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The Challenges of Green Marketing Communication: Effective Communication to Environmentally Conscious but Skeptical Consumers

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Abstract: Effectively communicating properties of environmental products to consumers can be challenging. This especially pertains to highly environmentally conscious (HEC)—yet skeptical—consumers, since this target group must balance the need for reliable product knowledge with high sensitivity to often ambiguous nonverbal cues about a product's environmental friendliness (e.g., environmental pictures). Using a group-specific (2 ×) 2 × 2 repeated-measures experimental study, we investigated the effect of communication-channel-specificity (verbal and nonverbal) to convey the environmental friendliness of products and evaluated consumers' environmental skepticism and attention during product presentation. Environmental information delivered via a verbal/text-based communication channel translates into low skepticism for both HEC and low environmental consciousness (LEC) consumers. However, nonverbal/pictorial communication proved persuasive only for LEC consumers; HEC consumers exhibited high levels of skepticism, which, in turn, decreased the products' perceived environmental friendliness. The analysis of combined verbal and nonverbal communication presented here provides a promising framework for effective green marketing communication.

Keywords: environmentally conscious consumer; environmental quality perception; nonverbal communication; verbal communication; environmental packaging communication

1. Introduction

"Green," highly environmentally conscious (HEC) consumers are the main target group for environmentally friendly products. They are willing to pay more for environmental friendliness and, therefore, need to be informed about a product's environmentally friendly qualities. However, it is challenging to find the right channel to communicate these environmental qualities to consumers. While they need to know about product quality, they are also sensitive to informational ambiguity, and environmental quality–related information is often ambiguous, with unclear propositional content (e.g., pictures of green landscapes). Moreover, such ambiguous environmental information appears to lead consumers to perceive information as greenwashing [1]. Thus, it begs the question: How can environmental friendliness be communicated to HEC consumers if they are skeptical and may perceive information as greenwashing? Furthermore, are HEC consumers becoming increasingly skeptical about environmentally friendly (product) information, increasing challenges for green marketing communication [2,3]? If so, how can the communication of environmental qualities be effectively achieved across consumer groups with different levels of environmental consciousness (EC)? To address these questions, we draw on recent findings and the elaboration likelihood model (ELM), as a theoretical framework to develop hypotheses regarding consumer responses to green marketing communication.

2. Theoretical Background and Hypotheses

2.1. Challenges in Addressing Environmentally Conscious, Skeptical Consumers

As noted, a major challenge in convincing HEC consumers that products are environmentally sound is that vague environmental arguments, such as phrases or motifs, might be perceived as "greenwashing" [4,5], that is, "misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service" [6] (p. 1). In practice, greenwashing is often executed through packaging design (e.g., using motifs of trees), even when neither the packaging nor the product is environmentally friendly. However, as the ability to effectively evaluate the credibility of environmental information is key for HEC consumers, encountering greenwashing practices may increase their general concern and skepticism and decrease the perceived credibility of products that are actually environmentally friendly [7,8]. Since such concerns are particularly frequent among HEC consumers, the term "skeptical HEC consumer" has been coined (cf. [2,9–13]). From these previous findings, we hypothesize that, overall, HEC consumers have a more skeptical attitude towards environmental information than low environmentally conscious (LEC) consumers (H1). Although this situation poses a serious issue for the effective communication of environmental information, some studies offer approaches that nevertheless remain promising for effective environmental communication.

2.2. Perceived Utility of Environmental Information Reduces Skepticism

Distinguishing between green advertising skepticism and general advertising skepticism shows that skepticism towards environmental information might depend on the information's level of perceived utility [3,14,15]. In other words, HEC consumers may not have a more skeptical attitude overall, but may be more skeptical if the environmental information utility is regarded as poor. Matthes and Wonneberger [3] showed that HEC consumers are, in general, no more skeptical than LEC consumers when evaluating environmental advertisements, and that, if HEC consumers believe the utility of environmental information is high, their skepticism about this information decreases. However, these authors' conclusion that HEC consumers derive more information utility from "green ads" than LEC consumers, and that this, "in turn, decreased their green advertising skepticism" [3] (p. 115) seems too broad and hasty, since the authors only investigated text-based stimuli. We propose a more detailed discussion of the relationship between the utility of information to consumers and the communication channel that carries that environmental information, while also drawing connections to the ELM and interindividual differences in information processing.

2.3. Verbal and Nonverbal Communication Channels for Conveying Environmental Information

Marketing communication distinguishes between verbal and nonverbal channels to communicate information (in this case, environmental information). These channels differ in their informational utility and how they convey meaning (for an overview, see [16]). Visual references (e.g., colors, materials, or pictorial motifs) are the most prominent mode of nonverbal communication [17]. In contrast to verbal or text-based communication channels, where environmental information is generally communicated via substantive product- or process-related claims, a (nonverbal) pictorial communication channel requires the viewer to interpret the content shown [1,18]. In pictorial communication, information about environmental friendliness is often conveyed through the use of natural scenes and representations of nature, which trigger an implicit visual association between nature and environmental friendliness in the consumer, and thus, function as an "associative claim" [1] (p. 110); see [19,20].

