

# Appeals of Product Pictures on the Product Detail Page - The Effect of Mental Imagery

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**Abstract.** Online shoppers are not able to touch and feel products when perusing online stores. Product images on the product detail pages are the main sources of information that users rely on to construct their interactions with a product. This study investigates how the appeal type of product images (attribute-based vs. benefit-based) influences shoppers' attitudes and purchase intention toward a product as well as the mediation of this process by the vividness and elaboration of mental imagery. The results shows that appeals of product images affect shoppers' attitude via vivid and elaborated imagery, but purchase intention is impacted by elaborated imagery only. For shoppers, the effect of attribute-based appeals on imagery elaboration is significantly more prominent for well-known brands than for less-known brands. The implication for product detail page design is to emphasize product attributes over benefits for well-known brands while the reverse is true for less-known brands.

**Keywords:** Product detail page · Product image · Mental imagery · Purchase intention · Attribute-based appeal · Benefit-based appeal

## 1 Introduction and Hypothesis Development

While the product detail page of an online store is likened to the merchandise display of a physical store, online shoppers are unable to touch and feel products when shopping over the Internet. Product pictures on the product detail pages are one of the main sources of information for product evaluation, resulting in a strictly visual mode of shopper-product interactions. Product pictures convey important information concerning product attributes (details on looks and functions) and benefits (what the product is good for). Few previous studies, if any, have looked into how these two types of information in product pictures can facilitate purchase decisions. A possible psychological mechanism adopted by shoppers to process product attributes and benefits is mental imagery, which has been consistently found to affect consumer responses [1–3]. This study investigates how product appeals (attribute-based vs. benefits-based) affect shoppers' visual interaction with the product in the form of mental imagery as well as how such experiences may be used to enhance users' product attitudes and purchase decisions. This study also clarify how these different effects could be modulated by brand awareness of the product.

## 1.1 Product Detail Page Design

Most product-related information is generally shown on the product detail page of online stores. From an overview of the situation for China, the product detail page can be divided into three parts: product descriptions, customers' reviews, and sellers' commitment; and product descriptions typically use a large amount of pictures to depict the products. Previous research indicated that object interactivity information (e.g., 3D interactive pictures), instead of descriptive text, on the product detail page evokes vivid mental imagery of products and thus increases intentions [3]. Depicting product pictures in different ways affects consumers' product simulating experience as well [4].

An important yet largely unanswered question on product detail page design concerns how marketing messages could be incorporated to facilitate shoppers' purchase decision. Lancaster [5]'s definition of the persuasiveness of message type is adopted here to distinguish between two types of product information depicted by product images. The attribute-based appeal emphasizes physical properties and visual characteristics that are measurable, concrete, and relevant in discerning alternatives attached to the product. By contrast, the benefit-based appeal highlights the results of possessing or using the products in terms of value, happiness, convenience, satisfaction etc. Regarding the persuasiveness of attribute-based and benefit-based appeals, previous studies provide mixed evidences. For example, Graeff [6] indicates that, compared to inferences about concrete attributes and features, inferences about self-relevant product consequences have stronger effects on consumers' brand attitudes. By contrast, Lautman and Percy [7] find that the attribute-based campaign commercials outperform the benefit-based oriented campaigns. However, it seems that these appeal types bring into play on different situations. Hernandez, Wright and Rodrigues [8] conclude that, benefit-based appeals are more persuasive than attribute-based appeals when a purchase is planned for the distant future or when construal levels are high.

## 1.2 Mental Imagery

Mental imagery is a process by which sensory information is represented and used in much the same way as perceptions of external stimuli, as a form that is "very like picturing and very unlike describing" [9, 10]. When drawing on imagery processing, consumers mentally embody the shopping experience. They may visually imagine a product in use, not only including the product's attribute information, but the benefit that consumers obtain from owning and using the product. Mental imagery processing is at play when one processes affect-rich information in particular [1, 2], and as such it has important roles in persuasion. Strong mental imagery improves attitude, induces intention, and is related to consumption experiences [10–16].

