A study on the influence of green advertising appeals on advertising effectiveness

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Abstract. As ecological sustainability has become an important public issue, more and more enterprises take green advertising as a marketing strategy while related studies are being conducted to explore the most positive way to maximize the advertising effect. The research uses the experimental method based on the heuristic-system model (HSM) to specifically explore the influence of green advertising appeals and its interaction effect with claim specificity and visual presentations on its effectiveness. It is shown that there are differences between the eight groups in terms of participants' attitude towards green advertising with respect to all the dimensions, advertising appeals, claim specificity and visual presentation. The self-benefit appeals, together with specific claims and dynamic presentations appear to have a stronger promotion for green advertising across all the perceptive measures towards green advertising. The findings provide useful insights to practitioners as to the type of appeals preferred for green advertising. Besides the theoretical contributions, the present research also offers important implications for marketers on green advertising strategies to develop green ads more effectively.

Keywords: Green advertising; Heuristic-system model (HSM); Claim specificity; Advertising appeals; Visual presentations.

1. Introduction

The essential of ecological sustainability is to encourage customers to purchase green products, while green advertising serves as a quite significant channel of communication. Green advertising can affect individual attitude towards advertisement and towards the products, thus motivating consumption. Therefore, more and more enterprises take green advertising as a marketing strategy, while scholars make various studies to analyze the motivation system of how green advertising inspires people to purchase certain products.

However, as for how green advertising motivates consumers to buy green products with high efficiency and quality, there are still certain research gaps. Therefore, the research intends to use the experimental research method based on the heuristic-system model (HSM), to specifically explore the influence of green advertising presentation on its effectiveness from three dimensions: advertising appeals, claim specificity and visual presentations.

2. Literature review and hypotheses

2.1. Heuristic-Systematic Model

The "Heuristic-Systematic Model" (HSM) is a possible model to explain the effects of information dissemination. The HSM model assumes that people process information in two parallel ways: heuristic information processing and systematic information processing. The systemic mode relies on the information processing mechanism - mainly content-related perceptions are important factors in forming judgmental decisions. Chaiken M argues that people who use the heuristic mode tend to make judgmental decisions based on a superficial analysis of non-content cues rather than purely on the content itself [1,2].

According to the HSM model, consumers will utilize both the systemic and heuristic modes to process thousands of advertising messages. In this study, it is suggested that advertising appeals (self-

benefit appeals vs. other-benefit appeals) and claim specificity (high vs low) are processed with the systemic mode due to semantic cognition related to the content, while visual presentation (dynamic vs static) is processed with the heuristic mode for the reason that visual stimuli are external cues for information presentation. At the same time, it has been shown that the heuristic mode can act simultaneously with the system mode and each of these two modes has an independent influence on opinion judgment [3]. Therefore, in this study, the influence of these two modes on information processing in different forms of advertising presentation will be discussed.

2.2. Green advertising effectiveness

A review of the literature shows that green advertising effectiveness can be divided into two aspects: internal responses (attitudes) and external responses (behaviors). In specific contexts, different scholars have adopted different operational concepts for the above two aspects. In a study on advertising effectiveness, scholars such as Wang et al measured its effectiveness by two parts: brand attitude and purchase intention [4]; Sun Jin and Miao Pan studied green advertising effectiveness in the perspective of construal level, and claimed the effectiveness of green advertising was measured by two parts: advertising attitude and product attitude [5]. In view of the existing studies, this research uses advertising attitude to measure consumers' internal responses after green advertising exposure and selects product attitude to measure consumers' external responses after green advertising exposure.

2.3. Systematic factor: advertising appeals

The type of green advertising appeals refers to the green consumption concept of advocating living a healthy and natural life and protecting the environment through the expression of advertising information, in order to obtain consumers' recognition of green advertising and products [6]. Appropriate and effective use of green advertising appeals will generate different attractive and infectious effects, thus enhancing the effectiveness of advertising. Since the type of green advertising appeals involves content-related cognition, which is an important factor in making judgmental decisions, it requires the application of systematic mode to process information.

