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Seen as Green? Assessing the Salience and Greenness of Environmentally Friendly Packaging Cues

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ABSTRACT

Environmentally friendly products become increasingly popular. To be considered for purchase, they must be (1) sufficiently salient and (2) perceived as environmentally friendly ("green"). The current paper investigates whether *implicit* (packaging material) and *explicit* (eco-labeling) packaging cues can facilitate such salience and greenness perceptions. We conducted a mixed-method, within-subjects experiment using self-report measures to assess perceived greenness, and mouse tracking as an exploratory measurement method to assess salience. Finally, we explored whether green consumerism, as a personal value, moderates these effects. Results confirm that both implicit and explicit cues that signalize environmental friendliness positively influence perceived salience and greenness. Furthermore, we find that implicit and explicit cues seem mostly independent in affecting salience and greenness perceptions and that green consumerism is no prerequisite for most of these packaging effects to emerge. As such, this research provides important new theoretical and practical insights on the role of packaging in food marketing.

KEYWORDS

Product packaging; eco-labeling; mouse tracking; green consumerism; sustainability; environmental friendliness

Introduction

Although consumers world-wide have become increasingly aware of their environmental impact, their excessive consumption patterns contribute to current ecological challenges (Stolz et al., 2013; Yoon-Na Cho, 2015). Especially food consumption has a big impact on the environment (Poore & Nemecek, 2018). Hence, one of the solutions to reduce the negative impact of food consumption on the environment is stimulating consumers to purchase less products, and if they do, purchase more environmentally friendly products. Environmentally friendly food products can be defined as products "that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations" (Oslo Roundtable on Sustainable Production and Consumption, 1994), which can be the reduction of meat consumption, the consumption of seasonal, local, and in some instances organically produced foods (Vermeir et al., 2020), and the consumption of products in a packaging with a lower environmental impact (Granato et al., 2022). In line with this, products in today's supermarkets are becoming increasingly environmentally friendly, meaning that they harm the environment as little as possible (Steg & Vlek, 2009). Although consumers value these environmentally friendly products (Rokka & Uusitalo, 2008) they do not always buy them (Alwitt & Pitts, 1996; Bech-Larsen, 1996; Jerzyk, 2016; Moisander, 2007; Thøgersen, 1999, 2004; Thøgersen & Ölander, 2003; Uusitalo, , 1990) and they remain the minority (Rex & Baumann, 2007; Van Doorn &

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Verhoef, 2011). To provide insights on how to stimulate environmentally friendly food purchases, we focus here on two important requirements in order for consumers to actually purchase environmentally friendly products: the product must be (1) sufficiently salient to be noticed, and (2) perceived as environmentally friendly ("green").

Previous research has shown that an important prerequisite for products being considered and actually chosen is being *salient*, in other words: they must be noticed (Krajbich et al., 2010; Van der Laan et al., 2015, 2017). In this light, it is worthwhile to consider that food is usually packaged and that product packaging does not only function as storage, but also as a communication vehicle that may attract attention (Ahmad et al., 2012; Bech-Larsen, 1996). Since different products are constantly competing for the consumers' limited attention, it is crucial to determine which food packaging characteristics are perceived as salient and have the potential to attract this attention (Smit et al., 2015).

Furthermore, it is possible to use the package to infer product characteristics (Van der Laan et al., 2012). Recent research has for example shown that consumers perceive food packaged in sustainable packaging as more satiating (Donato et al., 2021), or natural (Marozzo et al., 2020) than food packaged in non-sustainable packaging. People might also infer from the product package whether a product itself is environmentally friendly. Thus, for environmentally friendly products to be considered, packaging cues must not only be salient, but they should also evoke *perceptions of environmentally friendliness* ("greenness"; Magnier & Schoormans, 2015). Although there is quite some literature on the effects of different types of environmentally friendly cues in advertising on product perceptions (Hartmann & Apaolaza-Ibáñez, 2009; Matthes et al., 2014; Schmuck et al., 2018) and the literature on the effects of packaging cues is steadily growing (Binninger, 2017; McGuicken & Palomo-Vélez, 2021; Popovic et al., 2019; Vila & Ampuero, 2007), findings do not yet shed light on whether and how different types of (implicit vs explicit) packaging cues might affect the perceived salience and environmental friendliness of those food packages.

A recent literature review revealed that consumers primarily rely on what is defined as *implicit* packaging cues (i.e., packaging material) and *explicit* packaging cues (i.e., eco-labels) to identify environmentally friendly food packaging (Granato et al., 2022; Ketelsen et al., 2020), and a recent cross-sectional study suggests that people may rely on these two packaging cues for determining whether a package is environmentally friendly (Herbes et al., 2020). Hence, implicit environmentally friendly cues in this study are packaging cues such as shape or material that consumers may associate with certain product attributes, but that not explicitly make claims about these attributes (e.g., a cardboard-look packaging might have a more sustainable 'look and feel' than a bright white packaging but *is* not necessarily more environmentally friendly; cf., Granato et al., 2022). Explicit cues, in contrast, directly express food product attributes (e.g., an eco-label, providing a 'proof' of environmental friendliness, such as organic or palm-oil free label; cf., Granato et al., 2022). However, it is not yet fully known whether implicit versus explicit packaging cues affect the perceived salience and perceived environmental friendliness of the food product itself, and whether these cues might interact. To address this research gap, the current research aims to explore the interplay of implicit and explicit packaging cues on consumers' product perceptions. Our overall research question for this study is: *To what extent do different food packaging cues (i.e., implicit and explicit) influence salience and perceptions of environmental friendliness ("greenness") of food products?*

Additionally, we will study whether this impact of packaging cues on salience and perceived environmental friendliness is influenced by the consumer characteristic 'green consumerism' (Sparks & Shepherd, 1992). As green consumers are more concerned about their environmental impact (Schuitema & De Goot, 2015), they are expected to be more sensitive to environmentally friendly cues and are more likely to recognize products as being environmentally friendly (Chen & Chiu, 2016; Magnier & Schoormans, 2015; Martinho et al., 2015).

The contribution of the current study will be threefold. Firstly, by testing the effectiveness of implicit and explicit environmentally friendly cues in an experimental setting, we cannot only quantify and replicate previous findings on the effectiveness of implicit and explicit environmentally friendly cues but, importantly, also discern which of these types of cues is most influential in affecting the salience and

perceived environmental friendliness of the product. Secondly, a mouse tracking method will be used to complement the commonly used self-report measures. This allows us to explore whether this less subjective paradigm can reveal the dynamics that underly consumers' decisions in response to different food packaging cues. Thirdly, the findings can contribute to a more sustainable society by providing important practical insights on what (combination of) packaging cues could be best used to make sure that environmentally friendly products are salient and perceived as environmentally friendly. We can hereby provide guidelines and suggestions on what type of product packaging (i.e., choice of packaging material, eco-label, or both) most saliently and successfully communicates environmentally friendliness. This knowledge will enhance the chance of consumers choosing environmentally friendly products and thereby inflict less environmental harm within their everyday consumption choices.

Environmentally friendly packaging cues

While food shopping, consumers often make use of packaging cues to assess products, because they are not able to assess the product directly (Olson & Jacoby, 1972). Packaging can influence perceptions of products, especially of low involvement, nondurable products (Underwood, 2003) and thus plays an important role in food marketing as a communication vehicle (Behe et al., 2014). An extensive body of literature has focused on implicit (e.g., packaging design) and explicit (e.g., claims or labels) packaging cues and showed that they can influence consumer perception of food products, including product quality (Van Ooijen et al., 2017), taste (Becker et al., 2011; Van Rompay et al., 2014) or healthiness (Van Ooijen et al., 2016). We argue that packaging as a vehicle can also communicate environmental friendliness of a food product. Hence, we focus on the two packaging cues that are possibly used by consumers to determine whether a product is environmentally friendly: packaging material (which may serve as an *implicit* cue from which consumers derive environmentally friendly product attributes) and eco-labeling (which may serve as an *explicit* cue to communicate the environmentally friendliness of the product).

