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How green is your packaging—A comparative international study of cues consumers use to recognize environmentally friendly packaging

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Abstract

Consumers have grown increasingly aware of the impact of packaging on the environment. Therefore, interest has grown in more environmentally friendly packaging, but we wondered how consumers recognize 'green' as distinct from 'grey' when evaluating packaging. We asked over 3,000 respondents from Germany, France and the United States how they recognize environmentally friendly packaging. To solicit responses that we may not have anticipated, we used an open-ended format, which we then followed with a closed-ended format so that we could compare the two sets of responses. Not surprisingly, in both sets of responses, we found labelling to be the attribute consumers rely upon most, as well as evidence of misleading labels. We also found consumers in Germany and the United States relied on information on the packaging and named searching for information as one of their preferred ways to decide whether packaging is environmentally friendly. French consumers seemed less trusting of published information and more trusting of the look and feel, especially the material, of the package. Our results point to the importance of cultural influences in the acquisition of perceptual cues by the consumer.

KEYWORDS

consumer, cue utilization theory, eco-friendly, environmentally friendly, labelling, packaging

1 | INTRODUCTION

Increasing environmental destruction and its consequences, such as global warming, have led to growing awareness of the importance of sustainable development. This in turn has heightened consumer concerns about sustainable consumption and the impact of day-to-day purchasing decisions, prompting abundant research (Fischer, Stanszus, Geiger, Grossman, & Schrader, 2017; Geels, McMeekin, Mylan, & Southerton, 2015; Liu, Oosterveer, & Spaargaren, 2016; Pekkanen, Pätäri, Albadera, & Jantunen, 2018). Tied to both concerns is the tremendous amount of waste created every year, one of the main environmental problems moving forwards into the 21st century (Hoornweg & Bhada-Tata, 2012). Roughly one-third of this waste comes from the packaging used in daily consumption, especially of food and water in industrialized countries. Germany, for example, in 2016 generated 221 kg of packaging waste per inhabitant, Italy 210 kg and France 190 kg (Eurostat, 2019a).

Helping to reduce the impact of packaging waste, innovations in sustainable packaging have emerged to play a pivotal role in supporting consumer desire for environmentally responsible action. But if consumers are to have access to these innovations, they must be able to identify what sustainable packaging is, differentiate it from normal packaging and factor its benefits into their purchasing decisions. Hence it is of interest not only to identify the cues consumers use to recognize packaging as 'environmentally friendly', but also to examine how consumer behaviour in responding to such cues may vary across cultures.

The industry itself has evolved in its conception of 'environmentally friendly' or sustainable, packaging. Two widely used definitions of sustainable packaging have been established by the Sustainable Packaging Alliance (SPA) (Lewis, Fitzpatrick, Verghese, Sonneveld, & Jordon, 2007; SPA, 2010) and the Sustainable Packaging Coalition (SPC) (2005). The SPA proposes four criteria packaging must meet to be considered sustainable; it must be *effective*, *efficient*, *cyclic* and *clean* (Lewis et al., 2007). Packaging is effective when it performs its role of protecting the product, as well as delivering information to the consumer. Efficient means that the use of resources and energy is as efficient as possible, while cyclic means that the used materials cycle throughout the system. The fourth attribute, clean, means all elements involved in the packaging process carry minimal risk to humans or the environment (Lewis et al., 2007).

The SPC uses eight factors in its definition. They are more specific than the SPA criteria and demand, among others, the use of renewable energy, the maximization the use of renewable or recycled materials and the efficient recovery in cradle to cradle cycles (SPC, 2005).

However, as comprehensive as the SPC definitions are, they only capture the environmental and economic aspects of sustainability. As (Nordin & Selke, 2010) point out, every packaging solution has environmental and economic, but also social impacts. Sustainable packaging helps protect the environment by reducing waste, but it also eases the societal burden of health care costs by reducing environmental health risks. Plastic waste and micro plastic pollution, for example, have become serious health issues (Comăniță, Hlihor, Ghinea, & Gavrilescu, 2016; Karbalaei, Hanachi, Walker, & Cole, 2018).

Consumers thus have a threefold interest in factoring sustainability concerns into their purchasing decisions, particularly as it comes to packaging. Yet, research into how consumers recognize sustainable packaging remains surprisingly scarce. There have been three studies, purely experimental (Magnier & Schoormans, 2015; Steenis, Herpen, Lans, Ligthart, & Trijp, 2017; Steenis, Lans, Herpen, & Trijp, 2018), but they worked with a limited number of cues predefined by the researchers rather than defined by consumers themselves. Another study expanded the range of cues by taking a qualitative interview approach (Magnier & Crié, 2015) and while this has contributed a broad categorization of cues used by consumers, it provides no quantitative basis on which to assess relative cue importance. Some insight into which cues may be most important to consumers comes from an online survey by Scott and Vigar-Ellis (2014). But this work was limited to a single developing country (South Africa); the cue acquisition process will likely differ in highly industrialized economies, where policy and educational initiatives have helped inform consumer decision making. Hence our three research questions emerged:

1. What cues do consumers in three large market countries—France, Germany and the US—use to assess the environmental merit of a packaging option?
2. How do consumer assessments compare across these countries in, for example, the priorities assigned to packaging cues?
3. Are consumers given enough information to make sound decisions about the environmental impact of the packaging they choose?

Other than past research, we used a mixed quantitative-qualitative approach in our methodology, which allowed us to expand the universe of potential cues available to a consumer. In this sense, our study is largely explorative. Doing so uncovered new insights into how consumers evaluate their packaging options. Our study makes a further contribution by being the first to adopt a cross-border comparative perspective on consumers in the United States, France and Germany. Our multinational survey sheds light on how consumer perceptions of environmentally friendly packaging differ, even among Western industrialized countries. The better these perceptions are understood, the better policy makers and marketers can help consumers work towards global sustainability goals. Specifically, our paper shows that labels are very often used as a cue in all three countries. This is in line with past single-country studies. Going beyond past research, the paper also examines external cues such as the manufacturer and the retailer as well as social cues such as asking friends and family or the retailer. Moreover, also expanding past research, it highlights interesting differences between countries: French consumers surprisingly often rely on colour or perceived material, much more often than consumers in the United States and Germany. They are also much less prone than German and U.S. consumers to search for more information, for example, on the internet. Among materials, paper or cardboard indicated environmentally friendly packaging for our respondents in all three countries. For our U.S. respondents, the amount or size of the packaging was much less often a cue for sustainability than in the other two countries.

