To Pack Sustainably or Not to Pack Sustainably? A Review of the Relationship between Consumer Behaviour and Sustainable Packaging

Gabriele Murtas, Giuseppe Pedeliento, and Daniela Andreini

Abstract In the past few decades, the massive amount of packaging waste produced every year has unquestionably become one of the most significant sources of pollution. Consequently, several nations worldwide are now openly addressing packaging-related environmental issues in their political agendas. Moreover, because consumers are becoming increasingly ecologically aware and informed, companies and retailers are being induced to rethink their supply chains at all levels. Adhering to the principles of eco-friendly packaging may be considered a first strategic step towards developing a sustainable image which may yield a broader competitive advantage. Academic research has therefore attempted to investigate consumers' responses to environmentally friendly packaging. In this chapter, we review the extant literature so as to give valuable guidance to all firms and retailers striving to fulfil more eco-friendly packaging standards. Besides offering practical and helpful suggestions, our review presents an agenda for future research.

Keywords Packaging · Sustainability · Green · Retail · Consumer behaviour

1 Introduction

According to Eurostat data (2021), in 2018 European consumers generated more than 174 kg of packaging waste per inhabitant (i.e. 77.5 million tonnes in total). And while e-commerce continues with its enormous growth, the huge amount of packaging waste does not seem likely to diminish in the coming years (Regattieri et al., 2014). In fact, with the rise of e-commerce, the packaging market has been growing at an annual rate of 4.2% since 2010, and it is expected to continue at the same rate until 2024 (ALL4PACK, 2016). Packaging pollution raises significant environmental issues. In addition to the massive amount of waste produced every year, packaging consumes raw materials, water, and energy, and it increases air pollution. The

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magnitude of this problem is colossal: Tencati et al. (2016) report that packaging accounts for almost 20% of total municipal solid waste, while plastic packaging alone accounts for 50% of global plastic waste.

As a result, packaging-related pollution issues are influencing the political agenda of several countries, especially in the West. Packaging waste is among the priorities of the 'New Circular Economy Action Plan' issued by the European Commission in March 2020 (COM/2020/98 final). Moreover, because consumers' interest in sustainable consumption is constantly increasing (Giesler & Veresiu, 2014), companies are now forced to rethink their processes and redesign their supply chains to include more sustainable practices (Ertekin et al., 2020). The fight against packaging waste is now on a par with the social struggles on environmental protection, social justice, and economic growth issues. Inevitably, the rising interest of consumers has prompted businesses to increase the number of initiatives aimed at developing sustainable packaging that adheres to circular economy principles (Bocken et al., 2016).

However, by redesigning packaging in accordance with more sustainable practices, a company should bear in mind the fundamental role that packaging performs in the consumer's decision-making process. Packaging not only preserves products; it also sells them with its designs and the information that it provides. As Clement (2007) argues, effective packaging guarantees that the product will be noticed, producing a purchasing intention and creating positive impressions and emotions. The advantage of packaging over other marketing communication tools consists in the fact that it impacts on customers while they are actively involved in the purchase process: they are in a retail store with a variety of products to choose from, and they want to fulfil their consumerist needs. Over 70% of buying decisions are made right in front of the shelf, where a buying decision takes just a few seconds (Clement, 2007). In fact, packaging plays a fundamental role in attracting the attention of, and connecting with, consumers at the crucial moment when the purchase is about to be made. It follows that companies and retailers must always achieve a good balance between environmental demands and an attractive appearance.

Having underlined the importance and the topicality of sustainable packaging, the aim of this chapter is to report the main evidence set out in the pertinent empirical literature and which may inspire retailers to better inform their transition towards the practice of sustainable packaging. The literature on sustainable packaging divides between two main research streams: the first concerns the industrial/technical aspects of packaging understood as a material artefact (i.e. material, ability to perform, recyclability, etc.); the second comprises consumer behaviour studies on the relationship between consumer behaviour and packaging designs. While both streams are of paramount importance to retailers—because the former has the primary goal of improving the technical functions of the packaging, and the latter concerns how packaging should be developed to suit consumers' emotional needs more closely—the analysis that follows is focused on studies that approach the topic of sustainable packaging from a marketing/consumer-oriented perspective.

The chapter is organized as follows. It first examines the roles that packaging plays in retailing in order to show how its functions have evolved over time to meet

ever-changing consumer needs. After providing a widely accepted definition of sustainable packaging from the literature reviewed, the chapter surveys the main studies investigating variations in consumers' responses to eco-designed packages. This will be followed by an exploration of the motivations, benefits, as well as doubts and barriers, experienced by retailers when shifting towards more environmentally friendly practices. In conclusion, the chapter identifies specific managerial and theoretical implications and proposes directions for future research.

2 The Evolution of the Role of Packaging in Retailing

According to the extant literature (Bramklev, 2009; García-Arca & Prado-Prado, 2008; Jönson, 2000), packaging fulfils both technical (i.e. functionality and overall quality) and marketing functions (i.e. elements relating both to the aesthetics and the appearance of the packaging). On the one hand, packaging is used to preserve the product's integrity by protecting it against possible damage caused by handling and transportation. On the other, packaging is considered a 'silent salesman' (Pilditch, 1957): consumers are exposed to the product's packaging at the point of sale before they can directly experience its consumption or use product. After all, what has always mattered to retailers is capturing consumers' attention when they are looking at a store shelf (Orth & Malkewitz, 2008). This so-called 'five-second advertising' effect (Kotler & Keller, 2012) helps consumers overcome information clutter in retail stores, which offer and promote hundreds of products at the same time. In fact, despite the numerous promotional techniques now available, packaging still plays a crucial role in influencing a consumer's buying intention and willingness to pay (Lamberz et al., 2020; Magnier & Schoormans, 2015; Steenis et al., 2018). Nevertheless, the functions that packaging performs in a conventional retail context extend beyond it. Packaging can in fact communicate the size, the relative expensiveness of the item, and specific benefits of the packaged product, thus suggesting its superior quality (Clement, 2007; Festila & Chrysochou, 2018). In sum, packaging can be defined as a 'touchpoint' able to communicate information and evoke feelings in buyers and consumers (Clement, 2007).

