Examining Kansei design keywords in Human Design technology (2)

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Abstract

This study's purpose is to estimate of design and ambiance of goods by using 5 Kansei design items. 5 Kansei design items are shape , color , sense of material , fit and functionality/convenience.

Introduction

At first, we can say that the good designers who has much of experience can understand how to use 5 Kansei design items intuitively. On the other hand inexperienced designers and engineers can't design quickly, because they do not know how to use 5 Kansei design items. So they take longer time in designing. This is very important problem because period to design is more shortly.

Moreover, it is all so very big problem that developers can not share information. Sometimes there is a big gap between the planner's feeling and the designer's one about ambiance.

So this study's purpose is to alleviate these problems through examination into the way of estimating ambiance

Method

1) I select image words (The word describing about item image) variously from catalogs and so on [the book related to the design, the magazine (design magazine, guide)] . Convertible term is unify.

2) A questionnaire was done about 50 samples targeting 115 university students. I select sample items variously from the catalog and so on [the book related to the design, the magazine (design magazine, guide)] . They are clipped with PhotoShop only in the part of the photograph. If there are specifications such as the characteristic function which is not understood, sense of material and color variation, they were added into bottom part of photograph. These are introduced to the public on the homepage. 115 university student see it, and answer t he following contents.

The contents

1: Weight of 5 Kansei items. I make them answer about weight of the 5 Kansei items by five steps. (1: not important 2: not so important 3: so so 4: a little important 5: important). It is the thing of whether to be how important as a factor that it feels the Kansei of the goods weight of the 5 Kansei items.

2: I make them select the image word from table.1 first choose it. When there is no ambiance, I make them answer with 'nothing'.

3) I ask the frequency of the image words.

4) I Classify the image words by using the principal component analysis, correspondence analysis, cluster analysis from the result of 3).

5) Do canonical correlation analysis. Explanatory variable is 5 Kansei items' value of weight which collected the results of 2). Criterion variable is the result of 4) (classified image words).

Result

Show the result of correspondence analysis in the figure.1.

Show the result of cluster analysis in the figure.2.

Show the result of the principal component analysis in the table.2. The principal component score takes out a thing beyond 0.15. Rearrange it in order that the principal component score is expensive.

image word	means										
Akarui	bright	light									
Atatakai	genial	mild	warm								
Bukotsuna	rusticity	boorishness	uncouth	unrefined							
Danseiteki	for men	masculine	manly	manlike							
Dentouteki	traditional										
Ganjyou	solid	firm	stone	strongly-built	strong	tough	robust				
Gocyagocya	mess	mixed-up	complicated	complex	intricate						
Gouka	splended	gorgeous	mostlouxurious								
Hanayaka	showy	fire	bright	splendid	gaudy	gorgeous	flowery	florid	specutaclar	brilliant	glorious
Joseiteki	for women	womanish									
Jouhinn	elegant	refined	polished	tasteful	graceful	genteel	delicate				
Jyuukou	deep	depth									
Kaikoteki (Retoro Kurasikku)	recollection	retrospection	classical (retrospective)		think of the good old days						
Kakkoii	smart										
Karui (Karoyaka Keikai)	light	airly	nimble	light-hearted	cheerful						
Katakurushii	formal	stiff	ceremonius								
Kateiteki	homely	domestic									
Katsudouteki	active	energetic	dynamic								
Kawaii	dear	loving	charming	lovely	sweet	pretty	comely	cute	tiny		
Kikaiteki	mechanical	machine									
Kindaiteki	modern										
Kinouteki	functional										
Koukyuuna	high class	high grade	exclusive								
Kuuru	cool										
Marui	round	rotund	globular	spherical							
Miraiteki	future	coming	to come	prospective	advance	new	up-and-coming				
Mukiteki	inorganic										
Ochitsuita	calm	cool	quiet	serene	placid	composed	self-possessed	staid	deliberate	poised	quiet-mannerd
Osyare	stylish	smart	dandy	duke	fop (onna)	making-up	finely	tasteful (otoko)			
Otonappoi	for adult										
Poppu	pop	popular									
Sappari	neat	neatly	refleshed								
Sawayaka	delightful	refleshing	reviving								
Seiketsuna	clean	neat	pure								
Seiyoufuu	foreign	european	western-style								
Seizenn	ordery	regularly	systematically								
Senrensareta	refined	polished									
Sensai	delicate	slender	exquisite								
Shittorishita	gently	softly									
Soboku	simple	naive	artless	unsophiticated							
Sukkirishita	neat	streamlined	clear-cut	eliminated of the waste							
Tanoshii	merry	pleasant	happy	cheerful	delight						
Tokaiteki	urban	urbanity									
Touyoufuu	orientalism										
Tsumetai	cold	chilly	icy	frosty	freezing	cool					
Yasashii (Yuugana)	gentre	tender	quiet	elegance	grace	refinement	gracefully				
Yasuraida	peaceful	tranquil	calm	quiet	restful						
Yawarakai	soft	tender	plastic	gentle							
Yuukiteki	organic										
Zannshinnna	novel	original	up-to-date	daring	new	untrad	unconventional				