2 | THEORETICAL BACKGROUND

2.1 | Consumer perceptions of packaging

A number of studies have addressed the question of what consumers perceive to be environmentally friendly packaging (Bech-Larsen, 1996; van Birgelen, Semeijn, & Keicher, 2009; Kassaye & Verma, 1992; Monnot, Parguel, & Reniou, 2015; Rokka & Uusitalo, 2008;

Scott & Vigar-Ellis, 2014). Many have examined consumer preferences for beginning-of-life attributes such as cardboard over plastic (e.g., Petljak, Naletina, & Bilogrević, 2019). Others have focused on end-of-life attributes such as reusability, recyclability and biodegradability (e.g., Bhardwaj, 2019).

Attributes pertaining to the production and use phases have received much less attention, both from researchers and consumers (Herbes, Beuthner, & Ramme, 2018). Consumers tend to focus their attention on end-of-life attributes, showing less concern for beginning-of-life attributes such as material origin and even less for attributes relating to the environmental costs of production (Herbes et al., 2018). Lending further evidence to this tendency is a recent study from Denmark (Boesen, Bey, & Niero, 2019), where consumers in a Danish survey judged packaging primarily on its raw material and end-of-life options. This tendency to overlook important attributes in the whole-life impact of packaging means consumer perceptions of sustainability often do not align with the results of life cycle analysis (LCA) (Boesen et al., 2019; Herbes et al., 2018; Steenis et al., 2017). This again points to a need to understand the cues consumers use to evaluate packaging. Are the cues simply being misread or are they inadequate to guide consumer behaviour? Looking at which cues consumers use will also help to better understand if and to which extent they are vulnerable to companies practicing greenwashing, which has been detected as a problem in the context of ecological packaging before (Koenig-Lewis, Palmer, Dermody, & Urbye, 2014).

A challenge lies in the fact that environmental attributes of products and packaging options are often credence attributes (Bello & Abdulai, 2016; Ford, Smith, & Swasy, 1988; Mason, 2009; Moser, Raffaelli, & Thilmany-McFadden, 2011), meaning even after having purchased and used the product or packaging, consumers cannot determine whether it possesses the claimed pro-environmental or pro-social attributes. A consumer, for example, cannot verify but must trust claims of the percentage of recycled plastic in a packaging option. The fundamental information asymmetry between producer and consumer makes trust a pivotal element in the purchasing decision (Delmas & Lessem, 2017). Hence not only are the cues that consumers use to assess packaging of interest, but also the credibility of these cues.

2.2 | Cue utilization theory

Sustainable purchasing choices are highly complex decisions (Moisander, 2007) causing 'information overload' (Weinrich & Spiller, 2016); however, the typical mode of thinking available for making everyday decisions does not support the cognitive effort that complex decision-making calls for (Biel & Dahlstrand, 2005). So it is not surprising that research has identified both time pressure and cognitive overload together with a lack of willingness to process more information (Weinrich, Franz, & Spiller, 2016; Weinrich & Spiller, 2016) as factors limiting consumer selection of environmentally friendly packaging (Biel & Dahlstrand, 2005; Sheth, Newman, & Gross, 1991). In past studies, consumers have also expressed concern about their ability to judge packaging solutions (Lindh, Olsson, & Williams, 2016).

To reduce high complexity, consumers often search for simple ways to identify if a product or its packaging is sustainable or environmentally friendly. This phenomenon lies at the heart of cue utilization theory (CUT) (Olsen, 1972; Olson, 1978). CUT models products not as bundles of utilities as in other theories but rather as a bundle of cues that indicate specific product attributes or utilities. These cues are first acquired and then processed before forming a judgement of a product and making a purchasing decision (Olson, 1978). This perspective is closely related to research on heuristics in decision making (Chen, Duckworth, & Chaiken, 1999; Eberhart & Naderer, 2017; Thøgersen, Jørgensen, & Sandager, 2012). Cues can take a number of forms, be they structural as in the size and look of the packaging; or informational as in text and numbers; or visual as in colour and shape; or sensory as in smell and texture. They can be intrinsic to the product, like the material or extrinsic like an eco-label (Kukar-Kinney & Xia, 2017). But the majority of research using CUT has looked at the influence of external cues on perceived product quality and the effect of price cues (Olson, 1978; White, Lin, Dahl, & Ritchie, 2016).

The application of CUT theory has been extended beyond examining how consumers judge product quality to include analysing sustainability judgements (Esteky, 2016; Gleim, Smith, Andrews, & Cronin, 2013; Heyns, Herbst, & Bruwer, 2014; Pancer, McShane, & Noseworthy, 2017; Seo & Scammon, 2017; Watts & Giddens, 2017; Whang, Ko, Zhang, & Mattila, 2015; Wood, Robinson, & Poor, 2018). The cues in Figure 1, which is based on our literature review, have been found to impact judgements on both the environmental or social impact of a product and the credibility of sustainability-related claims.

Size and shape, a sub-category of structural cues in Figure 1, are probably the first cues that consumers recognize when doing their shopping. In past qualitative research, consumers mentioned the absence of packaging, the absence of over-packaging, smart shapes that help reducing packaging material, small size in comparison with the packaged product as well as bigger containers instead of many small containers as signals of environmentally friendliness (Magnier & Crié, 2015). In another study, most consumers identified over-packaging as environmentally harmful (Elgaaïed-Gambier, 2016). Packaging material has been identified as an easy cue for consumers to determine sustainable products (Eberhart & Naderer, 2017). Among the visual cues, eco-labels have been identified in many studies to impact consumers' perception of the environmental impact of products and packagings. In the qualitative study by Magnier and Crié (2015), eco-labels giving information on the carbon footprint or recyclability of a packaging were mentioned by consumers as being helpful for judging a given packaging. For a hypothetical laundry detergent, another study found that a green product seal significantly increased perceived product greenness among the study participants (Spack, Board, Crighton, Kostka, & Ivory, 2012). Another study goes further in the analysis and finds that multilevel labels could lead to higher shares of labelled products than binary labelling schemes (Weinrich & Spiller, 2016). There is also research looking at factors that may influence the effect of