While until a few decades ago the role of packaging would have stopped at this point, today these functions represent only a part of it. In fact, as evidenced by existing research, packaging must shed the stigma of being only an accessory. Ciliberti et al. (2008) underline that, in addition to supporting consumers in making informed and responsible purchase decisions, packaging has a significant impact in increasing efficiency at all production and logistical levels. Improvements in this fundamental domain may bring benefits in terms of efficiency and sustainability to the entire supply chain. Moreover, as e-commerce continues its enormous growth—in 2020 online retail sales accounted for 18% of all retail sales worldwide (eMarketer, 2021)—packaging must be adapted so that it satisfies evolving consumer needs. Regattieri et al. (2014) argue that packaging functions must now develop to match these new requirements, which include an increased need to protect

items during shipment, larger amounts of packaging materials for each product, end-of-life management of products, and the growing attention of consumers to environmental sustainability. According to the latter, Jerzyk (2016) suggests that—in addition to its logistical (i.e. protection against damage and loss during handling and transportation) and commercial (i.e. communicative and promotional role) functions—packaging has another important function, which concerns the environment. In her study, Jerzyk (2016) argues that, because of packaging's environmental impact, retailers should redesign it according to more sustainable standards so as to meet the increasing consumer demand for more environmentally friendly practices, and develop, reinforce, and promote a green position. Consequently, the recent literature suggests that, once retailers have implemented green packaging practices, they should not only provide on the package information regarding the product contained in it, but also attach eco-sustainability claims and labels (Lamberz et al., 2020; Magnier & Schoormans, 2015; Samant & Seo, 2016). As we shall show in the following sections, properly communicating a package's eco-friendliness is an effective way to build a sustainable image which may influence both the consumer's brand impression as well as his/her purchase intention (Koutsimanis et al., 2012; Magnier & Schoormans, 2015; Orth & Malkewitz, 2008).

3 Methodology

In order to gather the main findings in the existing literature that may inspire retailers to adopt more sustainable practices, we conducted a systematic literature review (Tranfield et al., 2003). Our research focused on the importance and relevance of eco-friendly packaging, and it sought to determine the following:

- Consumers' responses to eco-designed packages.
- The benefits and risks experienced by retailers when adopting sustainable packaging.
- Specific managerial and theoretical implications.
- Directions for future research.

As shown in Fig. 1, to identify the publications suitable for this chapter, we first scanned the Scopus and Web of Science databases, searching for the keywords 'sustainable packaging' OR 'environmentally friendly packaging' OR 'eco-packaging' OR 'ecological packaging' OR 'green packaging' OR 'eco-friendly packaging'. After merging the results and removing all duplicates, we collected over 624 articles. During the second step, we removed all the studies in non-relevant fields ($n = 493$) and those studies that mentioned sustainable packaging but did not study it in their full text ($n = 85$). The selected papers ($n = 46$) were retained for a four-step analysis involving (1) documenting, (2) familiarizing with the field, (3) coding, and (4) categorizing (Kaartemo & Helkkula, 2018).

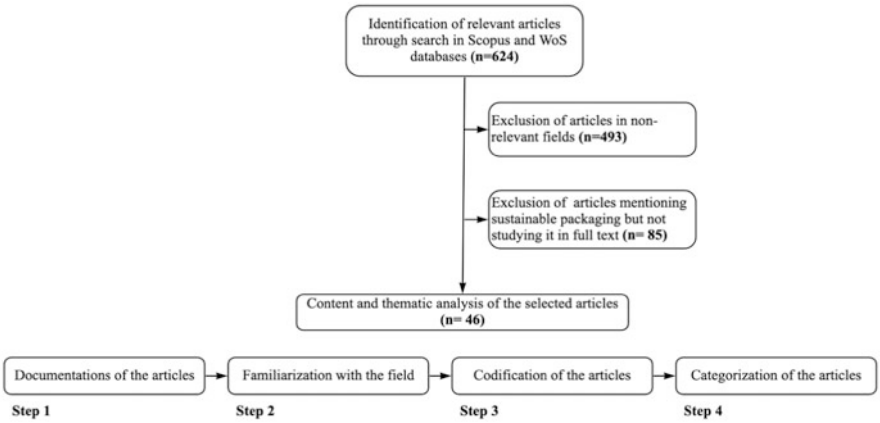

Fig. 1 The research process

4 The Meaning(s) of Sustainable Packaging

Although issues of sustainability are gaining importance and centrality in corporate agendas, it must be noted that one of the main reasons why retailers are now emphasizing the eco-friendly nature of the packaging that they use is the significant increase that the packaging market has undergone in recent years due to the rapid growth of e-commerce. In fact, e-commerce raises new challenges, such as an additional need to safeguard products and a growing concern among consumers with environmental sustainability. The latter notwithstanding, there has been only limited research into consumer perceptions of eco-friendly packaging, and—as we shall also show in this chapter—eco-friendly packaging has never been a clear concept in the consumer behaviour literature.

