-free products can stem only from a single variable (sufficient or necessary to explain the outcome).

5. Study 2: configural analysis on consumers' motivation behind package-free purchase

To empirically test the theoretical tenets, the study adopts an asymmetric approach based on the fuzzy-set comparative qualitative analysis (fsQCA) showing how there may exist several effects rather than the main effect (Woodside, 2016).

5.1. Study context

A European country was selected to conduct the empirical analysis due to the increasing attention that the European Commission and its Waste Framework Directive (WFD) is spreading among European countries to dramatically reduce packaging waste. France emerges to be the European country with the highest rate of package-free product sales, from €100 million in 2013 to €1.3 billion in 2020, and is expected to reach €3.2 billion in 2022 (Statista, 2022). This trend was confirmed by the study conducted by YouGov between August 23 and 28, 2022 on bulk product consumption of >3000 people in France, Spain, and Italy (Cosmeticobs, 2022). Retailers' strategies have strongly supported the growing attention of consumers toward bulk products in France. For example, E.Leclerc extended its assortment with several package-free products (Leclerc, 2018). Auchan's 2019 report declares its intention to start selling more items without packaging to contain the production of packaging waste (Auchan, 2019). Today Auchan sells its "*produits en vrac*" also online. In May 2019, Carrefour launched the Loop service allowing consumers to buy – both in-store and online – bulk products in durable and reusable containers, from glass yogurt containers to dishwasher tabs sold in aluminum boxes. After use, the consumer returns the container in-store or to the courier to be sanitized and reused, offering a 360° zero waste experience (Carrefour, 2021). The retailer also tests the relevance of packaged and unpackaged products in the shopping journey through different in-store areas. Further, the retailer offers bulk products unbranded and with national brands (Dauvers, 2022). France has been therefore selected as a suitable European country to conduct the study. Due to the wider assortment extension of French retailers toward package-free products and the extensive propensity of French to purchase bulk products, France has been selected as a suitable European country to conduct the second study.

5.2. Research design

The fsQCA is developed on a dataset based on a structured questionnaire filled out by French consumers. The questionnaire was adapted to a Google Moduli and shared on social networks, a data-collection channel boosted during the pandemic and still very trendy among scholars (Flanagan and Priyadarshini, 2021). To intercept consumers with a minimum buying experience, the link to the online questionnaire was shared only on French Facebook thematic pages discussing zero-waste and pro-environmental shopping topics. The participation was voluntary to control for opportunistic responses, with no remuneration. Respondents declaring no previous experience in package-free shopping were thanked and excluded from the survey. The final dataset is composed of 233 completed and valid questionnaires.

5.3. The sample characteristics

233 questionnaires were collected in April 2020. Table 1 presents all

Table 1
Socio-demographic profiles of surveyed subjects ($N = 233$).

Demographics	Categories	Respondents	Percentage
Gender	Male	76	32.6 %
	Female	157	67.4 %
Age	<20	9	3.9 %
	21–30	112	48.1 %
	31–40	81	34.8 %
	41–50	24	10.3 %
	>50	7	3 %
Annual Income	< € 36,000	115	49.4 %
	€ 36.000–70.000	101	43.3 %
	€ 70.000–100.000	16	6.9 %
	> € 100.000	1	0.4 %

Source: Authors.

demographics regarding the number of respondents and percentage for each category. The sample presents a higher presence of females (67.4 %) and a heterogeneous distribution by age, with a higher representativity of consumers aged 21–30 (48.1 %) and 31–40 (34.8 %). Regarding annual income, the segments of respondents earning <36.000€/year (49.4 %) and between 36.000 and 70.000€/year (43.3 %) are mainly represented.

5.4. Variables

To obtain reliable information from respondents, previously established and validated scales were selected from the pro-environmental and consumer behavior literature. Items were slightly adapted to the package-free context although leaving the semantic structure of the item close to the original measure. To reduce the translation bias, a double translation procedure English – French, French- English was adopted, and the final questionnaire was pre-tested on a small sample of 10 students and lecturers involved in an academic language course (master's degree). All items were measured using a 7-point Likert scale anchored by "strongly disagree – 1" and "strongly agree – 7".

To develop Study 2, we identified a set of measures, presented in Table 2, emerging in the literature and the results of Study 1 (please see Sections 2.2, 3.2, and 3.3). Intention to buy bulk products expresses the consumer's preference and intended behavior of choosing products without packaging in grocery purchases. While personal norms represent the individual perception of society's responsibility toward the environmental issue, social norms express social conditioning on individual pro-environmental behavior. The concept of environmental concern refers to a general attitude toward environmental protection. Lastly, convenience and cost perception constructs capture aspects relating to the accessibility and cost of bulk products.