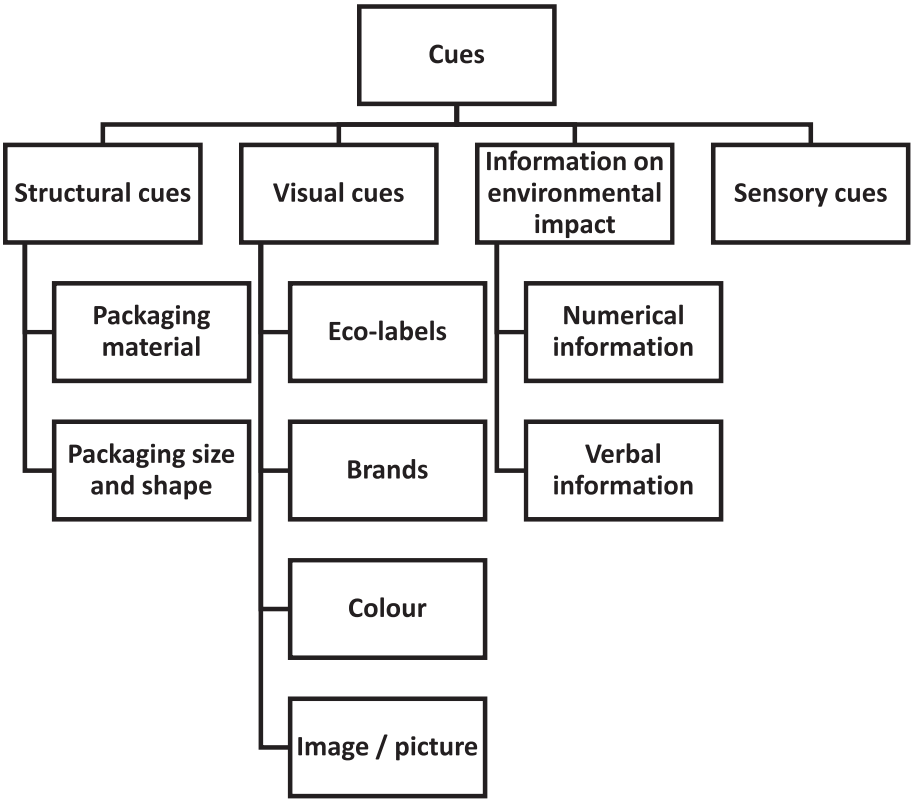

FIGURE 1 Cues on environmental or social impact from the literature

labels on consumers' decisions such as environmental concern or brand familiarity (Bickart & Ruth, 2012). Packaging colour as an cue for the eco-friendliness of brands (Seo & Scammon, 2017), products and packaging (Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014) have been examined in consumer research and consumers seem to associate green, brown and generally dull colours with eco-friendliness. Also images of leafs or a green globe or other pictures may act as a cue for eco-friendliness (Wood et al., 2018). Turning from simple cues to more detailed ones, information on environmental impact has been mentioned in various studies as influencing the perception of eco-friendliness of products and packaging. These can be specific information on the packaging material, for example, stating that plastic packaging is free of BPA (Magnier & Crié, 2015). Gleim et al. (2013) found verbal information to be more effective than numerical information but that more detailed verbal information did not cause stronger purchasing intentions than simple text (Gleim et al., 2013). In a similar vein, additional claims may counteract the benefit of a simple environmental claim (Hidalgo-Baz, Martos-Partal, & González-Benito, 2017). Consumers also show differential changes in perception of credibility depending on the strength of the environmental claim (Spack et al., 2012). However, there seem to be complex interactions between verbal environmental information and eco-labels on the packaging (Ertz, François, & Durif, 2017) and consumers are not always aware that certain logos already contain the criteria that are outlined in the verbal information on the packaging (Hoogland, Boer, & Boersema, 2007). Also, green brands can influence consumer perception (Kang & Hur, 2012; Mary Riya, 2016). Last but not least, consumers also use their hands to feel a product and derive judgements on naturalness from what they feel. Rough, warm and soft are sensory cues that are associated with naturalness (Karana, 2012).

With this outline of cue categories and the considerations given to attribute credibility, we will analyse the results of our survey.

While the abovementioned cues have been shown to be used by consumers for products, only a few studies, notably those by Scott and Vigar-Ellis (2014), and Magnier and Crié (2015) as well as Magnier and Schoormans (2015) have examined specifically how consumers identify sustainable or environmentally friendly packaging. Scott & Vigar-Ellis compiled 350 answers from a questionnaire with closed and open questions they distributed by snowball sampling via Facebook in South Africa. By conducting a thematic analysis of the answers to the open question on how respondents can distinguish environmentally friendly and other packaging, they found that 44% of their respondents relied on information on the label and another 30% made judgements based on an image or logo embedded on the packaging (Scott & Vigar-Ellis, 2014), that is, most respondents based their judgement on visual cues. Only a small group of respondents tried to evaluate the packaging independently, by checking its material or colour. These respondents saw natural brown and green colors as more environmentally friendly; similarly, the less ink or colour on a package, the greater the sustainability attributed to that package (Scott & Vigar-Ellis, 2014). Following the abovementioned categorization of forms, Magnier and Crié (2015) differentiate between 'structural cues, graphical/iconic cues and informational cues'

(Magnier & Crié, 2015) and present a taxonomy of cues pertaining to ecological attributes of packaging. Their explorative study is based on qualitative interviews. However, sometimes the areas of cues (indicating attributes) and the attributes themselves seem to flow into each other. 'Recycled materials' would from our perspective not be a cue but an attribute that can be indicated by different cues such as a label or a text describing the material or a number indicating the percentage of recycled material in the product. Magnier and Schoormans (2015) in an experiment with 185 French consumers tested visual and verbal claims of sustainability of packaging and showed that consumers with low environmental concerns were sensitive to contradictions between the two while consumers with high environmental concerns were not. They used two types of visual apperance with one of them ecological-looking and two types of verbal claim, that is, with sustainability claim or without. Steenis et al. (2017) differentiate packaging design into structural (e.g., material), graphical (e.g., packaging colour) and verbal elements. In their experiment with 249 Dutch university students they tested seven structural cues, that is, different packaging materials like can or plastic pouch for tomato soup and two graphical cues. They showed that the packaging material had the strongest influence on consumer perception of packaging sustainability, while graphic design only had a medium influence (Steenis et al., 2017).