Green advertising appeals are generally divided into other-benefit appeals and self-benefit appeals, in which other-benefit appeals focus on promoting the environmental benefits of green products and proclaiming the ecological and social values brought by environmental attributes; self-benefit appeals focus on promoting the consumer benefits of green products and advocating the consumer's own interests brought by functional attributes [5]. Different types of green advertising appeals can have significantly different effects on advertising effectiveness.

Xiong et al. found that self-benefit appeals influence consumers' purchase decisions more than other appeals [4]; Chen et al. also demonstrated that self-benefit appeals are more likely to stimulate consumers' green purchase intentions than other-benefit appeals [7]. Thus, the advertising effectiveness of self-interested appeals is evidenced to be stronger than other-benefit appeals in the process of green product purchase decisions.

Based on the theoretical foundation mentioned above, the following hypothesis is provided:

H1. Advertising appeals (self-benefit appeals vs. other-benefit appeals) positively affect green advertising efficiency.

2.4. Systematic factor: claim specificity

Claim specificity refers to the specificity of the environmental claim, the level of emphasis given the environmental claim and the context for presenting the claim. Claim specificity is the extent to which the paragraph can be supported by factual evidence, which is also defined by some scholars as the extent of the content of the advertisement text to be full, objective, and specific [8-10]. When there is objective and specific detailed information in the ad text, the specificity of the ad claim is high; when there is no objective and specific information in the advertisement, but a vague overall

description is used, the specificity of the ad claim is low. Similar to the factor of ad appeals, claim specificity of green ads also involves content-related cognition, therefore it requires an application of the systematic mode of information processing.

In the area of green advertising, high ad claim specificity refers to the use of specific, explicit data and information such as specific benefits of the natural environment in the text to describe a company's environmentally friendly behavior [8]. For example, ads with a high claim specificity level can contain text such as "It can produce more than 30% more oxygen and absorb more than 35% more carbon dioxide per kilogram than trees, which makes it a big environmental winner in the long run as it maintains environmental safety!" On the contrary, the low level of specificity of green advertising claim is a vague and non-detailed content description of a company's environmentally friendly behavior [8,10]. For example, "more environmentally friendly", "absorbing carbon dioxide", "improve the soil" etc., without further data or factual proof, are green advertising with low claim specificity. Previous studies have shown that green ads with high claim specificity can improve consumers' evaluation of the ads, increase their positive perceptions and attitudes toward the ad and product, and increase purchase intentions. while green ads with low claim specificity can lead to consumer skepticism about the green ad [8,11-13].

Based on the analysis above, the following hypotheses are provided:

H2. There is an interactive effect between ad appeals (self-benefit appeals vs. other-benefit appeals) and claim specificity (specific vs. ambiguous) on green ad effectiveness.

H2a.With the other-benefit appeals, green advertising with higher claim specificity can lead to higher advertising effectiveness.

H2b.With the self-benefit appeals, green advertising with higher claim specificity can lead to higher advertising effectiveness.

2.5. Heuristic factor: visual presentation

The visual presentation of green ads is divided into two types: static and dynamic. Static presentation refers to the formation of graphics or pictures after the textual distillation of information about the product, and the purpose of conveying product information through layout [14]. Compared with the static presentation, dynamic presentation increases the interaction between the consumer and the advertisement, and the position relationship between dynamic presentation and the viewer changes from a monotonous space to an interactional relationship, while the multimedia video that diversifies the information conveys by means of dynamic technology. Dynamic presentation has a richer connotation and integrity while intuitively displaying product information. Since the visual presentation (dynamic vs. static) of green ads leans on non-content-related information, it calls for an application of the heuristic mode of information processing.

In fact, different ways of presenting advertisements can lead to differences in consumers' thinking paths and focus, which in turn affect the effectiveness of advertising [15]. In turns of static advertisements, consumers are more likely to call attention to attribute features, while under the circumstance of dynamic advertisements the consumers may pay more attention to the interaction and connection between the content of the advertisement and the consumer itself. In all, dynamic ads convey more compact and comprehensive information than static ones, thus effectively enhancing consumers' attitudes toward the ads and products.