When it concerns implicit cues like packaging materials, there have been multiple innovations when it comes to "greening" packaging materials over the past years. This ranges from pet-bottles made from plant-based materials to removing the plastic layer on the surface of milk cartons. Importantly, these packaging materials may not only be better for the environment compared to their regular counterparts, but they might also stand out more compared to the regular packages (i.e., salience) and additionally signal implicitly to the consumers that the product is more environmentally friendly (Magnier & Schoormans, 2015; Steenis et al., 2017). In fact, this implicit signaling function (of, for instance, a carboard look) is now sometimes even misused by companies to pose a packaging as environmentally friendly while in fact it is not (e.g., plastic wrappers with a carboard look), referred to as greenwashing (Koenig-Lewis et al., 2014).

Eco-labels, in contrast, are more explicit cues. Eco-labels are visuals that "provide consumers with information about the environmental quality of individual products" (Thøgersen et al., 2010, p. 1787). There are many types of eco-labels. Some are vague and misleading (e.g., "dolphin friendliness"), whereas others are specific and have an objective truth value (e.g., the EU organic label; European Comission, 2020). Labels in general are known to have a positive effect, as they attract consumers' attention (Eelen et al., 2015) and are thus possibly more salient (Bhatt et al., 2021). Furthermore, labels are able to provide insights into the intrinsic attributes of a product (Herbes et al., 2020), like possibly the environmental friendliness of the product (Binninger, 2017; Meijers et al., 2019; Sundaraja et al., 2021). Although there are some contradictory findings in regard to the persuasiveness of eco-labels (e.g., D'Souza et al., 2007), most published studies have found a positive effect of eco-labels on product perceptions and preferences, such as a higher perceived quality (i.e., the belief that the product offers good taste) or a higher overall satisfaction with the product (e.g., D'Souza et al., 2006; Larceneux et al., 2012; Thøgersen et al., 2010).

Stimulus-Driven processing: Environmentally friendly cues

To assess the communicative impact of the implicit and explicit cues, a distinction is made between two types of processes, being stimulus-driven and goal-directed information processing (Yantis, 2000). We focus on stimulus-driven processing in this section and elaborate on goal-directed processing in the next section. Stimulus-driven, or bottom-up processing, is triggered by information from the environment, such as the visual field (Chandon et al., 2009). With stimulus-driven processing, consumers are likely to focus on attributes that stand out (Meißner et al., 2016). Research on this topic, focusing both on print advertisements and product packaging, indicated size and color as the most notable factors determining salience and focal attention (Ampuero & Vila, 2017; Pieters & Wedel, 2004; Pieters et al., 2010; Smit et al., 2015; Underwood, 2003; Zhang et al., 2009).

Considering stimulus-driven processing, both implicit and explicit environmentally friendly cues can be seen as relevant stimuli for increasing the perceived salience of the packaging, as the frequency of cues that signal environmental friendliness on packages in a supermarket might still be lower than the frequency of other packaging cues (IRi, 2020). Scarce research suggests that implicit cues, such as innovative packaging materials that give an appeal of being biodegradable, might indeed stand out against other packaging materials through color and material (Rundh, 2009). Furthermore, eye-tracking research shows that some of the most looked-at areas of a product package are labels (i.e., explicit cues; Piqueras-Fiszman et al., 2013). This implies that both implicit and explicit cues are capable of capturing attention.

Environmentally friendly packaging material and labels are not only used to influence the salience of a product; they are also used to promote perceptions of environmental friendliness (Thøgersen et al., 2010). However, the fact that a product carries an environmentally friendly cue does not automatically mean that it is actually perceived as such. This study therefore aims to test whether and how the use of implicit and explicit environmentally friendly cues is actually successful in promoting environmentally friendly product attributes. Based on centrality theory, a packaging cue as a feature can influence the overall perception of the package and thereby of the product (Gershoff & Frels, 2015). This leads to the following hypotheses:

H1. Product packages with an implicit environmentally friendly cue (packaging materials suggesting environmentally friendliness – cardboard) are more often perceived as salient (H1a) and environmentally friendly (H1b) than product packages without an implicit environmentally friendly cue (i.e., packaging materials not suggesting environmentally friendliness – white or brown).

H2. Product packages with an explicit environmentally friendly cue (i.e., an eco-label) are more often perceived as salient (H2a) and environmentally friendly (H2b) than product packages without an explicit environmentally friendly cue (i.e., no eco-label).

RQ1. Does adding an explicit environmentally friendly cue (eco-label) to the product package moderate the effect of an implicit environmentally friendly cue (cardboard versus white or brown) on perceptions of salience (RQ1a) and environmental friendliness (RQ1b)?

Goal-Directed processing: The moderating effect of green consumerism

In contrast with stimulus-driven processing, goal-directed processing or top-down processing is conceptualized as a volitional, focal process depending on personal characteristics and motivation (Smit et al., 2013). In the case of environmentally friendly products, green consumerism might therefore be an important consumer characteristic. A so called 'green consumer' is an "individual that wants and knows how to satisfy his or her needs in the everyday life causing as little as possible impact on the environment" (Sharma & Joshi, 2017, p. 208). Consumers with stronger environmentally friendly beliefs indeed show

more environmentally responsible buying behavior (Collins et al., 2007). Green consumerism is expected to stimulate goal-directed processing and potentially make cues more likely to be perceived as salient and environmentally friendly. As these cues are able to communicate environmentally friendliness, they are likely to especially attract consumers who prioritize environmental protection (Thøgersen, 2000). Furthermore, it is easier for those high in green consumerism to actually understand the message of being environmentally friendly (Thøgersen, 2000).

Because stimulus-driven and goal-directed processes often interact, we expect that green consumers might process environmentally friendly product packaging cues differently than non-green consumers. This notion is supported by studies showing that consumers with higher levels of environmental concerns or stronger environmental values respond differently to information about product sustainability (Bamberg, 2003; Birgelen et al., 2009) and their purchase intentions are more affected by environmentally friendly product attributes (Schuitema & De Goot, 2015). We therefore expect that those scoring high on green consumerism are more susceptible to packaging cues suggesting environmental friendliness, making it more likely that they perceive these cues as salient and environmentally friendly than those low on green consumerism. This leads to the following hypotheses:

H3: Green consumerism enhances the effect of an implicit environmentally friendly cue on perceived salience (H3a) and environmental friendliness (H3b), resulting in greater perceived salience and environmental friendliness for product packages with an implicit environmentally friendly cue (cardboard, as compared to white and brown materials) in green (versus non-green) consumers.

H4: Green consumerism enhances the effect of an explicit environmentally friendly cue on perceived salience (H4a) and environmental friendliness (H4b), resulting in greater perceived salience and environmental friendliness for product packages with an explicit environmentally friendly cue (eco-label, as compared to no label) for green (versus non-green) consumers.

Materials and methods

Rationale for exploring a mouse tracking paradigm

Perceived salience of the package, the first dependent variable, was measured using a mouse tracking paradigm. This measurement method logs the x- and y-coordinates of the computer mouse with a minimum sampling rate of 60 times per second as participants move their mouse to one of multiple response alternatives on the screen (Freeman & Ambady, 2010). This paradigm has been successfully used in various research domains in cognitive science (for an overview, see http://www.mousetracker.org/publications) and was adopted to explore its potential in food marketing.

The rationale behind this exploration is that most research on the effectiveness of packaging cues has asked consumers to self-report about their perceptions of the product. For less volatile concepts like perceived environmental friendliness (or greenness) that are better suited for introspection, this is fine and not problematic. However, such self-reports might have disadvantages when examining communication effects that are more volatile like salience (Vandeberg et al., 2015, 2016). First, self-reports usually provide a static outcome measure at one point in time and might thereby miss short-lived attention effects. Second, they rely on introspection, while it is long known that people might lack the insight to report about the often latent cognitive processes that mediate the effect of a stimulus on a response such as salience (Nisbett & Wilson, 1977). Thus, because salience is characterized by rapid, volatile stimulus-driven attention processes that are known to change over milliseconds (e.g., Theeuwes, 1991) which as such are unlikely to (fully) enter awareness, the mouse tracking paradigm seems optimal as it not only provides a self-reported assessment of salience, but is importantly also able to reveal fine-grained information about the real-time evolution of mental processes by measuring the motor dynamics of the hand (Freeman & Ambady, 2010; Freeman et al., 2011).

