Journal of Environmental Psychology 44 (2015) 53–62

Contents lists available at ScienceDirect

Journal of Environmental Psychology

journal homepage: www.elsevier.com/locate/jep

Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal claim and environmental concern

Lise Magnier [a, b, *], Jan Schoormans [b]

[a] IAE Lille – School of Management, 104 Avenue du Peuple Belge, 59043 Lille, France
[b] TU Delft, Landbergstraat 15, 2628CE Delft, The Netherlands

ARTICLE INFO

Article history:
Received 13 April 2015
Received in revised form
14 September 2015
Accepted 19 September 2015
Available online 25 September 2015

Keywords:
Packaging
Ecological design
Visual appearance
Verbal sustainability claim
Purchase intention

ABSTRACT

More and more companies are developing sustainable packaging. In two studies on detergent and mixed nuts packages, we manipulated their visual appearance and verbal sustainability claims that communicate eco-friendliness, and tested the influence of these elements on consumers' affective attitudes and purchase intention. Drawing on two non-student samples, the results show that consumers' level of environmental concern influenced their responses to the visual appearance and verbal sustainability claims of packages. Low (high) environmental concern consumers were (not) sensitive to incongruence in visual appearance and verbal sustainability claim and showed negative (positive) responses. Next, we demonstrate that brand ethicality mediated the relationship between the interaction of the visual appearance, the verbal sustainability claim and environmental concern and purchase intention.

1. Introduction

Packaging holds a number of functional benefits related to product protection and transport efficiency. Next to these practical benefits, consumers use packaging to evaluate products and brands, particularly in the case of fast-moving consumer goods (Bloch, 1995; Garber, Burke, & Jones, 2000; Hertenstein, Platt, & Veryzer, 2005; Orth & Malkewitz, 2008; Rettie & Brewer, 2000; Schoormans & Robben, 1997). A serious downside of packaging is that it is usually discarded directly after product use and unavoidably adds to our environmental footprint. Each European citizen generates approximately 160 kg of packaging waste on a yearly basis (source: Eurostat, data for 27 countries in 2011), which means that packaging is an important issue when considering ecological inefficiency. One way to lower this environmental weight is to use ecologically-designed packaging. Ecological design is an emerging concept that refers to design that promotes sustainable and ecological efficiency (Boks & Stevels, 2007; Esslinger, 2011) and that is especially relevant in contexts where actual patterns of consumption are unsustainable (Koenig-Lewis, Palmer, Dermody, & Urbye, 2014). In this context and considering the importance of the issue, new contributions are needed in order to create knowledge that can be used to enhance the design of sustainable packages and to stimulate consumers' choice of these packages.

Introducing sustainable packages seems to be a logical company strategy, as consumers are showing increasing concern about sustainability issues (Olsen, Slotegraaf, & Chandukala, 2014). For example, 96% of European citizens agree that companies should take more initiatives to limit plastic waste and extend recycling (European Commission, 2014). Moreover, Tobler, Visschers, and Siegrist (2011) found that in the context of ecological food consumption, consumers believed that avoiding excessive packaging had the strongest impact on the environment.

Based on the above, we assume that, ceteris paribus, consumer evaluations of ecological packages that contain elements communicating their eco-friendliness will be mostly positive. However, research has shown that different design elements, such as color, shape, and materials influence consumers' evaluations in a multifaceted way. For example, the use of certain shapes can boost product attention, and at the same time influence the ease of product categorization (Schoormans & Robben, 1997). New ecological package designs may influence product knowledge negatively. In order to have a positive effect on purchase intention, a package needs to be categorized as sustainable by consumers and

* Corresponding author. TU Delft, Landbergstraat 15, 2628CE Delft, The Netherlands.
E-mail addresses: l.b.m.magnier@tudelft.nl (L. Magnier), j.p.l.schoormans@tudelft.nl (J. Schoormans).

http://dx.doi.org/10.1016/j.jenvp.2015.09.005
0272-4944/

consequently trigger positive affective attitudes (Carrus, Passafaro, & Bonnes, 2008; Ellen, 1994; Fraj & Martinez, 2006; Kilbourne & Pickett, 2008; Koenig-Lewis et al., 2014; Meneses, 2010).

In order to convince consumers to buy sustainable packages, a thorough understanding of how they evaluate ecological packages is needed. This paper examines under what conditions consumers perceive and trust different ecological package design elements and how these elements influence purchase intention. The first study focuses on consumers' evaluation of detergent packages in which the visual and verbal design elements signal sustainability. In this study, we take consumers' level of environmental concern into consideration and show how it influences affective attitudes towards detergent and their purchase intention using a sample of French consumers. The second study replicates Study 1, using the product category of mixed nuts and a sample of Dutch consumers. We introduce the concept of brand ethicality to explain some of the results of the first study.

2. Theoretical background and hypotheses

2.1. The effect of visual and verbal design elements on consumers' responses

From a holistic point of view, package design informs consumers about the product category, the quality of the product or brand personality (Orth & Malkewitz, 2008). Literature drawing on analytical approaches describes how different discrete design elements (e.g., color, shape, size, images, pictures, logos, claims) influence consumers' reactions (Cooper & Kleinschmidt, 1987; Hoegg & Alba, 2011; Schoormans & Robben, 1997; Silayoi & Speece, 2004; 2007). More precisely, the latter approach categorizes package design elements in several ways. While Underwood (2003) splits them into graphic (color, typography, shapes, and images) and structural elements (e.g., form, size of the containers, and materials), Silayoi and Speece (2004; 2007) suggest two categories: visual package elements (e.g., graphics, color, shape, and size) and informational package elements (information provided and technology). Rettie and Brewer (2000) propose a slightly different division into visual (e.g., appearance, images) and verbal package elements (e.g., claims and descriptions). We adhere to this division as visual and verbal packaging signals have been reported to influence consumer responses (Kauppinen-Räisänen, 2014; Naylor, Droms, & Haws, 2009; Orth & Malkewitz, 2008; Wansink, Sonka, & Hasler, 2004).

Visual signals are primarily processed by consumers, for which reason they are important in drawing attention and in subsequent product categorization (Rettie & Brewer, 2000; Schoormans & Robben, 1997). Furthermore, visual signals are processed quickly and automatically (Luna & Peracchio, 2003; Paivio, 1971; Townsend & Kahn, 2013; Unnava & Burnkrant, 1991). Verbal package elements are considered to be concrete and related to more intentional cognitive processing. A verbal claim indicating that the package is sustainable is usually direct and easy to understand. A downside of verbal claims is that they are subject to skepticism (Obermiller & Spangenberg, 1998).

In the case of sustainable packaging, we assume that consumers use the visually-processed design elements, such as material and color, to categorize the package as a sustainable package. However, consumers can only make the right categorization when the visual design elements clearly signal sustainability. In some cases, this categorization is easy because companies show their efforts in terms of packaging sustainability by designing packages that have an ecological look. Good examples are carton-based packages such as the one designed by Samsung for their phones and tablets or the green-fiber bottle project developed by Carlsberg.

