Original Article

The relationship between the amount of product information provided online via suitcase product images, titles, and descriptions:

A study consumer perception of product function suitcase shopping

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Abstract

Using suitcase e-commerce sites as a subject of inquiry, this study aimed to examine the effect that differences in the amount of information in the "product image," "product title," and "product description" have on users' perception of product functions. In addition, this study also evaluated the visibility of e-commerce sites. The factors examined in this study were "product image," "product title," and "product description," and the amount of information in each factor was set as either high or low. For the image factor, the low amount information level displayed one image, while the high amount of information level displayed four images. For the product title, the low amount information level displayed only the product name, while the high amount of information level displayed the product name and words related to the suitcase's functions. For the product description, the low amount information level displayed only an overview, while the high amount of information level displayed detailed information about the suitcase. This experiment used a within-participants design. Thirty-three men in their twenties who had no visual impairment participated in the experiment by examining the product factors and responding to a questionnaire. The questionnaire included four items on basic participant information, the following five items on the participant's subjective evaluation of functional elements such as durability, convenience, appearance, texture, and size, and the one items on the participant's subjective evaluation of the visibility of e-commerce sites. For each product factors, participants viewed e-commerce sites (for 30 seconds), answered measurement items (until completion), and took a break (for 15 seconds). Based on the analysis of the questionnaire responses, the study recommends that e-commerce sites make it easy to recognize the durability, convenience, appearance, texture, and size of suitcases by including a high amount of image information while limiting the amount of information contained in the product title to ensure the user-friendly nature of the site.

Keywords

online shopping, suitcase, information, image of production, subjective evaluation

1. Introduction

Expansive Internet access has led to increased online shopping by all generations [NRI, 2021]. This is because users can shop without being restricted by time or place, and shops have the advantage of not needing their own storefronts or sales staff. Since the emergence of COVID-19, many consumers resorted to shopping online as it allows them to shop without human interaction [MIC, 2023]. In Japan, the online shopping market is predicted to grow at an average annual rate of 6-8 % from 2024 to 2028 [MIC, 2004] and is expanding in business-to-customer (B to C), business-to-business (B to B), and customer-to-customer (C to C) markets [METI, 2024]. Online shops have also been extensively researched. Examples of previous studies include reports using actual market data, such as a comparison of purchasing behavior in brick-and-mortar stores and online shops [Katawetawaraks and Wang, 2011], differences in purchasing behavior based on age [Lian et al., 2014; Hasan, 2010] and gender [Awad et al., 2008], and differences in the perceptions of site content between online buyers and information researchers [Cai et al., 2003]. In addition, reports on e-commerce site interfaces have examined the impact of differences in information formats on user purchasing behavior [Hong et al., 2004] and the relationship between the distribution of product information and visual search behavior/reaction time using eye tracking [Zhu et al., 2016]. The interface of e-commerce sites has also been introduced in a "how-to" book based on the authors' experiences [Korekara, 2020; Ooura, 2021; Fujikawa, 2022]. Online shopping sells many types of products, but some products are suitable for online shops, while others are not. For example, products such as books, which have few similarities and few differences between them, are suitable for online shopping. However, products with many similarities and many differences between them are unsuitable for online shops. To engage with this assumption, this study examines how to make e-commerce sites most suitable for online suitcase sales, which are important tourism items. Suitcases have functional elements, such as material, weight, and design. Users must be aware of these functional elements and select a suitcase suitable for their intended use. Therefore, online shops must devise websites that provide product information to their users. However, no previous studies on online shops have examined the relationship between e-commerce site design and product functional image. Therefore, this study focuses on a method for providing product information in an online shop for

suitcases. Then, an experimental study was conducted to examine the effect that differences in the amount of information in the "product image," "product title," and "product description" on the site have on users' perception of product functions. In addition, the study evaluated the visibility of e-commerce sites.

2. Experimental design

2.1 Participants

Thirty-three men in their twenties with no visual impairments participated in the experiment. Of the 33 participants, 28 used e-commerce sites several times per month or more.

2.2 Evaluation items

The evaluation items were formulated through working-group discussions, focusing on the functional elements of the suitcase. Figure 1 shows the worksheet used for the evaluation. These included four questionnaire items (1-4) on basic participant information, five questionnaire items (5-9) on the participants' subjective evaluation of functional elements such as durability, convenience, appearance, texture, and size, and the last questionnaire item (10) on the participants' subjective evaluation of the visibility of e-commerce sites. The subjective evaluation of functional elements for suitcases and the evaluation of the visibility of e-commerce sites were rated on a five-point scale. The measurement items were displayed on a personal computer screen and the participants responded using Google Forms.