Other studies, like that of Lindh et al. (2016) who asked an open-ended question about the environmentally friendliness of packaging, indicate that consumers primarily take the material as a cue to judge environmental friendliness.The abovementioned three studies informed our research in the following ways: It helped in categorizing cues (Magnier & Crié, 2015) and gave first ideas of which cues might be most important (Scott & Vigar-Ellis, 2014), although we hypothesized that the cue acquistion process might be different in South Africa as a developing country as compared to industrialized economies. Moreover, the above studies examined consumers only from one nation each: Scott and Vigar-Ellis collected their data in South Africa, Magnier and Schoormans (2015) worked with a French sample and Steenis et al. (2017 with a Dutch student sample. Past studies neither have looked at the effects of social cues such as communication with friends and family, nor have they examined the effect of retailer brand on how environmentally friendly consumers perceive a packaging to be. Overall it seems that consumers lack knowledge to determine the environmental impact of packaging they are confronted with in their daily shopping: 'Consumers have a hard time judging the environmental impact of packaging'. (Lindh et al., 2016, p. 16).

This study provides new insights by combining open-ended questions allowing a qualitative analysis and quantitative methods and looking at a larger number of potential cues. The scarce research on the subject of how consumers recognize sustainable packaging has either taken a quantitative perspective and focused on one or few cues or a qualitative perspective and taken a more comprehensive view. Moreover, our study takes, for the first time, a cross-country comparative perspective and by looking at consumers in the United States, France and Germany helps to understand how even between Western industrialized countries consumer behaviour with regard to recognizing environmentally friendly packaging can differ. Thus, our study contributes to the body of research by providing a deeper insight through an approach including qualitative and quantitative elements and by rendering a more comprehensive picture through a comparative perspective.

3 | METHOD

We collected data through a combination of online and face-to-face interviews with qualified consumers from Germany, France and the United States. To qualify, an interviewee had to be over 18 and to have bought household goods or groceries regularly within the past year. We focused on France, Germany and the United States as important developed, culturally close, yet distinctive markets. With regard to general cultural traits, we can characterize the three cultures using Hofstede's widely used dimensions as follows (Hofstede Insights, 2019): France has a higher power distance (68) than Germany (35) and the United States (40) which are quite similar. Also for the masculinity-femininity dimension France sticks out with a value of 43, while Germany and the United States score about 20 points higher. As for individualism, the United States (91) shows a higher value than Germany and France which are rather similar with values around 70 on this dimension. For uncertainty avoidance (UA), all three countries are rather different with the French culture exhibiting strong UA with a value of 86, Germany a medium score of 65 and the United States a rather low value of 46. Another general cultural trait is whether people trust in authorities. The European Social Survey (ESS) revealed marked differences between France and Germany in this regard: French people trust the legal system, the police and the politicians of their country significantly less than Germans do (Norwegian Centre for Research Data [NSD], 2016). We will come back to these general cultural traits in the discussion.

Regarding environmental cultural values, we also turned to the ESS but did not find any major differences between French and Germany: both cared about equally for nature and the environment and also assumed personal responsibility for reducing climate change to a comparable degree (NSD, 2016).

The interview instrument we used to survey consumer recognition of green packaging included both open-ended and closed-ended questions. We presented the open-ended version of each question first to avoid sequence effects from the closed-ended options. This approach allowed us to compare freely given responses to our research question against fixed-choice responses.

The first version of our questionnaire was developed in English by an American-German team. The German version was created through translation by native speaking team members. The back-translation method (Brislin, 1970) was used to ensure quality. In France, the translation was done by two native speakers who independently translated the questionnaire from English into French, followed by a comparison of the two versions by a university professor; this is known as the parallel translation method (Harkness & Schoua-Glusberg, 1998). We further refined the translated versions

to adjust categories like income and education to contextualize the questions within each cultural tradition.

We used quota sampling of consumers in all three countries, conducting interviews both online and face-to-face. Each interviewer had to conduct 10 interviews, fulfiling a certain previously given combination of quotas. All interviewers where given a short interviewer training, to reduce interviewer effects. The first quota dimension was age, where we divided the sampling into three groups: under 30, 30–59, 60 and older. The second dimension was gender, where we used the two biological categories with a distribution of 50% in each. We also sought a representative distribution of interviewees across socio-economic categories. Although quotas were not completely fulfiled, for example, the sample slightly leans towards people with a higher education, a regression analyses confirmed that the demographic factors in question had no influence on the values of interest. In this regard, when we speak of French, American or German consumers, we have to bear the limitations of a quota sample in mind.

The French sample consisted of 226 face-to-face interviews and 227 online interviews, mostly accomplished by team members and students at as part of their university classes. The collection of interviews in Germany was similarly done by students in face-to-face and online interviews and consisted of 1,032 interviews. In the United States, 610 online interviews were conducted by university students.

Responses to the open-ended questions were categorized following a thematic text analysis (Krippendorff, 2018) by which we inductively created low-level categories used to analyse the responses. Answers such as 'Ich gucke ob viel, Verpackung verwendet wurde' [I look, if a lot of packaging was used] and 'anhand der reinen masse an verpackung (je weniger—desto besser)' [on the basis of the pure mass of packaging (the less—the better)] were first coded with the low-level category 'less or as little packaging as possible'. Then, we abstracted higher-level categories based on the literature and grouped the lower-level results accordingly. In the abovementioned case, we summarized the category 'less or as little packaging as possible' together with the low-level category 'no packaging' into the category 'amount of packaging'. We could then apply descriptive statistical analysis to both the open- and closed-ended questions.

4 | RESULTS

Three research objectives guided our survey: gain insight into the cues consumers use to evaluate the environmental merit of packaging; assess similarities and differences in perceptions among consumers in the three countries; and evaluate the adequacy of information available to consumers.

4.1 | Open-ended responses

With regard to the first objective, our survey posed the open-ended question[1]:

> *If you want to determine if the packaging of a product is green (i.e., environmentally friendly), how do you find out? In the box below, please start each answer on a new line*

This question generated 5,388 distinct codings. Their distribution is shown in Figure 2, with groupings along the vertical axis and along the horizontal, the percentage of respondents from each country who named the given attribute.

We see that 'Label' is important to consumers in all three countries, but the distribution of other attributes is less even. This becomes evident when we compare the top three attributes named by each group of consumers. Table 1 presents these by country; the figure in parenthesis gives the codings per 100 participants.

Certain of the 'other' attributes named by our French respondents—such as 'absence of plastics', 'made from paper or cardboard', 'recyclable' and 'reusable'—represent further evidence of the prime importance that the French consumer attaches to the packaging material.