Yet, recent innovations enable manufacturers to produce sustainable packaging with a conventional look that does not signal sustainability. For example, Unilever employs MuCell® technology, which uses 15% less plastic thanks to gas injection that creates gas bubbles in the middle layer of the bottle wall, reducing the density of the bottle and the amount of packaging required. Coca-Cola uses PlantBottle® technology, in which up to 30% of recyclable PET is made from plant materials. However, it is not always easy for consumers to understand that structures based on recycled materials are more ecologically friendly. Indeed, although these packages are designed to lower environmental impacts, they can easily be misunderstood because they look conventional. Package sustainability claims are especially important in the case of such packages. Verbal claims can highlight visual design elements that signal sustainability. The combination of visual and verbal claims increases the amount of arguments provided by the package and as such increases its persuasive impact by giving individuals more information to think about (Eagly & Warren, 1976; Petty & Cacioppo, 1984). Hence, an ecological verbal sustainability claim appears to be important not only when the visual look of the package is ecological, but also when the visual design of the package looks conventional, such as in the case of Unilever's newly introduced sustainable packages. However, the positive effect of an ecological verbal claim on a package is not straightforward. On the one hand, it may indeed improve affective attitude towards the package and purchase intention; on the other hand, it may backfire when individuals question the verbal sustainability claim.

2.2. The role of environmental concern (EC)

Consumers' perceptions and behaviors are generally influenced by their prior attitudes and beliefs. Consumers that are highly involved with a certain topic react differently to product information relevant to that particular topic than other consumers. Consumers' attitude towards sustainability is often referred to as environmental concern (Bickart & Ruth, 2012; Kilbourne & Pickett, 2008; Mohr, Eroglu, & Ellen, 1998). Research has shown that consumers with a high level of environmental concern react to information about sustainable products differently than consumers with low levels (Bamberg, 2003; van Birgelen, Semeijn, & Keicher, 2009). These consumers are more vigilant about environmental information and Matthes and Wonneberger (2014) showed that perceived consumer effectiveness - the extent to which the consumer believes that the efforts of an individual acting alone can make a difference - which is highly interrelated to environmental concern is negatively correlated with green ad skepticism. In their case, environmental information might trigger an availability heuristic. This heuristic is a mental shortcut relying on immediate examples that come to mind. This will happen to a much lesser degree with consumers who are not concerned with the issue. It can therefore be expected that people with low environmental concern will respond differently to packaging claims. By including these prior environmental attitudes in this study, we investigate a possible interaction with visual and verbal elements.

It appears that individuals with stronger opinions on social issues tend to accept confirming evidence of their existing beliefs at face value and discount others (Gilovich, 1983; Lord, Ross, & Lepper, 1979). Similar phenomena have been revealed in the case of nutritional arguments processing. Naylor et al. (2009) showed that consumers with strong health consciousness have a tendency to choose alternatives displaying a nutritional argument through a confirmation bias, even when this argument is presented jointly with a conflicting argument. On the other hand, consumers with

weaker health consciousness tend to reject alternatives displaying a nutritional argument jointly with a conflicting argument.

Therefore, and in agreement with the suggestions of Lord et al. (1979), we propose that consumers with high environmental concern (HEC) may be more open to environmental initiatives and that any incremental environmental information (congruent or not with visual design) will generally increase the persuasive impact of the package. In contrast, consumers with low environmental concern (LEC) are likely to interact with visual and verbal ecological elements of the package design, drawing on the persuasion knowledge model (Friestad & Wright, 1994). This model represents an interesting theoretical foundation because it hinges on the idea that consumer beliefs about marketing strategies shape consumer persuasion and it explains the role of consumer skepticism with regard to ecological cues (Bickart & Ruth, 2012; Chang, 2011). Consumers with low environmental concern may have less nuanced knowledge structures than consumers with high environmental concern, and therefore be more suspicious towards a brand's sustainability claim when no other contextual cues support this verbal claim, especially when this claim is incongruent with visual design elements, such as the look of the package.

2.3. The interplay of packaging visual appearance, verbal claim and EC on affective attitudes and purchase intention

Purchase intention is often influenced by the attitude that consumers have with respect to the packaged product. Attitudes are usually considered to have cognitive and affective components. In an earlier investigation on this topic, Koenig-Lewis et al. (2014) examined whether emotional and rational evaluations of an ecological package influenced purchase intention. Their results revealed that only emotional evaluations had direct effects on purchase intention, but that the rational evaluations had direct effects on the emotional evaluations. However, their survey study did not test how different ecological elements of the package interact with individuals' environmental concern to influence reactions.

Considering the impact that the perception of environmental stimuli has on attitudes (Boks & Stevels, 2007; Koenig-Lewis et al., 2014) and the influence of environmental attitudes towards eco-friendly alternatives (Bamberg, 2003; van Birgelen et al., 2009), we expect that the perception of the visual and verbal ecological elements of packaging will influence affective attitude as a function of environmental concern. We define affective attitudes as the emotional reactions an individual experiences when perceiving a package, and in the context of ecological consumption, affects are important because they are often related to buying intention (Carrus et al., 2008; Fraj & Martinez, 2006; Koenig-Lewis et al., 2014; Meneses, 2010).

To summarize, we suggest that for HEC consumers, the presence of a verbal signal of eco-friendliness will mostly have a positive influence in the case of both the conventional-looking and the ecological-looking packages and that no change in direction will be noted. In contrast, for LEC consumers, the incongruence between the visual appearance and the verbal sustainability claim will lower affective attitudes and purchase intention.

In sum, we expect a three-way interaction between environmental concern, visual appearance, and verbal sustainability claim, as follows:

H1. When environmental concern is low, the ecological-looking or conventional-looking of a package by the presence or absence of a sustainability claim will affect (a) affective attitude and (b) purchase intention.

In contrast:

H2. When environmental concern is high, the ecological-looking or conventional-looking of a package by the presence or absence of a sustainability claim will not affect (a) affective attitude and (b) purchase intention.

3. Study 1

3.1. Method

We used a 2 (visual appearance: conventional-looking vs. ecological-looking) x 2 (verbal sustainability claim: absent vs. present) x environmental concern (measured variable) experimental between-subject design. The product category is laundry detergent. This product category is relevant because household cleaners are often promoted with green claims (Bickart & Ruth, 2012). The stimuli had either an ecological (molded-pulp bottle) or a conventional (red hard plastic bottle) look, depending on condition. In order to enhance the realism of the study, the visual appearances of the stimuli materials were taken from actual packages of laundry detergent that are not sold in the country where the study took place. The ecological-looking structure has been taken from a bottle sold by the brand *Seventh generation*® whereas the conventional-looking one was taken from a bottle sold by the brand *Tide*®. In the presence of a verbal sustainability claim, an informative ecological claim —"*bottle made out of recycled materials*" — was displayed on the package design whereas in the absence condition this information was absent. The brand displayed on the bottle was *Cheer*®, which was not sold in the country where the study took place. The brand name and all other information on the package remained constant across stimuli.