2.3 Experimental conditions

In this experiment, the factors were "product image," "product title," and "product description," and the amount of information in each factor was set as either high or low, as shown Table 1. For the image factor, the low-information level displayed one image, whereas the high amount of high-information level displayed four images, as shown in Figure 2 (a). For the product title, the low-information level displayed only the product name, whereas the high amount of high-information level displayed the product name and words related to the suitcase's functions, as shown in Figure 2 (b). For the product description, the low-information level displayed only an overview, whereas the high amount of high-information level displayed detailed information about the suitcase, as shown in Figure 2 (c). A within-participants design was used in this experiment.

Table 1: Experimental conditions

		Product title			
		High		Low	
		Product description		Product description	
		High	Low	High	Low
Product Image	High	site1	site2	site3	site4
	Low	site5	site6	site7	site8

2.4 Experimental procedure

Eight e-commerce sites were randomly selected to mitigate order effects. Figure 3 depicts the experimental procedure. In each condition, participants viewed e-commerce sites (for 30 seconds), answered measurement items (until completion), and took a break (for 15 seconds). Additionally, participants were allowed to continue viewing e-commerce sites while answering the measurement items. A 22-inch monitor was used to display e-commerce sites. The experiment was conducted on weekdays from 10:00 to 14:00 in May and June 2024. This study was conducted in accordance with the "Research Ethics Review Self-Check Sheet for Human Subjects" at Nippon Institute of