While consumers in all three countries rank label cues highly, the Americans and Germans both rate them more highly than the French. Figure 1 shows both German and American consumers have a distinct preference over French consumers for using information on the package. Differences in the value assigned to information become even more pronounced when we consider that Figure 1 shows fewer than 5% of the French respondents would get more information, in contrast to nearly one-third of the American and an even greater percentage of the German. On the contrary, the French consumer values the efficiency ('amount of packaging') and tangible attributes ('material') of the packaging solution more highly than does either the German or the American. We also see that German respondents named 'personal evaluation' roughly twice as frequently as did either the American or the French.

We glean further insight into consumer perception when we look at subcategories identified under the major groupings of Figure 1. Table 2 lists the most frequent subcategories under 'Label'. While respondents most often simply named 'Label' without further qualification, when they did specify the type of label, it was most commonly one for recyclability, an end-of-life attribute, rather than a label for overall environmental merit.

Respondents also mentioned country-specific labels such as the 'Gruener Punkt' in Germany or the 'point vert' in France. Noteworthy is the fact that 'Gruener Punkt' indicates simply that the manufacturer of the product is contributing to the cost of its disposal. It does not signify any package or product attribute that corresponds to items in either the SPC or SPA definition of sustainability.

Table 3 lists the subcategories coded under 'characteristics of material' (Table 3), the attribute valued significantly more by French consumers than by either German or American. While again, the most common response included no further qualification, where respondents did name specific materials, paper and cardboard ranked first. These materials apparently enjoy an image of naturalness and environmental friendliness. The 'natural' colour of cardboard (brown) was mentioned by French respondents, who also mentioned colour as an attribute cue more than twice as often

[1]All questions are reported in their English versions.

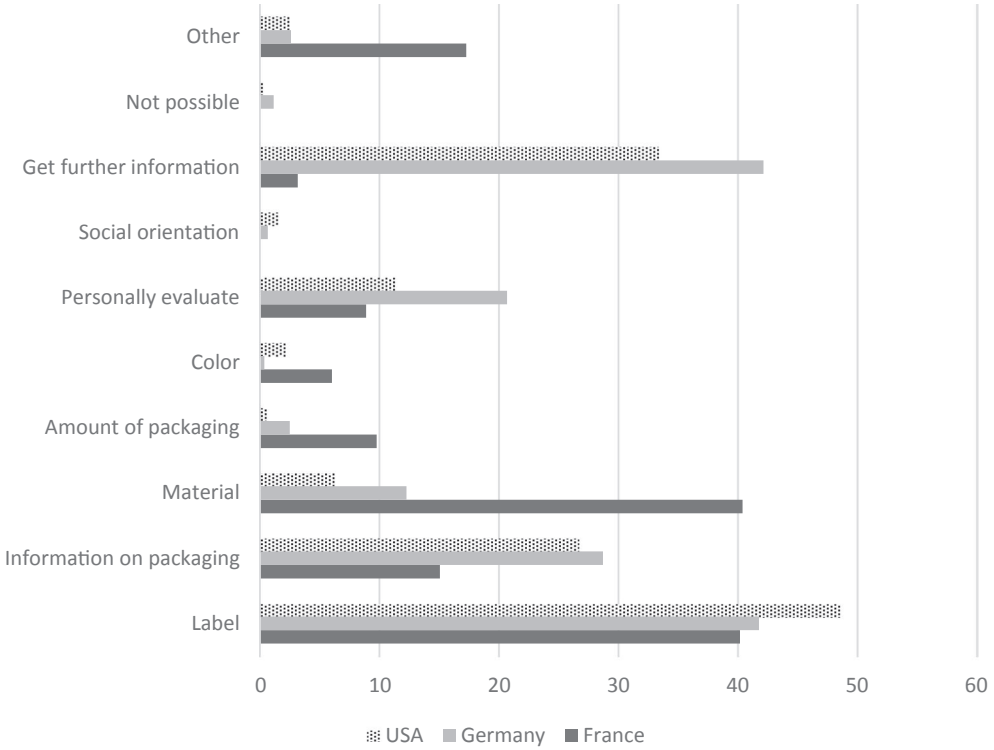

FIGURE 2 How to recognize packaging—qualitative analysis (per 100 respondents per country)

TABLE 1 Priority order of green attributes by country of respondent

Rank order	France	Germany	United States
1st	Material (40)	Get further info (42)	Label (49)
2nd	Label (40)	Label (42)	Get further info (33)
3rd	Other (17)	Info on Package (29)	Info on package (27)

TABLE 2 Most frequent sub-categories of 'Label' (codings per 100 per country)

Rank order	France	Germany	United States
Label in general	25	22	37
Recycling label	7	5	9
Environmental label	3	3	1
Certificate	0	2	0

TABLE 3 Most frequent sub-categories of 'material' (codings per 100 per country)

Rank order	France	Germany	United States
Material in general	20	7	3
Paper/cardboard	4	1	1
No plastics	2	2	1
Glass	1	0	0

as did the Americans. By the Germans, the colour attribute was barely mentioned at all.

Plastic, however, was regarded as a knock-out criterion, its absence signalling environmental merit to all three consumer groups. Respondents did, however, provide many answers pertaining to attributes like recyclability, biodegradability or production from recycled material but did not specify how they would recognize packaging possessing those attributes. We excluded those answers (or parts of answers) from this analysis.

Tables 4 and 5 list the subcategories coded under 'personally evaluate' and 'get further information'. Visual cues play the dominant role for those who evaluate a package personally. When looking for more information, an internet search far outweighs any other option.

4.2 | Closed-ended responses

Differences in consumer valuations of packaging across the countries of interest were also evident in responses to the closed-ended question:

TABLE 4 Most frequent sub-categories of 'personally evaluate'

Rank order	France	Germany	United States
Personally evaluate (general)	2	5	1
Look at packaging	3	7	8
Texture/touch	3	1	1
Smell	0	1	0

From the list below, please choose 3 answers for how you most strongly determine if packaging is green (i.e., environmentally friendly) for you

The responses are illustrated in Figure 3.