The current literature has used several terms to denote sustainable packaging: 'environmentally friendly packaging', 'eco-packaging', 'ecological packaging', 'green packaging', and 'eco-friendly packaging'. A widely accepted definition of sustainable packaging—which embraces functional as well as environmental and technological dimensions of sustainability—is provided by the Sustainable Packaging Coalition (SPC) (2011). A sustainable packaging:

- Is beneficial, safe, and healthy for individuals and communities throughout its life cycle.
- Meets market criteria for performance and cost.
- Is sourced, manufactured, transported, and recycled using renewable energy.
- Maximizes the use of materials from renewable or recycled sources.
- Is manufactured using clean production technologies and best practices.
- Is made from materials healthy in all probable end-of-life scenarios.
- Is physically designed to optimize materials and energy.

- Is effectively recovered and utilized in biological and/or industrial cradle-to-cradle cycles.

In sum, from production to disposal, sustainable packaging is required to protect the product and to communicate its benefits, while also embracing material reuse and waste reduction.

Forerunning studies in the thriving field of sustainable packaging have dealt with consumer-focused inquiries aimed at gaining knowledge about what consumers consider to be eco-friendly and what characteristics can be associated with sustainability. For instance, Scott and Vigar-Ellis (2014) studied consumer understanding, perceptions, and behaviours in regard to environmentally friendly packaging. Their findings showed that when the participants were asked about what eco-friendly packaging meant, they cited 'non-harmful', 'biodegradable', and 'recyclable' as the most common features. Respondents also highlighted that environmentally friendly packaged products are believed to enhance the quality of life because they help to reduce pollution, thus saving the planet. Finally, when asked how they could tell the difference between eco-friendly and normal packaging, respondents replied that they relied on the label as well as the recyclable logo. While analysing this difference, respondents cited also other features as indicative that the packaging is environmentally friendly. Earth colours such as cream, brown, or green were identified as more eco-friendly and therefore associated with environmentally friendly packaging.

Magnier and Crié (2015) examined the packaging features able to convey eco-friendliness, as well as consumers' responses to eco-designed packaging. The results of their interviews suggested that the ecological perception of a package is based on the evaluation of three different sets of macro-cues: structural cues, i.e. those referring to size, over-packaging removal, shape, recycled/biodegradable materials, and reusability; graphical cues, i.e. cues concerning the use of natural colours, photographs, images, and the recyclable logo; and informational cues, i.e. ones relating to the use of ethical vocabulary, general environmental claims, and environmental certifications from organizations that aim at protecting the environment.

Regarding the perceived benefits that consumers attribute to sustainable packaging, Magnier and Crié (2015) distinguished between private and pro-social benefits. The former comprise health benefits related to the decrease in pollution; convenience in terms of the easiness of eliminating or transforming packages after their use; the emotional (i.e. ability of an alternative to arouse positive feelings) and social (i.e. perceived utility linked to a product and one or several specific social groups) benefits that arise in a context where pro-environmental attitudes and behaviours have become social norms. On the other hand, pro-social benefits consist of protection of the environment (i.e. altruistic benefits that stem from protection of the Earth's resources) and protection of the well-being of others (i.e. benefits related to the protection of the Earth's well-being for future generations).

Additionally, Zeng et al. (2020) observed that consumers prefer to purchase products that are characterized by highly visible social signalling—such as

Table 1 The meaning(s) of sustainable packaging

Production techniques and design	
Physically designed to minimize its shape and over-packaging (Magnier & Crié, 2015), and to optimize the use of renewable/recycled/biodegradable materials (Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014; SPC, 2011); Manufactured, transported, and recovered (or recycled) using renewable energy and clean production technologies (SPC, 2011); Must inform the consumer by means of its label, the use of ethical vocabulary, general environmental claims, environmental certifications, as well as the recyclable logo (Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014; Zeng et al., 2020).	
Benefits	***Risks***
Beneficial and safe for both individuals and communities (Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014; SPC, 2011); Non-harmful to the environment because it decreases pollution and waste (Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014); Easy to eliminate or transform after its use (Magnier & Crié, 2015; SPC, 2011).	Its minimalist design may cause hygiene as well as protection-related problems (Magnier & Crié, 2015); Greenwashing concerns because consumers do not consider themselves as possessing the expertise necessary to judge packaging (Magnier & Crié, 2015); Perceived as more expensive (Magnier & Crié, 2015).

sustainable verbal attributes—in order to establish socially desirable traits for themselves: products able to communicate highly visible social signals are often preferred.

Besides mentioning the benefits, Magnier and Crié (2015) also reported the perceived costs of implementing sustainable packaging. It is important to note that a series of factors evidenced by the respondents may exert a negative effect on consumers' perceived value and benefits. Negative attitudinal responses are related to the loss of pleasure during the consumption experience because eco-friendly packaging is often perceived as less appealing—in terms of aesthetics and social value—due to its lack of colours and minimalist design. The latter, which also refers to the removal of over-packaging, may evoke hygiene as well as protection-related concerns that are likely to affect the overall perceived quality of packaging. Furthermore, in addition to being considered more expensive, sustainable packaging can generate problems in terms of trust among consumers that do not consider themselves as possessing the expertise necessary to judge whether or not the packaging is environmentally friendly.

The following table (Table 1) provides a brief summary of the main meanings typically attributed to sustainable packaging in the existing literature.