Design

An experimental laboratory study was conducted, implementing a 3 (implicit cue: cardboard vs. white vs. brown control packaging material) x 2 (explicit cue: eco-label vs. no eco-label) within-subjects design. Adopting a mouse tracking paradigm, a within-subjects design with multiple trials was necessary to distinguish signal from noise, due to high variability in mouse trajectories between (and even within) subjects.

Procedure and participants

Participants were recruited at a Dutch university and participated in return for research credits. After giving informed consent, they were first presented with the mouse tracking exercise in which they were asked to judge the salience of several product packages by moving the computer mouse to their preferred response options. Afterward they filled in a survey with self-report measurements about perceived environmental friendliness of the product and green consumerism. The study was administered in English and the dataset, syntaxes, and full questionnaire are available on OSF.[1]

A G*Power analysis of repeated measures with between-within interactions showed that, with a medium effect size of 0.25, an alpha of 0.05, two groups, and two measurements, the sample size should be at least 34 to reach a power of .80. Forty-two participants were recruited. They completed a total of 1260 (42*30) mouse tracking trials.

Participants were between 18 and 27 years old (M = 20.61, SD = 1.62) and 71.4% were female (28.6% male), none of the participants was colorblind and thus could see all the colors of the packaging. Six participants reported eating a vegetarian diet (14.3%) and three reported a vegan diet (7.1%). The sample is overall international (i.e., non-Dutch) with 73.8% of the participants living in the Netherlands for five years or less at the time of the study. Among the respondents, 83.3% were familiar with the EU organic label used in this study. The percentage of participants that were familiar with the label did not differ by level of green consumerism ($x^2(1) = 1.54$, $p = .214$).

Stimulus materials

In a pretest, multiple product categories and packages were pretested to investigate which environmentally friendly packages should be used as stimulus materials. As a result, milk packages were chosen, because of their high realism and medium likability (the latter was chosen in order to prevent any floor or ceiling effects).[2] Especially fast-moving consumer goods such as milk are interesting products to study, as they are purchased on a regular basis. Furthermore, milk as a product is not necessarily environmentally friendly, which allows to study the specific impact of packaging attributes (Poore & Nemecek, 2018). In the mouse tracking exercise, a second product (i.e., chocolate) was used as a filler stimulus to make the exposure to the milk packages less repetitive.

The *implicit* environmentally friendly cue was manipulated by changing the look and feel of the packaging material (cf., Granato et al., 2022) and included three levels. In the condition with the implicit cue, the package had a cardboard design to give it the appeal of a biodegradable material (Figure 1 first column). In the control conditions without the implicit cue, white and brown packages were created (column 2 and 3). A brown package was added as an extra control condition to control for the color of the package in contrast to the (white) background, so to exclude the possibility that a higher salience and environmental friendliness was attributable to the contrasting colors per se, rather than the apparent biodegradable nature of the package. This extra control condition allows us to test the hypotheses more stringently on implicit cues.

[1]This study was part of a larger project. The full questionnaire is available on OSF, see: https://osf.io/vg29e/?view_only=327fcad8e05047a2970e991ae0605457.
[2]The pretest is available on OSF.

Figure 1. Stimulus material.

The *explicit* environmentally friendly cue was manipulated using an eco-label (cf., Granato et al., 2022) and included two levels. Half of the packages included the EU organic label (Figure 1, first row), while the other half of the packages did not include this label (second row). Besides for reasons of ecological validity, we selected this well-known, often used label to rule out familiarity as a potential alternative explanation to H4. Based on the assumption that most of our sample would recognize the familiar eco-label (regardless of whether people were high or low in green consumerism), we aimed to investigate whether green consumerism as a personal characteristic – rather than familiarity with the label – drives an interaction with explicit cues. This resulted in six different packages.

Measurements

Perceived salience

The assessment of perceived salience was programmed using MouseTracking Software (http://www.mousetracker.org/, also see, Freeman & Ambady, 2010). Participants were instructed to select which of two horizontally aligned images of product packages they noticed first, by moving their computer mouse and clicking on the corresponding package (with the "LEFT" button indicating the left image, and the "RIGHT" button indicating the right image).[3] Upon the start of the task, participants were exposed to

[3]These left and right labels were selected to prevent any verbal cues from giving away differences between the packages.

a computer screen with a "START" button on the bottom center of the screen, a "LEFT" button on the top left side and a "RIGHT" button on the top right side. When they clicked the "START" button, the button disappeared and was replaced with the pictures of two products side by side, see, Figure 2 for an example of the set-up. Participants were instructed to initiate mouse movement immediately after clicking the start button.[4] No limit was placed on the response time per trial, as research shows that no (versus a 2.5 sec) time limit does not affect mouse trajectories or effect sizes (Kieslich et al., 2020). Each possible combination of packages was presented twice (in different order) to randomize the position of the packages and create a fully balanced within-subjects design; this resulted in a total number of 30 trials (reflecting fifteen different package combinations in two orders).

Several measures were taken from the mouse tracking data. First, we assessed which package was selected in any given combination of package pairs. Across the 30 trials, each packaging type had the opportunity to be selected a maximum of ten times. *Response* reflects the percentage of selections for a certain package in those ten trials (on a scale of 0–100) and reflects how often each package was judged to be most salient.

Second, we assessed the ease or certainty with which any expected decisions were made. This was done with two measures that each represent a unique characteristic of the mouse trajectories leading up to the expected response, one temporal measure and one spatial measure. *Response times* (RT) was the temporal measure and reflects the time it took participants to make the decision, with a shorter RT indicating more certainty. *X-flips* is the spatial measure and reflects the number of times the participant switched direction on the x-axis of the screen (tending to the left versus right response) while making the decision, with less x-flips indicating more certainty between the two response options. For each package, RTs and x-flips were averaged across the trials in which that package was selected. That is, if a package was selected seven out of ten times, the average is based on these seven trials. If packages were selected less than two times across trials, no average was calculated, and the case was treated as missing. Outliers in RTs and x-flips were winsorized, i.e., they were corrected by

Figure 2. Example of a computer screen with a mouse tracking set-up. Note.Error bars indicate 95% CI.

[4]Participants were instructed as follows: "Start moving your mouse as soon as you see the images, even if you are not completely certain about your answer yet". Participants completed several example trials to practice the mouse tracking exercise. For the full instructions, see OSF.

replacing values that were more than two standard deviations from the sample mean (−2SD<M< +2SD) by the value that reflected this cutoff point (i.e., exactly two standard deviations below or above the mean, respectively; Dixon, 1960).

Perceived environmental friendliness

After completing the mouse tracking exercise, participants were exposed to each of the six packages a second time in randomized order. Participants were asked to evaluate to what extent they perceived the respective product package as "green," on a 7-point scale ranging from 1 (not green at all) to 7 (very green).

Green consumerism

Green consumerism was measured by eighteen items based on earlier research on environmental concern (three items, e.g., "I am concerned about the environment"; Schuhwerk & Lefkoff-Hagius, 1995), attitudes toward green products (four items, e.g., "I like green products"; Chang, 2011), green purchase behavior (four items, e.g., "I make a special effort to buy products in biodegradable packages"; Kim & Choi, 2005; Matthes & Wonneberger, 2014; Shrum et al., 1995), and subjective knowledge (seven items, e.g., "I am very confident that I buy products in packages which are environmentally safe"; Ellen, 1994; Pieniak et al., 2010; the full list of items is available on the OSF). The scale is internally consistent with a Cronbach's alpha of .85 (M = 4.47, SD = 0.69). To be able to include this variable in the subsequent analysis, we relied on a median split and grouped responses into two equally large groups (n = 21) which are high, or low in green consumerism.[5]

Results

Effects on salience

Mixed ANOVAs were conducted to compare the main effects of *implicit cue* (packaging material: cardboard, white, brown) and *explicit cue* (eco-label, no eco-label) as within-subjects factors and *green consumerism* as a between-subjects factor (high, low) on each of the three salience outcome variables (responses, response times, x-flips) separately.