Consumers in all three countries selected labelling the most frequently, consistent with the frequent citing of 'label' in the open-ended question. The intention of the German consumer to 'personally evaluate packaging material' again stands out in comparison to that of either the American or the French. Both American and German consumers indicated they were roughly three times as ready to do 'research online' as their French counterparts, while the French consumers again find the efficiency of the packaging solution—its quantity and size—to be more important than do either the German or American. The difference, however, is much smaller than in the free-response case; in fact, when presented with the option explicitly, the German consumer rates it almost as highly as the French (Figure 2), yet does not freely associate the amount of packaging with environmental performance nearly as readily as does the French consumer (Figure 1). Of the three consumer groups, 'amount of packaging' was least frequently named by the Americans in the open-ended question; similarly, in the closed-ended question, Americans were roughly half as likely as either French or German to select this option.

We see further from Figure 2 that the French and German consumers showed little inclination to consult 'friends and family' about eco-friendly packaging, while the Americans ranked this option above personally evaluating the packaging quantity and size. Interestingly, the 'colour of packaging', while again rated more highly by the French than by either the Americans or Germans, when presented as an explicit option, is rated by the American consumers almost as highly as by the French.

What also stands out in Figure 2 is the ranking given by French consumers to 'information provided by retailer'. They chose this response to the closed-ended question more frequently that did either the Americans or Germans. In contrast, 'information on packaging' appeared roughly half as often in the open-ended responses of French consumers as it did in that of either the German or American (Figure 1). In fact, the ranking of the three countries is reversed. In open-ended responses, 'information on packaging' is mentioned most often by the German, then by the American and finally by the French consumers. In the closed-ended responses: 'information provided by the retailer' was chosen most often by the French, then by the American, then lastly by the German consumers. As discussed in the theoretical background, cues to environmental performance are often credence attributes. Hence a comparison of Figures 1 and 2 suggests that to the French consumer, information is more credible when provided by the retailer than when printed on the packaging. The situation is reversed for the Germans and Americans.

TABLE 5 Most frequent sub-categories of 'get further information'

Rank order	France	Germany	United States
Internet/search engines	1	25	11
Ask retailer	0	3	2
Research (general)	0	1	5
Information about producer	1	1	3
Ask producer	0	3	2

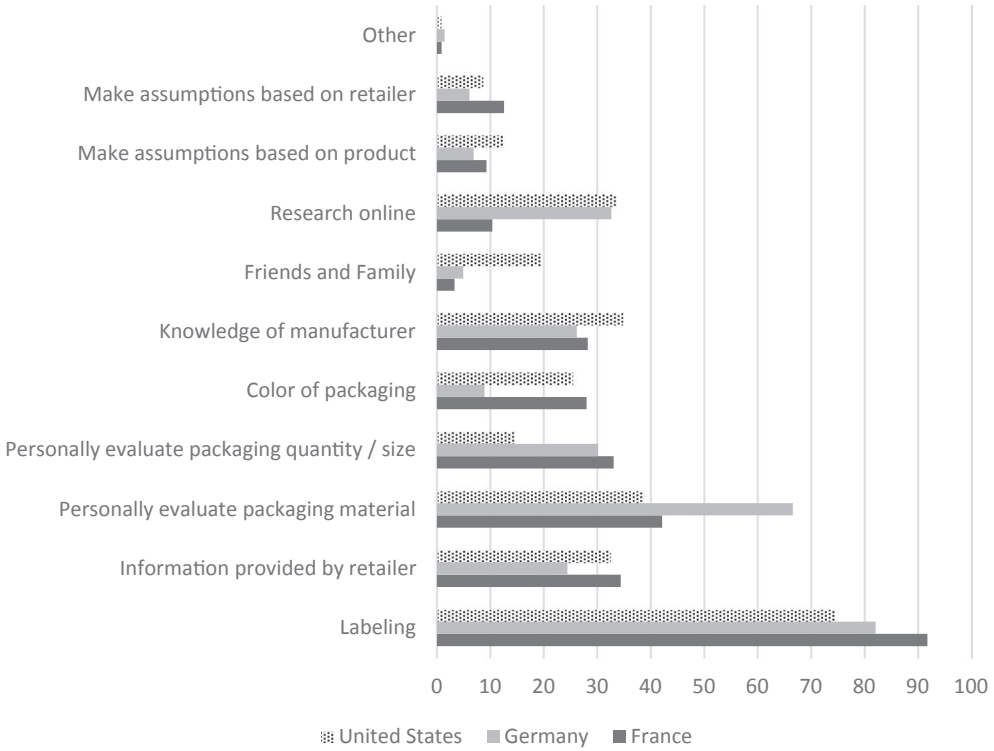

FIGURE 3 How to recognize eco-friendly packaging—quantitative analysis of closed question (codings per 100 respondents per country)

We also assessed three external cues that did not appear in the free responses: the retailer where the purchase takes place, the manufacturer and the product that is packaged. They are not directly related to the packaging but past research has shown, that both packaging and the retail outlet influence perceptions of the product (Chialoue, Moustier, & Manivong, 2018; Dodds, 1991; Render & O'Connor, 1976) and that perceived brand ethicality influences the interactions of sustainability claims, purchase intentions and other factors (Magnier & Schoormans, 2015), and therefore, such an 'image transfer' to packaging seemed plausible. This image transfer also works vice versa, since consumers also use the packaging as a cue to determine if a product is sustainable or not (Eberhart & Naderer, 2017). As shown in Figure 2, both, retailer and product seem to play a medium role overall, but are more often used by United States and French consumers than by German consumers. However, this image transfer effect is three to four times stronger for the manufacturer than for the retailer.

5 | DISCUSSION

Using a combination of online and face-to-face interviews with consumers from Germany, France and the United States, we investigated the cues these consumers use to evaluate the environmental performance of packaging. We also sought to compare cue recognition among consumers in the three countries and to evaluate the sufficiency of information available to them for making environmentally responsible purchasing decisions.

5.1 | How consumers identify environmentally friendly packaging

Not surprisingly, consumers in all three groups identified labelling as their first cue to the environmental merit of packaging. This is consistent with the findings of Scott and Vigar-Ellis (2014), who conducted a thematic analysis of freely given responses to the question of how to identify packaging as environmentally friendly and found 44% of their respondents relied on information on the label and another 30% made judgements based on visual cues embedded in the packaging, such as an image or logo. In freely given responses from the consumers in our study, 'label' came in at similar percentages; respondents also mentioned country-specific visual cues such as the 'Gruener Punkt' in Germany or the 'point vert' in France but did not explicitly mention branding marks. In closed-ended responses, such marks would have been subsumed under 'labelling'. Another finding consistent across countries is the relatively low importance given to social cues. Although in closed-ended responses, the American consumers did select consulting with 'friends and family' almost three times as often as either the German or French, in open-ended responses, social cues were barely mentioned. Social cues have neither been mentioned at all in the studies by Scott and Vigar-Ellis (2014), nor in the studies by Magnier and Crié (2015) or Magnier and Schoormans (2015).