5 Sustainable Packaging and Consumers' Responses

As the growing importance of sustainability in the minds of consumers is inducing companies and retailers to rethink all the levels of their supply chains (Ertekin et al., 2020), adhering to the principles of green packaging may be an effective way to build a sustainable image. Indeed, recent research shows that as consumers become increasingly environmentally smart and knowledgeable, the adoption of sustainable packaging solutions by a company positively affects their attitude (Martinho et al., 2015; Prakash & Pathak, 2017; Steenis et al., 2017, 2018). Furthermore, the literature underlines that when sustainability becomes central in the design of the supply chain and is properly communicated, consumers tend to purchase environmentally friendly packaged products in order to satisfy their moral goals (Magnier & Crié, 2015), which results in a higher willingness to pay (Gershoff & Frels, 2015). Below we present the main empirical findings related to how consumers' behaviour is impacted by sustainable packaging.

5.1 Purchase Intention and Willingness to Pay

Because the principles of sustainable packaging are often adopted by companies and retailers to achieve better commercial results (Gustavo Jr et al., 2018), it is not surprising that research has often addressed the question as to whether the eco-friendliness that consumers attribute to packaging may increase their intention to buy and willingness to pay.

In their studies on detergent and mixed nuts packages, Magnier and Schoormans (2015) manipulated the visual appearance and verbal sustainability claims while testing the influence of these elements on consumers' affective attitudes and purchase intentions. Specifically, in the first study, the authors investigated whether the respondents' level of environmental concern influenced their response to the visual appearance and verbal sustainability claims of packages. The findings revealed that while the purchase intention showed no significant increase in low environmentally conscious respondents, the effect was positive and significant in high environmentally conscious ones, indicating that the purchase intention was stronger when there was a sustainability claim on the package. In their next study, Magnier and Schoormans (2015) tested whether brand ethicality mediates the relationship between the visual appearance, the verbal sustainability claim, and environmental consciousness, on the one hand, and purchase intention on the other. The results suggested that firms which greenwash by displaying false environmental claims on their packages will be seen as having low brand ethicality and that this decreases purchase intention. Indeed, the findings showed that the positive (or negative) effects of the combinations of visual and verbal ecological elements relate closely to brand ethicality, which directly affects the purchase intention.

Again adopting purchase intention as the main dependent variable, the study by Steenis et al. (2018) investigated consumers' responses to packaging redesigned in accordance with the principles of circular (e.g. adoption of biodegradable materials) and linear (e.g. packaging light-weighting) strategies. Two experiments were conducted in order to understand how the single (or multi-) strategy implementation of these two different sustainable design strategies affects consumers' purchase intentions. The findings suggested that consumers are more positive towards redesigns that follow the circular design strategy compared to the linear one. Moreover, Steenis et al. demonstrated that multi-strategy redesigns are perceived only as marginally more sustainable than single strategies.

Aagerup et al. (2019) investigated the effects of rational vs. emotional green packaging claims on consumers' purchase propensity for organic coffee. Overall, their findings showed that consumers prefer products with green claims over those with neutral (control) claims, and products with emotional green claims over those with rational green claims. In fact, only the most environmentally committed respondents with the highest level of information-processing ability expressed no preference for packaging with emotional claims. In sum, Aagerup et al. (2019) suggested that managers should emphasize their product's 'greenness' whenever possible, but they should use emotional or rational green packaging claims according to whom they target.

In regard to the willingness to pay, Lamberz et al. (2020) argued that if retailers and brand manufacturers of food succeed in presenting their sustainable packaged products at the point of sale, the likelihood of a purchase will be significantly increased. Employing an eye-tracking software at a point of sale, Lamberz et al. demonstrated that individual display elements (i.e. labels) have an influence on visual attention, search, and buying intention, as well as on the willingness to pay. Consumers who associate individual packaging features with sustainability are more likely to buy a product while also increasing their trust in it (Samant & Seo, 2016). In particular, the results showed that consumers with a positive attitude towards sustainability looked longer at individual display elements that addressed sustainability issues. The results also confirmed the hypothesis that consumers with a positive attitude towards sustainability have a greater willingness to pay.

5.2 Consumers' Perceptions and Preferences

Since—as underlined above—sustainable packaging is able to affect important dependent variables such as intention to purchase and willingness to pay, the literature has also focused on consumers' perceptions and preferences in regard to eco-friendly packaging.

For instance, Nguyen et al. (2020) studied consumers' perceptions of eco-friendly packaging in the context of packaged food products. Their findings demonstrated that the perceptions of a package's eco-friendliness are based on three key dimensions: packaging materials, manufacturing technology, and market appeal.

Regarding packaging material, consumers use their evaluation of different types of packaging materials to determine whether or not the packaging is sustainable. While plastic is considered negatively due to its environmental impact, both paper and biodegradable materials are perceived as environmentally friendly. However, consumers acknowledge the better protective performance of plastic compared to paper-based packaging, thus valuing the role of protection against possible damage more than sustainability. In regard to the dimension of manufacturing technology, consumers show limited understanding of the packaging manufacturing process: they are unable to evaluate the most environmentally friendly techniques. Nevertheless, consumers still desire and demand the adoption of eco-friendly manufacturing processes. Finally, with regard to market appeal, Nguyen et al.'s results show that consumers consider the graphic design as well as the functional performance when evaluating sustainable packaging. Consumers are attracted by colourful images but seem to be dissatisfied with the poor appearance of paper-based packages. These findings resonate with those of Magnier and Crié's (2015) study, which showed that eco-friendly packaging may cause a loss of pleasure during the consumption experience due to protection- as well as aesthetic-related problems. This highlights the functional role and aesthetic needs that eco-friendly packaging should satisfy in order to gain acceptance from some consumer segments.