Responses. The mixed ANOVA showed a strong and significant main effect of *implicit cue* on *responses* (F(1.19, 80) = 7.06, p = .008, η^2 = .15).[6] Pairwise comparisons showed that the cardboard package (M = 60.83, SE = 3.46) was significantly more often identified as salient than the white package (M = 42.62, SE = 3.54, p = .035) and the brown package (M = 46.55, SE = 1.24, p = .002). White and brown packages did not significantly differ (p = 1.00). These findings significantly support H1a, showing that product packages with an implicit environmentally friendly cue are more often perceived as salient than product packages without an implicit environmentally friendly cue.

The main effect of *explicit cue* on *responses* was also significant and strong (F(1, 40) = 38.07, p < .001, η^2 = .49). Pairwise comparisons showed that the packages with an eco-label (M = 60.56, SE = 1.71) were identified significantly more often as salient than the packages without label (M = 39.44, SE = 1.71, p < .001). This supports H2a, by showing that product packages with an explicit environmentally friendly cue are more often perceived as salient than product packages without an explicit environmentally friendly cue.

[5]Mixed ANOVA analysis only allows for categorical independent variables.

[6]Note that Levene's test indicated unequal variances for the brown no label package (F(1, 40) = 4.18, p = .047) and for the cardboard label package (F(1, 40) = 4.67, p = .037). Since group sizes were similar, the ANOVA was assumed to be sufficiently robust to the violation of the assumption of homogeneity of variance (Pallant, 2010; Stevens, 1996). Also, Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated for implicit cue (χ^2(2) = 44.06, p < .001), and thus the Greenhouse-Geisser correction is reported.

There also was a strong and significant interaction effect of *green consumerism* and *explicit cue* on *responses* ($F(1, 40) = 10.25$, $p = .003$, $\eta^2 = .20$). As illustrated in Figure 3, green consumers identified packages with an eco-label significantly more often as salient than packages without label. Non-green consumers did not show any significant differences in their salience responses. This supports H4a, namely, that an explicit cue (eco-label, as compared to no label) results in greater perceived salience in green (versus non-green) consumers. All other main and interaction effects were non-significant (p's > .129), thereby rejecting H3a about an interaction between green consumerism and implicit cues (cardboard versus white and brown packages) on salience and showing no explicit*implicit cue interaction on salience (RQ1a).

In the analysis for *response times* and *x-flips*, we combined the white and brown packages (i.e., the ones with no implicit green cues) into one group of packages, since the white packaging material with no eco-label condition had too few cases to analyze separately (i.e., it was too rarely chosen as the most salient option to be able to conduct the mouse tracking analyses regarding salience response time and salience x-flips). Table 1 shows the overall means for salience responses, salience response time, salience x-flips and greenness ratings per package.

Response times. The main effect of *implicit cue* on *response times* was significant and strong ($F(1, 35) = 7.72$, $p = .009$, $\eta^2 = .18$). Pairwise comparisons showed that the response time for cardboard packages ($M = 1314.04$, $SE = 65.55$) was significantly shorter than for no cardboard packages ($M = 1380.13$, $SE = 77.41$, $p = .009$), supporting H1a. The main effect of *explicit cue* on *response times* was significant and moderately strong ($F(1, 35) = 4.77$, $p = .036$, $\eta^2 = .12$). Pairwise comparisons showed that the response time for packages with an eco-label ($M = 1322.57$, $SE = 68.89$) was significantly shorter than for packages without eco-label ($M = 1371.60$, $SE = 74.24$, $p = .036$), supporting H2a. There were no interaction effects (p's <.190), showing no support for H3a and H4a, and showing no explicit*implicit cue interaction (RQ1a).

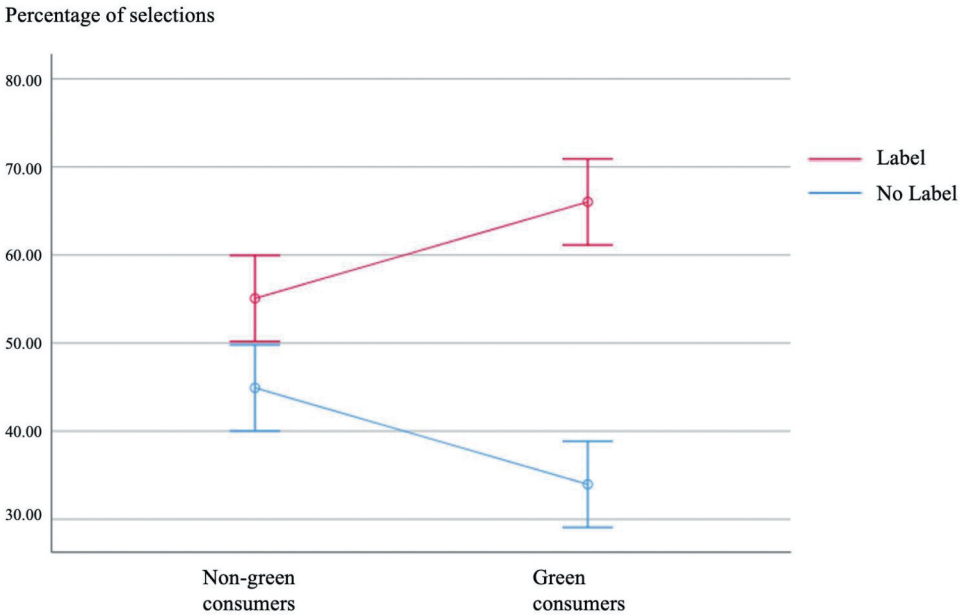

Figure 3. Interaction effect of green consumerism and label on salience.

Table 1. Means and SDs of salience responses, salience response time, salience x-flips and greenness ratings per package.

	Salience Response %			Salience Response Time			Salience x-flips			Greenness Rating		
	M	*SD*	n	*M*	*SD*	n	M	SD	n	*M*	*SD*	n
White, no label												
Non green cons.	33.81	25.19	21	1499.01	531.39	14	6.29	1.79	14	2.62	1.07	21
Green consumers	28.57	34.10	21	1398.41	226.82	8	5.83	1.44	8	1.71	0.90	21
Total	31.19	29.73	42	1462.43	440.91	22	6.12	1.65	22	2.17	1.08	42
Brown, no label												
Non green cons.	40.00	17.03	21	1259.26	477.85	19	5.86	1.51	19	3.29	1.27	21
Green consumers	29.05	10.44	21	1527.27	561.99	19	7.24	2.00	19	2.71	1.38	21
Total	34.52	15.01	42	1393.23	532.14	38	6.55	1.88	38	3.00	1.34	42
Cardboard, no label												
Non green cons.	60.95	24.27	21	1220.45	362.05	21	6.38	1.52	21	3.62	1.56	21
Green consumers	44.29	23.15	21	1423.65	430.66	18	6.38	1.71	18	4.24	1.51	21
Total	52.62	24.90	42	1314.24	403.10	39	6.38	1.59	39	3.93	1.55	42
White, label												
Non green cons.	45.24	23.16	21	1277.39	458.64	19	5.24	2.14	19	4.90	1.48	21
Green consumers	62.86	24.32	21	1428.41	419.73	20	6.11	1.27	20	4.67	1.28	21
Total	54.05	25.09	42	1354.84	439.98	39	5.69	1.78	39	4.79	1.37	42
Brown, label												
Non green cons.	54.76	17.21	21	1238.23	385.45	21	5.90	2.07	21	5.10	1.04	21
Green consumers	62.38	13.00	21	1404.16	488.51	21	6.16	2.23	21	5.14	0.85	21
Total	58.57	15.55	42	1321.20	442.64	42	6.03	2.13	42	5.12	0.94	42
Cardboard, label												
Non green cons.	65.24	22.72	21	1244.23	369.59	21	5.79	1.47	21	5.95	1.16	21
Green consumers	72.86	33.19	21	1431.00	473.94	20	6.06	1.54	20	6.38	0.67	21
Total	69.05	28.35	42	1335.34	428.87	41	5.92	1.49	41	6.17	0.96	42

X-flips. The mixed ANOVA analysis showed a significant and strong main effect of *explicit cue* on *x-flips* ($F(1, 35) = 13.22$, $p = .001$, $\eta^2 = .27$). Pairwise comparisons showed that participants showed significantly fewer x-flips for packages with an eco-label ($M = 5.82$, $SE = 0.24$) than for packages without an eco-label ($M = 6.44$, $SE = 0.26$, $p = .001$), supporting H2a. All other effects were non-significant (p's >.084).

