

Comparative Analyses on Logo Image Designs between Arab and Japan

○Ahmad Eibo, Toshiyuki Yamashita, Keiko Kasamatsu

Tokyo Metropolitan University
6-6 Asahigaoka, Hino. Tokyo 191-0065 Japan
eibo@eiboenterprise.com

ABSTRACT

With the present announcement of the International Olympic Committee (IOC) that upcoming 2020 Olympic Games is scheduled to be held in Tokyo and with various initiatives of Japanese government aimed at increasing foreign visitors to Tokyo and stimulating greater foreign products consumption, Arabian products are beginning to spread throughout Japan regional market. This paper is divided into two surveys. Survey I and survey II compare products and corporate logos of Arabic alphabetic design to products logos of Japanese characters design and corporate logos of English alphabetic design, respectively. Factorial invariances showed that extracted main images -- "Familiar & Favorable", and "Creative & Innovative, "Traditional & Consistent" -- were the same in both surveys. Unpredictably our application of cluster analyses for survey I as well as average scores comparison of survey II revealed that Arabic logotypes designs are creative but not as familiar to Japanese people as English alphabetic logotypes. More importantly rough sets analyses clarified that logo familiarity image correlates with the familiarity of language characters used in design to be known by consumers. Our findings highlighted future work new theme and suggested that in order to promote Arabic corporate and products in the Japanese marketplace, it is extremely important to familiarize Japanese with the Arabic alphabets.

KEYWORDS

Arab, Japan, 2020 Olympic, Logos, Design, Cluster analyses, Rough sets.

1 INTRODUCTION

Although people read periodicals for less than ten minutes per day on average, they watch television for about three hours per day, and outdoors they see many billboards and shop fronts. Within this visual "the clamor of market", people form impressions of corporate identities and products brands. Enhancing a corporation's image is important for

corporate survival in the current competitive marketplace. Among the strategies incorporated for obtaining effective brand image is logo formation, which represents a vital appeal in commercials for consumer products. Logos appear on television, packaging, letterhead, business cards, advertising signs, annual reports, and product designs. Logos are considered a critical in-store recognition aid for speeding up the selection process for preferred product. This explains why researches on the psychological effects of logo design structures are many [1, 2, 3] Okata & Yamashita [4] have aggregated these previous studies into three effects: 1) Recognition: People's awareness of logo's existence, 2) A common shared meaning: Commonality between people's perception of logo and intended logo's image, and 3) Positive effect: Logo design's favorable impression on people. Since these three relatively improve consumer products purchase in marketplace and employment for human resource professionals, they are arguably able to influence the logo industry significantly [4, 10].

2 PROBLEM STATEMENT

With the lack of resources in Japan, the Arab world with its resource of oil has been important to Japan great economic development. Although Arab oil contribution to Japan is historical, it is unfortunate to declare that Japan's image in Arab is still ambivalent in contrast to the Arab world where people's image in Japan is being extremely positive due to the diverse curricula of compulsory education being taught in most of the Arab countries. Although this had reflected trade relation unfavorably between both ends [5] "made in Arab" products have begun to increase recently in Japan marketplace, in part, as a result of the development of diplomatic and commercial communications between Japan and Arab countries [6]. However,

since Japan has adopted English in compulsory education even daily life Japanese people have become much more knowledgeable of English language alphabets than other foreign languages [7]. The need for appropriate image of Arabic alphabetic logotype design to influence Japanese people positively is compelling.

3 PURPOSE

Although evolutionary psychology suggests that people from different cultures response to visual stimuli is genetically programmed and relatively immune from cultural influence [8] a number of empirical research data indicates that emotional reaction to individual's preferred design attributes is influenced by cultural differences [9, 10] Therefore, in order to understanding how logos bring image or cause impression on people, it is extremely important to grasp the psychological effect of logo's attributes on one's personality traits. It was the mismatched image and diversity rhetoric of Arab in Japanese society that led us to examine the differences of Japanese consumer perception towards the influence of Arabic, Japanese, and English logotypes images attempting to utilize our findings in improving Arabic logotypes design for the Japan marketplace.