2.4. Influence of Environmental Consciousness and the Use of Communication Channels (Verbal, Nonverbal) on Perception of Environmental Information

Studies dealing with the effects of verbal versus nonverbal communication channels highlight the importance of consumers' environmental involvement for their responses to green marketing

communication. Based on the ELM, we derive hypotheses describing and evaluating attitudinal differences between the two communication channels for HEC and LEC consumers. In the ELM [21], individual involvement level is a decisive factor influencing motivation to process incoming information. The formation of attitudes towards a brand or product takes place via either the central or the peripheral route of persuasion, depending on the recipient's motivation and ability to process the communicated information. Motivated and/or competent consumers form their attitudes through "active thinking about either the issue or object-relevant information provided by the message," which is known as the central route of persuasion [21] (p. 256). In contrast, unmotivated and/or less competent consumers use nonverbal, executional elements, such as motifs or colors, to form their attitudes, making inferences about these elements and categorizing them based on the derived heuristics in a process called the peripheral route of persuasion (cf. [1]).

Consumers' EC is key to determining their response to environmental marketing information [15,22]. There is empirical evidence showing that, while HEC consumers are less responsive to peripheral cues (e.g., nonverbal information), they have "superior elaborative ability" [23] (p. 5) to correctly process and interpret product-related verbal cues. For example, Parguel et al. [1] (Study 1) showed that the evaluation of environmental motifs (but not conventional motifs) differs between participants with different levels of involvement: low involvement had a positive effect on the evaluation of the company's environmental image, while no statistically significant increase was found among highly involved consumers. Moreover, Grebmer and Diefenbach [24] showed that consumer EC has a significant influence on the evaluation of products featuring pictorial environmental communication: higher EC entails the lower perceived environmental friendliness of products. However, environmental friendliness communicated via nonverbal, material-based information, revealed no significant moderating influence of EC.

Providing support for the central route of persuasion among highly involved consumers, Matthes et al. [25] and Magnier and Schoormans [26] showed that advertising with argumentative text-based environmental information was only persuasive for HEC, and not LEC, consumers. This indicates that, for HEC consumers, environmental text generates a significantly more positive affective attitude and purchase intention than conventional text. Aligned with the ELM, LEC consumers appeared less motivated and less capable of processing information with high elaborative content, such as text about eco-friendliness. However, brand attitudes and purchasing intentions in response to pictorial environmental information and to combined environmental information (text-based and pictorial) did not vary with EC. Schmuck et al. [27] also found conflicting evidence, and concluded that environmental, functional, text-based advertising messages are persuasive for all recipients, regardless of EC. However, their study was flawed, as their verbal stimuli were very simple, using only a well-known eco-label, the processing of which might not have required high processing motivation or cognitive capacity, making it peripherally perceptible for all consumer groups.

2.5. Effects of Communication Channel and Environmental Consciousness on Attention to Environmental Information

Studies examining the impact of visual and verbal arguments on preference formation show that images are not only easier to remember than words but can also change consumer attitudes (cf. [28,29]). Edell and Staelin [30] (p. 46) find that "pictures are more attention-getting, pleasant and easier to process than is verbal text." While a general "picture superiority effect" over text-based information when memorizing product information is well acknowledged in the literature (cf. [31–33]); processing text-based information strongly depends on motivational level [29]. Pictorial communication is used as a heuristic shortcut for product evaluation, while elaborate processing of verbal product information requires a more motivated and capable consumer. Following the ELM, we suggest that consumer attention to nonverbal/pictorial (versus verbal/text-based) environmental information varies as a function of EC (i.e., consumer motivation to process environmental information). We thus hypothesize that, compared to LEC consumers, HEC consumers tend to pay less attention to nonverbal, pictorial information, and more attention to verbal, text-based information (H2).

2.6. Relationship between Consumer Environmental Skepticism and Communication Channel (Nonverbal Versus Verbal)

Parguel et al. [1] were the first to identify effects of environmental information communication channel (verbal/nonverbal) on consumer environmental skepticism. Thus far, perceived environmental skepticism and consumer perception of greenwashing have been considered in terms of "claim greenwashing." Parguel et al. [1] conversely introduced the concept of "executional greenwashing," which describes how executional elements (nonverbal elements such as motifs or colors) function as communication sources, while simultaneously arousing the subjective feeling of being greenwashed. This differentiation is important to enable accurate environmental communication, and thereby, create "effective, transparent, verifiable, non-misleading and non-discriminatory consumer information tools to provide information relating to sustainable consumption and production" [34].

The advertising literature draws a distinction between substantive, concrete, specific communication channels, for example, verbal/text-based communication channels (such as packaging text) (cf. [35,36]), or vague, associative communication, such as nonverbal/pictorial communication channels (such as motifs on packaging) (cf. [35,37]). In terms of environmental skepticism, the less vague/associative environmental information is, the more credible it will be and therefore the less skeptical consumers will be (cf. [3]). Accordingly, we hypothesize that environmental skepticism and product environmental friendliness depend on the information channel used to communicate environmental-friendliness information (H3). More precisely, consumers are less skeptical about verbal, text-based environmental information than about nonverbal, pictorial information (H3a), and consequently, consumers attribute more environmental friendliness to a product with environmental information communicated, via a verbal, text-based communication channel, than when communicated via a nonverbal, pictorial communication channel (H3b).

2.7. Relationship between Skepticism, Communication Channels (Nonverbal Versus Verbal), and Consumers' Environmental Consciousness

Parguel et al. [1] (Study 2) distinguish between claim and executional greenwashing, and highlight that EC is key for the effective communication of environmental information. However, how consumers' EC shapes their skepticism towards environmental marketing communication remains an open question. To address this gap, we draw on the ELM and the conceptual approach of the perceived information utility to show how communication channel choices may influence skepticism towards environmental information for HEC versus LEC consumers.