Participants were obtained through a networking procedure or what is often referred to as snowball sampling. 185 French individuals (age range: 18–81 years, $M_{age} = 34.28$ years; $SD = 11.59$ years; male: 36.2%) were presented with one of the four conditions in an online study. Next, participants filled in a questionnaire containing a purchase intention scale (Lepkowska-White, Brashear, & Weinberger, 2003; $\alpha = .96$). This scale consists of three, 5-point Likert-type statements (1 = not at all agree, 5 = totally agree) used to assess the likelihood of a person to buy a brand featured in an advertisement. Affective attitude was measured using five 7-point Likert-type statements (Sweeney & Soutar, 2001; $\alpha = .93$) aiming at assessing how participants would feel when using the product (*This package of laundry detergent is one that I would enjoy*; *This package of laundry detergent would make me want to use it*; *This package of laundry detergent is one that I would feel relaxed about using*; *This package of laundry detergent would make me feel good*; *This package of laundry detergent would give me pleasure*). Environmental concern was measured on a continuous variable composed of 6 items (Kilbourne & Pickett, 2008; $\alpha = .88$). The six items reflected concern, environmental abuse, importance of limiting consumption, political and social change, and stricter enforcement of environmental laws and were measured on 7-point Likert scales. In order to control for potential brand knowledge (Orth, Campana, & Malkewitz, 2010; Underwood & Klein, 2002), brand familiarity was assessed using the following item: *Are you familiar with this brand of laundry detergent (yes/no)*. To check for confounding effects of attractiveness, we used a self-formulated 7-point semantic differential scale (unattractive/attractive). This measure is important to make sure the packages did not differ on their attractiveness and that this variable did not explain the differences in attitudes and behavioral intention (Mugge & Schoormans, 2012). At the end of the study, participants were

given the opportunity to participate in a lottery to compensate them for their participation.

3.2. Results

3.2.1. Manipulation and confounding checks

No participant was familiar with the brand featured in the study. In order to test if the manipulations of the ecological visual and verbal appearances were perceived as intended, an analysis of variance was performed using the self-formulated item "this packaging is eco-friendly" measured on a 7-point Likert scale (1 = not at all agree, 7 = totally agree) as a dependent variable and the visual appearance and verbal appearance as independent variables. A significant main effect of the visual appearance ($M_{\text{conventional-looking}} = 3.28$, $M_{\text{ecological-looking}} = 5.06$, $F(1, 181) = 48.2$, $p < .01$; $\eta_p^2 = .85$) and a significant main effect of the verbal sustainability claim ($M_{\text{absent}} = 3.62$, $M_{\text{present}} = 4.82$, $F(1, 181) = 23.55$, $p < .01$; $\eta_p^2 = .21$) were found. No significant differences were found on attractiveness of both the visual appearance ($M_{\text{conventional-looking}} = 3.87$, $M_{\text{ecological-looking}} = 3.77$, *ns*) and the verbal sustainability claim ($M_{\text{absent}} = 3.62$, $M_{\text{present}} = 3.98$, *ns*). No other significant effects were found.

3.2.2. Hypotheses testing

Since environmental concern was a measured variable that should not be dichotomized (Fitzsimons, 2008; Irwin & McClelland, 2001), moderated regression analyses were conducted to test for a moderating effect of environmental concern on the relationship between the visual appearance, the verbal sustainability claim and the dependent variables.

In the analyses, affective attitude and purchase intention were regressed on dummy variables representing the visual appearance of the package (−1 = conventional-looking and 1 = eco-designed-looking) and the verbal sustainability claim (−1 = absent and 1 = present), EC (mean-centered, $M = 5.65$; $SD = 1.00$) and their two-way interactions and three-way interaction. Attractiveness was standardized and included as an independent variable in order to control for its potential effect on the dependent variables. Regression results are shown in Table 1.

3.2.2.1. Affective attitude. We examined the results of the moderated regression for affective attitude. As expected, attractiveness had a positive effect on affective attitudes ($b = .60$, $SE = 06$, $t = 10.02$, $p < .01$, CI [.47, .71]). There was also a significant effect of visual appearance on affective attitude ($b = .21$, $SE = .08$, t = 2.73, $p < .01$, CI [.06, .37]), indicating that globally the ecological appearance positively influenced affective attitude. The effect of the verbal sustainability claim on affective attitude was also significant ($b = .19$, $SE = .08$, $t = 2.38$, $p < .05$, CI [.03, .34]), indicating that globally the verbal sustainability claim positively influenced purchase intention.

A significant two-way interaction between the verbal sustainability claim and EC was found ($b = .31$, $SE = .08$, $t = 3.99$, $p < .01$, CI [.16, .46]). Using model 1 of the PROCESS macro (Hayes, 2012), we examined this interaction for participants with low and high levels of environmental concern (one *SD* below and above the mean of EC, $SD = 1.00$). The examination of this interaction revealed that for LEC participants, there was again no significant effect of the verbal sustainability claim on affective evaluation ($b = -.17$, $SE = .13$, $t = -1.30$, $p > .19$). For HEC participants, the effect was significant and positive ($b = .53$, $SE = .12$, $t = 4.55$, $p < .01$, CI [.34, .74]), suggesting that affective attitude was stronger when there was a sustainability claim.

More importantly (as described in Fig. 1a), the three-way interaction between the visual appearance, the verbal sustainability claim and EC was significant ($b = -.33$, $SE = .08$, $t = -4.15$, $p < .01$, CI [−.16, −.46]). Because we hypothesized EC as a moderator, we examined the significance of the visual appearance x verbal sustainability claim at low and high levels of EC using the PROCESS macro (model 3) (Hayes, 2012). Consistent with H1a, for LEC participants, the visual appearance x verbal sustainability claim was significant ($b = .54$, $SE = .12$, $t = 4.46$, $p < .01$, CI [.30, .79]). As shown in the left panel of Fig. 1a, for LEC consumers, when the package did not display a sustainability claim, there was a negative effect of the ecological visual appearance of the package on affective attitude ($b = -.29$, $SE = .13$, $t = -2.23$, $p < .05$, CI [−.54, −.03]). When the package included a sustainability claim, there was a positive effect of the ecological visual appearance on affective attitude ($b = .79$, $SE = .20$, $t = 3.85$, $p < .01$, CI [.39, 1.21]). One can remark that the claim appears to hurt evaluations of the conventional-looking packaging for LEC consumers. Indeed, when the package was conventional-looking, there was a significant negative effect of the sustainability claim on affective attitude ($b = -.70$, $SE = .17$, $t = -4.04$, $p < .01$, CI [−1.04, −.35]). However, when the package was ecological-looking, there was a positive effect of the presence of the sustainability claim on affective attitude ($b = .39$, $SE = .17$, $t = 2.25$, $p < .05$, CI [.05, .73]).

Also consistent with H2a, for HEC participants, the visual appearance x sustainability claim was not significant ($b = -.17$, $SE = .11$, $t = -1.55$, $p > .12$). As shown in the right panel of Fig. 1a, for HEC participants, when the package did not include a sustainability claim, there was a positive effect of the ecological visual appearance of the package on affective attitude ($b = .34$, $SE = .15$, $t = 2.19$, $p < .05$, CI [.03, .65]). When the package included a sustainability claim, there was no positive effect of the ecological appearance of the package on affective attitude ($b = -.01$, $SE = .16$, $t = -.01$, $p > .98$). When the package was conventional-looking, there was also a significant positive effect of the sustainability claim on affective attitude ($b = .70$, $SE = .16$, $t = 4.43$, $p < .01$, CI [.39, 1.02]). Finally, when the package was ecological-looking, there was a significant positive effect of the sustainability claim on affective attitude ($b = .35$, $SE = .15$, $t = 2.32$, $p < .05$, CI [.05, .66]).

3.2.2.2. Purchase intention. Finally, we explored the results of the regression for the variable of purchase intention. Attractiveness also had a positive effect on purchase intention ($b = .39$, $SE = .05$, $t = 7.50$, $p < .01$, CI [.29, .49]).