Regarding the design and the choice of colours, Barchiesi et al. (2018) explored the capacity of a package's colour to convey CSR to consumers by focusing on packaged goods such as bottled water, deodorant, canned tuna, and hand soap. The study revealed that the colour of packaging directly influences the credibility and clarity of a CSR message. Specifically, Barchiesi et al.'s findings showed that, for the purpose of communicating a CSR message, the use of the colour 'green' may not be the best choice. In fact, 'white' and 'blue' are widely considered as the most attractive colours with which to credibly convey a sustainable message.

Focusing on the material, Ferrara and De Feo (2020) studied the attitudes of consumers towards more sustainable wine packaging alternatives. Since glass is the most commonly used packaging for wine worldwide, there is widespread scepticism towards the adoption of more eco-friendly packaging alternatives such as bag-in-box, aseptic cartons, or PET bottles. Nevertheless, the large majority of the respondents stated that they would reconsider purchasing wine in alternative packaging after being informed that the quality of the wine did not change. The results thus showed that, often, even the most unwilling consumer can develop new opinions and adopt new solutions when properly educated.

Skard et al. (2020) investigated consumers' perceptions about a product's functional quality when its core (e.g. the ingredients) and peripheral attributes (e.g. the packaging) are environmentally friendly. For this purpose, the core attribute was manipulated using the description '100% natural ingredients', while the peripheral one was manipulated using the description '100% recycled packaging material'. Although Skard et al.'s findings demonstrated that both eco-friendly core and peripheral attributes do not induce consumers to infer higher functional product quality, they suggested that the green peripheral attribute is preferred among eco-friendly shoppers: while consumers may believe that they must choose between

quality and sustainability, sustainable packaging has no effect on the product's functional performance, reducing the perception of this trade-off.

It should be noted that different consumers may have alternative purchasing patterns in regard to sustainable packaging. For instance, Testa et al. (2020) tested an integrated conceptual model that explored the influence of consumers' personal concerns, other pro-environmental behaviours, greenwashing beliefs, and consumer innovativeness. The data showed that consumers with higher environmental concerns are more likely to gather additional information on the environmental features of packaging, thus highlighting that the propensity to gather additional information mediates the relation between consumers' environmental concerns and purchasing intentions.

In sum, managers must provide clear and unequivocal information on the circular characteristics of packaging to support consumers in making informed and responsible consumption choices (Ciliberti et al., 2008).

5.3 Consumers' Demographic Variables

Perceptions of sustainable packaging and environmental friendliness are closely bound up with the demographic characteristics of consumers. The extant literature underlines attitudes and responses that differ mainly according to cultural background, age, and gender.

By surveying attitudes in three different cultures (i.e. Germany, France, and the USA), Herbes et al. (2018) examined how the interaction of eco-friendly packaging features impacts on an overall judgment of environmental sustainability. Specifically, the authors sought to determine how culturally diverse consumers rate different packaging materials in terms of environmental friendliness. Their results revealed that reusable materials are regarded as the most ecologically friendly in Germany, whereas recyclable ones are perceived as the most sustainable in both France and the United States. In general, renewable and biodegradable materials were rated highly, while plastic—despite being made of biomethane—was perceived as the least eco-friendly material. On average, American respondents gave scores higher than the European ones, thus suggesting that US consumers consider the options as more sustainable. However, unlike the American consumers surveyed, the Europeans also deemed 'reduced packaging' to be fundamental in a company's effort towards sustainability. In sum, the respondents frequently chose end-of-life attributes such as 'reusable', 'recyclable', and 'biodegradable', while giving lower ratings to attributes related to the use of raw material (e.g. made from natural/renewable resources).

In regard to age, Barber (2010) observed that belonging to different generations greatly influenced the participants' willingness to pay for greener packaging. Specifically, Baby Boomers (i.e. those born between 1946 and 1964) were willing to pay more for eco-friendly packaging compared to Millennials (i.e. 1981–1996). Koutsimanis et al. (2012) noted a similar higher willingness to pay among Baby

Boomers as well as Gen Xers (i.e. 1965–1980). The authors also observed that consumers aged over 25 are more inclined to recycle, and therefore have a positive attitude towards packaging materials that are more eco-friendly. Analogous results were obtained by Baruk and Iwanicka (2016), who recorded a closer attention to environmental concerns as the respondents' age increased.

As regards gender, Jezewska-Zychowicz and Jeznach (2015) found that women are more likely than men to consider the environmental friendliness of packaging and to minimize packaging-related waste. Similarly, Chekima et al. (2016) revealed that women are consistently more environmentally friendly than men. In another study, women with an average age of 50 showed the highest preference for eco-friendly packaging compared to men (Martinho et al., 2015). In short, the literature seems to suggest that women tend to engage in sustainable purchasing and disposal more than men.

To conclude, levels of education appear to be less important. For instance, Barber (2010) found that the level of education does not have an influence on the willingness to pay for eco-friendly packaged products. Similarly, Neill and Williams (2016) showed that the level of education does not have a statistically significant effect on the preference for returnable glass milk bottles. Baruk and Iwanicka (2016) claimed that an increase in the educational level does not indicate an increase in pro-environmental awareness. However, it should be noted that empirical results suggest that high-income countries are usually more environmentally concerned than low-income ones (Paul et al., 2016).

6 The Communicative Function of Sustainable Packaging

Effective communication may be achieved through a variety of channels, from CSR reports and press releases to websites and social media posts. However, because packaging is one of the most suitable means with which to convey a company's efforts in regard to sustainability (Barchiesi et al., 2018), it can undoubtedly be considered among the most effective communication channels (Pilditch, 1957). Indeed, packaging design has become crucial in the communication between retailers and consumers because it is able to communicate values and philosophies with which consumers can identify (Magnier & Crié, 2015; Zeng et al., 2020). Becoming increasingly skilled in conveying to the public the sustainable efforts that the company is undertaking across all steps of production and distribution may have positive effects on customer loyalty, word-of-mouth communication, resilience to negative news, and, consequently, positive economic results.