With the analysis above, the following hypotheses are provided:

H3. There is an interactive effect between ad appeals (self-benefit appeals vs. other-benefit appeals) and visual presentation (dynamic vs. static) on green ad effectiveness.

H3a.With the other-benefit appeals, the use of dynamic presentation of green advertising can lead to higher advertising effectiveness.

H3b.With the self-benefit appeals, the use of dynamic presentation of green advertising can lead to higher advertising effectiveness.

The theoretical model shown in Figure 1 explains the relationships among the proposed constructs.

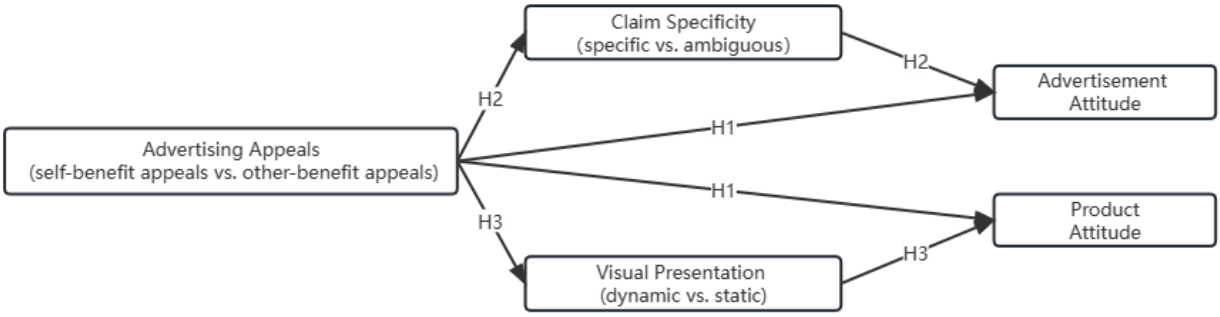

Figure 1. Theoretical model

3. Method

3.1. Research design and subject

This research discusses the difference in the effect of green ad appeals (self-benefit appeals vs. other-benefit appeals) on advertising effectiveness, i.e., H1, and explores the interaction effects between advertising appeals and claim specificity (specific vs. ambiguous) and visual presentation (static vs. dynamic) on green ad effectiveness, i.e., H2 and H3.

Therefore, the author set a 2 (advertising appeals: self-benefit appeals vs. other-benefit appeals) × 2 (claim specificity: specific vs. ambiguous)× 2 (visual presentation: dynamic vs. static) between-subjects design, with a total of 8 different experimental situations. The dependent variables were advertising attitude and product attitude.

In the experiment, each participant received the same electronic questionnaire, including an advertisement and some post-exposure questions, which included: advertising attitude, product attitude, and manipulation check. After modifying and improving the research design on the basis of the pre-experiment, 253 volunteers were recruited for the formal experiment at a university in Beijing. The formal experiment procedure was the same as the pre-experiment, and subjects were randomly assigned to eight experimental conditions. Subjects were guided by the instructional text in the electronic questionnaire to read the experimental material.

In addition to the test, a gift was given to the subjects to encourage them to fill in the questionnaire. The personal willingness of subjects rejecting to fill in the questionnaire was also respected. There were 30-40 subjects in each experimental situation, for a total of 253 subjects participating in the experiment. After invalid questionnaires were removed, a total of 240 valid questionnaires were gained, among which males account for 51.25% (totaling 123 males) and females account for 48.75% (totaling 117 females).