There was a significant effect of the visual appearance of the package on purchase intention ($b = .21$, $SE = .07$, $t = 3.00$, $p < .01$, CI [.07, .34]), indicating that the ecological visual appearance of the package had a positive influence on purchase intention.

A significant two-way interaction between the verbal sustainability claim of the package and environmental concern was also

Table 1
Moderated regression analysis for the package visual appearance (dummy), the verbal sustainability claim (dummy) and environmental concern on affective attitude and purchase intention (unstandardized coefficients).

	Affective attitude	Purchase intention
Constant	.79***	.87***
Visual	.21***	.21***
Verbal	.19**	.07
Visual × verbal	.19**	.10
EC (mean-centered)	.01	−.01
Visual × EC (mean-centered)	−.04	.04
Verbal × EC (mean-centered)	.31***	.21***
Visual × verbal × EC (mean-centered)	−.33***	−.19***
Attractiveness	.60***	.39***
Overall model (F)	22.48***	12.92***

***p < .01; **p < .05; *p < .10.

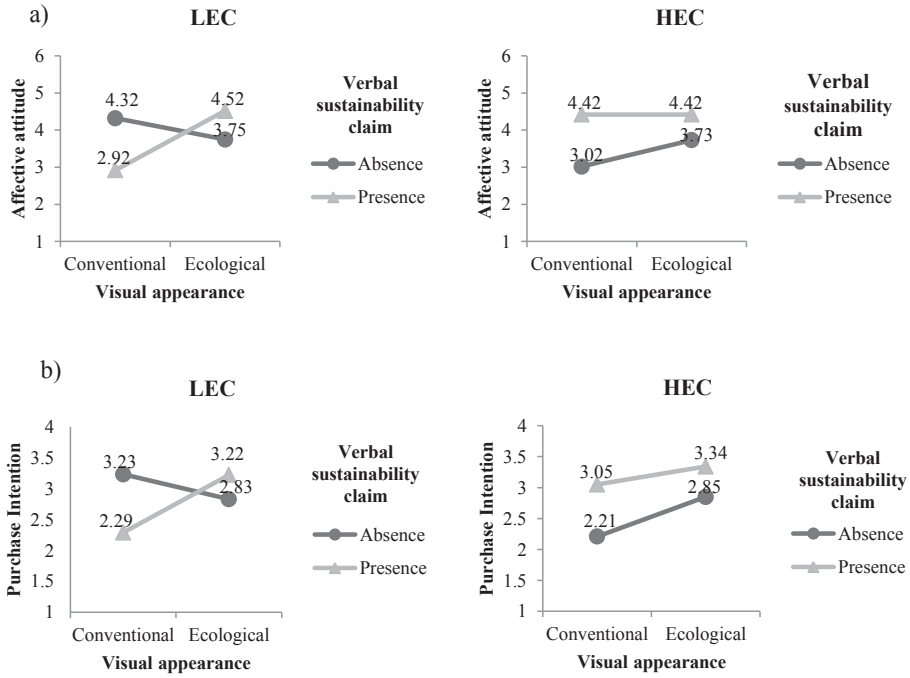

Fig. 1. Spotlight analyses of affective attitude (a) and purchase intention (b) for consumers with low environmental concern (left panels) and high environmental concern (right panels).

found (b = .21, SE = .07, t = 3.12, p < .01, CI [.08, .35]). For LEC consumers, there was no significant effect of the sustainability claim on purchase intention (b = −.18, SE = .11, t = −1.58, p > .11). For HEC consumers, the effect was positive and significant (b = .30, SE = .10, t = 3.02, p < .01, CI [.12, .50]), indicating that purchase intention was more important when there was a sustainability claim on the package.

Moreover, consistent with H1b and H2b (as described in Fig. 1b), the three-way interaction between the visual appearance, the verbal sustainability claim and environmental concern was significant (b = −.19, SE = .07, t = −2.78, p < .01, CI [−.33, −.06]). These results also suggest that the interaction between the visual appearance and the verbal sustainability claim varies as a function of environmental concern.

We examined the significance of the visual appearance x verbal sustainability claim at low and high levels of EC. Consistent with H1b, for LEC participants, the visual appearance x verbal sustainability claim was significant (b = .31, SE = .11, t = 2.88, p < .01, CI [.10, .52]). As shown in the left panel of Fig. 1b, for LEC consumers, when the package did not display a sustainability claim, there was no significant effect of the ecological visual appearance of the package on purchase intention (b = −.15, SE = .11, t = −1.33, p > .18). When the package included a sustainability claim, there was a positive effect of the ecological visual appearance on purchase intention (b = .47, SE = .18, t = 2.55, p < .05, CI [.11, .83]). It is interesting to observe that here, again, the claim appears to hurt evaluations of the conventional-looking packaging for LEC consumers. Indeed, when the package was conventional-looking, there was a significant negative effect of the sustainability claim on purchase intention (b = −.47, SE = .15, t = −3.11, p < .01, CI [−.77, −.17]). However, when the package was ecological-looking, the effect of the presence of the sustainability claim on purchase intention was not significant (b = .15, SE = .15, t = .96, p > .33).

Also consistent with H2b, for HEC participants, the visual appearance x sustainability claim was not significant (b = −.11, SE = .09, t = −1.16, p > .24). As shown in the right panel of Fig. 1b, for HEC participants, when the package did not include a sustainability claim, there was a positive effect of the ecological visual appearance of the package on purchase intention (b = .37, SE = .14, t = 2.67, p < .01, CI [.10, .64]). When the package included a sustainability claim, there was no significant positive effect of the ecological appearance of the package on purchase intention (b = .14, SE = .14, t = 1.03, p > .30). When the package was conventional-looking, there was also a significant positive effect of the sustainability claim on purchase intention (b = .42, SE = .14, t = 3.01, p < .01, CI [.14, .69]). Finally, when the package was ecological-looking, the effect of the sustainability claim on purchase intention was not significant (b = .19, SE = .14, t = 1.42, p > .15).

3.3. Summary and discussion of study 1

The results of this first study show that consumers' responses to the visual appearance and verbal sustainability claims of the package depend on their level of EC. Next, we shed light on the critical role of these visual and verbal elements on affective attitude and purchase intention of eco-designed packaging. The most important result of Study 1 is that consumers with LEC evaluate a conventional-looking package with a verbal sustainability claim more negatively, consistent with H1. An explanation for this result is the fact that the verbal package element is subject to skepticism (Mohr et al., 1998). Indeed, some consumers might interpret ecological verbal claims as a method of greenwashing, especially when these claims are not congruent with the visual appearance of the package. The limited studies on greenwashing indeed show that *green talking* in particular may hurt brands. *Green talking* is when brands try to convince customers that their activities are sustainable when they are not (Walker & Wan, 2012).

In the next study, we introduce the concept of brand ethicality (Brunk, 2012). This concept aims at understanding consumers' perceptions of a company's morality; it summarizes consumers' subjective impressions about the moral dispositions of a brand

towards society. Indeed, green talking is a form of unethical behavior and consumers are reported to negatively judge brands that engage in unethical behavior. On the contrary, consumers usually reward brands whose behavior is ethical (Du, Bhattacharya, & Sen, 2007; Trudel & Cotte, 2009). In sum, we suggest that the inferences on brand ethicality through the perception of the package will mediate the effect of the visual appearance, the verbal sustainability claim and EC on purchase intention. Thus we propose:

H3. The impact of the visual appearance of the package, the verbal sustainability claim and EC on purchase intention will be mediated by brand ethicality.