Altogether, the results indicate that both implicit (cardboard packaging materials) and explicit (eco-label) eco-cues result in more and more certain salience judgments. Across the three measures of salience, we found support for H1a and H2a, the main effects of implicit and explicit eco-cues on salience. We also found support for an interaction between an explicit (eco-label) cue and green consumerism, but only for responses and not for response times or x-flips.

Effects on perceived environmental friendliness

A mixed ANOVA was performed with *implicit cue* (packaging material: cardboard, white, brown) and *explicit cue* (eco-label, no eco-label) as within-subjects factors and *green consumerism* as a between-subjects factor (high, low) on perceived environmental friendliness (scale 1–7). The analysis showed a significant and strong main effect of *implicit cue* on *perceived environmental friendliness* ($F(1.54, 80) = 37.44$, $p < .001$, $\eta^2 = .48$).[7] Pairwise comparisons showed that the cardboard package ($M = 5.05$, $SE = 0.16$) was perceived as significantly more environmentally friendly than the white package ($M = 3.48$, $SE = 0.15$, $p < .001$) and the brown package ($M = 4.06$, $SE = 0.13$, $p < .001$). The brown package was also perceived as significantly more environmentally friendly than the white package ($p < .001$). Furthermore, there was a significant and strong main effect of *explicit cue* on *perceived environmental friendliness* ($F(1, 40) = 145.90$, $p < .001$, $\eta^2 = .79$). The package with an eco-label

[7]Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated for implicit cues (χ^2 (2) = 13.67, $p = .001$), and thus the Greenhouse-Geisser correction is reported.

(M = 5.36, SE = 0.14) was perceived as significantly more environmentally friendly than the package without an eco-label (M = 3.03, SE = 0.15, p < .001). All other main and interaction effects were non-significant (p's > .061). These findings support H1b and H2b by showing that product packages with an implicit cue (H1b, cardboard packaging material) and an explicit cue (H2b, eco-label) are more often perceived as environmentally friendly than product packages without an implicit or explicit eco-cue. We find no support for H3b and H4b concerning interactions between more environmentally friendly cues and green consumerism on perceptions of environmental friendliness, and we find no explicit*implicit eco-cue interactions on perceived environmental friendliness (RQ1b).

In sum, results showed that both an implicit packaging eco-cue (cardboard material) as well as an explicit eco-cue (an eco-label) are generally capable of making food product packages more salient (H1a, H2a). We find both implicit and explicit eco-cues to lead to higher salience responses and shorter response times. For x-flips, the picture is slightly more nuanced. While we find an explicit cue (an eco-label) to lead to fewer x-flips (compared to no eco-label), we do not find differences in x-flips for packages with different implicit (packaging material) cues. Additionally, the results show that food packages as perceived more environmentally friendly when carrying an implicit or explicit cue (H1b, H2b). These cues, however, do not interact (RQ1). Furthermore, green consumerism mostly did not moderate this effect. That is, only for the salience response, results showed that green consumers were more sensitive to product packages with (versus without) an eco-label than non-green consumers (H4a was accepted for the response measures, but not for response time and x-flips measures; H3 and H4b were rejected).

Conclusion and discussion

This study aimed to investigate two requirements for environmentally friendly food purchasing, namely the extent to which products are (1) salient and (2) perceived as environmentally friendly. We hereby tested the impact of implicit and explicit packaging cues on salience and perceptions of environmental friendliness of food products. We present four key contributions.

Firstly, we find that not only cues that explicitly provide "proof" of environmental friendliness (i.e., eco-label), but also cues that implicitly suggest environmental friendliness (i.e., cardboard material), are capable of increasing salience and perceptions of environmental friendliness in consumers. This is in line with previous research showing that consumers utilize different cues to determine whether a product is environmentally friendly (Herbes et al., 2020). We can conclude that environmental friendly packages stand out, and are perceived as such, and thus, that they might have an advantage in ending up being considered and actually chosen by consumers (Krajbich et al., 2010; Van der Laan et al., 2015, p. 2017).

Secondly, we find that an explicit cue also influences the perceived salience and perceived environmental friendliness. Furthermore, these effects on salience and environmental friendliness are larger for explicit (i.e., label) than implicit cues (i.e., cardboard material). This finding supports that an explicit cue such as an eco-label is still the stronger cue signaling environment friendliness, possibly because it explicitly provides information about the environmental quality of a product (Binninger, 2017; Thøgersen et al., 2010). Interestingly, we find that the two cues do not interact, meaning that they are influencing salience and environmental friendliness independently of each other. Yet, from a practical perspective, we can conclude that both implicit and explicit cues can be used as a method to promote environmental friendliness.

Thirdly, to explore whether we were able to gain additional insights into salience, we explored a mouse tracking paradigm (Freeman & Ambady, 2010). In this paradigm, the response measure provided real-time insights into people's salience judgments. Responses indicated that people judge packages with explicit (eco-label) but also implicit (cardboard material) cues to be more salient than packages without such eco-cues. Moreover, the mouse tracking paradigm also allowed for measures of response *certainty*, with response times providing a proxy of response certainty on a temporal dimension and x-flips providing a proxy of response certainty on a spatial dimension. Response

times showed that salience judgments on packages with explicit and implicit cues were faster, and thereby more driven by certainty, than judgments on packages without such cues. The x-flips measure showed that explicit cues (eco-label versus no eco-label), but not implicit cues (cardboard versus non-cardboard material), provided people with more certainty.

One way to use these additional measures is to validate the self-reported judgments. We speculate that, if salience judgments were a mere result of social desirability, these additional temporal and spatial measures might not result in similar result patterns. Since our results regarding *certainty* (response time, x-flips) support the findings stemming from the self-reported assessment of salience, this suggests that the salience judgments are not a result of mere social desirability and thus provide stronger evidence for the results that both implicit and explicit packaging cues can enhance packaging salience. Furthermore, these additional measures give more detailed insights into how consumers reach product judgments. The findings on the spatial dimension (i.e., x-flips) show that explicit cues, thus showing an eco-label versus no eco-label, result in more certain salience judgments. That is, when an eco-label is shown, consumers are physically less drawn in the direction of the alternative package without label and more directly move their mouse to the response representing the package with an eco-label. This finding does not hold for implicit (cardboard versus non-cardboard material) cues. These findings further suggest that explicit cues may be more effective in attracting consumers' attention than implicit cues. This could be further explored in future research.

Lastly, we examined whether green consumers are more susceptible to packaging cues suggesting environmentally friendliness, making it more likely that they perceive these cues as salient and environmentally friendly than those low on green consumerism. We find that green consumers more often identified the eco-label (versus without) as salient than non-green consumers. However, this salience judgment was not reflected in faster responses or less x-flips, nor was it reflected in a direct perception of being environmentally friendly. We also do not find differences in perceptions of different package materials (implicit cues). In other words, for non-green consumers, implicit (e.g., packaging materials) and explicit (i.e., eco-labels) cues also enhance salience and perceived environmental friendliness. This suggests that the well-documented finding of non-green consumer purchasing less environmentally friendly products (Schuitema & De Goot, 2015) cannot be attributed to non-green consumers not seeing the environmentally friendly products, or not perceiving the product as environmentally friendly. Other than perceptions, more motivated reasons might play a role, like value-congruence or a price premium. This distinction can be further addressed in future research, as such adding to green consumer knowledge.

Our study is not without limitations which can provide suggestions for future research. We conducted this study in a laboratory setting to be able to implement the mouse tracking paradigm and complement the commonly used self-report measures. This comes with the limitation that we could only include a limited number of products in the experimental setup. Future research should expand the variety of stimuli in a larger number of trials. Furthermore, we relied on a student sample that is young and highly educated. Therefore, findings cannot be generalized beyond the population examined in this study. Future research should replicate these findings with a different, more heterogeneous sample, preferably in a more ecological valid setting.