Based on the theoretical postulation that, if the specificity of an information channel is high, then HEC consumers can derive high utility from that channel; we assume that, in this case, skepticism is reduced, and the evaluation of product environmental friendliness is high. In contrast, if the specificity of the information channel is low (i.e., the information is vague and associative), the information's utility is low, resulting in more skepticism and a lower evaluation of the product's environmental friendliness. In line with Matthes and Wonneberger [3], HEC consumers prefer verbal, text-based communication to gain information and form a reliable opinion about the environmental quality of a product, while for LEC consumers, product information that involves no elaborate cognitive processing and can be heuristically and peripherally perceived is the basis for attitude formation and evaluation of environmentally relevant products and advertisements. Accordingly, we assume that LEC consumers are skeptical of neither verbal nor nonverbal environmental information, and probably lack the motivation and attention for elaborate processing of the former, but not the latter. Nonverbal environmental information refers to easily perceptible references that create an implicit visual association with the product's environmental quality. We thus hypothesize that consumer environmental skepticism, triggered by verbal and/or nonverbal packaging information, depends on EC level (H4): HEC consumers are less skeptical about verbal, text-based information than LEC consumers are (H4a), but more skeptical about nonverbal, pictorial information than LEC consumers (H4b).

Experimental testing and modeling of the relationship between communication channel, EC in environmental communication, and the consumer's environmental skepticism is at the heart of this study. The other focal point is to understand how skepticism and the evaluation of environmental friendliness are related. Thus, we hypothesize that skepticism mediates the relationship between communication channel type (verbal or pictorial) and a product's attributed environmental friendliness; as skepticism increases, perceived environmental friendliness decreases (H5). Taking everything together, we expect that the relationship between communication channel and a consumer's perception of a product's environmental friendliness can be explained by the consumer's environmental skepticism toward the product, moderated by the consumer's EC (Figure 1).
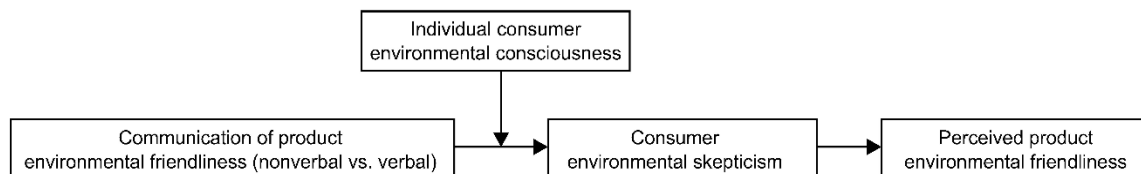
Figure 1. Model for first stage moderated, moderated mediation analysis. Note. Control variables (age, gender and product category involvement), fixed effect (participant), direct effects, and interactions between all independent variables on the dependent variables, consumer environmental skepticism and product environmental friendliness, are omitted for clarity.

3. Materials and Methods

3.1. Participants

A convenience sample of $N = 560$ participants (male = 282, $M_{age} = 50.95$ years, $SD = 14.15$) was recruited via crowdsourcing. Participants received a link to the online survey from the Respondi AG survey website. The study was carried out in German. To select a balanced sample in terms of HEC and LEC, EC was assessed on the SEU-3 short scale in a pre-study ($N = 267$, $M = 4.71$, $SD = 1.07$) [38]. As in reference studies (cf. [25]), the cut-off value was set at participants showing values more extreme than one SD below (LEC: values ≤ 3.64 points on a 7-point scale) or above the mean (HEC: values ≥ 5.78 points). The resulting sample consists of $n = 210$ in the LEC consumer group ($M = 3.08$, $SD = 0.46$), and $n = 350$ in the HEC consumer group ($M = 6.21$, $SD = 0.26$). Participation was voluntary and anonymous, and participants received a cash incentive (0.75€). All the participants gave their written consent. Once all the data had been collected, participants were debriefed as to the purpose of the study and offered a copy of the study's results when available. All ethical procedures aligned with standard practice, as outlined in the Declaration of Helsinki, and the ethical guidelines of the university, at which the research was conducted.

3.2. Study Design

The overall design is a (2 ×) 2 × 2 mixed design. EC (low, high) was adopted as a between-subject factor. The communication channel was investigated by two within-subject factors, resulting in four different products: The first within-subject factor was information communicated via a verbal, text-based claim (environmental or conventional), while the second factor's information was communicated via nonverbal, pictorial appearance of the product (environmental or conventional) (see Figure 2). Each participant received the full resulting set of four products in random order, and in the following analyses, we controlled for possible order effects and modeled subject-specific variations with a random effect for the intercept. This resulted in $N_{obs} = 2240$ total observations. Participants were instructed to pay attention to the featured products as if they were considering purchasing them. They were also told to respond to some associative questions about the products. Spontaneous associations with given product statements were surveyed during product evaluations. In addition to items for the two dependent variables—participants' environmental skepticism and product's perceived