4 SURVEY I

In survey I, in order to ensure that the questions are designed to address the needs of this research and are asking the correct questions, the questionnaire structure was based on empirical Japanese research previously conducted [4, 11, 12] A booklet of 12 pages where each contained pair of product Logos from Arab and Japan. Each pair of logos appeared on separate page with five-point rating scales: ("1. Yes", "2. Somewhat Yes", "3. Neither way", "4. Somewhat No", and "5. No") to be evaluated by respondents. Subjects participated in this study were 22 undergraduate students (18 females and 4 males). We firstly show all participants four example logos (Biscuits, Soft drink, Soap, Fruit can) to illustrate the task, and then gave them the questionnaire booklets to simultaneously rate his/her answers one at a time, each logo of the following 12 products: Washing detergent, Laundry Detergent, Glass detergent, Dishwasher detergent, Soft drink, Perfume, Soap, Beer, Biscuits, Fruit can, Toilet Paper, and Tobacco in

local Japan and Arab market as shown in Figure 1.



Figure 1. Example of product logos

The description of the 12 logo image questions are as follows: "1. Energetic: motion sense", "2. Innovative: inspiration sense", "3. Familiar: recognition sense", "4. Consistent: solid sense", "5. Reliable: professionalism sense", "6. Favorable: goodness sense", "7. Traditional: custom sense", "8. Promotable: progress sense", "9. Futuristic: vision sense", "10. Creative: skill sense", "11. Characteristic: feature sense", and "12. Luxurious: class sense."

4.1 Factor Analyses

The validity of cross-individual comparison scores are vital to many practices in applied psychological research. The premise of researching in individual personality traits or perception is to construct comparability; hence the utilization of an adequate analyses method is important for true representation of the collected data. Relative factorial invariance is widely tested with Factor Analysis that allows one to empirically test obtained data and then translate it into factor analytic language, so that the main factors can be clarified [4, 10] In our survey, the correlation matrix in the evaluation data of the 22 products logotypes was examined by Factor Analysis method application [10] Analytic procedures

revealed three groups of substantially correlated variables representing three main factors with given values equals or more than 1 ($\lambda \geq 1$) and cumulative contribution rate of 62.514%. The following three variables combinations "3. Familiar" and "6. Favorable", "10. Creative" and "2. Innovative ", and "7. Traditional" and "4. Consistent" have high factor loadings scores, each

pair was considered a main factor and respectively represented the level of the following images: 1) "Familiar- Favorable", 2) "Creative-Innovative" , and 3) "Traditional-Consistent" used in logos design. For the sake of simplicity, we employed Varimax rotation technique to determine the dimensionality of extracted factors and their relationships as in Table 1 below.

Table 1. Factor loadings

Item	Factor 1 (F1)	Factor 2 (F2)	Factor 3 (F3)
	Familiar-Favorable	Creative-Innovative	Traditional-Consistent
3. Familiar	0.857	-0.049	-0.024
6. Favorable	0.851	0.134	0.114
5. Reliable	0.842	-0.093	0.298
12. Luxurious	0.582	-0.270	0.350
8. Promotable	0.421	0.274	0.416
10. Creative	-0.084	0.824	0.144
2. Innovative	-0.030	0.792	-0.055
11. Characteristic	-0.041	0.727	0.201
1. Energetic	0.333	0.568	-0.328
9. Futuristic	0.339	0.151	0.727
7. Traditional	0.190	-0.155	0.691
4. Consistent	0.054	0.441	0.626
Eigenvalue	2.959	2.575	1.967
Factor contribution ratio	24.661	21.459	16.394
Cumulative contribution ratio	24.661	46.120	62.514