3.2. Material design

The advertised product was a virtual brand of bamboo pulp environmental tissue. The reason for not choosing the real brand is that when consumers have a certain experience with the brand, that experience moderates the advertising effect of emotional transformation on the consumer experience [16]. Therefore, the use of virtual brands prevents subjects from being influenced by past consumption experiences, which may subsequently affect the dependent variable. Previous experiments have shown that Chinese consumers pay moderate attention to the advertising of daily products such as tissue [17]. At the same time, since the majority of consumers had previous experience with tissue, choosing tissue as the advertised product avoids the effect of extremes in consumer involvement (too high or too low) and lack of actual consumption experience on the predictiveness of the experimental results. Therefore, in order to exclude the influence of the brand

factor, the brand name was fictitiously used as a random combination of English letters "EFT" in this research.

Referring to YANG et al.'s study, this study designed two green advertisements with different types of appeal (self-benefit vs. other-benefit) [18]. Referring to Davis' study, two advertisement texts with different degrees of specificity (specific vs. ambiguous) were designed in this research [8]. The experimental material texts are shown in Table 1.

Table 1 Experimental text design

	Ambiguous	Specific
Self-benefit	The healthy skin-friendly tissues, purely made from bamboo without bleaching, also applicable for sensitive skin. By the way, it's saving money as much as you can with a big discount!	The healthy skin-friendly tissues, purely made from bamboo without bleaching, also applicable for sensitive skin. By the way, it's saving money as much as you can with a big discount of 20%, equivalent to 4 yuan!
Other-benefit	Natural skin-friendly facial tissues, more environmentally friendly than those made from wood pulp, are better than trees in absorbing carbon dioxide and producing oxygen, and can be planted on degraded land to improve the soil.	Natural skin-friendly facial tissue, can produce more than 30% more oxygen and absorb more than 35% more carbon dioxide per kilogram than trees, making it a big winner for the environment in the long run as it maintains more environmental safety!

This research takes advantages of Roggeveen's method to control the angle and size of the images to ensure the uniformity of the provided information content [19]. In order to ensure the background, color and style of the static and dynamic ads are uniform, and there is no difference in the size of the text and images, three images (Figure 2-5) from the dynamic images were selected as the static material. The three images are placed parallel and side by side on the same slide.

Fig. 2 Self-benefit, ambiguous, static material

Fig. 3 Self-benefit, specific, static material

Fig. 4 Other-benefit, ambiguous, static material

Fig. 5 Other-benefit, specific, static material

3.3. Variables measure

Referring to the studies of Xue Jiayu et al. and Sheng Guanghua et al., this research sets two questions for manipulation checks, and the questions were all scored on a 7-point scale [20,21]. The manipulation check questions were "To what extent do you think the above advertisement is ambiguous ("1" stands for very specific and "7" stands for very ambiguous)", "To what extent do you think the above advertisement is based on self-benefit or other-benefit ("1" is based solely on personal interests and "7" is based solely on environmental interests)".

As mentioned before, two dimensions, advertising attitude and product attitude, were adapted for the measurement of the dependent variable (advertising effectiveness) in this research, and each variable in the theoretical model (Figure 1) was measured with four items, all on a 7-point scale. For the measurement of advertising attitudes, this research refers to the item scales used by Keller et al. and Friedman and Friedman for the measurement of advertising effectiveness [22,23]. It was integrated and adapted to the following four items in this research: I think this advertisement is useful; I think this advertisement is credible; I think this advertisement is attractive; I like this advertisement. The internal consistency reliability of the experiment was tested, and the results show that advertising attitude α=0.917. For the measurement of product attitudes, the 7-item scale generalized by Shamdasani, Stanaland and Tan [24] was used in this study. Four items were adjusted in the measurement of this study: this product is good; I like the product; I have a positive opinion of the product; and the product is attractive. The internal consistency reliability of the experiment was tested, and the results show that product attitude α=0.948.

4. Results

4.1. Manipulation check

In the experiment, the research tested whether the types of self-benefit and other-benefit green advertising appeals were significantly different for consumers.