environmental friendliness—several other items were presented to the participants that were intended to conceal the study objective by addressing, for example, other product qualities and the product's perceived effectiveness. Finally, after the participants had evaluated all the products, they completed the attention task for verbal versus nonverbal information. In addition, for each participant, general skepticism about environmental information and focus of attention to nonverbal, pictorial (versus verbal, text-based) information was calculated. Therefore, for each of the products shown beforehand, we presented three variations of the product, two of which differ in one feature (i.e., either a different text or a different motif), and one of which differed in two features (another text and another motif) (see Figure 3). Participants were asked to indicate which of the products they thought that they had seen before.
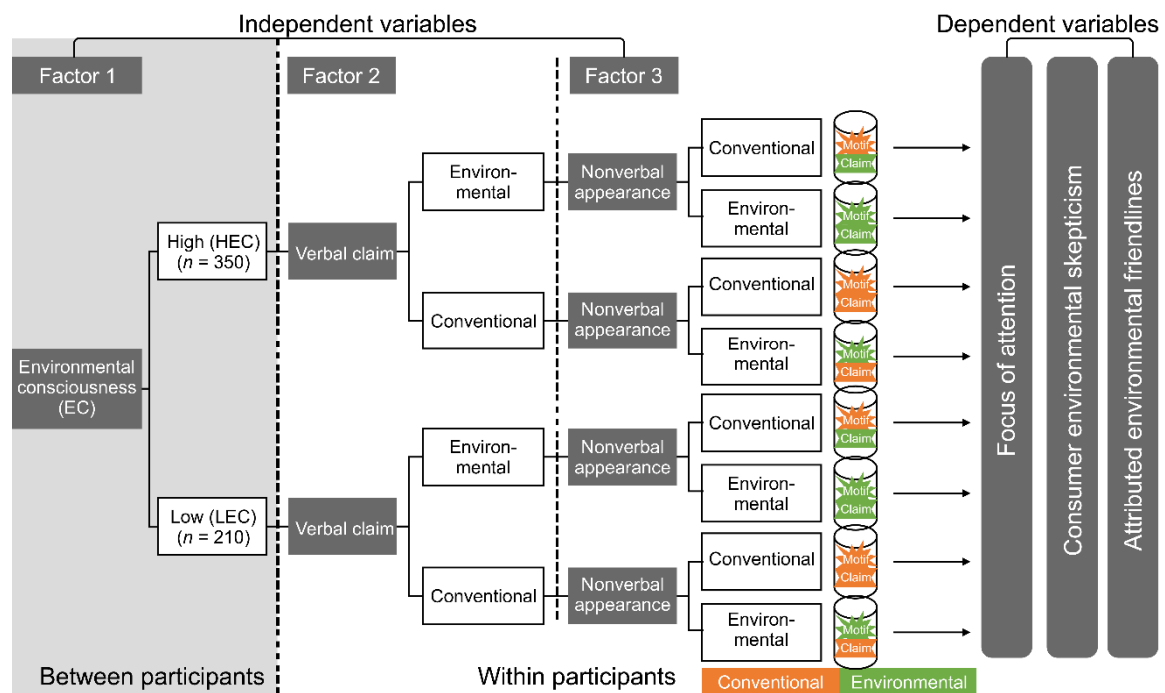

Figure 2. Study design.

Figure 3. Design of the stimuli.

3.3. Stimuli

The product stimuli were dietary supplements, designed according to the four test conditions in four different packaging designs. The environmental and conventional pictorial information was selected from a pool of 25 motifs, pre-tested by an independent sample of 37 participants (29 women, average age = 25.20 years, *SD* = 9.02) (see Figure S1).

. Participants evaluated the motifs in terms of expressed environmental friendliness. Both the motif pool and the product text used were based on previous studies (cf. [39–43]). To control for confounding brand familiarity effects and packaging communication effects, we used a neutral, non-existent brand name ("Seli") and brand logo (cf. [44,45]). Furthermore, the packaging shape, color, and materials and the on-package verbal communication were kept constant across all stimuli, thus taking the neutrality and customary design of the packaging into account (see Figure 3).

3.4. Measures

We now describe the theoretical background and sample items for the different measures.

- Environmental consciousness. Participant EC was measured by fifteen items, including environment-related attitudes, willingness, and self-reported actions in the content areas of littering/ environmental aesthetics, waste separation and recycling, protection and health, environmentally conscious purchasing, water pollution, control and preservation (cf. Schahn et al. [38] on a 7-point Likert-type agreement scale: 1 (do not agree at all) to 7 (very strong agreement); $\alpha = 0.78$).

- Attributed environmental friendliness was surveyed using two items that have shown high correlation with the product environmental friendliness scale by Grebmer and Diefenbach [23], namely, "associated with environmental sustainability" and "associated with environmental friendliness," 1 (not at all) to 7 (very strong); ($r = 0.82$, $p < 0.001$).

- Consumer environmental skepticism. This value was measured using two items on a 7-point approval scale (1 (not at all) to 7 (very strong); $r = 0.89$, $p < 0.001$), namely, "this product exaggerates how green its functionality actually is" and "this product misleads in terms of environmental features"; these were described in Chen and Chang (2012) and Grebmer and Diefenbach [23].

- Focus of attention on nonverbal versus verbal environmental information was conceptually adapted from Childers and Houston [46]. The focus of attention value represents the total value calculated for each product shown per participant, whereby a correctly recognized motif was scored +1 point, and each correctly recognized text was scored −1 point. Thus, participants could attain scores from −4 to +4 on the differential scale across the four products, with higher values indicating attention to nonverbal rather than verbal information.

- Overall skeptical attitude towards environmental information is defined as the negatively valued attitude of consumers towards advertising motifs and statements [47] within the green marketing sector. The scale was adopted by Mohr et al. [15], using four items on a 7-point agreement scale (1 (not at all) to 7 (very strong); $\alpha = 0.82$), such as "I do not believe most environmental cues made on package labels or in advertising." The items were adapted following Mohr et al. [15] and Matthes and Wonneberger [3], who restricted item formulation to verbal marketing communication (claims). To investigate consumers' overall degree of skepticism towards environmental information not restricted to verbal communication, the term "claim" has been altered to "cue" or "information," so as to be unspecific regarding communication channels.