In order to further explain the results of Study 1, in Study 2 we will examine to what degree the effects found relate to perceived brand ethicality. Next, the objective of this second study is to replicate the results of Study 1 on purchase intention in another sample and in a second product category.

4. Study 2

4.1. Method

We used a 2 (visual appearance: conventional-looking vs. ecological-looking) x 2 (verbal sustainability claim: absent vs. present) x environmental concern (measured variable) between-subject experimental design to test the hypothesis. Packages of mixed nuts were chosen as stimuli. Mixed nuts is an interesting product to complete the results found on laundry detergent because this food product is generally considered to be healthy, thanks to which it makes sense to use sustainable packaging. Four different packages were created by visually modifying the visual appearance (recycled paper appearance vs. red aluminum) and the presence or absence of a verbal claim suggesting the eco-friendliness of the package. These operations were realized digitally by a trained designer and all other elements of the package remained constant. The brand chosen was *Emerald*®, which was not sold in the country where the study took place.

Participants were recruited from a Dutch university-based consumer panel. This panel consists of 1700 households representative of the Dutch population. The questionnaires were sent to a sample of 320 individuals and the response rate was 37.2%. 119 individuals participated in the study (age range: 19–59 years; $M_{age} = 42.37$ years; $SD = 12.96$ years; male: 45.4%). The number of people in their household ranged from 1 to 6 ($M = 2.71$; $SD = 1.46$). The net monthly incomes in the household were diverse ([<1500€]:16.53%; [1500€-3000€]: 22.31%, [3000–4500€]: 29.75%, [>4500]: 31.41%). Each participant was randomly presented with one of the packages of mixed nuts.

We instructed participants to look closely at the picture and to respond to several rating scales. The scales of purchase intention ($\alpha = .93$), environmental concern ($\alpha = .88$) and attractiveness were the same as in Study 1. Brand ethicality was measured on a 7-point scale composed of 3 items ($\alpha = .91$) adapted from Brunk (2012) (*When I look at the packaging, I think the brand Emerald respects ethical standards*; *When I look at the packaging, I think the brand Emerald is a socially responsible brand*; *When I look at the packaging, I think the brand Emerald will make a decision only after careful consideration of the potential positive or negative consequences of its products*). Brand familiarity and attractiveness were also assessed to control for brand knowledge and potential confounding effects, respectively. Participants received a small financial compensation for their participation.

4.2. Results

4.2.1. Manipulation and confounding checks

As expected, the results show that all participants were unfamiliar with the brand that was used. In order to test if the manipulations of the ecological visual appearance and the verbal sustainability claim were successful, a one-way ANOVA was performed using the self-formulated variable "this packaging is eco-friendly" measured on a 7-point Likert scale (1 = not at all agree, 7 = totally agree) as a dependent variable, and the visual appearance and verbal sustainability claim as independent variables. The recycled paper was rated as more eco-friendly than the red aluminum ($M_{conventional\text{-}looking} = 3.52$, $M_{ecological\text{-}looking} = 4.12$, $F(1, 115) = 5.01$, $p < .05$, $\eta_p^2 = .05$) and a significant main effect of the verbal sustainability claim was also found ($M_{absent} = 3.20$, $M_{present} = 4.57$, $F(1, 115) = 27.76$, $p < .01$; $\eta_p^2 = .19$). To check for potential confounding effects of attractiveness, an analysis of variance was performed to compare the four packaging stimuli on the attractiveness scale. No significant differences were found on attractiveness of the visual appearance ($M_{conventional\text{-}looking} = 4.23$, $M_{ecological\text{-}looking} = 3.88$, *ns*) or of the verbal sustainability claim ($M_{absent} = 3.91$, $M_{present} = 4.25$, *ns*). No interaction effect was found.

4.2.2. Findings

For the reasons explained in Study 1, moderated regression analyses were conducted to test for a moderating effect of environmental concern on the relationship between the visual appearance, the verbal sustainability claim and the dependent variables (Fitzsimons, 2008; Irwin & McClelland, 2001). These regression results are shown in Table 2.

Because we expected that brand ethicality would mediate effects of the independent variables on purchase intention, we examine the purchase intention variable first. Purchase intention was regressed on dummy variables representing the visual appearance (−1 = conventional-looking and 1 = ecological-looking) and the verbal sustainability claim (−1 = absent and 1 = present), EC (mean-centered) and the interactions of these variables. Attractiveness was included in the analysis as an independent variable and had a positive effect on purchase intention ($b = .41$, $SE = .06$, $t = 6.82$, $p < .01$, CI [.29, .52]).

There was a significant effect of the visual appearance on purchase intention ($b = .20$, $SE = .07$, $t = 2.61$, $p = .01$, CI [.05, .35]), indicating that the ecological appearance positively influenced purchase intention.

More importantly (as shown in Fig. 2), the three-way interaction between the visual appearance, the verbal sustainability claim and EC was significant ($b = -.17$, $SE = .09$, $t = -1.93$, $p = .05$, CI [−.34, −.00]). Because we hypothesized EC as a moderator, we examined the significance of the visual appearance x verbal sustainability claim at low and high levels of EC using model 3 of the PROCESS macro (Hayes, 2012). For participants low in EC, the appearance x sustainability claim was significant ($b = .22$, $SE = .11$, $t = 2.00$, $p < .05$, CI [.00, .44]), thus confirming H1. As shown in the top panel of Fig. 2, for LEC participants, when the package did not display a sustainability claim, there was no effect of the visual appearance on purchase intention ($b = .06$, $SE = .15$, $t = .41$, $p > .68$); in contrast when the package included a sustainability claim, purchase intention was more favorable for the ecological-looking package ($b = .50$, $SE = .16$, $t = 3.14$, $p < .01$, CI [.18, .82]). Once again, the sustainability claim hurts the evaluation of the conventional-looking package for LEC consumers. Intention to purchase the conventional-looking package was significantly lower when a sustainability claim was present on the package than when no such claim was presented ($b = -.27$, $SE = .13$, $t = -2.12$, $p < .05$, CI [−.52, −.02]), while the presence of the sustainability claim did not

Table 2
Moderated regression analysis for the package visual appearance (dummy), the verbal sustainability claim (dummy) and environmental concern on purchase intention and brand ethicality (unstandardized coefficients).

	Dependent variable model	Mediator variable model	Dependent variable model with mediator
	Purchase intention	Brand ethicality	Purchase intention
Constant	1.06***	2.298***	−.48*
Visual	.20***	.346***	.11
Verbal	.04	.243*	−.02
Visual × verbal	.07	.004	.07
EC (mean-centered)	.09	.149	.05
Visual × EC (mean-centered)	−.10	−.166	−.03
Verbal × EC (mean-centered)	.10	.149	.06
Visual × verbal × EC (mean-centered)	−.17**	−.243*	−.11
Attractiveness	.41***	.253***	.34*
Brand ethicality			.26***
Overall model (F)	7.55***	3.68***	13.24***

***p < .01; **p < .05; *p < .10.

significantly affect intention to purchase the ecological-looking package ($b = .17$, $SE = .18$, $t = .94$, $p > .34$).