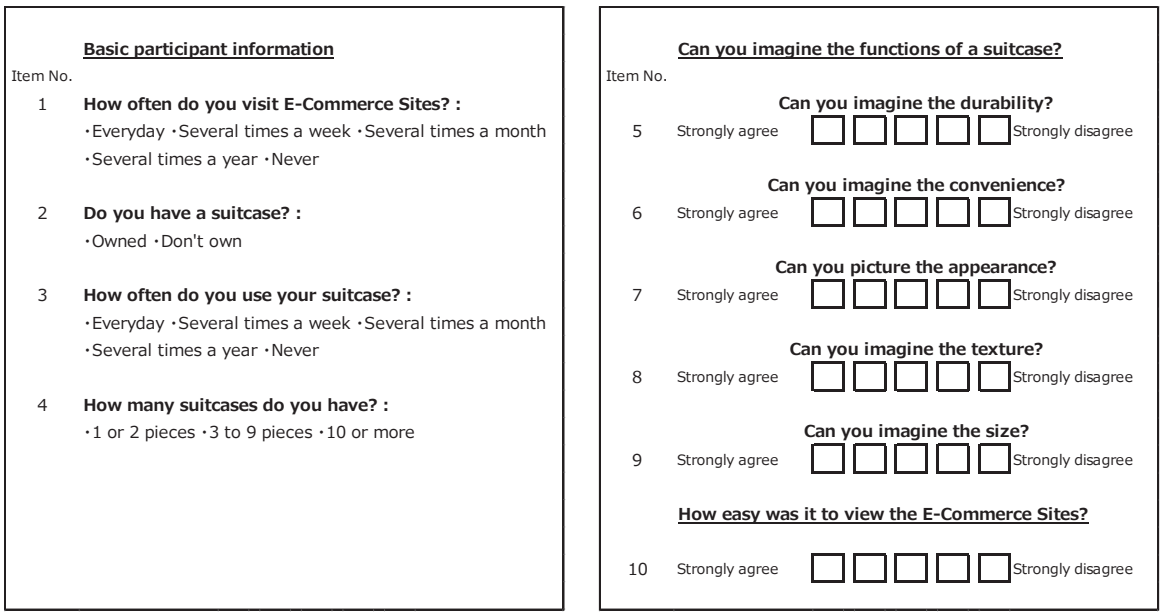

Figure 1: Evaluation items

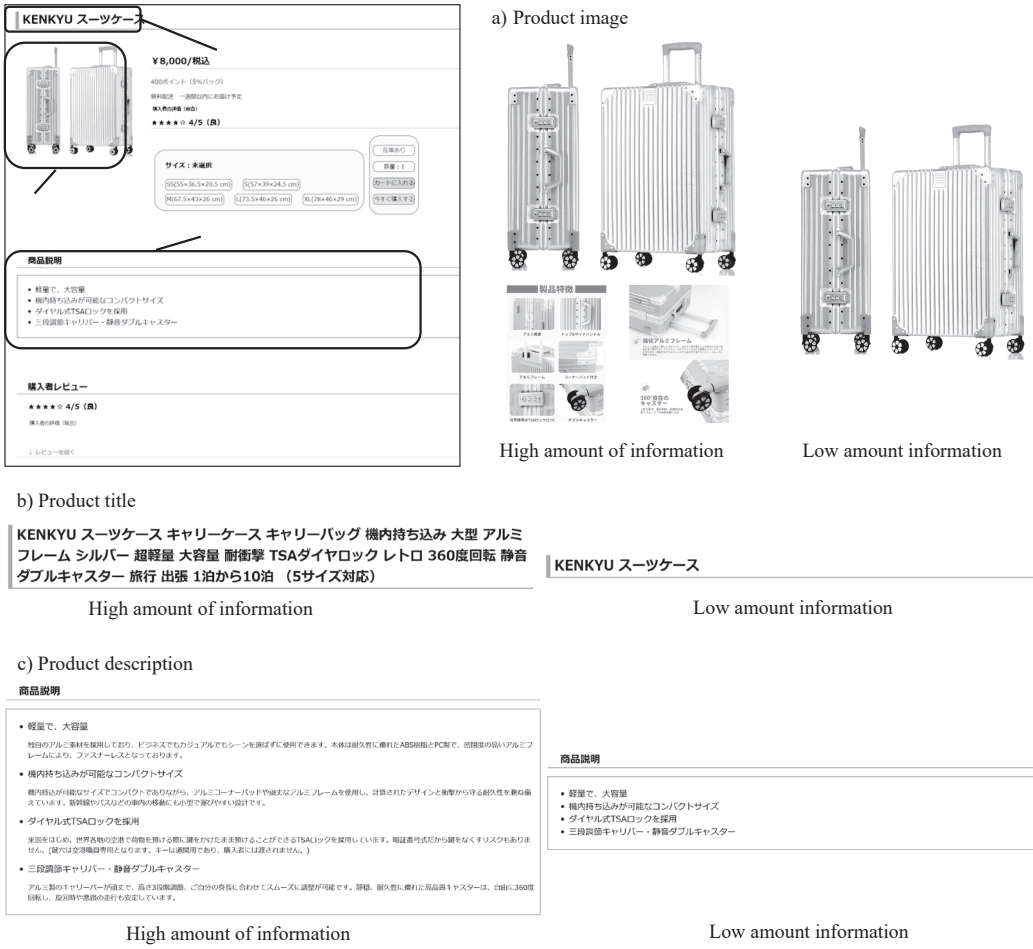

Figure 2: Examples of e-commerce sites used in this experiment

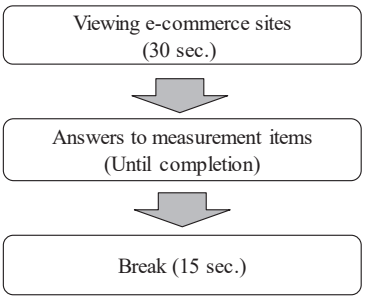

Figure 3: Experimental procedure

Figure 4: Experimental scenario

Technology. The participants provided informed consent prior to the experiment and were assured that they could withdraw from the experiment for any reason. The experimental setup is shown in Figure 4.

2.5 Data analyzing

This section describes the data analysis method. As shown in Table 2, values between 1 (“strongly disagree”) and 5 (“strongly agree”) were assigned. The analyses described in the following sections were conducted using numerical data.

Table 2: The data were converted into numerical data

Result	Numerical data
Strongly agree	5
Slightly agree	4
Neither agree nor disagree	3
Slightly disagree	2
Strongly disagree	1

3. Results and discussion

3.1 Characteristics of subjective evaluation for each factor

A three-way analysis of variance (ANOVA) was performed

Table 3: Results of ANOVA for each subjective evaluation of functional elements

(a) Durbility

Conditions	*S.S.*	*df*	*M.S.*	*F* value	*P* value
Product image (A)	88.670	1	88.670	94.059	< .001 **
Product title (B)	1.670	1	1.670	1.772	0.184
Product description (C)	98.186	1	98.186	104.153	< .001 **
A * B	0.640	1	0.640	0.679	0.411
A * C	9.095	1	9.095	9.647	0.002 **
B * C	0.640	1	0.640	0.679	0.411
A * B * C	1.670	1	1.670	1.772	0.184
Error	241.333	256	0.943		
Sum	441.904	263			