Table.1: means of image word

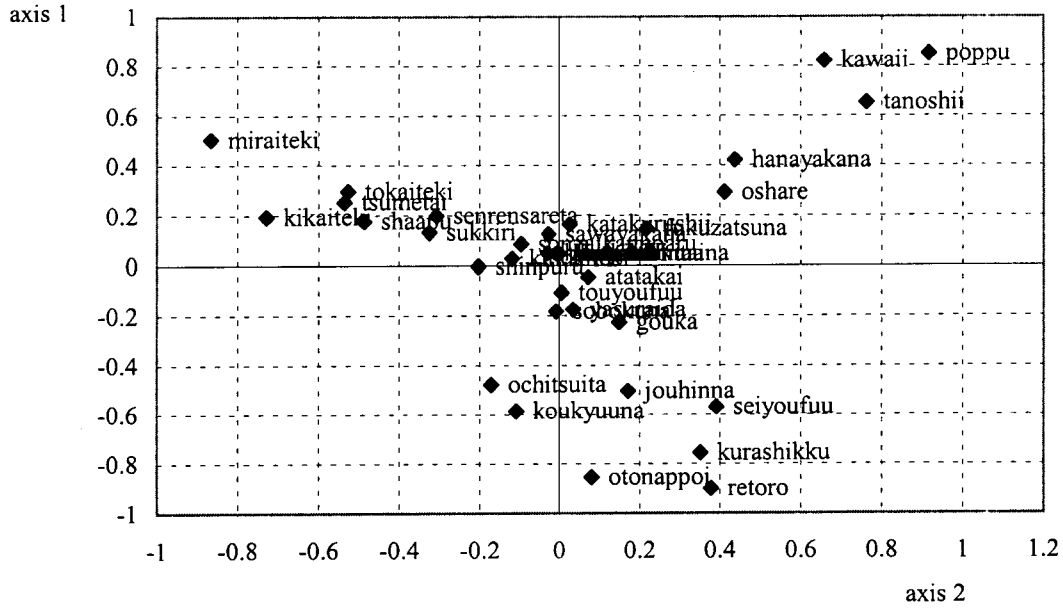

Figure.1: the result of correspondence analysis

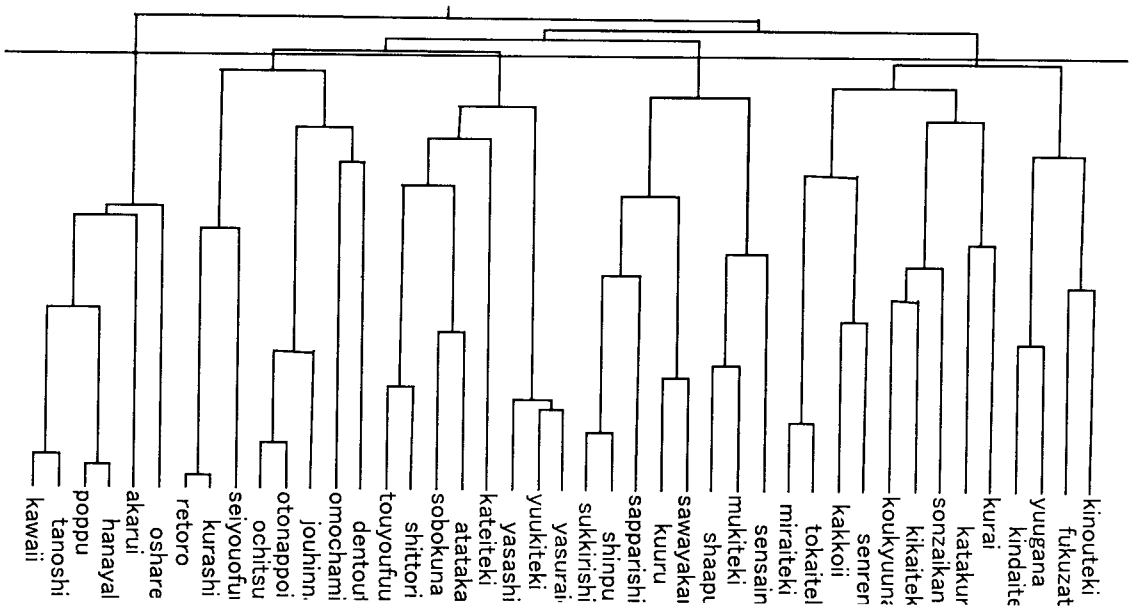

Figure.2: the result of cluster analysis

principal component 1		principal component 2		principal component 3		principal component 4	
ochitsuita	0.256	tokaiteki	0.325	sappari	0.306	yasuraida	0.314
sukkiri	0.241	miraiteki	0.288	sappari	0.264	yasashii	0.313
shinpuru	0.213	senrensareta	0.223	sukkiri	0.252	yuugana	0.261
shaapu	0.199	kuuru	0.215	sawayaka	0.216	yuukiteki	0.251
sappari	0.198	kakkoii	0.198	akarui	0.194	atatakai	0.249
shittori	0.189	shaapu	0.192	poppu	0.178	kindaiteki	0.218
jouhin	0.178	kikaiteki	0.166	kawaii	0.161	kateiteki	0.216
mukiteki	0.167	sukkiri	0.163	hanayaka	0.159	fukuzatsu	0.196
yuukiteki	0.159			shinpuru	0.153	kinouteki	0.184
otonappoi	0.153					kikaiteki	0.157
principal component 5		principal component 6		principal component 7		principal component 8	
sobokuna	0.297	oshare	0.386	mukiteki	0.279	kateiteki	0.263
retoro	0.235	kakkoii	0.339	kindaiteki	0.272	sensai	0.246
kurashikku	0.181	sawayaka	0.221	oshare	0.272	seiyoufuu	0.241
kateiteki	0.163	onzaikannoan	0.204	retoro	0.218	onzaikannoan	0.232
		yasuraida	0.188	kurashikku	0.215	senrensareta	0.211
		yuuga	0.183	kakkoii	0.194	kinouteki	0.181
				shinpuru	0.179	kikaiteki	0.163
				atatakai	0.153	kakkoii	0.158
						shaapu	0.154

Table.2: the result of principal component analysis

I compare the result of the principal component analysis, correspondence analysis, cluster analysis. The result what is classified image words as shown in the table 3. The name of each group is given temporarily.

simple	advance	light	soft	retorospective
sukkiri	tokaiteki	akarui	yasuraida	retoro
shinpuru	miraiteki	poppu	yasashii	kurashikku
shaapu	senrensareta	kawaii	yuukiteki	ochitsuita
sappari	kakkoii	oshare	atatakana	otonappoi
mukiteki	kikaiteki	hanayaka	yuugana	dentoutekina

Table.3: classified image word

Show the result of canonical correlation analysis in the table 4: the structure coefficient, the table 5: weight coefficient.