Consistent with H2, for participants high in EC, the visual appearance x verbal sustainability claim was not significant ($b = -.08$, $SE = .11$, $t = -.77$, $p > .45$), confirming H2. As shown in the bottom panel of Fig. 2, for HEC participants, when the package did not display a sustainability claim, there was no effect of the visual appearance on purchase intention ($b = .20$, $SE = .15$, $t = 1.34$, $p > .18$); when the package included a sustainability claim, there was also no significant effect of the ecological appearance on purchase intention ($b = .03$, $SE = .16$, $t = .20$, $p > .84$). There was also no significant influence of the sustainability claim when the package had a conventional appearance ($b = .21$, $SE = .16$, $t = -1.33$, $p > .18$), and finally the presence of the sustainability claim did not significantly affect intention to purchase the ecological-looking package ($b = .04$, $SE = .15$, $t = .30$, $p > .77$).

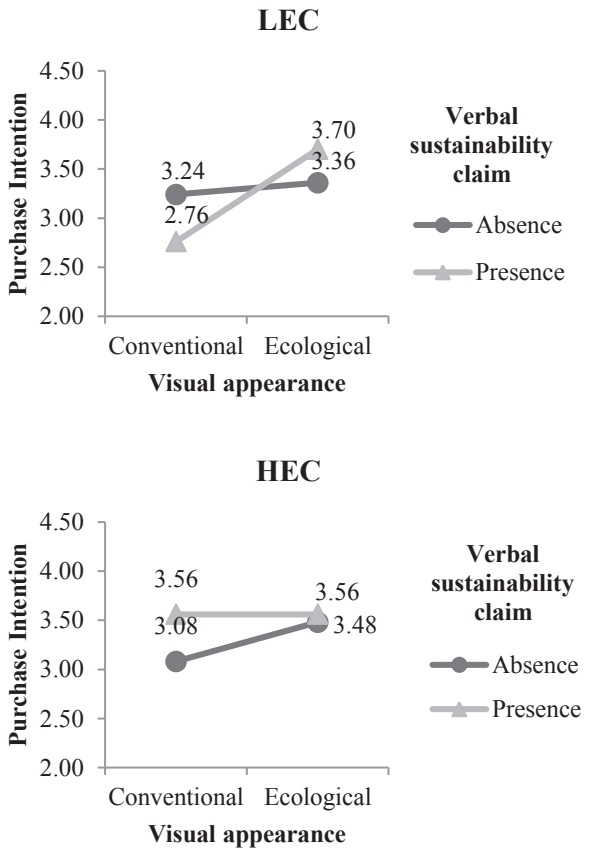

Fig. 2. Spotlight analyses of purchase intention for LEC consumers (top panel) and HEC consumers (bottom panel).

To test whether brand ethicality is a mediator, we first ran a regression model with brand ethicality as a dependent variable and the dummy variables representing visual appearance, verbal sustainability claim, EC, their interactions and attractiveness as independent variables. These results are shown in the middle column of Table 2. To test the significance of the indirect effect, we used PROCESS (model 12) (Hayes, 2012). This macro provides a bootstrap confidence interval for the indirect effect of the independent variable on the dependent variable through the mediator. As shown in Table 2, the three-way interaction of visual appearance, sustainability claim and EC was significant. In addition, the bootstrapping technique employed to test indirect effects confirmed the mediating role of brand ethicality (95% *CI*; [−.16,−.00]).

5. Discussion and implications

The need for more research on how consumers process eco-designed market alternatives has been acknowledged in past research on consumer behavior (Bickart & Ruth, 2012; Kronrod, Grinstein, & Wathieu, 2012; Luchs, Naylor, Irwin, & Raghunathan, 2010; Luchs, Scott Swan, & Creusen, 2015). Prior research has focused on the effects of ecological cues on consumers' purchase intention (Koenig-Lewis et al., 2014; Tobler et al., 2011). Other authors have taken into account the effect of consumers' characteristics and more specifically environmental concern on purchase intentions of ecological alternatives (Bamberg, 2003; Kilbourne & Pickett, 2008; Mohr et al., 1998), but little research has focused on how individual characteristics and product environmental cues interact and influence evaluations (Bickart & Ruth, 2012; Luchs et al., 2010). The present research aimed to address this gap in the literature by empirically testing how, in the context of packaging consumption, visual and verbal design elements presented in a conventional or in an ecological way affected consumers' responses as a function of their environmental concern.

Specifically, we demonstrated in two countries and across two product categories that attractiveness was an important variable to take into account when designing an ecological package, because it strongly affected all dependent variables. These results add to the contributions of Luchs, Brower, and Chitturi (2012) who show that superior aesthetic design of sustainable products increases choice likelihood.

Existing literature led us to segment consumers on the environmental concern criterion in order to better explain their reactions to ecological visual and verbal package communications (Bamberg, 2003; van Birgelen et al., 2009). The results were carefully examined for each condition – conventional or ecological-looking with the absence or presence of an ecological verbal sustainability claim, for low and high levels of environmental concern. In the first study, we showed that when there was no ecological verbal sustainability claim displayed on the package, the ecological-looking package positively influenced purchase intention for HEC consumers, while there was no significant effect for LEC consumers. However, even if the trends were going in the same direction, these results were not confirmed in the second study. As we stated before, this phenomenon probably comes from the fact that the effect of the ecological visual appearance of the package on the perception of eco-friendliness, although significant, was not as strong as in the first study.

The results also revealed that when the ecological verbal sustainability claim was congruent with the visual appearance of the package, both LEC and HEC consumers' responses tended to be more favorable. In contrast, when the visual appearance and verbal sustainability claim were incongruent, there was an important difference between both types of consumers. For HEC consumers, responses were globally more favorable when there was a verbal sustainability claim even when presented on a conventional-looking package, whereas the responses of LEC consumers were clearly less positive when presented with incongruent verbal and visual information. In this context, drawing from the persuasion knowledge model also seems to be particularly relevant (Friestad & Wright, 1994), as our results confirm that LEC consumers are more doubtful than HEC consumers about companies' environmental claims (Bickart & Ruth, 2012; Chang, 2011) and incongruence between the verbal sustainability claim and visual appearance leads to a decrease in affective attitudes towards the package and behavioral intention.

These results are interesting for eco-innovation development efforts because they attest that the evaluation of affective attitudes towards an eco-designed alternative, and brand ethicality more generally, can be manipulated by changing the levels of analytical elements available to consumers.

Our results extend the results of Naylor et al. (2009) in the context of ecological consumption. Indeed, similar patterns of evaluations were found between HEC consumers and highly health-conscious consumers when confronted with conflicting information targeting an important issue. We showed that consumers with a strong attitude towards a target issue tend to believe information confirming their prior opinion. In our research, HEC consumers positively interpreted as ecological the visual appearance and verbal sustainability claim whether they were congruent or not, while LEC consumers tended to decrease their evaluations of packages presenting conflicting visual and verbal information.

In the second experiment, we introduced the concept of brand ethicality (Brunk, 2012) as a possible explanation for the low affective attitudes and subsequent purchase intention in the incongruent condition for LEC consumers. We suggest that firms practicing greenwashing by displaying fallacious environmental claims on their packages will be seen as having low ethicality brands and that this phenomenon would decrease purchase intention. The results indeed show that the positive and negative effects of the combinations of visual and verbal ecological elements relate strongly to brand ethicality, which in turn affects purchase intention. In other words, brand ethicality mediated the relationship between the visual appearance, the verbal sustainability claim and EC on the one hand and purchase intention on the other hand.