4.2 Cluster Analyses

There has been a traditional way to reduce the dimensionality of the data is to use some variant of principle component analysis, a technique that permits us to determine which traits are related. In psychology, using cluster analysis faces one hurdle; the manner in which the technique can be applied to gathered data and the way in which the data can be interpreted. Nevertheless, if we wish to determine which variables are the most similar or different using the results of the derived principle factors of Varimax technique, it is worth using cluster analysis approach to define similarities and differences among obtained variables more directly by determining the multi-dimensional distances between various groups of variables and then selecting those groups of variables within which the distances are relatively small [11] Since the

implantation of factor analyses helped in reducing the dimensions and minimizing multicollinearity effect in our data, it made it easier to run the cluster analyses. Based on the information found in the data describing products logs of Arab (A) and Japan (J) and their relationships with logos image of "Favorable-Familiar", "Creative-Innovative" and "Traditional-Consistent", we decided to choose only meaningful variables for analyses. Cluster analyses clarified two useful groups among Japanese and Arabic logotypes.in our data. To ensure good indiscriminant interpretation across clusters we consider in particular, are those clusters with great homogeneity in group (J) and group (A) of {7 (J), 18 (J), 10 (J), 19 (J), 15 (J), 14 (J)} and {4 A), 8 (A), 1 (A), 12 (A), 24 (A)}, respectively. as far as for the remaining group of {3(J), 20(A), 6(J), 2(J), 22(J), 9(9), 17(A), 5(A), 13(A), 21(A), 16(A) , 11(J), 23(J), it was omitted as shown in Table 2.

Table 2. Cluster

Number of clusters	Stimuli	Factor 1 (F1)	Factor 2 (F2)	Factor 3 (F3)
		Familiar-Favorable	Creative-innovative	Traditional-Consistent
1	3 (J)	0.534	-0.026	-0.388
2	20 (A)	0.447	-0.031	-0.422
3	6 (J)	0.661	-0.010	0.013
4	2 (J)	0.644	-0.407	-0.472
5	22 (J)	0.615	-0.594	-0.158
6	9 (A)	0.191	-0.168	-0.307
7	17 (A)	0.137	0.073	-0.372
8	5 (A)	-0.105	-0.128	-0.551
9	7 (J)	1.051	0.417	0.116
10	18 (J)	0.742	0.683	0.305
11	10 (J)	0.844	-0.401	0.500
12	19 (J)	0.477	-0.252	0.405
13	15 (J)	0.446	-0.434	0.964
14	14 (J)	0.297	-1.228	0.789
15	13 (A)	-0.881	-0.200	-0.346
16	21 (A)	-0.705	-0.058	-0.329
17	16 (A)	-0.892	0.289	0.016
18	11 (J)	-0.427	-0.381	0.229
19	23(J)	-0.601	-0.322	0.792
20	4 (A)	-0.786	0.628	-0.953
21	8 (A)	-0.542	0.663	-0.698
22	1 (A)	-0.271	0.100	-1.018
23	12 (A)	-0.700	1.357	0.835
24	24 (A)	-1.174	0.431	1.048

The examination number of cases in the final cluster solution in Table 3 shows that average scores of main factor "Favorable-Familiar" and "Creative-Innovative" is significant for Japan group (J) and Arab group (A). Analytic comparison between average scores of two groups (J) and (A)

reveals that in spite of that "Familiar-Favorable" image level for Arabic logotypes is relatively lower than is for Japanese logotypes (-0.698*<0.499*), "Creative-Innovative" image level is, on the contrary, greatly higher for Arabic logotypes than in Japanese logotypes (0.251**>-0.179**).