Mental imagery is defined along three dimensions: vividness, quantity, and elaboration [17]. Vividness is the most frequently studied imagery dimension and refers to the intensity and clarity of the imagery that arises. As the intensity of vividness rises, consumers are much more able to imagine the details of the product. Elaboration refers to the extent to which the information stored in long-term memory - that is, information other than that provided by a stimulus - is activated and retrieved to working memory in

information processing. It reflects the extent to which information is integrated with prior knowledge. Previous studies indicated that imagery elaboration could induce psychological ownership, or a feeling of “the object is mine” [15, 16]. Quantity refers to the amount of different images generated. As imagery quantity is redundant with the degree of elaboration [15], the current study focuses on imagery vividness and elaboration.

Although mental imagery can be induced by pictures, concrete words, and instructions for imagination, pictures are the most established predictors of imagery [10]. Product pictures on the product detail page are likely to induce mental imagery, varying on the dimension of vividness and elaboration, which in turn affect shoppers’ attitude and purchase intention toward the product. Thus, this study presents the first hypothesis.

H<sub>1</sub>: Mental imagery is induced by product pictures on the product detail page. The differences in imagery vividness and elaboration are positively related to product attitude and purchase intention. Vividness and elaboration of mental imagery induced by product pictures on the product detail page are positively related to product attitude and purchase intention.

### 1.3 Brand Awareness

Brand awareness is an important contributing factor to product evaluation and purchase intention. It reflects the extent of marketing commitment by the enterprise or sellers. Consumers are likely to base their choices on brand awareness consideration under low involvement [18, 19]. Research also suggested that improving brand awareness can enhance brand loyalty and thus generate repurchase behavior [20].

Brand awareness is based on one’s brand knowledge that can be conceptualized in associative network memory terms. Brand knowledge consists of a set of nodes in the network where brand related information is stored [19]. Relationships between brand attributes are amassed in links that vary in strength. The strength of the associated links between the activated nodes determines the extent to which information spreads through related nodes and the extent of retrieved memory representation [21, 22]. Product or brand-related information may thus serve as the retrieval cue by activating nodes in the brand knowledge network. For example, “running shoes” is strongly associated with the well-known brand node “Nike”, which in turn is associated with other brand-related properties. Consumers are likely to think of the well-known brand name Nike when considering purchasing running shoes. Knowledge that is linked to Nike should also come into mind, such as the concrete product features, self-image, and identity that consumers can obtain by owning the product, past usage experience, or a recalled image from recent advertising content.

Shoppers are accordingly more likely to retrieve brand knowledge related to the benefits of product use as the basis for elaborated imagery for high awareness brands (versus low awareness ones) even when merely concrete attributes of the product are presented in the product picture. In other words, shoppers are able to retrieve benefit-related information through a previous experience with a well-known brand based on the attribute-based appeal product picture. This leads to the next hypothesis.

H<sub>2</sub>: The effect of attribute appeal from a product picture on imagery elaboration is more prominent on higher awareness brands.

## 2 Method

### 2.1 Pre-Test

This study implements a pre-test to determine the level of awareness for the backpack brands used herein. A total of 43 students (11 males and 32 females,  $M_{\text{age}} = 20.2$  years) at Soochow University took part in the study. Participants completed a paper-and-pencil questionnaire that assessed their brand awareness. Four brands are assessed according to two items: “I can recognize X among other competing brands.” and “I am aware of X.” (1 = very agree; 7 = very disagree) [23]. Participants completed demographic measures, including age and gender in the end.

A one-way ANOVA reveals different brand awareness between the chosen brands (Adidas, Nike, AspenSport, and MCYS&JPN) ( $F(3,168) = 158.88; p < .001$ ). A post hoc test shows that there is no difference respectively between Adidas and Nike, and between AspenSport and MCYS&JPN ( $M_{\text{Adidas}} = 5.59, M_{\text{Nike}} = 6.03, p = .31; M_{\text{AspenSport}} = 1.95, M_{\text{MCYS\&JPN}} = 1.86, p = .98$ ); in addition, students are more aware of Adidas and Nike than they are of AspenSport and MCYS&JPN ( $M_{\text{Adidas}} - M_{\text{AspenSport}} = 3.64, p < .001; M_{\text{Adidas}} - M_{\text{MCYS\&JPN}} = 3.73, p < .001; M_{\text{Nike}} - M_{\text{AspenSport}} = 4.08, p < .001; M_{\text{Adidas}} - M_{\text{MCYS\&JPN}} = 4.17, p < .001$ ). Thus, Adidas and Nike are chosen to be used in the high awareness group, while in comparison, AspenSport and MCYS&JPN are chosen to be used in the low awareness group. A follow-up pretest taken by 49 participants was implemented to confirm whether the stimuli of the four brands are different in perceived quality and product attitude. The result presents that neither perceived quality nor product attitude are different in the four brands (product attitude:  $t(48) = -1.40, p = .17$ ; perceived quality:  $t(48) = -1.63, p = .11$ ).