5.1. Managerial implications

This research provides interesting information for marketers, packaging managers and designers on how consumers respond to eco-designed packaging. First, marketers and packaging managers should be very clear in their briefs about their target, because the influence of ecological design elements on preferences strongly depends on consumers' level of environmental concern.

So far, companies have made greater use of textual information to signal the eco-friendliness of their packaging. This has probably happened because a substantial change in the visual appearance of a package also tends to alter perceptions of the company's positioning. The results show that both HEC and LEC consumers are more likely to believe and prefer an alternative when its visual appearance is ecological and when it is supported by an environmental textual claim. However, for companies who do not wish to structurally alter the visual appearance of their package, a targeted strategy might represent an appealing solution. Since HEC consumers are likely to believe and show preferences for alternatives displaying a verbal claim even when the visual appearance is conventional, such a strategy might represent an opportunity. Yet, when products are targeted to LEC consumers, packages that do not show an environmental claim might even be more successful, since incongruence between visual appearance and verbal information appears to decrease affective and conative reactions. In other words, the brand and the product seem to be hurt by this combination of package elements. In order to counteract this negative effect, tangible proofs of the arguments should be emphasized and a pre-test must be carried out to ensure the believability of such elements.

5.2. Limitations and further research

Our research is limited in several ways. First, this study has been run online with pictorial stimuli and the respondents were not able to interact physically with the products. We suspect that making it possible for respondents to touch the packages and feel the paper-like materials would enhance the results. However, further research may seek to replicate these results with real prototypes in order to test the effect of haptics on consumer responses.

Second, for HEC participants and unlike the first study, we do not reach significance for the effect of the ecological appearance of the package on purchase intention. This phenomenon can be explained by the fact that, although significant, the difference in the means of eco-friendliness perception of the conventional and the ecological visual appearance was not as strong as in the first study.

Third, the results are limited to low involvement products, but we can expect that vigilance and skepticism associated with persuasion knowledge would be even more evident when consumers assess packages of high-involvement products; it may therefore be interesting to replicate this study using products with a higher level of involvement. Future studies could take purchase frequency into account. One would expect that ecological packaging matters less for products with a low purchase frequency, because the quantity of packaging is not significant for products bought sporadically. Moreover, future research on the influence of eco-designed packaging on attitudes and behaviors might integrate brand concepts, that is, "unique, abstract meanings associated with brands" (Torelli, Monga, & Kaikati, 2012) in the analysis. Indeed, we can expect that ecological design may reflect values in conflict with certain brand concepts, especially brands featuring a self-enhancement concept (e.g., dominance over people and resources, such as luxury brands or brands whose main attribute is based on efficacy and strength), and subsequently cause disfluency and a decrease in evaluations.

Fourth, this study did not take into account respondents' cognitive resources. Literature has shown that consumers' responses to visual and verbal cues can vary depending on cognitive resources (Hoegg, Alba, & Dahl, 2010; Shiv & Fedorikhin, 1999). Future research could test the influence of visual and verbal stimuli in different conditions of cognitive load in order to determine if, in situations of high cognitive load, consumers' responses would be influenced to the same extent by both visual and verbal signals. Cognitive constraints indeed lead to the predominance of automatic and affective processes over systematic and cognitive ones (Hoegg et al., 2010). When doing their grocery shopping, consumers are likely to experience high variety and temporal pressure corresponding to situations of high cognitive load. It is likely that consumers do not process verbal signals because they require more cognitive capacities.

Then, by using pictorial stimuli in an online experimental study, we were not able to take into consideration the fact that, in reality, consumers make their product purchase decisions in environments featuring other competing products. In future studies, researchers could investigate how ecological design elements on product packaging tend to influence subsequent attitudes and behaviors considering products in their environment.

Finally, we showed that LEC consumers' attitudes were negatively affected when they were presented with a package featuring a conventional appearance and a verbal sustainability claim. In this study, we showed that the ecological look of a package can help; however, future research might seek to further investigate under which conditions the believability of this sustainability claim can be improved. For example, the presence of an eco-seal issued by a third-party or a government agency could enhance evaluations of the claim (Bickart & Ruth, 2012; Dean & Biswas, 2001). Likewise, more tangible proofs or explanations of the process leading to package eco-friendliness are likely to positively influence the evaluations of the claim. Next, brand familiarity, and especially prior knowledge about a company's corporate social responsibility may positively influence evaluations of incongruence between the visual appearance and verbal sustainability claim.

With the development of environmental initiatives in business and the use of ecological design in new product development, the preceding questions will be of importance for design, product and brand management.

Acknowledgments

The authors wish to thank Ruth Mugge, Ellis van den Hende, the editor and the two anonymous reviewers for their helpful comments on earlier versions of this paper.