- The modified personal involvement inventory (PII) was adapted from Mittal [48], who examined and modified the Zaichkowsky [49] PII, using five items scored on a 7-point agreement scale (1 (not at all) to 7 (very strong); $\alpha = 0.94$).

- The modified consumer involvement profile (CIP) was adapted from Mittal [48], who examined and modified that of Laurent and Kapferer [50], CIP, using 6 items scored on a 7-point agreement scale (1 (not at all) to 7 (very strong); $\alpha = 0.89$).

4. Results

Statistical analysis was conducted using R 3.4.4 [51] and the *lmerTest* [52], *lme4* [53], *knitr* [54], *kableExtra* [55], *r2glmm* [56], and *mediation* [57] packages.

4.1. Manipulation check

To check our manipulation, we ran two one-way ANOVAs, testing the effect of nonverbal, pictorial appearance and that of verbal, text-based claim on perceived environmental friendliness. As expected, there was an effect of nonverbal, pictorial appearance, F_{motif} (1.224 = 36.90, $p < 0.001$, $\eta^2 = 0.02$: the conventional motif was perceived as less environmentally friendly than the environmental motif ($M_{\text{conventional}} = 3.49$, $SD = 1.70$, $M_{\text{environmental}} = 3.93$, $SD = 1.74$). Likewise, there was an effect of verbal, text-based claim, F_{text} (1.224) = 174.20, $p < 0.001$, $\eta^2 = 0.07$), whereby the conventional text was perceived as less environmentally friendly than the environmental text ($M_{\text{conventional}} = 3.24$, $SD = 1.61$, $M_{\text{environmental}} = 4.18$, $SD = 1.74$).

4.2. Hypothesis Testing

4.2.1. Differences in Overall Skepticism towards Environmental Information

We first tested whether HEC consumers had a more skeptical attitude towards environmental information than LEC consumers overall, using a one-way analysis of variance with EC level as the between-subjects factor. The ANOVA results showed a significant effect of EC level, $F(1.558) = 75.63$, $p < 0.001$, $\eta^2 = 0.12$. Planned contrasts indicate that HEC consumers ($M_{\text{HEC}} = 4.03$, $SD = 1.52$) are significantly more skeptical towards environmental information than LEC consumers are ($M_{\text{LEC}} = 2.95$, $SD = 1.25$), supporting *H1*.

4.2.2. Difference in Focus of Attention to Verbal Versus Nonverbal Information

To investigate differences in focus of attention between communication channels, we tested the participants' attention scores on pictorial versus verbal environmental information in terms of EC difference (HEC, LEC). T-test results showed that this difference was significant: $t(381.52) = 8.10$, $p < 0.001$; that is, HEC consumers are significantly less attentive to pictorial information ($M_{\text{HEC}} = 0.54$, $SD = 1.22$) than LEC consumers are ($M_{\text{LEC}} = 1.47$, $SD = 1.46$) and are more attentive to verbal information, supporting *H2* (see *S2*). The consumers, in general, were more attentive to motifs than to text, however, $t(2239) = -15.74$, $p < 0.001$, $M_{\text{motifs}} = 0.76$, $SD = 0.43$; $M_{\text{text}} = 0.54$, $SD = 0.50$ (see Figure S2).

4.2.3. Effects of Communication Channel and Environmental Consciousness on Environmental Skepticism and Product Environmental Friendliness Evaluation

To account for subject-specific variations, linear mixed models were used for mediation (outcome: consumer environmental skepticism) and observation (outcome: product environmental friendliness). Both models include the following fixed effects: nonverbal, pictorial information; verbal, text-based information; EC level; and the covariates of product category involvement (PII and CIP), age and gender. The mediator, consumer environmental skepticism, was included as a fixed effect in the observation model. For the first-stage moderated, moderated mediation model (cf. [58]), the binary variables were coded as follows: (1) nonverbal, pictorial information: 0 = conventional, 1 = environmental; (2) verbal, text-based information: 0 = conventional, 1 = environmental; (3) EC level: 0 = LEC, 1 = HEC). The main effects, as well as the two- and three-way interactions between nonverbal and verbal information and EC level, were modeled as fixed effects. Subject-specific variation was modeled using the participant's ID, with a random effect for the intercept. Another random effect for the intercept was used for the order factor (of the stimuli represented).

For both models, the standard deviation of the random intercept for the order effect did not differ significantly from zero (likelihood ratio test; mediation model: Chisq = 0.58, *df* = 1, $p = 0.446$;

observation model: Chisq = 0.001, *df* = 1, *p* = 0.999). This agrees with our expectation that no order effect of stimuli should be visible, because the sequence of stimuli was counterbalanced between participants. Subsequently, this random effect was removed from the models. The standard deviations of the random intercepts of the participant's ID, however, significantly differed from zero (likelihood ratio test; mediation model: Chisq = 980.73, df = 1, *p* < 0.001; observation model: Chisq = 618.28, df = 1, *p* < 0.001). Therefore, the consideration of subject-specific variation using random intercepts is necessary.

4.2.4. Effects of Communication Channels on Environmental Skepticism and Environmental Friendliness

The analysis shows that environmental information significantly increases environmental skepticism compared to conventional information. If environmental information is communicated via pictorial communication, skepticism is about 1.8 times stronger than if communicated via text-based communication, supporting *H3a* (Table 1). Their interaction is significant and shows that skepticism triggered by nonverbal environmental stimuli can be significantly reduced when the environmental motif is supported by an environmental product text justifying the environmental motif.

Table 1. First-stage moderated, moderated mediation model estimation. Independent variables: nonverbal and verbal packaging information and EC level. Dependent variables: consumer environmental skepticism and environmental friendliness.