### 2.2 Participants

A total of 117 adults (42 males and 75 females,  $M_{\text{age}} = 21.7$  years) recruited from the Internet by snowball sampling took part in the study online. Most of them are students.

### 2.3 Procedure

Pictures of backpack products were first collected from the Internet. Participants browsed six backpack products' detail pages, each one composed of two pictures depicting the backpack and a brief text explaining some product detail including the brand name (see Fig. 1). Among the six backpacks, half are low awareness brands, and the other half are high awareness brands chosen from the pretest. The presentation sequence was counterbalanced. After browsing each product detail page, participants completed a questionnaire that assessed all variables. On average, participants took 15 to 20 min to complete it.



**Fig. 1.** An example of a product detail page used in this study (from [www.tmall.com](http://www.tmall.com))

## 2.4 Materials

All items were assessed under 7-point scales. The assessment order follows the description below.

All pictures of the product depict both the attribute and benefit appeals. For example, a picture depicting a model carrying a backpack not only presents the attribute of the backpack, but also conveys the benefit information, such as the self-image that the user can get by carrying the backpack. Participants are assessed on the attribute and benefit appeals that they were aware of from the product detail page. Attribute and benefit appeals are each assessed by one item based on Lancaster [5] (“I am aware of the concrete characteristics of the backpack via the pictures”, and “I am aware of the values or utilities from the possession of the backpack via the pictures”).

This research assesses mental imagery by Babin and Burns [17], capturing all the dimensions. Vividness is measured on a semantic scale comprising eight items (“The product image that occurred was detailed/clear/weak/fuzzy/vague/vivid/sharp/well-defined”; construct  $\alpha = .93$ ). Elaboration is taken on three items (“I can mentally image the backpack in the ad”; “I imagined what it would be like to use the backpack”; and “I imagined the feel of the backpack”; construct  $\alpha = .80$ ).

Product attitude is assessed on two items [15] (“All in all, I evaluate the backpack very positively”; and “I really like the backpack”; construct  $\alpha = .90$ ). Purchase intention is assessed on two items [4, 14] (“I might purchase this backpack”; and “I am willing to find the backpack in the store and purchase it”; construct  $\alpha = .97$ ).

## 2.5 Result

This research executes path analysis using the maximum likelihood estimation in AMOS. Two dependent variables, purchase intention and product attitude, are inspected as separate outcome variables. In particular, the study performs multi-group analyses to compare the findings between two levels of brand awareness.

**Descriptive Analysis.** Table 1 shows the mean scores and standard deviations of all variables. The normality assumption [24] and the offending estimate checks are conducted following the suggestions by [25] (i.e. skewness > 3; kurtosis > 10) and [26] (i.e. standardized estimate < 0.95 and standard errors are not negative; see Table 2). The values of all variables fall well within the permissible ranges for the conduction of further analyses.

**Table 1.** Mean, standard deviation of all variables

Construct	Overall sample (n = 234)		High awareness brand (n = 117)		Low awareness brand (n = 117)	
	M	SD	M	SD	M	SD
Benefit-based appeal	4.59	1.11	4.58	1.13	4.60	1.10
Attribute-based appeal	4.75	1.12	4.72	1.07	4.77	1.17
Imagery vividness	4.70	.93	4.68	.94	4.73	.92
Imagery elaboration	4.04	1.10	3.95	1.11	4.12	1.08
Product attitude	3.71	1.12	3.58	1.17	3.83	1.06
Purchase intention	3.00	1.20	2.88	1.22	3.07	1.17

Notes: M = mean; SD = standard deviation.