Table 3. Distribution of cases in cluster

Case	N	% of Combined cases	% of Total cases	% of F1	% of F2	% of F3	
Cluster	Japan (J)	6	54.5%	25.0%	0.499 *	-0.179**	0.030
	Arab (A)	5	45.0%	20.8%	-0.698*	0.251**	-0.042
	Combined	11	100.0%	45.8			
Excluded Cases		13		54.2			
Total		24		100.0%			

4.3 Result & Discussion

The results of clusters analyses were consistent with prior works [12] this is especially true for "Familiar-Favorable", "Creative-Innovative" and "Traditional-Consistent" main images, where the patterns of the path estimates are consistent across response variables and obtained clusters. But the effect of unfamiliarity & creativity on participants was higher for Arabic logotypes than for Japanese logotypes. Our findings reveal that the perception of Arabic and Japanese logotypes by Japanese people towards the same kind of product differs because of the unfamiliarity with Arabic language alphabets and familiarity with the Japanese characters, however, a strong image of creativity was found in Arabic logo design attributes although Arabic alphabets are not well-known in Japan. Would our finding be the same for English logos design? In other words, the question of whether or not English alphabetic logotypes would have about the same effect of Arab logos design on Japanese people is worth asking. A study done by Takahashi [13] showed that although Japanese graduate students do not often understand English, they do not have negative image of it. The sociocultural situation in Japanese is truly unique due to American culture influence. The possible reasons for the extensive filtering of American culture into the Japan are manifold. In Japan, generally Western languages were seen as symbolic of progress and modernization. After World War II Japanese aspired to creating a country similar in economic and technological progression to the United States of America. Through desire to emulate the American way of life, the Japanese people began, willingly, to adopt much more American culture [14] In recent decades, even though Japan has certainly reached its goal of becoming a modern, economically powerful society, America still maintain its allure to the Japanese as a culture which is fashionable, and generally appealing. This is not simply a matter of cultural contact, but part of a complex process of identity reformation mediated by a sense of tendency related to the representation and appropriation of the "other". Despite the evident importance of research on such a wide-ranging and complex phenomenon of cultural and differences, hardly any attempt has been made until recently, hence in this paper we wanted to include studying the significance of English logotype influence [15]

5 SURVEY II

Because we found that Arabic logotypes are unfamiliar by Japanese people, we can now test whether or not this result is the same for English logotypes. Since the first survey examined Arabic and Japanese logotypes, our interest in the second one was focused on Arabic and English logotypes. 50 undergraduate students (35 males and 15 females) participated in this survey. We applied the same questionnaire structure used in survey I for 20 well-known logos of 10 global corporate in Arab and Japan with Arabic and English alphabetic logotypes respectively: FedEx, Burger King, CNN, Subway, Tide, Baskin Robbin, Vodafone, Starbucks, Coca Cola, and Adidas as is shown in Figure 4.



Figure 2. Examples of corporate logos

5.1 Factor Analyses

In survey II, factor analyses also prioritize three significant factors resembling main factors in survey I "3. Familiar" and "6. Favorable", "10. Creative" and "2. Innovative", and "7. Traditional" and "4. Consistent" as is shown in Table 4. Astonishingly, the three influential images of corporate and products logotypes are the same in both surveys as it has been found in relevant research conducted previously [11, 16] In Table 4. Since the result is relatively consistent with what

survey I concluded, it fairly suggest that the association made between three logo images of “Familiar-Favorable”, “Creative-Innovative”, and “Traditional-Consistent” is highly significant. Thus, the combination of logo structures are being

designed based on specific set between the three seems to influence Japanese people perception, and therefore it is recommended to be considered as main images in logos design for products and corporate.