Based on the ANOVA results, the manipulation of advertising appeals was effective ($F=152.76$, $p<0.0001$). In the case of self-benefit advertisement, the appeals were considered to be based on individual interests ($M=3.46$, with "1" representing exclusively individual interests and "7" representing exclusively environmental interests); in the case of other-benefit advertisement, the appeals were considered to be based on environment ($M=4.81$, with "1" representing totally based on

personal interests and "7" representing totally based on environmental interests). Based on the above data, it is shown that the experimental materials were successful in manipulating the types of green advertising appeals.

Similarly, the manipulation of claim specificity was effective (F=86.583, p<0.0001). In the experimental context with high claim specificity, the ad text was considered concrete (M=3.57, "1" for very specific and "7" for very ambiguous); in the experimental context with low textual specificity, the ad text was considered abstract (M= 4.62,"1" for very specific and "7" for very ambiguous). Based on the above data, it is shown that the experimental material was successful in manipulating the claim specificity of green advertisements.

4.2. Advertising appeals

The results of the ANOVA analysis showed (Table 2) that the adoption of self-benefit advertising appeals for green products had more positive results on advertising attitudes and product attitudes compared to other-benefit advertising appeals did. Thus, H1 was verified.

Table 2 ANOVA analysis on the main effect of advertising appeals

Table 2 ANOVA Analysis

	self-benefit or other-benefit (mean ± standard deviation)		*F*	*p*
	Self-benefit (*n*=120)	Other-benefit (*n*=120)		
Advertising attitudes	3.35±0.60	3.54±0.62	6.225	0.013*
Product attitudes	3.37±0.60	3.56±0.65	5.196	0.024*

* *p*<0.05 ** *p*<0.01

4.3. Interactional effects

ANOVAs were conducted with advertising attitude and product attitude as dependent variables, respectively, and advertising appeal (self-benefit vs. other-benefit), claim specificity (specific vs. ambiguous), and visual presentation (static vs. dynamic) as independent variables.

For advertising attitude (Table 3), the main effect of advertising appeals (self-benefit vs. other-benefit) was significant (F=7.054, p=0.008<0.05), and the interaction effect of advertising appeals and claim specificity was significant (F=8.292, p=0.004<0.05); the interaction effect of advertising appeals and visual presentation was significant (F=3.940, p=0.048< 0.05).

Table 3. ANOVA analysis on the interaction effect

	Advertising attitudes		Product attitudes	
Source of variation	*F*	*p*	*F*	*p*
Intercept	8547.584	0.000**	8437.351	0.000**
advertising appeals	7.054	0.008**	5.833	0.016*
appeals*claim specifity	8.292	0.004**	8.653	0.004**
appeals*visual presentation	3.940	0.048*	7.243	0.008**
	R 2: 0.158		*R* 2: 0.167	

* *p*<0.05 ** *p*<0.01

For product attitude (Table 3), the main effect of advertising appeals (self-benefit vs. other-benefit) was significant (F=7.054, p=0.008<0.05) and the interaction effect of advertising appeals and claim specificity was significant (F=8.292, p=0.004<0.05); the interaction effect of advertising appeals and visual presentation was significant (F=3.940, p=0.048< 0.05).

ANOVAs indicated that ads with high claim specificity would have a more positive effect on advertising attitudes than ads with low claim specificity in both ad types. Simple effects analysis showed that claim specificity had a greater effect on advertising attitudes and product attitudes when

green ads emphasized self-benefits (Figure 6&8.). When green ads emphasize environmental benefits, visual presentation has a greater effect on advertising attitudes and product attitudes (Figure 7&9.)

In summary, there are interaction effects between the type of advertising appeal and claim specificity and visual presentation. Under the self-benefit type of advertising appeals, higher claim specificity has greater positive effects on green advertising effectiveness; under the other-benefit type of advertising appeals, dynamic presentation has greater positive effects on green advertising effectiveness. Hypothesis H2a and hypothesis H3b are verified.