Additionally, it could be argued that the exploratory mouse tracking salience measure is inappropriate, given that the measure is goal-directed whereas saliency is stimulus-driven. Ideally, we would have indeed adopted an objective, real time, fine-grained saliency measure without any goal-directed processes involved in the measurement process (e.g., eye tracking or ERP measurements), but these are difficult to implement in online experimental environments. Mouse tracking is notably more sensitive than retrospective self-report (because it provides valid, fine-grained, real-time information) and even self-reports might provide valid measures of attention (as they often correlate with more implicit or objective measures of attention, e.g., Keith et al., 2017; Morillas-Romero et al., 2015). Therefore, we consider mouse tracking to be a promising, fine-grained, easily implementable tool for online packaging research in academia and practice.

The findings have some practical managerial and societal implications stemming from the support that implicit and explicit packaging cues lead consumers to notice environmentally friendly products and perceive them as such. Marketers as well as policy makers benefit from the insight that eco-labels and environmentally friendly packaging materials matter, which enables them to more specifically use these cues to target consumers. It could thus be very beneficial for marketers to invest in new, innovative, more environmentally friendly packaging materials. This would be better for the environment, but also it would make their products "pop" on the shelf amongst the other products, thus drawing more consumers attention. Furthermore, it would also be beneficial for marketers to try more environmentally friendly ways of producing their food products, as this makes their product eligible for official eco-labels that enhance the salience of their products. Additionally, this implementation of environmentally friendly packaging and eco-labels will lead consumers to conclude that the product is environmentally friendly, a product trait that is valued by many consumers (e.g., D'Souza et al., 2006; Larceneux et al., 2012; Thøgersen et al., 2010). Trustworthy and responsibly implemented packaging cues can thus encourage environmentally friendly behavior and can be a first step to overcoming todays' ecological challenges.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

Ahmad, N., Billoo, M., & Lakhan, A. (2012). Effect of product packaging on consumer buying decision. *Journal of Business Strategies*, *6*(2), 1–10. https://doi.org/10.4135/9781483329864.n4

Alwitt, L. F., & Pitts, R. E. (1996). Predicting purchase intentions for an environmentally sensitive product. *Journal of Consumer Psychology*, *5*(1), 49–64. https://doi.org/10.1207/s15327663jcp0501_03

Ampuero, O., & Vila, N. (2017). Consumer perceptions of product packaging. *Journal of Consumer Marketing*, *23*(2), 100–112. https://doi.org/10.1108/JCM-10-2014-1179

Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology*, *23*(1), 21–32. https://doi.org/10.1016/S0272-4944(02)00078-6

Bech-Larsen, T. (1996). Einstellungen dänischer Verbraucher zu Funktions- und Umwelt-Eigenschaften von Lebensmittelverpackungen. *Journal of Consumer Policy*, *19*(3), 339–363. https://doi.org/10.1007/BF00411413

Becker, L., van Rompay, T. J. L., Schifferstein, H. N. J., & Galetzka, M. (2011). Tough package, strong taste: The influence of packaging design on taste impressions and product evaluations. *Food Quality and Preference*, *22*(1), 17–23. https://doi.org/10.1016/j.foodqual.2010.06.007

Behe, B. K., Campbell, B. L., Khachatryan, H., Hall, C. R., Dennis, J. H., Huddleston, P. T., & Fernandez, R. T. (2014). Incorporating eye tracking technology and conjoint analysis to better understand the green industry consumer. *HortScience*, *49*(12), 1550–1557. https://doi.org/10.21273/HORTSCI.49.12.1550

Bhatt, S., Ye, H., Deutsch, J., Jeong, H., Zhang, J., & Suri, R. (2021). Food waste and upcycled foods: Can a logo increase acceptance of upcycled foods? *Journal of Food Products Marketing*, *27*(4), 188–203. https://doi.org/10.1080/10454446.2021.1955798

Binninger, A. S. (2017). Perception of naturalness of food packaging and its role in consumer product evaluation. *Journal of Food Products Marketing*, *23*(3), 251–266. https://doi.org/10.1080/10454446.2014.885868

Birgelen, M. V., Semeijn, J., & Keicher, M. (2009). Packaging and proenvironmental consumption behavior. *Environment And Behavior*, *41*(1), 125–146. https://doi.org/10.1177/0013916507311140

Chandon, P., Hutchinson, J. W., Bradlow, E. T., & Young, S. H. (2009). Does in-store marketing work? Effects of the number and position of shelf facings on brand attention and evaluation at the point of purchase. *Journal of Marketing*, *73*(6), 1–17. https://doi.org/10.1509/jmkg.73.6.1

Chang, C. (2011). Feeling ambivalent about going green: Implications for green advertising processing. *Journal of Advertising*, *40*(4), 19–31. https://doi.org/10.2753/JOA0091-3367400402
Chen, M. Y., & Chiu, C. I. (2016). Go green: How to influence the perceived effectiveness of a green product? *International Journal of Advertising*, *35*(4), 622–641. https://doi.org/10.1080/02650487.2015.1105647
Cho, Y.-N. (2015). Different shades of green consciousness: The interplay of sustainability labeling and environmental impact on product evaluations. *Journal of Business Ethic*, *128*(1), 73–82. https://doi.org/10.1007/s
Collins, C. M., Steg, L., & Koning, M. A. S. (2007). Customers' values, beliefs on sustainable corporate performance, and buying behavior. *Psychology & Marketing*, *24*(6), 555–557. https://doi.org/10.1002/mar
D'Souza, C., Taghian, M., & Lamb, P. (2006). An empirical study on the influence of environmental labels on consumers. *Corporate Communications*, *11*(2), 162–173. https://doi.org/10.1108/13563280610661697
D'Souza, C., Taghian, M., Lamb, P., & Peretiatko, R. (2007). Green decisions: Demographics and consumer understanding of environmental labels. *International Journal of Consumer Studies*, *31*(4), 371–376. https://doi.org/10.1111/j.1470-6431.2006.00567.x
Dixon, W. J. (1960). Simplified estimation from censored normal samples. *The Annals of Mathematical Statistics*, *31*(2), 385–391. https://doi.org/10.1214/aoms/1177705900
Donato, C., Barone, A. M., & Romani, S. (2021). The satiating power of sustainability: The effect of package sustainability on perceived satiation of healthy food. *British Food Journal*, *123*(13), 162–177. https://doi.org/10.1108/BFJ-12-2020-1094
Eelen, J., Verlegh, P., & Bergh, B. V. D. (2015). Exploring the effectiveness of the label "new" in product packaging and advertising. *Advances in Consumer Research*, *43*(1), 512–513. http://www.acrwebsite.org/volumes/v43/acr_vol43_1020261.pdf
Ellen, P. S. (1994). Do we know what we need to know? Objective and subjective knowledge effects on pro-ecological behaviors. *Journal of Business Research*, *30*(1), 43–52. https://doi.org/10.1016/0148-2963(94)90067-1
European Comission. (2020). The organic logo. Retrieved 2020 December 12. https://ec.europa.eu/info/food-farming-fisheries/farming/organic-farming/organic-logo_en
Freeman, J. B., & Ambady, N. (2010). MouseTracker: Software for studying real-time mental processing using a computer mouse-tracking method. *Behavior Research Methods*, *42*(1), 226–241. https://doi.org/10.3758/BRM.42.1.226
Freeman, J. B., Dale, R., & Farmer, T. A. (2011). Hand in motion reveals mind in motion. *Frontiers in Psychology*, *2* (APR), 1–6. https://doi.org/10.3389/fpsyg.2011.00059
Gershoff, A. D., & Frels, J. K. (2015). What makes it green? The role of centrality of green attributes in evaluations of the greenness of products. *Journal of Marketing*, *79*(1), 97–110. https://doi.org/10.1509/jm.13.0303
Granato, G., Fischer, A. R. H., & H. C. M. Van, T. (2022, February).2021 A meaningful reminder on sustainability : When explicit and implicit packaging cues meet. *Journal of Environmental Psychology*, *79*, 101724. https://doi.org/10.1016/j.jenvp.2021.101724
Hartmann, P., & Apaolaza-Ibáñez, V. (2009). Green advertising revisted: Conditioning virtual nature experiences. *International Journal of Advertising*, *28*(4), 715–739. https://doi.org/10.2501/S0265048709200837
Herbes, C., Beuthner, C., & Ramme, I. (2020). How green is your packaging—A comparative international study of cues consumers use to recognize environmentally friendly packaging. *International Journal of Consumer Studies*, *44*(3), 258–271. https://doi.org/10.1111/ijcs.12560
IRi. (2020). *Keurmerken rapport 2019*. https://agfstorage.blob.core.windows.net/misc/AGF_nl/2020/06/08/Keurmerken_rapport_2019_2_juni_2020_FINAL_PERS.pdf
Jerzyk, E. (2016). Design and communication of ecological content on sustainable packaging in young consumers' opinions. *Journal of Food Products Marketing*, *22*(6), 707–716. https://doi.org/10.1080/10454446.2015.1121435
Keith, J. R., Blackwood, M. E., Mathew, R. T., & Lecci, L. B. (2017). Self-reported mindful attention and awareness, go/no-go response-time variability, and attention-deficit hyperactivity disorder. *Mindfulness*, *8*(3), 765–774. https://doi.org/10.1007/s12671-016-0655-0
Ketelsen, M., Janssen, M., & Hamm, U. (2020, May 1). Consumers ' response to environmentally-friendly food packaging - A systematic review. *Journal of Cleaner Production*, *254*, 120123. https://doi.org/10.1016/j.jclepro.2020.120123
Kieslich, P. J., Schoemann, M., Grage, T., Hepp, J., & Scherbaum, S. (2020). Design factors in mouse-tracking: What makes a difference? *Behavior Research Methods*, *52*(1), 317–341. https://doi.org/10.3758/s13428-019-01228-y
Kim, Y., & Choi, S. M. (2005). Antecedents of green purchase behavior: An examination of collectivism, environmental concern, and Pce. *Advances in Consumer Research*, *32*, 592–599. http://www.acrwebsite.org/volumes/9156/volumes/v32/NA-32
Koenig-Lewis, N., Palmer, A., Dermody, J., & Urbye, A. (2014). Consumers' evaluations of ecological packaging - Rational and emotional approaches. *Journal of Environmental Psychology*, *37*, 94–105. https://doi.org/10.1016/j.jenvp.2013.11.009
Krajbich, I., Armel, C., & Rangel, A. (2010). Visual fixations and the computation and comparison of value in simple choice. *Nature Neuroscience*, *13*(10), 1292–1298. https://doi.org/10.1038/nn.2635