References

Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology, 23*, 21–32.
Bickart, B. A., & Ruth, J. A. (2012). Green eco-seals and advertising persuasion. *Journal of Advertising, 41*, 51–67.
van Birgelen, M., Semeijn, J., & Keicher, M. (2009). Packaging and proenvironmental consumption behavior: Investigating purchase and disposal decisions for beverages. *Environment & Behavior, 41*, 125–146.
Bloch, P. H. (1995). Seeking the ideal form: product design and customer response. *Journal of Marketing, 59*, 16–29.
Boks, C., & Stevels, A. (2007). Essential perspectives for design for environment. Experiences from the electronics industry. *International Journal of Production Research, 45*, 4021–4039.
Brunk, K. H. (2012). Un/ethical company and brand perceptions: conceptualising and operationalizing consumer meanings. *Journal of Business Ethics, 111*, 551–565.
Carrus, G., Passafaro, P., & Bonnes, M. (2008). Emotions, habits and rational choices in ecological behaviours: the case of recycling and use of public transportation. *Journal of Environmental Psychology, 28*, 51–62.
Chang, C. (2011). Feeling ambivalent about going green. *Journal of Advertising, 40*, 9–32.
Cooper, R. G., & Kleinschmidt, E. J. (1987). New products: what separates winners from losers? *Journal of Product Innovation Management, 4*, 169–184.
Dean, D. H., & Biswas, A. (2001). Third-party organization endorsement of products: an advertising cue affecting consumer prepurchase evaluation of goods and services. *Journal of Advertising, 30*, 41–57.
Du, S., Bhattacharya, C. B., & Sen, S. (2007). Reaping relational rewards from corporate social responsibility: the role of competitive positioning. *International Journal of Research in Marketing, 24*, 224–241.
Eagly, A. H., & Warren, R. (1976). Intelligence, comprehension, and opinion change. *Journal of Personality, 44*, 226–242.
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*, 43–52.
Esslinger, H. (2011). Sustainable design: beyond the innovation-driven business model. *Journal of Product Innovation Management, 28*, 401–404.
European Commission. (2014). *Attitudes of Europeans towards waste management and resource efficiency*. last accessed 12.12.14. available at: http://ec.europa.eu/public_opinion/flash/fl_388_en.pdf.
Fitzsimons, G. J. (2008). Death to dichotomizing. *Journal of Consumer Research, 35*, 5–8.
Fraj, E., & Martinez, E. (2006). Ecological consumer behavior: an empirical analysis. *International Journal of Consumer Studies, 31*, 26–33.
Friestad, M., & Wright, P. (1994). The persuasion knowledge model: how people cope with persuasion attempts. *Journal of Consumer Research, 21*, 1–31.
Garber, L. L., Burke, R. R., & Jones, J. M. (2000). *The role of package color in consumer purchase consideration and choice*. Boston: Marketing Science Institute Working Paper Series.
Gilovich, T. (1983). Biased evaluation and persistence in gambling. *Journal of Personality and Social Psychology, 44*, 1110–1126.
Hayes, A. F. (2012). *Process: A versatile computational tool for observed variable mediation, moderation and conditional process modeling, white paper*. Ohio State University. available at:www.afhayes.com/public/process2012.pdf.
Hertenstein, J. H., Platt, M. B., & Veryzer, R. W. (2005). The impact of industrial design effectiveness on corporate financial performance. *Journal of Product Innovation Management, 22*, 3–21.
Hoegg, J., & Alba, J. W. (2011). Seeing is believing (too much): the influence of product form on perceptions of functional performance. *Journal of Product Innovation Management, 28*, 346–359.
Hoegg, J., Alba, J. W., & Dahl, D. W. (2010). The good, the bad and the ugly: influence of aesthetics on product feature judgments. *Journal of Consumer Psychology, 20*, 419–430.
Irwin, J. R., & McClelland, G. (2001). Misleading heuristics for moderated multiple regression models. *Journal of Marketing, 38*, 100–109.
Kauppinen-Räisänen, H. (2014). Strategic use of colour in brand packaging. *Packaging Technology and Science, 27*, 663–676.
Kilbourne, W., & Pickett, G. (2008). How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *Journal of Business Research, 61*, 885–893.
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.
Kronrod, A., Grinstein, A., & Wathieu, L. (2012). Go green! Should environmental messages be so assertive? *Journal of Marketing, 76*, 95–102.
Lepkowska-White, E., Brashear, T. G., & Weinberger, M. G. (2003). A test of ad appeal effectiveness in Poland and the United States: the interplay of appeal, product and culture. *Journal of Advertising, 32*, 57–67.
Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: the effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology, 37*, 2098–2109.
Luchs, M. G., Brower, J., & Chitturi, R. (2012). Product choice and the importance of aesthetic design given the emotion-laden trade-off between sustainability and functional performance. *Journal of Product Innovation Management, 29*, 903–916.
Luchs, M., Naylor, R., Irwin, J. R., & Raghunathan, R. (2010). The sustainable liability: potential negative effects of ethicality on product preference. *Journal of Marketing, 74*, 18–31.
Luchs, M. G., Scott Swan, K., & Creusen, M. (2015). Perspective: a review for marketing research on product design with directions for future research. *Journal of Product Innovation Management*. in press.
Luna, D., & Peracchio, L. A. (2003). Visual and linguistic processing of ads by bilingual consumers. In L. M. Scott, & R. B. Mahwah (Eds.), *Persuasive imagery: A consumer response perspective* (pp. 153–175). NJ: Erlbaum. http://dx.doi.org/10.1111/jpim.12276.
Matthes, J., & Wonneberger, A. (2014). The skeptical green consumer revisited: testing the relationship between green consumerism and skepticism toward advertising. *Journal of Advertising, 43*, 115–127.
Meneses, G. D. (2010). Refuting fear in heuristics and in recycling promotion. *Journal of Business Research, 63*, 104–110.
Mohr, L. A., Eroglu, D., & Ellen, P. S. (1998). The development and testing of a measure of skepticism toward environmental claims in marketers' communications. *Journal of Consumer Affairs, 32*, 30–55.
Mugge, R., & Schoormans, J. P. L. (2012). Product design and apparent usability. The influence of novelty in product appearance. *Applied Ergonomics, 43*, 1081–1088.

Naylor, R., Droms, C. M., & Haws, K. L. (2009). Eating with a purpose: consumer response to functional food health claims in conflicting versus complementary information environments. *Journal of Public Policy & Marketing, 28*, 221–233.
Obermiller, C., & Spangenberg, E. R. (1998). Development of a scale to measure consumer skepticism toward advertising. *Journal of Consumer Psychology, 7*, 159–182.
Olsen, M. C., Slotegraaf, R. J., & Chandukala, S. R. (2014). Green claims and message frames: how green new products change brand attitude. *Journal of Marketing, 78*, 119–137.
Orth, U. R., Campana, D., & Malkewitz, K. (2010). Formation of consumer price expectation based on package design: attractive and quality routes. *Journal of Marketing Theory and Practice, 18*, 23–40.
Orth, U. R., & Malkewitz, K. (2008). Holistic package design and consumer brand impressions. *Journal of Marketing, 72*, 64–81.
Paivio, A. (1971). *Imagery and verbal processes*. New York: Holt, Rinehart, & Winston.
Petty, R. E., & Caccioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: central and peripheral routes to persuasion. *Journal of Personality and Social Psychology, 46*, 69–81.
Rettie, R., & Brewer, C. (2000). The verbal and visual components of package design. *Journal of Product & Brand Management, 9*, 56–71.
Schoormans, J. P. L., & Robben, H. S. J. (1997). The effect of new package design on product attention, categorization and evaluation. *Journal of Economic Psychology, 18*, 271–287.
Shiv, B., & Fedorikhin, A. (1999). Heart and mind in conflict: the interplay of affect and cognition in consumer decision making. *Journal of Consumer Research, 26*, 278–292.
Silayoi, P., & Speece, M. (2004). Packaging and purchase decisions: an exploratory study on the impact of involvement level and time pressure. *British Food Journal, 106*, 607–628.
Silayoi, P., & Speece, M. (2007). The importance of packaging attributes: a conjoint analysis approach. *European Journal of Marketing, 41*, 1495–1517.
Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: the development of a multiple item scale. *Journal of Retailing, 77*, 203–220.
Tobler, C., Visschers, V. H. M., & Siegrist, M. (2011). Eating green. Consumers' willingness to adopt ecological food consumption behaviors. *Appetite, 57*, 674–682.
Torelli, C. J., Monga, A. B., & Kaikati, A. M. (2012). Doing poorly by doing good: corporate social responsibility and brand concepts. *Journal of Consumer Research, 38*, 948–963.
Townsend, C., & Kahn, B. E. (2013). The "visual preference heuristic": the influence of visual versus verbal depiction on assortment processing, perceived variety, and choice overload. *Journal of Consumer Research, 40*, 993–1015.
Trudel, R., & Cotte, J. (2009). Does it pay to be good? *MIT Sloan Management Review, 50*, 61–68.
Underwood, R. L. (2003). The communicative power of product packaging: creating brand identity via lived and mediated experience. *Journal of Marketing Theory & Practice, 11*, 62–77.
Underwood, R. L., & Klein, N. M. (2002). Packaging as brand communication: effects of product pictures on consumer responses to the package and brand. *Journal of Marketing Theory and Practice, 10*, 58–68.
Unnava, H. R., & Burnkrant, R. E. (1991). An imagery-processing view of the role of pictures in print advertisements. *Journal of Marketing Research, 28*, 226–231.
Walker, K., & Wan, F. (2012). The harm of symbolic actions and green-washing: corporate actions and communications on environmental performance and their financial implications. *Journal of Business Ethics, 109*, 227–242.
Wansink, B., Sonka, S. T., & Hasler, C. M. (2004). Front-label health claims: when less is more. *Food Policy, 29*, 659–667.