**Path Analysis.** Figure 2 illustrates the path model. Table 3 indicates that model fits are good for both product attitude and purchase intention. To verify whether mental imagery mediates the effect of attribute-based and benefit-based appeals on purchase intention and product attitude, the study employs bootstrap estimation with 1000 resamples. The results show that all the indirect effects in the model are significant (see Table 4).

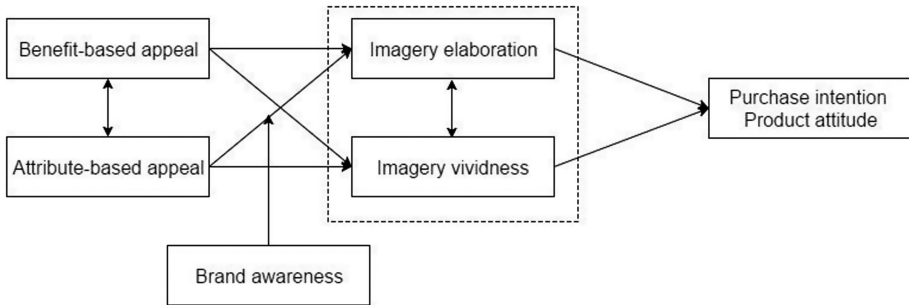
According to the above findings, Hypothesis 1 is partially supported. As expected, attribute-based and benefit-based appeals could improve both imagery vividness and imagery elaboration. Different from the proposed model, imagery vividness does not affect purchase intention significantly. Imagery vividness reflects the intensity and clarity of the image that arises, rather than the interaction between the individual and the product. By contrast, imagery elaboration refers to the information retrieved from long-term memory, and it reflects more information related to the individuals. Thus, imagery elaboration is an important predictor of purchase intention. However, the effect of imagery vividness on product attitude is significant ( $p < .05$ ). Purchase intention reflects the behavior level rather than product attitude; and compared with product attitude, even if the perception of the image is clear and detailed, the influence on purchase intention is limited.

**Table 2.** Path coefficient of the model across two models

	Overall sample (N = 234)		High awareness (N = 117)		Low awareness (N = 117)		Path difference <i>z</i>
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	
Att → Vivid	.44***(.53)	.05	.44***(.50)	.08	.44***(.55)	.07	-0.01
Att → Ela	.36***(.36)	.07	.50***(.48)	.11	.26**(.28)	.09	-1.78*
Ben → Vivid	.24***(.29)	.05	.26***(.31)	.08	.22**(.26)	.07	-0.40
Ben → Ela	.36***(.36)	.07	.24**(.25)	.10	.45***(.45)	.09	1.47
Ela → PI	.78***(.72)	.05	.79***(.72)	.07	.76***(.70)	.07	-0.32
Ela → PA	.73***(.71)	.05	.78***(.74)	.08	.66***(.68)	.07	-1.11
Vivid → PI	.08(.06)	.07	.34(.03)	.10	.13(.10)	.10	0.68
Vivid → PA	.14**(.12)	.06	.09(.07)	.09	.20**(.17)	.08	0.92

Notes:

1. Att = Attribute-based appeal; Ben = Benefit-based appeal; Vivid = Vividness of imagery; Ela = Elaboration of imagery; PI = Purchase intention; PA = Product attitude.
2. Values in parentheses are standardized estimates.
3. \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.10$ .
4. Path difference refers to the difference in path coefficients between high and low brand awareness groups.



**Fig. 2.** Illustrated effects of appeal types on mental imagery, product attitude, and purchase intention (see Table 2 for the significance of paths)

**Table 3.** Model fit indices of overall sample and multi-group sample

	$\chi^2$ (df)	<i>p</i>	RMR	GFI	NFI	CFI	RMSEA
<b>Overall sample</b>							
Purchase intention	1.116(2)	.943	.004	.100	.100	1.00	.000
Product attitude	1.662(2)	.436	.010	.997	.998	1.00	.000
<b>Multi-group sample</b>							
Purchase intention	3.267(4)	.514	.015	.994	.995	1.00	.000
Product attitude	5.253(4)	.262	.016	.991	.993	.998	.037

**Table 4.** Bootstrap estimation result

	Attribute appeal	Benefit appeal
Purchase intention	.002 (.177, .374)	.002 (.187, .385)
Product attitude	.002 (.220, .413)	.002 (.207, .391)

*Notes:* Values in parentheses are 95% confident interval; values outside parentheses are p-value.