Antecedent	**Mediator (Consumer Environmental Skepticism)**			**Outcome (Attributed Product Environmental Friendliness)**		
	β	*SE*	*p*	β	*SE*	*p*
Fixed Parts						
Residuals	4.10	0.31	<0.001	2.41	0.29	<0.001
Nonverbal, pic. comm.	0.39	0.10	<0.001	0.94	0.09	<0.001
Verbal, text-based comm.	0.22	0.01	0.024	0.23	0.09	0.010
EC	0.53	0.16	0.001	−0.38	0.15	0.009
Nonverbal × verbal	−0.36	0.14	0.009	0.14	0.13	0.279
Nonverbal × EC	1.03	0.12	<0.001	−0.70	0.11	<0.001
Verbal × EC	−0.04	0.12	0.755	1.09	0.11	<0.001
Nonverbal × verbal × EC	−0.59	0.18	0.001	−0.19	0.16	0.233
Consumer environmental skepticism	NA	NA	NA	−0.10	0.02	<0.001
Gender	−017	0.12	0.157	0.08	0.11	0.456
Age	0.00	0.00	0.241	−0.00	0.00	0.669
CIP	−0.09	0.05	0.081	0.09	0.05	0.064
PII	−0.26	0.05	<0.001	0.24	0.04	<0.001
Antecedent	*SD*	N_{grp}	*ICC*	*SD*	N_{grp}	*ICC*
Random parts						
Residuals	1.00			0.91		
Person ID	1.30	560	0.56	1.17	560	0.56
	$R^2 = 0.28$			$R^2 = 0.37$		
	$F_{(11,2227)} = 77.13, p < 0.001$ [1]			$F_{(12,2227)} = 108.59, p < 0.001$ [1]		

[1] R^2 and Ominbus F-test follow Edwards et al. [56], using the r2glmm R package. Note. EC = consumer environmental consciousness. CIP = consumer involvement profile. PII = Personal involvement inventory.

As the manipulation check showed, environmental information significantly increased perceived environmental friendliness compared to conventional information for both communication channels. Hence, in principle, a picture is about four times as effective in communicating environmental friendliness as a verbal cue, contradicting *H3b*. The two-way interaction between communication channels is not significant, so the effect of nonverbal and verbal information seems to be additive, in accordance with previous results.

4.2.5. Effects of Environmental Consciousness on Consumer Environmental Skepticism and Product Environmental Friendliness

HEC consumers are more skeptical across all four products than LEC consumers. This result cross-validates the results concerning overall skeptical attitude of HEC and LEC consumers in *H1*.

The same applies to the perceived environmental friendliness evaluation of products. Consumers' EC level is a significant predictor of their evaluation of product environmental friendliness: HEC consumers generally rate products as less environmentally friendly than do LEC consumers.

4.2.6. Effects of Communication Channel as a Function of Environmental Awareness on Consumer Environmental Skepticism and Product Environmental Friendliness

While HEC consumers were generally more skeptical, regardless of communication channel, there were also significant differences between communication channels (pictorial and text-based), depending on the EC level (HEC, LEC), as formulated in *H4*. Linear mixed regression analysis found significant results for the proposed interaction between pictorial information and EC level (HEC, LEC), and three-way interactions between communication channel (verbal, nonverbal) and EC level (HEC, LEC). The results confirm *H4a*, namely, HEC consumers are significantly more skeptical about nonverbal environmental information than LEC consumers. However, there was no difference in skepticism in the assessment of verbal environmental information between HEC and LEC consumers, so *H4b* is not supported (as depicted in Figure 4).
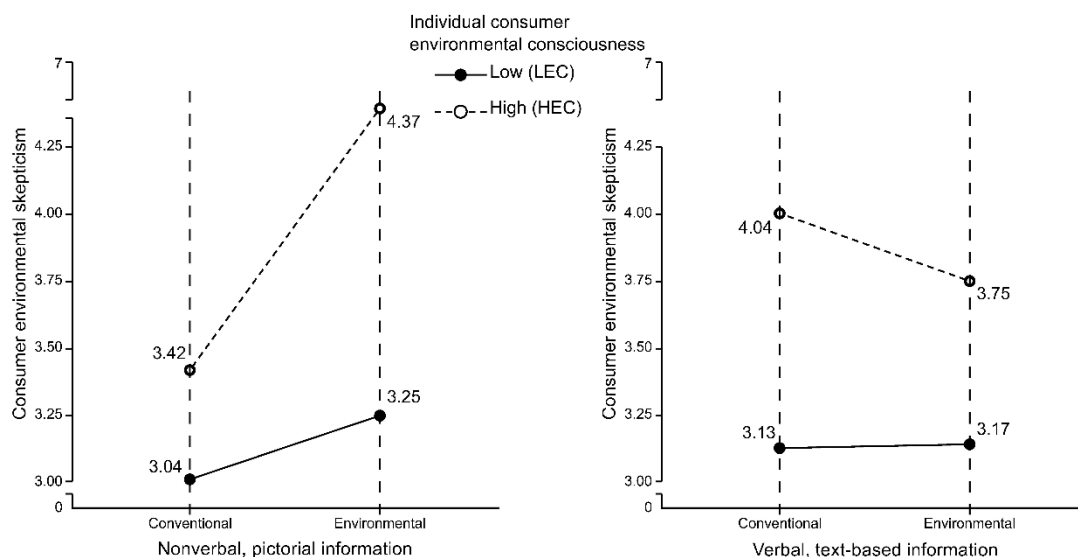

Figure 4. Effect of nonverbal, pictorial (**left**) and verbal, text-based (**right**) information and environmental consciousness on consumer environmental skepticism.