Some element of social cueing may be at work, however, in the apparent credibility premium given by French consumers to information provided by the retailer, over that given to information on the packaging. Retailers as an information source were not analysed in the three abovementioned studies.

Our study went beyond past research by introducing the manufacturer, so far only used once by Magnier and Schoormans (2015) and the retailer as well as the product which have not been analysed as cues before. While the manufacturer is of medium importance, a finding consistent across consumers in all three countries is that they are not likely to use assumptions about either the product or the retail outlet when judging the packaging.

5.2 | Differences among French, German and American consumers

Our results point strongly to cross-cultural differences in the interpretation of packaging cues by consumers. In open-ended responses, French consumers placed the highest value on the materials a package is made of, a cue named far less frequently by either the German or American consumers. The differential valuation given to the tangible evidence of the packaging, that is, structural cues, shows up in the personal evaluation of its quantity and size, rated highest by the French and in the naming of 'colour' as a cue by the French consumers more often than by consumers from the other two countries. The colours that signal environmental merit seemed to be tones of natural green and brown, reported both in free association and even more in response to the closed-ended question. The same result was observed by Scott and Vigar-Ellis (2014) in South Africa. Green and brown, dominant colours in nature, are easily branded to convey the impression of environmental friendliness. Indeed, Steenis et al. (2018) found that consumers strongly relate perceptions of naturalness to their judgements of sustainability.

The fact that among the three groups, German consumers rank 'colour' lowest is likely a sign of a more mature green consumer. Years of experience with green energy and other pro-environmental products have taught Germans they cannot simply rely on cues like colour or material to judge environmental merit, whether of a product or a packaging option. This experience likely shows up in the relative rankings of the other external cues—assumptions about the retailer, the product, the manufacturer or information provided by the retailer. In all four categories, German consumers value the attribute less than either the French or American. Besides knowledge, there may also be a spillover effect (Lanzini & Thøgersen, 2014) from other environmentally friendly behaviour categories such as buying green energy towards selecting environmentally friendly packaging. But past studies have also shown negative spillover effects, in which consumers who recycle are not as prone to avoid packaging waste (Thogersen, 1999).

Several factors could explain why French consumers rely more on their own judgement based on colour and German consumers do not. First, general cultural characteristics (Hofstede, 2001) could

drive this behaviour. However, France ranks higher than Germany and the United States both on UA and power distance. This suggests that French consumers are looking for reliable and unambiguous information on the environmental performance of packaging options and would rely on authorities for that. However, this does not correspond with their strong reliance on their own judgement based on colour. But if we look into the results of the ESS (see Methods Section), a possible explanation emerges: As French trust authorities and possibly also those issuing eco-labels less than Germans, they might be more inclined to make an own judgement based on simple cues like colour.

Second, knowledge on sustainability and environmental issues could be a driver, however, we did not find any comparable data for the countries under review to follow this point further. Future qualitative research would have to look into the reasons why French consumers rely on the colour as a cue. This research would have to explore the attitudes towards colour in context with other cues and also address issues of trust towards authorities and third parties.

And third, different policy schemes which then reflect on consumer knowledge and behaviour could be an influencing factor. While a full comparative analysis of the policies pertaining to packaging is beyond the scope of this paper, it is probably fair to say that Germany exhibits a comparatively elaborate system for the recycling of packaging waste and has started early on tackling this problem. The country started as early as 1992 to implement extended producer responsibility (EPR) to shift a part of the burden for waste to producers which was only later followed by corresponding EU legislation while in the United States legislation remains on the state level (Kunz, Mayers, & Wassenhove, 2018). Also, the share of treatment of packaging waste is much higher in Germany in 2016 (recovery rate 97.2%, recycling rate 70.7%) than in France (recovery rate 75.6%, recycling rate 66%) (Eurostat, 2019b) while in the United States the recycling rate of packaging stood only at 53% in 2015 (EPA, 2019). On the contrary, lightweight plastic bags have been banned in France, but not in Germany (Xanthos & Walker, 2017), a policy that should draw consumers' attention to packaging waste issues. Looking at overall environmental policy, consumers according to the OECD find themselves in a much more stringent environmental policy framework in Germany as compared to France and the United States which are rather close (OECD, 2017). Another issue that could influence consumers' awareness of environmental issues is the prominence of green political parties. In Germany, the green parties sits in the national parliament, has been part of the federal government from 1998–2005 and is part of the government in nine out of 16 Bundeslaender. In France, the green party was part of the government of Lionel Jospin in the late 1990s but never made it beyond 5% on the national level. The Green Party in the United States so far did not play a role on the national level.

German consumers assigned high value to their personal evaluation of the packaging. They, together with the Americans, also show the greatest inclination to search out information on their own, an option much less likely to appear in the free responses of the French consumers. Similarly, the Germans and Americans elected three times more often than the French to research options online. The three pertinent studies by Scott and Vigar-Ellis (2014), Magnier and Crié (2014) and Magnier and Schoormans (2015) do not mention internet search as a means for consumers to find out how environmentally friendly a packaging option is.

We recognize, however, that these consumers stated their *intentions* through our test instruments; how these intentions are realized in action can be inferred, but with caution, since social desirability may play a role in the answers. Both German and American consumers indicated a clear preference over the French consumer to search for further information, including researching online. This may seem to contradict the findings in the literature that consumers are not willing to put in the cognitive effort needed to grasp the complex aspects of sustainability (Biel & Dahlstrand, 2005) and that they try to minimize cognitive efforts to achieve a certain level of confidence (Chen et al., 1999). These earlier findings do not necessarily contradict our own. Nearly 20 years later, searching for information by researching online is almost trivial for many consumers, given the increasing penetration of smart devices into their home markets. Moreover, it is the *difference* we found between consumer responses in the three countries that should spur further enquiry.

5.3 | Do consumers have sufficient information?