(b) Convenience

Conditions	*S.S.*	*df*	*M.S.*	*F* value	*P* value
Product image (A)	65.004	1	65.004	80.877	< .001 **
Product title (B)	1.095	1	1.095	1.362	0.244
Product description (C)	116.004	1	116.004	144.330	< .001 **
A * B	0.852	1	0.852	1.060	0.304
A * C	12.307	1	12.307	15.312	< .001 **
B * C	2.004	1	2.004	2.493	0.116
A * B * C	1.670	1	1.670	2.078	0.151
Error	205.758	256	0.804		
Sum	404.694	263			

(c) Appearance

Conditions	*S.S.*	*df*	*M.S.*	*F* value	*P* value
Product image (A)	91.004	1	91.004	98.337	< .001 **
Product title (B)	0.034	1	0.034	0.037	0.848
Product description (C)	0.095	1	0.095	0.102	0.749
A * B	0.186	1	0.186	0.201	0.655
A * C	0.095	1	0.095	0.102	0.749
B * C	0.186	1	0.186	0.201	0.655
A * B * C	0.186	1	0.186	0.201	0.655
Error	236.909	256	0.925		
Sum	328.695	263			

(d) Texture

Conditions	*S.S.*	*df*	*M.S.*	*F* value	*P* value
Product image (A)	51.852	1	51.852	37.274	< .001 **
Product title (B)	1.367	1	1.367	0.983	0.322
Product description (C)	15.034	1	15.034	10.807	0.001 **
A * B	1.670	1	1.670	1.201	0.274
A * C	0.640	1	0.640	0.460	0.498
B * C	0.034	1	0.034	0.025	0.876
A * B * C	0.095	1	0.095	0.068	0.794
Error	356.121	256	1.391		
Sum	426.813	263			

(e) Size

Conditions	*S.S.*	*df*	*M.S.*	*F* value	*P* value
Product image (A)	16.004	1	16.004	16.959	<.001 **
Product title (B)	0.004	1	0.004	0.004	0.950
Product description (C)	0.458	1	0.458	0.486	0.486
A * B	0.034	1	0.034	0.036	0.849
A * C	0.004	1	0.004	0.004	0.950
B * C	0.458	1	0.458	0.486	0.486
A * B * C	0.458	1	0.458	0.486	0.486
Error	241.576	256	0.944		
Sum	258.996	263			

on the subjective evaluation scores, such as durability, convenience, appearance, texture, and size, with product image, product title, and product description as factors, and the amount of information in each factor as the level. A paired *t*-test was performed between the levels of each factor that showed significant differences in the results of the three-way ANOVA. Three-way ANOVA and paired t-tests were performed using SPSS version 28. In this study, the significance level was set at 1 %. The results of the three-way ANOVA are presented in Table 3. As shown in Table 3 (a) and 3 (b), the results of a three-way ANOVA for "durability" and "Convenience" showed significant differences for two factors of "product image," and " product description," as well as the interaction effect between "product image" and "product description." Also, as shown in Table 3 (c) and 3 (e), the results of a three-way ANOVA for "appearance" and "size" showed significant differences for one factor of "product image." Moreover, as shown in Table 3 (d), the results of a three-way ANOVA for "texture" showed significant differences for two factors of "product image" and "product description." The results of the paired *t*-test between the levels of factors that showed significant differences in the three-way ANOVA are shown in Table 4. As shown in Table 4, the subjective evaluations of durability, convenience, and texture received high scores when there was a high amount of information in the image and product description. In addition, the subjective evaluations of appearance and size received high scores when there was a high amount of information in the product image. However, the subjective evaluations of durability and convenience indicate an interaction effect between product image and description. Therefore, multiple compari-

Table 4: Results of *t*-test for each subjective evaluation of functional elements

Item	Conditions	Average for high amount of information	Average for low amount of information	Difference in mean value	T Value
Durability	Product image	4.061	2.902	1.159	–11.068 **
	Product description	4.091	2.871	1.220	–1.945 **
Convenience	Product image	4.280	3.288	0.992	–9.595 **
	Product description	4.447	3.121	1.326	–1.554 **
Appearance	Product image	4.621	3.447	1.174	–11.478 **
Texture	Product image	3.720	2.833	0.886	–9.121 **
	Product description	3.515	3.038	0.477	–5.250 **
Size	Product image	3.583	3.091	0.492	–6.443 **

Note: ▭ High average.