5.5. Results

5.5.1. Method selection

As outlined in paragraph 2.3, linear analyses may lead to a good model fit although results may poorly fit the reality in practice (Proksch et al., 2017). Conversely, the configurational comparative analysis captures alternative combinations of causally relevant variables able to lead to a specific outcome (Ragin, 2008). The fuzzy-set qualitative comparative analysis (fsQCA) has been employed in several management and marketing empirical settings (Pappas and Woodside, 2021), while no study has implemented this asymmetric method to understand the setting of drivers leading consumers to buy package-free products. Furthermore, implementing fsQCA requires data calibration, a technique common in natural sciences but unusual in social sciences allowing the researcher to interpret how variables variate concerning other variables (Pappas and Woodside, 2021; Ragin, 2008). We used the software fsQCA 3.0 to perform the multi-step approach and assess the fsQCA results (Ragin, 2017).

5.5.2. fsQCA procedure and results

The first step to developing the fuzzy set qualitative comparative analysis (fsQCA) is the definition of the property space, which defines the maximum number of combinations leading to the outcome. The property space is derived by the binary combinations (presence/absence) of the variables considered antecedents of the outcome (2^8). Scales have been calibrated following the conventional set-membership calibration procedure for configuration analysis, namely, 6: full membership; 4: indifference point; 2: non-membership. Due to the good numerosity of the dataset (higher than 50 responses), the minimum number of three best-fit cases, and the 0.8 "quasi-sufficiency" threshold value were set in the analysis (Ragin, 2008). The truth table shows all the possible combinations of variables determining consumers' intention to buy package-free products (Table 3).

The complex fsQCA solution shows three highly informative

Table 2
Descriptive statistics for the variables used in the study.

Original scales	Variable	Items	Mean	SD
Lee and Yun (2015) and Qi and Ploeger (2019).	Intention to buy package-free products (BBULK) $\alpha = 0.887$	When I choose between two similar products, I prefer the one without packaging	5.73	1.30
		If I had a choice, I would buy bulk products	5.97	1.21
		I will buy package-free products shortly	5.98	1.36
		I think if bulk products were available, I would buy them	5.86	1.31
		If there were bulk products in supermarkets, they would be my choice	5.81	1.34
Bang et al. (2000).	Package-free products familiarity (PFAM)	How familiar are you with bulk products?	5.66	1.29
	Package-free store familiarity (SFAM)	How familiar are you with zero-packaging stores?	4.78	1.77
Chen and Chai (2010), Tanner and Wölfing Kast (2003), and Michaelidou and Hassan (2008).	Personal Norms (PN) $\alpha = 0.871$	Environmental issues are very important to me.	6.00	1.25
		Everybody has a responsibility to contribute to environmental preservation by avoiding packaged products.	5.84	1.15
		Everybody should contribute to promoting package-free production by buying only bulk products.	5.51	1.26
		I think of myself as someone concerned about ethical issues	5.30	1.36
		I think of myself as an ethical consumer	4.85	1.36
Qi and Ploeger (2019).	Social Norms (SN) $\alpha = 0.826$	Most people who are important to me think I should buy package-free products	2.90	1.77
		Most people whose opinions I value would prefer that I buy package-free products	3.34	1.87
	Group Conformity (GC) $\alpha = 0.772$	I may consider purchasing package-free products if people around me think bulk products are good	3.06	2.00
		I will purchase package-free products if people around me purchase bulk products too	2.53	1.81
Wei et al. (2018)	Environmental Concern (EC) $\alpha = 0.884$	If all of us, individually, contributed to environmental protection, it would have a significant effect.	6.22	1.10

(continued on next page)

Table 2 (*continued*)

Original scales	Variable	Items	Mean	SD
		Everyone is responsible for protecting the environment in their everyday life.	6.06	1.10
		Preserving and protecting the environment should be one of our priorities.	6.32	1.12
Voon et al. (2011)	Convenience perception (CONV) $\alpha = 0.778$	Package-free products are only available in limited stores/ markets	2.95	1.88
		The stores that I frequently shop at do not sell a variety of package-free products	2.61	1.91
	Cost perception (COST) $\alpha = 0.867$	Only consumers with higher income can afford package-free products	3.09	1.97
		Package-free products are beyond my budget	3.25	2.06

Source: Authors.

configurations with a consistency coefficient higher than 0.99, representing almost 60 % of the possible combinations of motivations behind the intention to buy package-free products. The existence of three configurations equally leading to the outcome variable: the intention to buy package-free products, addresses the second research question, showing that more than a combination of motivations may equally drive consumers to buy package-free products. Further configurations 1 and 2 show the highest raw coverage (0.4 on average) and consistency (higher than 0.99), supporting T1. T1 is also confirmed by the third configuration, where all variables are present apart from the familiarity with package-free stores. Configuration 3 shows the lowest raw coverage (0.134) but the highest unique coverage evidencing that this specific configuration exclusively covers the highest percentage of cases. In response to the third research question, the configurational analysis highlights the presence of necessary conditions. Familiarity with package-free products, personal norms, and environmental concerns emerge as necessary conditions. Thus, the intention to buy package-free products is always driven by those aspects, confirming T2.