For the outcome variable of "perceived environmental friendliness," there were significant effects in the two-way interactions, indicating that HEC and LEC consumers attribute different degrees of environmental friendliness to a product depending on the information channel (nonverbal, verbal), through which environmental information is communicated. HEC consumers evaluate products with an environmental text on the packaging with high product environmental friendliness, that is,

they show "verbal highlighting" in comparison to LEC consumers. On the other hand, HEC consumers rate a product with an environmental motif as low in environmental friendliness compared to LEC consumers, which suggests that LEC consumers are pictorial highlighters.

While the three-way interaction term is not significant for environmental friendliness, the visual presentation and post hoc linear regression analyses with the four product combinations and consumer EC level as independent variables showed an interaction effect between HEC and LEC when environmental information is communicated through only one channel (products: "pictorial environmental" and "text-based environment"); β = −1.72, *SE* = 0.13, *t* = −13.54, *p* < 0.001. If environmental or conventional information is communicated via two specifically different channels ("fully environmentally friendly" and "fully conventional"), there is no difference in the product's environmental friendliness evaluation between HEC and LEC consumers: β = 0.21, *SE* = 0.12, *t* = 1.79, *p* = 0.074 (as depicted in Figure 5).
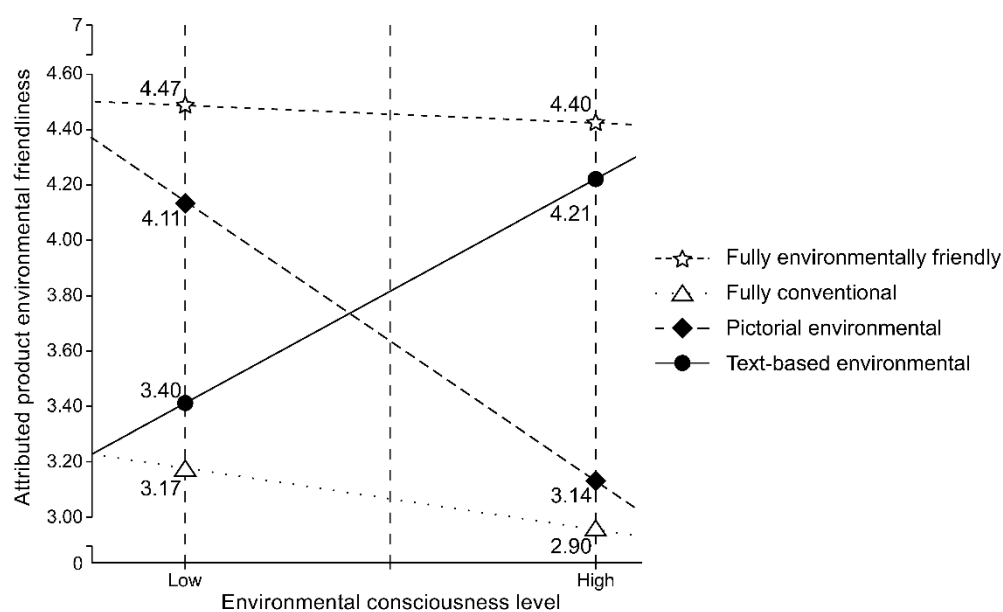

Figure 5. Effect of packaging design and environmental consciousness on attributed product environmental friendliness.

4.2.7. Covariates

Among the covariates, only involvement in dietary supplements proved to have a significant effect on consumers' environmental skepticism and evaluation of environmental friendliness. The greater the involvement, the less skeptical the consumers were, and the higher the environmental friendliness evaluation was.

4.2.8. Effect of Consumer Environmental Skepticism on the Evaluation of Product Environmental Friendliness

Hypothesis *H5* indicates that consumer environmental skepticism indirectly explains the relationship between communication channel and perceived environmental friendliness. The first stage moderated, moderated mediation analysis showed that: (1) the main effect of consumer environmental skepticism is significant and negative on perceived product environmental friendliness; (2) the relationship between communication channels taking consumer type and perceived environmental friendliness into account can be explained indirectly through consumer environmental skepticism. So, $\beta_{indirect}$ = 0.06, *SE* = 0.02, BCa CI [0.02, 0.11], supporting our choice for the first-stage moderated, moderated mediation model.

5. Discussion

The results of this study expand on the findings of previous studies dealing with the effectiveness and design of green marketing communication, in particular, the communication channel used for communicating environmental product information, consumer environmental skepticism, and the perception of a product's environmental friendliness. The research presented in this thesis supports, to a large extent, the persuasiveness theory regarding consumer knowledge [59–61] and, in particular, the theoretical model of the ELM [21]. This study clarifies various conflicting results and reveals shortcomings in the communication of environmentally friendly product qualities to its main target group, HEC consumers. We investigated the role of EC in the consumer perception of various environmental and conventional product information types using text and motifs; we examined effects on consumers' environmental skepticism and on their evaluation of a product's environmental friendliness.