Table 5: Results of multiple comparisons for each factor and level combination

(a) Durability

Conditions/Level	Average for high amount of information	Average for low amount of information	Difference in mean value
	Product description	Product description	
Product image/High	4.485	3.636	0.848 **
Product image/Low	3.697	2.106	1.591 **
	Product image	Product image	
Product description/High	4.485	3.697	0.788 **
Product description/Low	3.636	2.106	1.530 **

(b) Convenience

Conditions/Level	Average for high amount of information	Average for low amount of information	Difference in mean value
	Product description	Product description	
Product image/High	4.727	3.833	0.894 **
Product image/Low	4.167	2.409	1.758 **
	Product image	Product image	
Product description/High	4.727	4.167	0.561 **
Product description/Low	3.833	2.409	1.424 **

Note: ▭ High average.

sons were conducted by combining each factor and level. As presented in Tables 5 (a) and 5 (b), the subjective evaluations of durability and convenience received high scores across all combinations when product image and description contained a high amount of information.

3.2 Characteristics of sites visibility for each factor

As in Section 3.1, ANOVA and paired *t*-tests were performed on the evaluation scores of the visibility of e-commerce sites. The results of the three-way ANOVA are presented in Table 6. As shown in Table 6, the results of a three-way ANOVA for "visibility of e-commerce sites" showed significant differences for three factors of "product image," "product title," and "product description." The results of the paired *t*-test between the levels of factors that showed significant differences in the three-way ANOVA are shown in Table 7. As shown in Table 7, the evaluations of "visibility of e-commerce sites" received high scores when there was high amount of information in the image and product description. However, when the product title contained a high amount of information, the visibility score was low.

4. Conclusion

This study focuses on a method for providing product information in an online shop for suitcases. Accordingly, an experimental study was conducted to examine the effect that differences in the amount of information in the "product image," "product title," and "product description" on the site have on users' perception of product functions. Moreover, the visibility of e-commerce sites was evaluated. Table 8 shows the index obtained using the results from sections 3.1 and 3.2. In Table 8, "✓" indicates that the item has an impact. Table 8 reveals that it is important for e-commerce sites to make it easy to recognize the durability, convenience, appearance, texture, and size of suitcases by including a high amount of image information.

The reason for this is considered to the human characteristic that more information can be obtained from images than from text [Ito, 2008]. Furthermore, in order to make it easier to recognize the durability, convenience, and texture of a suitcase, not only the amount of information in the image but also the

Table 6: Results of ANOVA for the subjective evaluation of e-commerce site visibility

Conditions	*S.S.*	*df*	*M.S.*	*F* value	*P* value
Product image (A)	44.182	1	44.182	34.714	< .001 **
Product title (B)	10.242	1	10.242	8.048	0.005 **
Product description (C)	19.636	1	19.636	15.429	< .001 **
A * B	2.561	1	2.561	2.012	0.157
A * C	2.561	1	2.561	2.012	0.157
B * C	0.015	1	0.015	0.012	0.913
A * B * C	0.970	1	0.970	0.762	0.384
Error	325.818	256	1.273		
Sum	405.985	263			

Table 7: Results of the *t*-test for subjective evaluation of e-commerce site visibility

Item	Conditions	Average for high amount of information	Average for low amount of information	Difference in mean value	*T* Value
Visibility	Product image	3.902	3.083	0.818	–7.467 **
	Product title	3.295	3.689	0.394	4.076 **
	Product description	3.765	3.220	0.545	–5.038 **

Note: ▭ High average.

Table 8: Indicators of e-commerce sites

Confitions / Items	Product image		Product title		Product description	
	High	Low	High	Low	High	Low
Image of durability	✓	–	–	–	✓	–
Image of convenience	✓	–	–	–	✓	–
Image of appearance	✓	–	–	–	–	–
Image of texture	✓	–	–	–	✓	–
Image of size	✓	–	–	–	–	–
Ease of viewing E-Commerce sites	✓	–	–	✓	✓	–

Note: ✓ Impactful factors and levels.

amount of information in the product description is important. The product description supplements the information that cannot be provided by images alone, making it easier to recognize a suitcase's durability, convenience, and texture. However, the amount of information in the product title did not significantly differ among the indicators. It can be assumed that users do not try to evaluate the functionality of a suitcase based on the product title. However, it was also shown that if the product title contained too much information, the sites became less user-friendly. Therefore, it is necessary to consider these factors when designing e-commerce sites. In this study, an indicator for the image of perception of product functions and visibility of e-commerce sites was presented. However, this indicator does not necessarily lead to users' purchasing intentions. In the future, we will conduct discussions considering users' purchasing intentions.

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