Table 4. Factor loadings

Item	Factor 1 (F1)	Factor 2 (F2)	Factor 3 (F3)
	Traditional-Consistent	Familiar-Favorable	Creative-Innovative
4. Consistent	0.79	0.19	-0.08
7. Traditional	0.75	0.11	0.15
9. Futuristic	0.71	0.35	0.23
12. Luxurious	0.67	-0.01	0.43
5. Reliable	0.67	0.55	0.05
8. Promotable	0.53	0.41	0.38
6. Favorable	0.39	0.75	0.17
1. Energetic	-0.08	0.75	0.37
3. Familiar	0.36	0.75	0.09
11. Characteristic	0.08	0.12	0.83
10. Creative	0.16	0.20	0.78
2. Innovative	0.12	0.44	0.62
Eigenvalue	3.20	2.56	2.28
Factor contribution ratio	26.64	21.34	18.97
Cumulative contribution ratio	26.64	47.98	66.94

the average Scores of factor 1 (F1) and factor 2 (F2) in Figure 3 shows that the image of “Familiar-Favorable” scored low for Arabic logotypes and high for English logotypes although logo designed marks are similar in shapes and colors relatively, indicating presence of unfamiliar attribute towards Arabic logotypes.

In the contrast to what we found in Figure 3, the average Scores of factor 2 (F2) and factor 4 (F3) in Figure 4 reveals that the image of “Innovative-Creative” scored high in Arabic logotypes than in English logotypes. It clarifies high level of creative attribute towards Arabic logotypes.