Larceneux, F., Benoit-Moreau, F., & Renaudin, V. (2012). Why might organic labels fail to influence consumer choices? Marginal labelling and brand equity effects. *Journal of Consumer Policy*, *35*(1), 85–104. https://doi.org/10.1007/s10603-011-9186-1

Magnier, L., & Schoormans, J. (2015). Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal claim and environmental concern. *Journal of Environmental Psychology*, *44*, 53–62. https://doi.org/10.1016/j.jenvp.2015.09.005

Marozzo, V., Raimondo, M. A., Miceli, G. N., & Scopelliti, I. (2020). Effects of au naturel packaging colors on willingness to pay for healthy food. *Psychology and Marketing*, *37*(7), 913–927. https://doi.org/10.1002/mar.21294

Martinho, G., Pires, A., Portela, G., & Fonseca, M. (2015). Factors affecting consumers' choices concerning sustainable packaging during product purchase and recycling. *Resources, Conservation and Recycling*, *103*, 58–68. https://doi.org/10.1016/j.resconrec.2015.07.012

Matthes, J., & Wonneberger, A. (2014). The skeptical green consumer revisited: Testing the relationship between green consumerism and skepticism toward advertising. *Journal of Advertising*, *43*(2), 115–127. https://doi.org/10.1080/00913367.2013.834804

Matthes, J., Wonneberger, A., & Schmuck, D. (2014). Consumers' green involvement and the persuasive effects of emotional versus functional ads. *Journal of Business Research*, *67*(9), 1885–1893. https://doi.org/10.1016/j.jbusres.2013.11.054

McGuicken, T., & Palomo-Vélez, G. (2021). What do carbon labels signal? The role of biospheric values on perceptions of "green" food consumers. *Journal of Food Products Marketing*, *27*(7), 340–364. https://doi.org/10.1080/10454446.2021.2021119

Meijers, M. H. C., Noordewier, M. K., Verlegh, P. W. J., Willems, W., & Smit, E. G. (2019). Paradoxical side effects of green advertising: How purchasing green products may instigate licensing effects for consumers with a weak environmental identity. *International Journal of Advertising*, *38*(8), 1202–1223. https://doi.org/10.1080/02650487.2019.1607450

Meißner, M., Musalem, A., & Huber, J. (2016). Eye tracking reveals processes that enable conjoint choices to become increasingly efficient with practice. *Journal of Marketing Research*, *53*(1), 1–17. https://doi.org/10.1509/jmr.13.0467

Moisander, J. (2007). Motivational complexity of green consumerism. *International Journal of Consumer Studies*, *31*(4), 404–409. https://doi.org/10.1111/j.1470-6431.2007.00586.x

Morillas-Romero, A., Tortella-Feliu, M., Bornas, X., & Putman, P. (2015). Spontaneous EEG theta/beta ratio and delta–beta coupling in relation to attentional network functioning and self-reported attentional control. *Cognitive, Affective & Behavioral Neuroscience*, *15*(3), 598–606. https://doi.org/10.3758/s13415-015-0351-x

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*(3), 231–259. https://doi.org/10.1037/0033-295X.84.3.231

Olson, J. C., & Jacoby, J. (1972). *Cue utilization in the quality perception process*. ACR Special Volumes.

Oslo Roundtable on Sustainable Production and Consumption. (1994). *The Imperative of Sustainable Production and Consumption*.

Pallant, J. (2010). *SPSS survival manual*. Sydney: Allen & Unwin Press.

Pieniak, Z., Aertsens, J., & Verbeke, W. (2010). Subjective and objective knowledge as determinants of organic vegetables consumption. *Food Quality and Preference*, *21*(6), 581–588. https://doi.org/10.1016/j.foodqual.2010.03.004

Pieters, R., & Wedel, M. (2004). Attention capture and transfer in advertising: Brand, pictorial, and text-size effects. *Journal of Marketing*, *68*(2), 36–50. https://doi.org/10.1509/jmkg.68.2.36.27794

Pieters, R., Wedel, M., & Batra, R. (2010). The stopping power of advertising: Measures and effects of visual complexity. *Journal of Marketing*, *74*(5), 48–60. https://doi.org/10.1509/jmkg.74.5.48

Piqueras-Fiszman, B., Velasco, C., Salgado-Montejo, A., & Spence, C. (2013). Using combined eye tracking and word association in order to assess novel packaging solutions: A case study involving jam jars. *Food Quality and Preference*, *28*(1), 328–338. https://doi.org/10.1016/j.foodqual.2012.10.006

Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, *360*(6392), 987–992. https://doi.org/10.1126/science.aaq0216

Popovic, I., Bossink, B. A. G., & van der Sijde, P. C. (2019). Factors influencing consumers' decision to purchase food in environmentally friendly packaging: What do we know and where do we go from here? *Sustainability (Switzerland)*, *11*(24), 1–22. https://doi.org/10.3390/SU11247197

Rex, E., & Baumann, H. (2007). Beyond ecolabels: What green marketing can learn from conventional marketing. *Journal of Cleaner Production*, *15*(6), 567–576. https://doi.org/10.1016/j.jclepro.2006.05.013

Rokka, J., & Uusitalo, L. (2008). Preference for green packaging in consumer product choices – Do consumers care? *International Journal of Consumer Studies*, *32*(5), 516–525. https://doi.org/10.1111/j.1470-6431.2008.00710.x

Rundh, B. (2009). Packaging design: Creating competitive advantage with product packaging. *British Food Journal*, *111*(9), 988–1002. https://doi.org/10.1108/00070700910992880

Schmuck, D., Matthes, J., & Naderer, B. (2018). Misleading consumers with green advertising? An affect–reason–involvement account of greenwashing effects in environmental advertising. *Journal of Advertising*, *47*(2), 127–145. https://doi.org/10.1080/00913367.2018.1452652