**Multi-group Analysis.** The multiple group moderation analysis was performed to verify the moderation by brand awareness on the effect of attribute appeal on imagery elaboration. The Chi-square difference test is first employed to verify the overall difference in two brand awareness groups, followed by critical ratios used to check the difference of each path in the model. The results indicate that the effect of attribute-based appeals on imagery elaboration is more prominent on higher awareness brands (see Tables 2 and 5). Hypothesis 2 is thus supported.

**Table 5.** Result of Chi-square difference test across two models

	$\chi^2_{diff}$	df <sub>diff</sub>	<i>p</i>
Purchase intention	2.885	4	.577
Product attitude	4.124	5	.532

### 3 Conclusion

This study examines findings from 117 participants, each person browsing six products' detail pages. The resulting model explains how the appeal of product pictures influences purchase intention and product attitude via imagery vividness and elaboration. Imagery elaboration, not imagery vividness, mediates the effects of attribute-based and benefit-based appeals on purchase intention. However, imagery vividness and elaboration both mediate the effect of attribute- and benefit-based appeals on product attitude. An elaborated imagery is characterized by the imagined product interaction with the shopper. Representing the product as such may serve as a significant basis for psychology ownership, i.e., the mental state in which individuals feel that the product is 'theirs' [27]. The connection with "inferred" ownership could explain why imagery elaboration effectively predicts purchase intention in the current study [28]. By contrast, vividness of imagery reflects the clarity of details in product representation and predicts product liking. However, it is less effective in creating a link between the product and the shopper and thus does not affect purchase intention.

Depicting benefit and attribute information in the product picture helps imagery vividness and elaboration to different degrees. Attribute-based appeals appear to more effectively increase imagery vividness, while benefit-based appeals influence imagery elaboration more. Attribute-based appeals highlight the physical properties and visual



characteristics of the product that may contribute to the intensity and clarity of the imagery that arises or just the simply vividness of the imagery. By contrast, benefit-based appeals emphasize the values and utilities of owning and using a product to depict the product picture. The self-related information in the product picture helps enhance the generation of elaborated imagery.

The results from multiple group analysis show that the effect from attribute-based appeals on imagery elaboration is more prominent on well-known brands than on less-known brands by the shopper. The brand knowledge activated by products of well-known brands supplements the benefit information of the product when merely product attributes are depicted in the picture. Such information may be used to induce elaborated imagery. For example, it could be relatively easy for a shopper to “feel” like an athlete by imagining wearing the Nike sports shoes while noticing the air cushion and the texture of the Nike product picture. Such a process is unlikely when the product brand is less known. Product pictures of unknown brands should explicitly demonstrate and emphasize the benefits of the sports shoes to support elaborated imagery.

To conclude this discussion, the current study has set out to examine the effect of attribute-based and benefit-based appeals of product pictures. The results provide clear implications for product detail page design by showing that attribute-based appeals are more useful for well-known brands while benefit-based appeals are critical for less-known brands. Product pictures devised as such may facilitate imagery elaboration that positively predicts both purchase intention and product attitude of shoppers.

**Limitation and Future Research Opportunities.** The high covariance of attribute-based and benefit-based appeals (standardized coefficient = .68) found in the current study may constitute a limiting factors for our results. This covariance may have to with how different types of appeals were measured in the current study. It may also result from the fact that the information participants relied on to rate attribute- and benefit-based appeals is implemented within the same merchandize. The relatedness may not be unexpected.

The second possible limitation has to do with the product category. As the product we used in this study was a backpack, for which users can mentally create interactions and relationships [29] with relative ease, as they interact with such product frequently in daily lives. It awaits future studies to exemplify the extent to which current findings apply to other product categories. It is interesting to investigate similar effects for products that are less likely to establish extensive user-product relationships (e.g. projector).

Sellers often use pictures exhibiting attribute-based and benefit-based appeals together on the product detail page. Thus, examining the proportion and sequence of presentation might be more valuable for practical use. In addition, users’ browsing behavior data on the product detail page can be taken into account, which could more accurately reflect real web-browsing behavior.

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