When the numerical value (absolute value) of criterion variable is seen about each axis of the table 3, a axis 3 is advance, retrospective, and soft and the retrospective of the axis 5 are simple and simple expensive with the axis 1 with the axis 2 which light with the axis 4 with being simple.

I compare that explanatory variable, and criterion variable. I decide that each criterion's axis shows it. (When the value of criterion variable is a minus, the sign of explanatory variable is made to be reversed, too.)

And, relational expressions are asked from the table 5. Show the result that these were collected in the table.6.

Weight of each axis is looked for when weight of 5 Kansei items is substituted for the relational expressions of the table 5. The ambiance which goods have by using this relational expressions can be predicted.

Conclusion

This study result is applicable only to the student before and after 20 years old. When design is done, we can say that it is possible that the ambiance of the goods is predicted to a certain extent by using 5 Kansei items.

Future research

It faces in the wider generation layer (Even the one by the generation is acceptable.), and examination is sometimes done as a future subject.

And, there is it to do an analysis (in such cases as the precise machine for example, the furniture, the stereo system by the kind of the goods).

Using a neural network as a future view is considered. For example, if I want to do simple design, I input `simple` to the neural network. It outputs weights of 5 Kansei items what is necessary for the simple design. It makes us be able to share information easier between the developers not only 5 Kansei items ambiance predict but also ambiance 5 Kansei items can look for by using this .

References

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6. S.Ishimura : Method of multivariate analysis by SPSS , Tokyotosho , Tokyo (1998)

	axis1	axis2	axis3	axis4	axis5
explanatory variable					
shape	0.6948	-0.125	-0.1394	-0.6941	0.021
color	0.775	0.1355	-0.3019	0.1702	-0.5109
sense of material	0.1249	-0.5277	-0.5152	-0.2364	-0.6201
fit	0.0042	0.0234	0.545	-0.4487	-0.7079
functionality/convenience	0.3104	0.6267	0.6861	0.0589	-0.1916
criterion variable					
simple	0.19712	-0.0594	0.6072	-0.7637	0.0752
advance	0.45921	-0.8406	-0.0556	0.2806	0.0269
light	0.73008	0.6279	-0.1058	0.2219	0.1112
soft	0.09877	-0.0162	-0.5453	-0.4173	-0.72
retorospective	-0.1095	-0.0595	-0.6064	-0.371	0.6922

Table.4: structure corfucent

	axis1	axis2	axis3	axis4	axis5
explanatory variable					
shape	0.5236	-0.0407	-0.0529	-0.8829	0.5207
color	0.7373	0.4832	-0.739	0.6522	-0.45
sense of material	-0.3825	-0.7735	-0.6469	-0.1271	0.4454
fit	-0.2807	0.5473	0.4678	-0.4954	-0.7221
functionality/convenience	0.3666	-0.8113	0.5568	0.4057	0.147
criterion variable					
simple	0.3721	-0.0873	0.5303	-0.775	0.1006
advance	0.6114	-0.7927	-0.0706	0.169	0.0572
light	0.8583	0.5152	-0.1155	0.1028	0.134
soft	0.1902	-0.032	-0.544	-0.4489	-0.6898
retorospective	-0.0042	-0.0758	-0.6022	-0.4058	0.6924

Table.5: weight coeficent

axis1	light	$Z_1=0.5236X_1+0.7373X_2-0.3825X_3-0.2807X_4+0.3666X_5$+constant term
axis2	advance	$Z_2=-0.0407X_1+0.4832X_2-0.7735X_3+0.5473X_4-0.8113X_5$+constant term
axis3	retorospective	$Z_3=-0.0529X_1-0.739X_2-0.6469X_3+0.4678X_4+0.5568X_5$+constant term
axis4	simple	$Z_4=-0.8829X_1+0.6652X_2-0.1271X_3-0.4954X_4+0.4057X_5$+constant term
axis5	soft	$Z_5=0.5207X_1-0.45X_2+0.4454X_3-0.7221X_4+0.147X_5$+constant term

Table.6: relational expression