Table 4 proposes a graphical representation of configurations in which the presence of the condition is indicated with the black circle (●), the absence condition with the crossed circle (⊗), and the *do not care* condition in a blank cell.

The first two configurations – with a higher level of raw coverage and consistency confirming the greater dimension of these segments – are similar in present variables and differ only in absent variables. Specifically, while customers in the first configuration do not consider the higher costs of package-free products, those in the second configuration do not buy package-free products due to social norms. However, in both cases, the motivation toward buying bulk products is dictated by familiarity with the store and package-free products, as well as by the individual perception of society's responsibility toward environmental issues and a greater attitude toward environmentalism.

Considering the novelty of the package-free phenomenon, configuration 3 confirms that, apart from familiarity with the store, which turns out to be a *do not care* aspect, both benefits (personal and social norms, conformism, and environmental concern) and barriers (product availability and cost) are relevant when buying package-free products.

6. Conclusions and implications

The highest amount of packaging waste is not recyclable (EPA, 2022; Marken and Hörisch, 2019). The urgency to meet the SDGs agenda and to provide a response to the EU Directive led scholars and practitioners to approach the complex sustainability problems through multi-faced perspectives (technology, culture, habits, system structure, and operation) and mixed-method and asymmetric methodologies (e.g., fsQCA) (Roger-Monzó et al., 2023). The spread of the package-free offer represents a valid solution to reduce single-use packages (Chang and Hung, 2023) and meet both regulations and a wider consumers' sensitivity toward environmental concerns. Nevertheless, due to product storage, traceability costs, and logistic reasons, manufacturers and operators are still too keen on traditional packages, with an alarming impact on waste production (Beitzen-Heineke et al., 2017). Stemming from the pro-environmental and retailing literature, the paper i) offers some market data useful for understanding the relevance of the phenomenon of the sale of bulk products (see Section 1 and 5.1); ii) tracks the perspective of consumers who, on the one hand, are favorable to purchase bulk products, and on the other, identify multiple critical issues in a daily adoption of bulk purchase (see results of Study 1); iii) analyzes the motivations behind the complex decision to buy bulk products showing heterogeneous perspectives among consumers (see results of Study 2).

The results of our first study – based on a focus group methodology – show that consumers are aware of their waste production when the incidence of packaging exceeds the number of products purchased or when they state to be ready to buy packaged-free products to impact less

Table 4
Forecasting results for consumers' intention to buy package-free products.

Configurations	1	2	3
Package-free products familiarity	●	●	●
Package-free store familiarity	●	●	
Personal Norms	●	●	●
Social Norms		⊗	●
Group Conformity	⊗	⊗	●
Environmental Concerns	●	●	●
Convenience perception	⊗	⊗	●
Cost perception	⊗		●
Raw Coverage	0.476	0.460	0.134
Unique coverage	0.050	0.030	0.078
Consistency	1.000	0.997	0.977
Solution coverage	0.591		
Solution consistency	0.995		

Source: Authors.

Table 3
The truth table for the intention to buy package-free products.

PFAM	SFAM	PN	SN	GC	EC	CONV	COST	Number	Raw consist	PRI consist	SYM consist
1	1	1	0	0	1	0	0	76	1	1	1
1	1	1	1	0	1	0	0	5	1	1	1
1	1	1	1	1	1	1	1	5	0.985005	0.974214	0.974214
1	0	1	1	1	1	1	1	4	0.966545	0.941035	0.964285
1	1	1	0	0	1	0	1	3	0.985878	0.976488	0.976488
0	0	0	0	0	0	0	0	3	0.762452	0.117438	0.117438