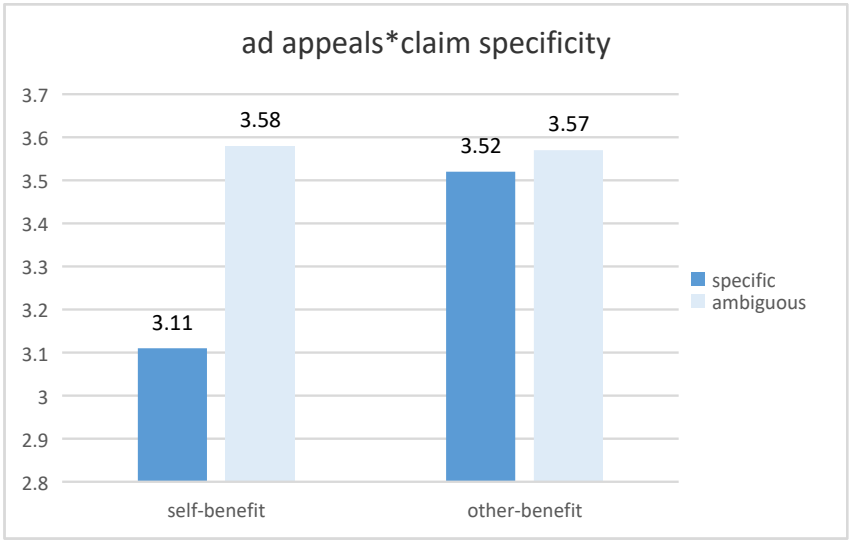

Figure 6 The interaction of advertising appeals and claim specificity on advertising attitudes

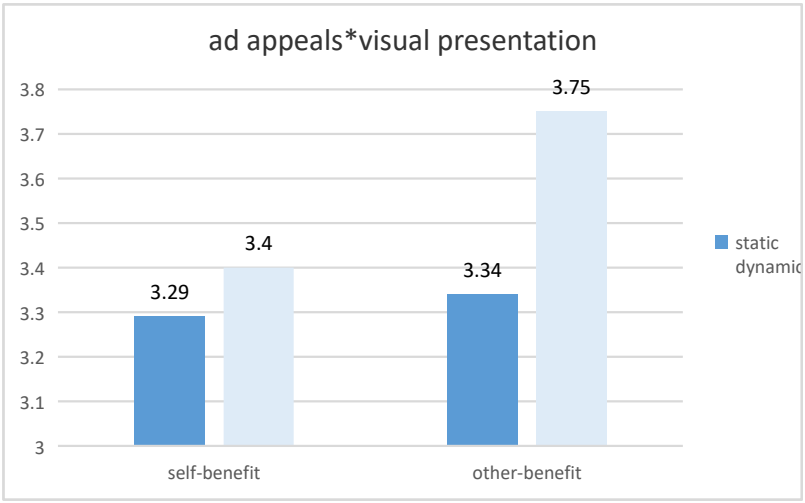

Figure 7 The interaction of advertising appeals and visual presentation on advertising attitudes

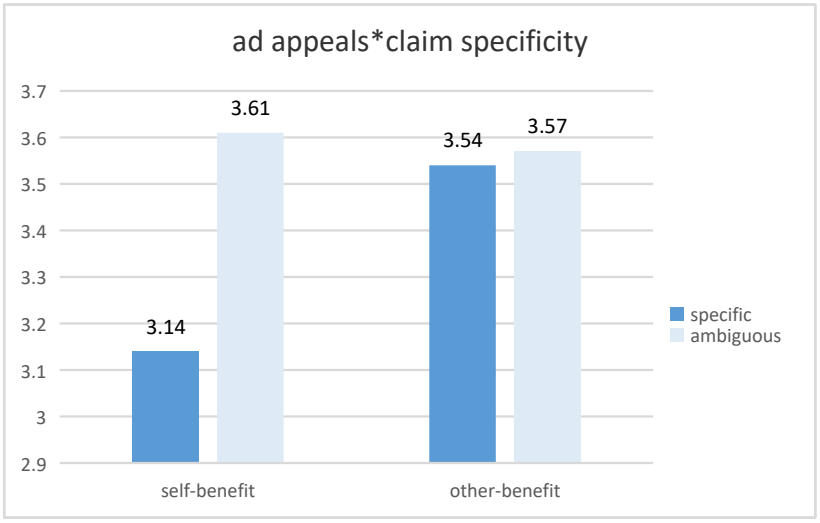

Figure 8 The interaction of advertising appeals and claim specificity on product attitudes