Schuhwerk, M. E., & Lefkoff-Hagius, R. (1995). Green or non-green? Does type of appeal matter when advertising a green product? *Journal of Advertising*, *24*(2), 45–54. https://doi.org/10.1080/00913367.1995.10673475
Schuitema, G., & De Goot, J. I. M. (2015). Green consumerism: The influence of product attributes and values on purchasing intentions. *Journal of Consumer Behaviour*, *14*(1), 57–69. https://doi.org/10.1002/cb
Sharma, A., & Joshi, S. (2017). Green consumerism: Overview and further research directions. *International Journal of Process Management and Benchmarking*, *7*(2), 206–223. https://doi.org/10.1504/IJPMB.2017.083106
Shrum, L. J., McCarty, J. A., & Lowrey, T. M. (1995). Buyer characteristics of the green consumer and their implications for advertising strategy. *Journal of Advertising*, *24*(2), 71–82. https://doi.org/10.1080/00913367.1995.10673477
Smit, E., Boerman, S., & Meurs, L. (2015). The power of direct context as revealed by eye tracking: A model tracks relative attention to competing editorial and promotional content. *Journal of Advertising Research*, *55*(2), 216–227. https://doi.org/10.2501/JAR-55-2-216-227
Smit, E., Neijens, P., & Heath, R. (2013). The differential effects of position, ad and reader characteristics on readers' processing of newspaper ads. *International Journal of Advertising*, *32*(1), 65–84. https://doi.org/10.2501/IJA-32-1-065-084
Sparks, P., & Shepherd, R. (1992). Self-Identity and the theory of planned behavior: Assesing the role of identification with "green consumerism. *Social Psychology Quarterly*, *55*(4), 388–399. https://doi.org/10.2307/2786955
Steenis, N. D., van Herpen, E., van der Lans, I. A., Ligthart, T. N., & van Trijp, H. C. M. (2017). Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations. *Journal of Cleaner Production*, *162*(2017), 286–298. https://doi.org/10.1016/j.jclepro.2017.06.036
Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, *29*(3), 309–317. https://doi.org/10.1016/j.jenvp.2008.10.004
Stevens, J. (1996). *Applied multivariate statistics for the social sciences* (4th ed.). Mahwah, NJ: Erlbaum.
Stolz, J., Molina, H., Ramírez, J., & Mohr, N. (2013). Consumers' perception of the environmental performance in retail stores: An analysis of the German and the Spanish consumer. *International Journal of Consumer Studies*, *37*(4), 394–399. https://doi.org/10.1111/ijcs.12028
Sundaraja, C. S., Hine, D. W., Alex, A., Cosh, S. M., & Lykins, A. D. (2021). Can consumers do it all? An exploration of factors that influence the purchase of sustainable palm oil products. *Journal of Food Products Marketing*, *27*(5), 223–242. https://doi.org/10.1080/10454446.2021.1965063
Theeuwes, J. (1991). Cross-dimensional perceptual selectivity. *Perceptions & Psychophysics*, *50*(2), 184–193. https://doi.org/10.3758/BF03212219
Thøgersen, J. (1999). The ethical consumer. Moral norms and packaging choice. *Journal of Consumer Policy*, *22*(4), 439–460. https://link.springer.com/content/pdf/10.1023/A:1006225711603.pdf
Thøgersen, J. (2000). Psychological determinants of paying attention to eco labels in purchase decisions: Model development and multinational validation. *Journal of Consumer Policy*, *23*(3), 331–360. https://doi.org/10.4324/9781351154529-27
Thøgersen, J. (2004). A cognitive dissonance interpretation of consistencies and inconsistencies in environmentally responsible behavior. *Journal of Environmental Psychology*, *24*(1), 93–103. https://doi.org/10.1016/S0272-4944(03)00039-2
Thøgersen, J., Haugaard, P., & Olesen, A. (2010). Consumer responses to ecolabels. *European Journal of Marketing*, *44* (11/12), 1787–1810. https://doi.org/10.1108/03090561011079882
Thøgersen, J., & Ölander, F. (2003). Spillover of environment-friendly consumer behaviour. *Journal of Environmental Psychology*, *23*(3), 225–236. https://doi.org/10.1016/S0272-4944(03)00018-5
Underwood, R. L. (2003). The communicative power of product packaging: Creating brand identity via lived and mediated experience. *Journal of Marketing Theory and Practice*, *11*(1), 62–76. https://doi.org/10.1080/10696679.2003.11501933
Uusitalo, L. (1990). Are environmental attitudes and behaviors inconsistent? Findings from a finnish study. *Scandinavian Political Studies*, *13*(2), 211–226. https://doi.org/10.1111/j.1467-9477.1990.tb00437.x
van der Laan, L. N., de Ridder, D. T. D., Viergever, M. A., & Smeets, P. A. M. (2012). Appearance matters: Neural correlates of food choice and packaging aesthetics. *PLoS ONE*, *7*(7), e41738. https://doi.org/10.1371/journal.pone.0041738
van der Laan, L. N., Hooge, I. T. C., De Ridder, D. T. D., Viergever, M. A., & Smeets, P. A. M. (2015). Do you like what you see? The role of first fixation and total fixation duration in consumer choice. *Food Quality and Preference*, *39* (2015), 46–55. https://doi.org/10.1016/j.foodqual.2014.06.015
van der Laan, L. N., Papies, E. K., Hooge, I. T. C., & Smeets, P. A. M. (2017). Goal-directed visual attention drives health goal priming: An eye-tracking experiment. *Health Psychology*, *36*(1), 82–90. https://doi.org/10.1037/hea0000410
Van Doorn, J., & Verhoef, P. C. (2011). Willingness to pay for organic products: Differences between virtue and vice foods. *International Journal of Research in Marketing*, *28*(3), 167–180. https://doi.org/10.1016/j.ijresmar.2011.02.005
van Ooijen, I., Fransen, M. L., Verlegh, P. W. J., & Smit, E. G. (2016). Atypical food packaging affects the persuasive impact of product claims. *Food Quality and Preference*, *48*(2016), 33–40. https://doi.org/10.1016/j.foodqual.2015.08.002

van Ooijen, I., Fransen, M. L., Verlegh, P. W. J., & Smit, E. G. (2017). Packaging design as an implicit communicator: Effects on product quality inferences in the presence of explicit quality cues. *Food Quality and Preference*, *62*(June), 71–79. https://doi.org/10.1016/j.foodqual.2017.06.007

van Rompay, T. J. L., Fransen, M. L., & Borgelink, B. G. D. (2014). Effects of packaging imagery on sensory product impressions and brand evaluation. *Marketing Letters*, *25*(4), 397–407. https://doi.org/10.1007/s11002-013-9260-3

Vandeberg, L., Murre, J. M. J., Voorveld, H. A. M., & Smit, E. G. (2015). Dissociating explicit and implicit effects of cross-media advertising. *International Journal of Advertising*, *34*(5), 744–764. https://doi.org/10.1080/02650487.2015.1011023

Vandeberg, L., Wennekers, A., Murre, J. M. J., & Smit, E. G. (2016, October). Implicit and explicit measures: What their dissociations reveal about the workings of advertising. *Advances in Advertising Research*, *VI*(2016). https://doi.org/10.1007/978-3-658-10558-7

Vermeir, I., Weijters, B., Houwer, J. D., Geuens, M., Slabbinck, H., Spruyt, A., Kerckhove, A. V., Lippevelde, W. V., & Steur, H. D. (2020, July). Environmentally sustainable food consumption : Areview and research agenda from agoal-directed perspective.*Frontiers in Psychology*, *11*, 1603. https://doi.org/10.3389/fpsyg.2020.01603

Vila, N., & Ampuero, O. (2007). The role of packaging in positioning an Orange juice. *Journal of Food Products Marketing*, *13*(3), 21–48. https://doi.org/10.1300/J038v13n03_02

Yantis, S. (2000). Goal-directed and stimulus-driven determinants of attentional control . In Monsell, S., & Driver, J. (Eds.), *Control of cognitive processes: Attention and performance* (Vol. *18*, pp. 73–103). Cambridge Massachusetts Institute of Technology Press.

Zhang, J., Wedel, M., & Pieters, R. (2009). Sales effects of attention to feature advertisements: A Bayesian mediation analysis. *Journal of Marketing Research*, *46*(5), 669–681. https://doi.org/10.1509/jmkr.46.5.669