Source: Authors

on the environment. This finding corroborates previous results (e.g., Zeng et al., 2021). However, although the package-free market is growing – and the French case is an example – the phenomenon is still not widespread. Consumers show simultaneously good predisposition toward package-free purchases and fear adopting new buying paths due to greater commitment and work. Purchasing bulk products require higher efforts and costs (De Canio, 2023). The results of Study 2 – based on a fuzzy set qualitative comparative analysis (fsQCA) – show in configuration 3 an active role of all the variables in consumers' purchasing choices. If we exclude the familiarity with package-free retailers – which in France are well consolidated (see par. 5.1) – a segment of consumers shows the need to get more knowledge about package-free products, as well as some worries about cost and convenience, as highlighted by Marken and Hörisch results (2019). That said, conformism, social and personal norms are key to leading these consumers to buy package-free products. This result adds a new piece of information to the package-free literature. While Marken and Hörisch (2019) had already highlighted how the role of pro-environmental personal norms is important for bulk buyers, social norms and group conformity had only found evidence in the pro-environmental literature (e.g., Qi and Ploeger, 2019; Moser, 2015). Overall, results underline the varied need for intervention by market players committed to supporting the diffusion and adoption of this emerging phenomenon. Study 2 also shows the existence of two additional configurations of consumers – the largest groups – where only four aspects are relevant, namely product and store familiarity, personal norms, and environmental concern. These consumers show an outcome-oriented mindset (Cornelissen et al., 2013) and are moved by the environmental issues and their personal beliefs that everybody should contribute to promoting package-free shopping. However, the two groups differ in the irrelevance of some aspects extending the previous results (e.g., Fuentes et al., 2019; Qi and Ploeger, 2019; Louis et al., 2021). In the first configuration, conformity, cost, and convenience are absent from the set of motivations that lead to the decision to purchase bulk products. In the second configuration, social norms, group conformity, and convenience are absent conditions opening new scenarios for studying the emerging phenomenon. Pollution emission and material waste management require extra efforts to be managed, while innovative solutions may align institutions, operators, and consumers (Kazancoglu et al., 2021). Package-free operators, jointly working with institutions, may support the consumers' switching toward more sustainable options to reduce the negative impact of consumption on the environment. Consumers are ready to improve their shopping of bulk products, although with extra effort and costs. Accordingly, manufacturers should improve their bulk product offer that meets emerging consumers' needs. Similarly, retailers should extend their assortments with further bulk product categories and with a wider range of national brands and private-label products. Retailers should pay attention to cost-price-related issues. Bulk products are often more expensive than packaged products due to storage, maintenance, and losses, although consumers assuming the absence of the packaging should justify a price reduction. Nonetheless, the French example highlights that although bulk products are not easy to manage in-store, have critical storage issues, and cost more, in the long-term, they may both improve customer loyalty and the retailer's brand image and attract new consumer segments. If the growth trends of buyers of package-free products will be confirmed soon, as the market is still not very manned by European retailers, those first offering a wider assortment of bulk products will have a competitive advantage in strengthening the relationships with their customers (Louis et al., 2021). However, as highlighted by Zeng et al. (2021), as products sold in bulk are still limited, mixing bulk products with sustainably packaged products may represent the best current strategy. A further aspect that zero packaging retailers should manage is the packaging's informative function and branding purpose, which is lost in the bulk context. Improved in-store communication, the presence of labels on dispensers, the use of QR codes, interactive and highly informative retailing apps, and a wider presence on social networks could be tools useful to compensate for the absence of packaging.

The study also offers compelling insights for institutions promoting pro-environmental actions among operators and consumers. First, package-free products represent a valuable opportunity to reduce packaging waste and directly impact the environment and pollution spread in the short term. Thus, financially supporting manufacturers and retailers to adapt their business model to this emerging phenomenon may return with short-term economic, social, and environmental benefits. Second, consumers are ready to adopt innovative buying and consumption behaviors. Nevertheless, the UN and EU should strengthen their communicational effort to improve citizens' familiarity with bulk products, spread knowledge about environmental issues, and promote the culture that everyone may contribute to safeguarding the environment with small but daily actions. Indeed, familiarity with package-free products, environmental concerns, and personal norms emerged as necessary conditions for buying package-free products.

7. Limitations and future research agenda

This manuscript explores the emerging phenomenon of package-free products. Although we offer a multi-faced view of this under-explored phenomenon, additional aspects deserve investigation. First, Study 2 was developed on a convenience sample living in France, a European country where bulk sales are rising fast. We offer a comparison with Italy in Study 1, but more nuanced insights are needed to fully assess cross-cultural differences in adopting pro-environmental buying behaviors (Cosmeticobs, 2022). Second, the study offers only a partial overview of the motivations (personal and social norms, conformism, and environmental concern) and barriers (convenience and cost perception) underlying the decision to purchase bulk products. Further, interaction among variables may be investigated using symmetric analyses (e.g., regression, structural equation models). Although the symmetric analysis may fail to offer an overall perspective on the phenomenon, above all considering emerging phenomena, it may provide the leading motivations for the intention to buy bulk products. Regarding the retailing sector, another interesting aspect concerns the incidence of impulse purchases in bulk sales. Since the customer has to plan purchases and carry the containers necessary to buy package-free products (Beitzen-Heineke et al., 2017), this could drastically reduce impulse purchases. Future studies might test the importance of packaging vs. package-free configurations by using virtual reality (Branca et al., 2023). Finally, an intriguing avenue for research is the policy on product returns (Lee and Yi, 2022).

Overall, these are just some of the possible research areas on bulk products. In general, package-free products require greater attention from scholars of various research fields, representing a pragmatic solution to the ever-increasing scarcity of packaging materials.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

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