We find no evidence that consumers in the three countries are adequately cued to the whole-life impact of packaging options. Relying strongly on colour or perceived material as reported by the French consumers skirts the complexity of determining the full ecological impact of packaging. Seo and Scammon (2017) have already highlighted how colours can lead to false perceptions of eco-friendliness for non eco-friendly brands. Using labels as a guide for decision making, the most frequently mentioned strategy, relies not only on the agency issuing the label, but most importantly on an understanding of the label's meaning. If consumers make misleading assumptions, then they are poorly served by the label. This was the case with the 'Gruener Punkt' label, named by many German respondents as a sign of environmental friendliness while in truth only a sign that the producers contribute to the costs of recycling and recovery. This example illustrates how important it is to provide consumers with cues that help them make accurate assessments about the impact of their purchases. In this context, it must be mentioned that it is not necessarily in the interest of companies to provide adequate cues, since creating a packaging that seems 'green' in order to increase sales, for example, using a brown-coloured material, is probably cheaper than creating a packaging that really possesses superior environmental qualities. Therefore, companies might be prone to greenwashing in this area and consumers, using cues as described in this article, are vulnerable to fall for it.

Labels should communicate unambiguously figures of merit for whole-life environmental performance in a format that consumers can quickly recognize, whether by standard symbols or by colours that provide instant visual cues. The fact that our German

respondents showed such high confidence in the 'Gruener Punkt' label, even though that confidence was misplaced, demonstrates the powerful role labels can have in supporting consumers in their desire for environmentally responsible action. Past research has already stressed the importance of providing specific knowledge about eco-labels besides general environmental knowledge (Taufique, Siwar, Chamhuri, & Sarah, 2016) and in the packaging context, Magnier and Crié (2015) have pointed out that logos can only be fully understood in combination with more detailed verbal information. We think that a multilevel label as suggested by Weinrich et al. (2016) would help to provide differentiated information while keeping complexity for consumers low, since past research has pointed out the problems of over-burdening the consumer with too complex labels (Olander & Thogersen, 2014). However, using an eco-label can also have negative effects for companies, as consumers' perception of product efficacy may suffer, since at least, a part of the population tends to believe that green products and packaging exhibit a lower performance regarding other criteria (Weinrich & Spiller, 2016; Wood et al., 2018).

That modern consumers show a willingness to search for information about the packaging they buy points to opportunities for innovations in labelling. The more accurately and succinctly usable information can be presented to consumers, the more likely is a packaging solution to succeed in the market. But that information must be perceived as trustworthy and our results point to cultural factors that go into the awarding of trust by the consumer.

Modern food packaging in many countries, certified by trained inspectors, has standardized its display of nutrient content and the respective percentage of the recommended daily intake per nutrient. Energy products of all kinds now come with well-recognized efficiency ratings. But how to convey sustainability criteria in a packaging solution remains open to debate. Questions include whether current labelling should be replaced or complemented with a traffic-light-style badge and if so where the badge should be placed for easy cue recognition (Lichtenstein et al., 2014; Roodenburg, 2017).

Our results add an important consideration to this debate. Namely, the notable differences we observed among consumers from the three countries underscore the cultural component in the acquisition of packaging cues. Hence it is unlikely that one solution will fit all countries. Communicating easily usable sustainability information to the consumer will likely require national, perhaps even regional, approaches.

6 | CONCLUSION

In this section, we would like to summarize the main results of our study following the research questions we posed in the Introduction: *What cues do consumers in three large market countries—France, Germany and the US—use to assess the environmental merit of a packaging option?* Overall, consumers in our study relied predominantly on labels on the packaging, followed by their own evaluation of the packaging material. They also evaluate the amount of packaging material and its colour. While these factors have been mentioned in previous research, our study also reveals the relative importance of these factors. Consumers also draw on information they ask from the retailer and do internet search, two options not mentioned in previous research. Besides these cues directly related to the packaging option in question, consumers also make inferences based on their image of the manufacturer of the product, and, to a lesser extent of the retailer and the packaged product. The two latter factors have neither been examined previously, nor the relative importance of these three ways of 'image-transfer'.

How do consumer assessments compare across these countries in, for example, the priorities assigned to packaging cues? While there are many similarities across the three nations in our study, French consumers seem to rely more on colour, especially compared to their German counterparts and are less willing to spend time for doing online research to find out about the environmental impact of a specific packaging solution. German consumers tend to rely on their personal evaluation of packaging material more than their American and French counterparts and relied less on colour or information provided by the retailer. These differences provide new insights, since our study is the first to do an intercultural comparison in this field.

Are consumers given enough information to make sound decisions about the environmental impact of the packaging they choose? Based on our results, we do not think that consumers already have all the information they need. While labels are in principle a good instrument for providing environmental information in a concise and easy to understand form, our respondents sometimes had problems in interpreting them correctly. Moreover, consumers in our sample used also much less reliable cues such as the colour or the material of the packaging solution in question. Therefore, our results point to the necessity of providing labels that give adequate and precise information on the environmental impact of a packaging and second of educating consumers about how they can recognize environmentally packaging with more accuracy.

7 | LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

In our study, we made use of both open-ended and closed-ended question responses. As valuable as the statistics so provided may be, they do not reveal how concepts critical to consumer wellbeing are understood. What is understood by 'recyclable' or 'environmentally friendly'? Are consumers sufficiently empowered to distinguish 'recyclable' from 'eco-friendly' or 'sustainable'? Do they have the knowledge needed to assess the environmental impacts made by packaging? How closely aligned are consumer indications of willingness to search for information and consumer actions to do the same? Are obstacles hindering consumers in their desire to carry out environmentally responsible actions? Questions like these can reveal both the constructs at work in the evolving world of consumer decisions and areas were those constructs warrant development. An

important finding from our years of research is that questions like these are most fully examined through qualitative research, where unexpected responses and unforeseen perspectives can best be discovered.

We readily acknowledge that the questions in this study target the sustainability dimension of packaging, while a daily purchasing decision is more complex. The sustainability of a product itself as well as other product-related factors such as price or familiarity undoubtedly influence, perhaps even dominate, a consumer's thinking. For many consumers, alas, packaging carries minimal or no importance at all.

Moreover, like most studies, we asked for specific criteria independently, but past research hints at the interdependencies across criteria and the importance of looking at packaging design holistically (Orth & Malkewitz, 2008). Researchers have observed differences between isolated and multiple environmental cues (Pancer et al., 2017).

As a final point, we note that our survey was based on a quota sample, with a slight bias towards certain regions of France, Germany and the United States. A large quantitative probability sample could extend our findings further.

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