By bridging the gap between previous conflicting results, we define a clearer image of the HEC consumer. In accordance with hypotheses H1, H3a and H4a, we find that (1) the skeptical nature of the HEC consumer is confirmed; (2) there is a difference in skepticism triggered by the communication channels used, that is, text reduces skepticism while a motif increases it; and (3) there is a difference in skepticism between HEC and LEC consumers that depends on the communication channel of the environmental information. Although the HEC consumers' skepticism is significantly reduced by text-based information, it is interesting to note that there was no difference in skepticism between HEC and LEC consumers regarding environmental text-based information (H4b). With regard to H2 and the interesting result of H3b, we also conclude (4) that the attitudinal picture superiority effect occurs in the environmental context and affects the communicative effectiveness of on-package motifs. Finally, supporting H5 and the comprehensive model, the results showed (5) that skepticism mediates the relationship between the communication channel and the perception of product environmental friendliness, conditional for HEC and LEC consumers. More detailed discussions of the findings, the resulting practical implications, future research and limitations are discussed below.

5.1. Skepticism and Environmentally Conscious Consumerism

As described in the literature, HEC have a skeptical attitude towards environmental information [2,9–13]. In contrast to many marketers, who believe that an overall more skeptical attitude leads to a negative interpretation in marketing communication, in the present case, this more skeptical attitude is an expression of HEC consumers' demand for products, that include credible, specific communication about the environmental benefits of a product, to identify which environmental aspects the company has committed itself, or this or that product, too. Given that a side-effect of increased levels of environmental communication is the entry of a black sheep, who try to boost their image and sales through greenwashing, into the marketplace, our results are particularly relevant because they show that companies with environmental products need to formulate strategies for effective communication.

5.2. The Importance of Communication Channels in Environmental Communication

The results show that focus of attention, consumer environmental skepticism, and product environmental friendliness varied according to the communication channel through which the environmental information was communicated. We found that an environmental motif increases consumer environmental skepticism by a factor of 1.8, but at the same time that the communicative effects of the environmental motif were four times stronger than for an environmental text. To understand this effect, it is important to recall that consumers generally pay more attention to nonverbal, pictorial information than to verbal, text-based information (the "picture superiority effect"). This effect may be at play here, contributing to the perceived environmental friendliness of the product.

A closer look at consumer types reveals attention differences for different communication channels, as derived theoretically from ELM. HEC consumers were less attentive to nonverbal, pictorial information, and more attentive to verbal, text-based information than LEC consumers. This pattern also appeared in the environmental skepticism toward pictorial environmental information. Indeed, while HEC consumers were much more skeptical about nonverbal, pictorial environmental information than LEC consumers were, the same cannot be said about the evaluation of verbal, text-based information. This result may indicate that the text is, as assumed, a precise and substantive source of information that does not increase skepticism among HEC or LEC consumers. Alternatively, it is conceivable that this argument only applies to HEC consumers, while LEC consumers, due to their lack of involvement and motivation, did not elaborately process the verbal information (cf. *H2* results). We might conclude that, if environmental information is not perceived, it cannot cause skepticism. As skepticism proved to be a relevant mediator for product environmental friendliness, the results showed that increased skepticism is accompanied by a lower product evaluation, namely, less efficient environmental communication.

5.3. Practical Implication

Companies must first have a clear idea of the product characteristics they intend to highlight, and their target group to allow them to address consumers through the most effective communication channels, and thus minimize product skepticism. HEC consumers should receive environmental information through a substantial, specific information channel (e.g., product text), while LEC consumers should receive environmental information via a peripheral, easily perceptible information channel (e.g., choice of motif).

5.4. Inclusive Approach to Effective Environmental Communication

While our conclusions suggest that environmental communication should be target-oriented in order to be effective, the analysis of the four product stimuli showed that an integrative approach to green marketing communication is effective for both skeptical HEC consumers and LEC consumers. Indeed, the communication of environmental information via the two different communication channels explored here proved to be very effective, allowing the environmental skepticism of the vague peripheral stimulus (motif) among HEC consumers to disappear. A possible explanation may be that the use of the pictorial information is "justified" by verbal cues, thus rendering pictorial information as a more trustworthy source of information. As a result, the perceived environmental friendliness increases.

The results also show that environmental information communicated through two communication channels of different specificity is as effective for LEC consumers as a single, vague, peripheral stimulus. Hence, the combined use of communication channels differing in their specificity to communicate environmental information has an impact across all consumer groups, regardless of their EC. The use of combined channels provides a promising inclusive approach to the challenges of environmental marketing communication. A higher quantity of communication does not result in higher perceived product environmental friendliness, but communication via two channels with different specificities has the ability to inform LEC consumers via their preferred nonverbal communication channel, with the verbal stimulus itself receiving little attention; while HEC consumers use the verbal stimulus as a credible source of information with the nonverbal stimulus interpreted in accordance with the text-based cue.

5.5. Limitations and Further Research

The generalizability of our results may be affected by several factors. Stimuli, packaging designs, communication and brand names were based on actual products, but were artificially created to avoid brand and product awareness effects and minimize possible attitudinal effects on skepticism and

product evaluation. In addition, the online study setting may have induced participants to examine and evaluate the products less critically than in a real shopping situation.

Dietary supplements were chosen as a low-involvement product category as there is no additional background knowledge or expertise required to evaluate them (as opposed to what a high-involvement product would require). Future work should consider high-involvement products. Perhaps LEC consumers exhibit different perceptual and evaluation patterns for high-involvement products and consider verbal, text-based information with greater attention. In the context of environmental communication, LEC consumers could conceivably show a comparable product evaluation pattern as HEC consumers for high-involvement products.

Finally, in this study, we addressed perceived specificity using different packaging communication channels, rather than asking participants to evaluate the specificity of existing products. To draw in-depth inferences on reduced skepticism towards a product featuring combined, text-based, and pictorial environmental information and the dynamics of environmental product evaluation processes for skeptical HEC consumers, future research should consider perceived specificity and perceived justification effects as explanatory factors.

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