However, although the existing literature has tried to provide answers to the question of how sustainable packaging should be, there is still scant consensus among researchers. The extant research underlines that material choice has a strong effect on perceived sustainability (Steenis et al., 2018), but consumers are also affected by graphical influences (Magnier & Crié, 2015). For instance, among the most appreciated materials, researchers have found paper, cardboard, and glass

(Herbes et al., 2018; Neill & Williams, 2016; Nguyen et al., 2020). The use of plastic, on the other hand, may cause such sustainable communication to backfire. On analysing the most suitable colour, some studies suggest that earth colours such as green, white, and brown are better at signalling sustainability (Scott & Vigar-Ellis, 2014), while others recommend blue and white (Barchiesi et al., 2018). Chrysochou and Festila (2019) underline the importance of employing prototypical elements and images, because complex ones tend to require too much effort from consumers, thereby driving their attention away from the product. In detail, the authors investigated how sustainable packaging designs differ from traditional and conventional ones. Their results showed that the presence of nature in the images, as well as organic claims, are more prevalent in sustainably packaged products. Similar studies have highlighted how one of the strategies most frequently used to communicate a product's sustainability and eco-friendliness is the use of labels and claims which assert that the product is less impactful on the environment (Lamberz et al., 2020; Scott & Vigar-Ellis, 2014). Although these elements are well-known to influence consumers' responses—from consumption patterns (Scott & Vigar-Ellis, 2014) to taste perceptions (Lee et al., 2013)—it should be noted that consumers' trust in the messages communicated through sustainable packaging appears to be crucial in the buying process (Aagerup et al., 2019). Indeed, Jerzyk (2016) showed that consumers are willing to change their choice to more sustainable packaging only if claims are credible. Therefore, in an environment where consumers are constantly bombarded with often misleading information, retailers—in addition to the use of sustainable materials, natural colours, and images—must provide clear and unambiguous data on packaging attributes because these matter in purchasing decisions and consumers' search for consistency among personal beliefs, past behaviours, and circular packaging attributes (Testa et al., 2020).

7 Turning to Sustainable Packaging

Circular economy has been gaining increasing attention from both institutions and, most importantly, consumers. The concept of circular economy focuses on extending the lifecycle of a product, minimizing waste, and maximizing its value. While in the previous sections the attention was focused on the characteristics and needs that eco-friendly packaging should fulfil, in the following sections motivations, benefits, as well as barriers related to the adoption of sustainable packaging by companies will be analysed.

For instance, Gustavo Jr et al. (2018) studied the motivations and doubts of a global retailer trying to improve packaging sustainability. Their findings showed that economic gains were among the main motivations for engaging in packaging redesign. Specifically, the economic gains that redesigned packaging generated were related to a reduction in the use of superfluous material, thus decreasing logistics costs and waste. Moreover, the study showed that retailers which combine economic gains with environmental sustainability develop more sustainable actions

when past experiences led to better economic results. On the other hand, the barriers that may prevent packaging redesign were mainly related to commercial uncertainties. To advance research on additional barriers limiting the development and spread of sustainable packaging, Ravi (2015) studied the electronics packaging industry. Through a survey on Indian electronic packaging companies, the author discovered that several barriers may prevent the adoption of eco-friendly packaging practices. In particular, constraints related to a widespread lack of awareness about environmental issues, as well as a lack of commitment in the top management which resulted in insufficient funds allocated to R&D departments.

Despite these doubts and barriers, the literature shows that the adoption of more sustainable practices can improve a business's productivity (Luthra et al., 2016), increase profits (Luthra et al., 2016; Hsu et al., 2016), and drive market share growth (Hsu et al., 2016). For example, Gurtu and Arendt (2020) showed that reducing packaging in the supply chain lowers the environmental impact of a company and improves its profitability. In fact, although packaging has an important role in every part of the distribution process, some of the materials used are often unnecessary. Over-packaging costs include not only those related to additional material and labour but also all expenses concerning storage, transportation, and safe disposal of packaging wastes. Therefore, better economic results are achieved mainly through a decrease in over-packing, which results in reduced packaging materials and production costs, as well as decreased storage and transportation expenses.

Similarly, Yildiz Çankaya and Sezen (2019) observed that companies engaging in green supply chain management practices (GSCM) obtained benefits on several fronts. Besides an improved social performance—because consumers and stakeholders in general appear to appreciate 'green' efforts—the adoption of these practices also affects the economic results of firms. For instance, a reduction in the packaging material used not only lowers material-related costs; it also reduces transportation expenses and production costs, and it increases overall efficiency. Cost advantages were also observed by Obrecht and Knez (2017), who studied the effects of the ecological redesigns of three different cargo containers on carbon emissions.

To examine the effects that occur when a company decides to implement a more sustainable packaging logistics approach, García-Arca et al. (2014) analysed the supply chain of Mercadona, one of the largest retailers in Spain. The analysis of the case study revealed that, as a result of the shift towards more sustainable practices, Mercadona achieved an average increase in palletization while simultaneously reducing the number of boxes handled. This resulted in an overall reduction of the packaging waste of plastic, paperboard, as well as cardboard. At the same time, Mercadona's supply chain experienced a reduction in costs related to transport, storage, and handling. García-Arca et al.'s findings also showed that total food losses and claims significantly decreased.