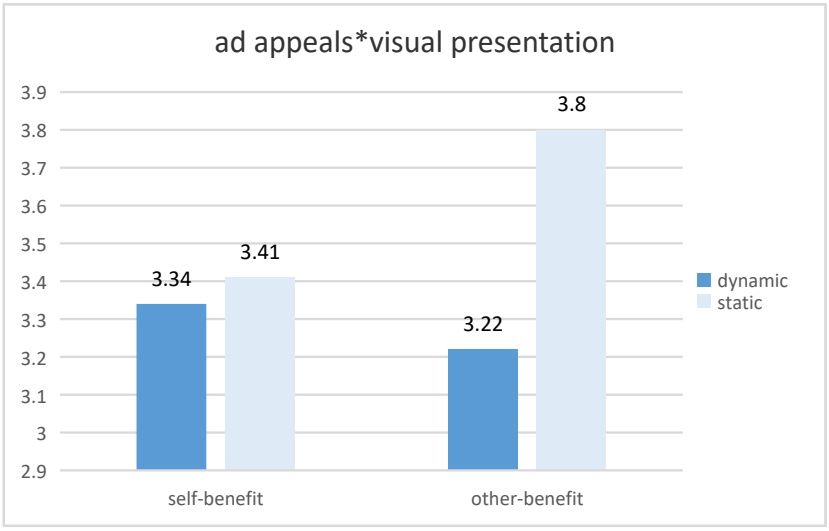

Figure 9 The interaction of advertising appeals and visual presentation on product attitudes

5. Discussion & Conclusion

Based on the Heuristic-System Model (HSM), this research explored and discussed the effects of appeals, claim specificity and visual presentation on the effectiveness of green advertising with the help of experimental research methods, and came to the following conclusions: (1) Advertising appeal type (self-benefit vs. other-benefit) has an impact on the effectiveness of green advertising, and green advertising of self-benefit can achieve better advertising results. (2) The interaction between ad appeals and claim specificity (specific vs. ambiguous) affects ad effectiveness, and the positive effect of specific claims on advertising effectiveness is stronger than the ambiguous claim in the self-benefit appeals, but there is no significant difference in the other-benefit appeals. (3) The interaction between ad appeals and visual presentation (dynamic vs. static) affects ad effectiveness, and the positive effect of dynamic presentation on advertising effectiveness is stronger than the static presentation in the other-benefit appeals, but there is no significant difference in the self-benefit appeals.

This study has both theoretical and practical significance. On the one hand, this research confirms the rationality and validity of adopting self-interest and altruism classification for green advertising appeals. Compared with other-benefit advertising appeals, green advertising with self-benefit appeals is more effective in advertising. This research introduces the heuristic-system model into the field of green advertising effectiveness and develops the theory related to green advertising. On the other

hand, this research verifies the types of green advertising appeals and their interaction with claim specificity and visual presentation on advertising effectiveness, which provides a theoretical reference for marketing practice, i.e., to achieve maximum advertising effectiveness. When designing green communication strategies, enterprises should focus on self-serving advertising claims, supplemented by specific claim and dynamic visual presentation to highlight the quality, security, happiness and sense of access that green products bring to consumers' lives in modern society, and enhance the value and image of green products in consumers' minds to strengthen consumer response. To sum up, enterprises should focus on the matching effect of the appeals, claim specificity and visual presentation to maximize the advertising effect.

At the same time, there are still some inadequacies in this research. For example, the sample is mostly concentrated in a university in Beijing, and only some dimensions of green advertising are discussed, which leads to several limitations. In the follow-up study, the aforementioned aspects can be further supplemented and explored.

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