To conclude, Silva et al. (2013) studied the effects of the adoption of a returnable packaging approach by a company located in Brazil. Their findings suggested that, compared to the disposable packaging system, returnable packaging provides several advantages. Specifically, returnable packaging consumes less material, thus

resulting in a decrease of production costs. Moreover, in regard to environmental performance, it reduces its environmental impact by minimizing waste generation in the final customer.

8 Managerial and Theoretical Implications

Throughout this chapter, we have examined the role that packaging plays in the purchase decision-making process, and we have reviewed studies investigating consumers' responses to eco-friendly packaging in retailing. This section presents and discusses the practical and theoretical contributions of our literature review. The first part offers practical advice to retailers who want to implement and pursue more sustainable packaging practices. Specifically, this section shows which materials and colours are perceived as most sustainable and which graphical and informational cues should be used to best present the newly adopted sustainable packaging. Implementing the following suggestions may lead to positive customer evaluations, thus furnishing an improved competitive advantage. In the second part of the section, we identify knowledge gaps in the existing literature that future research on sustainable packaging needs to address.

In regard to managerial implications, the studies analysed show that shifting towards more eco-friendly packaging standards is an effective way to develop a sustainable image. In fact, green packaging is well suited to all those retailers wanting to achieve higher sustainability rates in their supply chain, as well as to communicate to their core audience their compliance with eco-friendly principles (García-Arca et al., 2014). In this direction, while adopting more sustainable practices, a retailer should always consider that packaging not only protects a product but also acts as a communication tool and as a source of sensations and experiences (Clement, 2007). As the existing literature suggests (Magnier & Crié, 2015; Nguyen et al., 2020), retailers should redesign their packaging according to three key dimensions which directly influence the perception of a package's eco-friendliness: packaging materials (i.e. structural cues), packaging manufacturing process (i.e. manufacturing technology), and overall appeal (i.e. graphical and informational cues) (see Table 2).

Although consumers tend to have little knowledge about the most environmentally friendly manufacturing techniques, packaging materials and market appeal are heavily judged. With regard to the structural cues, paper, cardboard, glass, and biodegradable materials are perceived as the most environmentally friendly, while plastic should be categorically avoided (Herbes et al., 2018; Nguyen et al., 2020). Additionally, eliminating over-packaging increases the perceived environmental friendliness of the package (Gurtu & Arendt, 2020). Current research also reports several findings on consumer preferences regarding graphical and informational cues of green packaging. For instance, consumers tend to presume the eco-friendliness of a package when it features organic and environmental (green) claims, nature in the images, earth colours as well as the use of little ink (Aagerup

Table 2 Consumers' perceptions of sustainable packaging

Packaging materials	Manufacturing process	Overall appeal
Paper, cardboard (Nguyen et al., 2020), and glass (Neill & Williams, 2016) are perceived as the most environmentally friendly materials; The use of plastic should be avoided (Herbes et al., 2018; Nguyen et al., 2020); Consumers tend to prefer end-of-life attributes such as 'reusable', 'recyclable', and 'biodegradable' (Herbes et al., 2018); Reducing over-packaging improves the perceived environmental friendliness (Gurtu & Arendt, 2020).	Although consumers seem unable to evaluate the most environmentally friendly techniques, they demand the adoption of eco-friendly packaging manufacturing processes (Nguyen et al., 2020). Consumers' awareness of the environmental friendliness of packaging manufacturing processes can provide differentiation.	Earth colours such as cream, brown, or green (Scott & Vigar-Ellis, 2014) but also blue and white (Barchiesi et al., 2018), and the use of little ink (Scott & Vigar-Ellis, 2014) are associated with eco-friendliness; Consumers are attracted by colourful natural images (Chrysochou & Festila, 2019; Magnier & Crié's, 2015); The use of eco-friendly claims and labels helps consumers understand whether a package is less environmentally impactful (Lamberz et al., 2020; Scott & Vigar-Ellis, 2014); Consumers are reassured by the presence of logos or certifications of organizations that aim to protect the environment (Lamberz et al., 2020, Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014).

et al., 2019; Barchiesi et al., 2018; Chrysochou & Festila, 2019; Scott & Vigar-Ellis, 2014). The sustainability of a package may also be communicated by using environmental certifications and labels from organizations that aim at protecting the environment (Lamberz et al., 2020, Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014). However, retailers need to be aware that communicating green practices subjects them to severe scrutiny by consumers who demand coherence between personal beliefs and packaging attributes (Aagerup et al., 2019; Jerzyk, 2016; Testa et al., 2020). In fact, the literature shows that purchase intention greatly decreases when retailers practise greenwashing (Magnier & Schoormans, 2015). On the other hand, when sustainability becomes central in the design of the supply chain and is properly communicated, consumers with a positive attitude towards sustainability issues show both a higher purchase intention and a greater willingness to pay (Lamberz et al., 2020; Magnier & Schoormans, 2015; Samant & Seo, 2016). Similar outcomes have been observed in several industries, thus signalling that adopting green packaging strategies can have positive effects on any company and retailer. In sum, when deciding how to redesign packaging in accordance with more sustainable practices, the literature suggests that focusing on attributes linked to the end-of-life of the materials (i.e. reusable, recyclable, biodegradable) and providing clear and

unambiguous information on the characteristics of the package are the most effective options (Herbes et al., 2018; Magnier & Crié, 2015; Testa et al., 2020).

Several studies underline that the attitude towards sustainable packaging is strongly influenced by the demographic characteristics of consumers. Barber (2010), Baruk and Iwanicka (2016), and Koutsimanis et al. (2012) agree that consumers tend to pay more attention to eco-friendly features as their age increases. In regard to gender, females are usually more inclined than males to judge the environmental friendliness of packaging (Chekima et al., 2016; Martinho et al., 2015; Jezewska-Zychowicz & Jeznach, 2015). By contrast, education levels tend to be less relevant to the purchase intention and willingness to pay (Barber, 2010; Baruk & Iwanicka, 2016; Neill & Williams, 2016).

Although research shows that green packaging provides both private (i.e. health-related benefits, highly visible social signalling) and pro-social (i.e. protection of earth and of future generations) benefits to consumers, Magnier and Crié (2015) note that a certain amount of negative attitude towards eco-friendly packaging is related to its minimalist design (i.e. lack of colours and removal of material) which makes it less appealing and may evoke hygiene- as well as protection-related concerns. Nevertheless, the literature agrees on two main results that a retailer can gain through the implementation of more sustainable packaging practices: (a) an improvement of the consumer's brand impressions as well as his/her purchase intention (Koutsimanis et al., 2012; Magnier & Schoormans, 2015; Orth & Malkewitz, 2008); (b) better direct and indirect economic results (García-Arca et al., 2014; Gurtu & Arendt, 2020; Lamberz et al., 2020). In fact, retailers that launched sustainable packaging programmes and tracked their performance gained greater economic results (e.g. Mercadona – García-Arca et al., 2014).

To conclude, our findings show that research on eco-friendly packaging is still in a nascent phase and has not yet been conducted comprehensively. Indeed, most of the relevant empirical studies considered in this review analyse consumer behaviour on the basis of changes on the marketing side (i.e. external factors) of the stimulus-response model (Kotler, 1997). For instance, these studies have investigated variations in consumers' responses to the use of more natural colours (Barchiesi et al., 2018; Scott & Vigar-Ellis, 2014), emotional and rational eco-friendly claims (Aagerup et al., 2019), reusable, recyclable, and biodegradable materials (Herbes et al., 2018; Nguyen et al., 2020), and labels that declare the eco-sustainability of a package (Lamberz et al., 2020). Consequently, their results suggest that a more marked change in the consumer's purchase intention and willingness to pay is evidenced mainly by those consumers with a pre-existing positive attitude towards sustainability. Although these findings have practical implications for increasing the market appeal of packaging following more eco-friendly standards, future research should also focus on consumers' mental processing frameworks that emphasize the influence that psychological factors (e.g. environmental awareness, sustainable thinking, and ecological knowledge) and consumers characteristics (e.g. lifestyle) exert on the purchase decision process that leads consumers to choose environmentally friendly packaged products. Filling this gap will provide deeper managerial insights not only into the key design elements that may deliver better direct and

indirect economic results to retailers but also which actions they should implement to inform and educate even the most unwilling consumers. Furthermore, since most of the studies reviewed in this chapter investigated the adoption of sustainable packaging in *business-to-consumer* companies and showed how to present sustainable packaging to end consumers, future research should focus on the *business-to-business* sector. Specifically, since B2B clients may be less responsive to graphical cues such as colours and natural images, future studies should investigate how to effectively communicate the adoption of green packaging in this sector. From a methodological standpoint, forthcoming studies in this nascent body of literature may benefit from the use of innovative research techniques, such as neuromarketing tools (e.g. eye-tracking), not only in physical research set-ups (Clement, 2007) but also in virtual ones, i.e. e-commerce websites. The latter are of particular interest considering the enormous and constant growth of e-commerce sales (Regattieri et al., 2014).

9 Conclusions

The colossal amount of packaging waste produced every year is arguably one of the major causes of environmental pollution in recent human history (Tencati et al., 2016). The result is that policies regarding environmental protection are now part of the political agenda of numerous nations and institutions worldwide. Furthermore, because consumers are becoming increasingly concerned about environmental pollution issues, retailers are forced to rethink their processes and increase the number of initiatives aimed at achieving higher sustainability rates (Bocken et al., 2016). Adhering to more eco-friendly packaging practices is a first strategic step towards creating an environmentally friendly image that may have positive effects on consumers' perceptions of a company. In recent years, academic research has therefore sought to provide useful advice to all those companies and retailers struggling to comply with eco-friendly packaging standards. The growing number of studies in the consumer behaviour literature investigating consumers' responses to green packaging prove that this research field is attracting increasing interest.

In this chapter, in order to offer practical guidance to retailers—and also to provide an overview on the evolution of the role of packaging—we have reviewed studies that test the effects that specific eco-friendly packaging design cues exert on consumers' choice and purchase intentions. Moreover, in order to provide a profile of those consumers who express a higher intention to buy green packaged products, we have reviewed studies that investigate the influence of socio-demographic variables (i.e. cultural background, age, gender, and level of education) on consumer behaviour.

While reporting practical and useful findings, our review has also outlined an agenda for future research based on some gaps identified during the review analysis. For instance, we noticed that there is a lack of attention paid to consumers' mental processing frameworks taking into account the influence that psychological factors

have in the purchase decision. Future research should focus on the role of environmental awareness, sustainable thinking, and ecological knowledge in the consumer decision-making process in order to inform retailers about the actions that they should implement so as to raise consumer concern about sustainability, thus making green packaging more appreciated and socially widespread. Moreover, because clients in the B2B sector may be less responsive to graphical cues, forthcoming studies should address the question of how to effectively communicate the adoption of green packaging practices in this sector. To conclude, because the alarming growth of e-commerce sales poses complex challenges in regard to packaging disposal, future research may benefit from innovative methodologies such as neuromarketing techniques with which to measure consumers' perceptions of sustainable packaging in virtual research set-ups, i.e. websites.

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