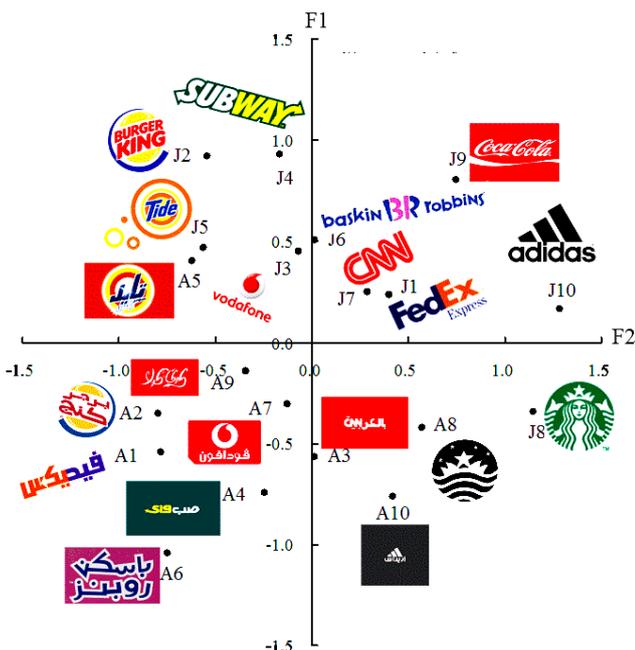


Figure 3. Factor 2 and Factor 3 Average scores

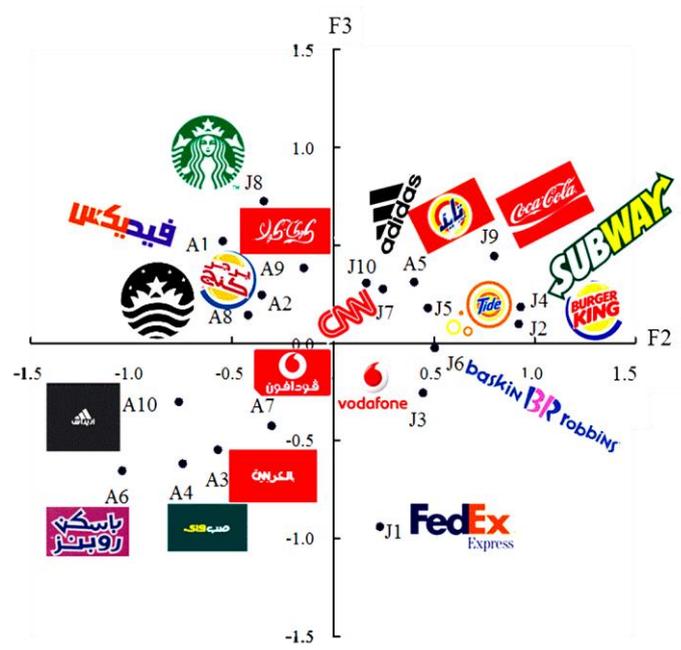


Figure 4. Factor 2 and Factor 3 Average scores

5.2 Rough Sets Analyses

Although Factor Analyses extracted three dimensions of the main corporate logo images "Tradition-Consistent", "Favorable-Familiar", and "Creative-Innovative," how logo attributes influence consumer perception was still unclear. In order to obtain adequate contraction of minimum attributes combination as well as identifying the psychological relationship between logo samples and consumer perception, an additional mathematical analyses approach known as Rough Sets proposed by Zdzisław Pawlak [17] would be imperative. In psychology, it is been used widely for data explicit interpretation and accurate minimal sets by revealing the causal relationship between "If" and "Then" rule decisions [16, 18, 19, 20] Rough Set analyses require binary variables for a case or an event. Each variable takes the values 0 or 1, that is, each case or event is conceived as a configuration of conditions. Data have the form of a decision table in which the columns represent causal variables (logical variables) may take the value 0 or 1 and the rows represent cases [21] In Table 5 the composition

decision table below between logo design structure (logo mark, logo entirety, and logotype) and main logo three images (Traditional-Consistent, Familiar-Favorable, and Innovative-Creative) is shown in Table 5: 1) Target set U, 2) Attribute Set Condition C, and 3) Attribute Set Decision D. Target set U is made of corporate logo, Attribute Set Condition C consists of the following equations: C = {Logo Mark (1 for Present, 0 for Absent), Active-Inactive (1 for Active, 0 for inactive), Solid sense (1 for Present, 0 for Absent), Logotype thickness (1 for thin, 0 for thick), Logotype Italic sense (1 for Present, 0 for Absent), Logotype variation of base line (1 for Present, 0 for Absent), Logotype white color processing of (1 for Present, 0 for Absent), Logotype language type (1 for Known, 0 for Unknown)}, and finally Attribute Set Decision D of three main images of corporate logo $D = \{\text{Traditional-Consistent and Familiar-Favorable, and Creative-Innovative}\}$ with 1 given value when image score is greater than zero and 2 value when image score is lower than zero. At this stage of data preparations, the number of attribute decision sets can be minimized by logical contraction.

Table 5. Decision Table

Target Set U	Attribute Set Condition C								Attribute Set Decision D		
	Logo Mark	Logo Entirety			Logo Type (Font)				Traditional Consistent	Familiar Favorable	Innovative Creative
Sample	Present Absent	Active Inactive	Solid Sense	Thickness	Italic Sense	Baseline Change	White Color Processing	Language			
J1	0	0	1	0	0	0	0	1	1	1	2
A1	0	0	0	0	0	0	0	0	2	2	1
J2	1	1	0	0	1	0	0	1	2	1	2
A2	1	1	0	0	1	0	0	0	2	2	1
J3	0	0	0	0	0	0	1	1	2	1	2
A3	0	0	1	0	0	0	1	0	2	2	2
J4	0	1	0	0	1	0	1	1	2	1	1
A4	0	1	1	0	0	0	1	0	2	2	2
J5	1	0	0	0	1	0	0	1	2	1	1
A5	1	0	1	0	1	0	1	0	2	1	1
J6	0	0	0	0	0	0	0	1	2	1	2
A6	0	0	1	0	1	0	0	0	2	2	2
J7	1	0	0	0	0	0	0	1	1	1	1
A7	1	1	1	0	0	0	1	0	2	2	2
J8	1	0	1						1	2	1
A8	1	0	1						1	2	1
J9	1	1	1	1	1	0	1	1	1	1	1
A9	0	1	1	1	1	0	1	0	2	2	1
J10	1	0	1	0	0	0	0	1	1	1	1
A10	1	0	1	1	0	0	1	0	1	2	2

The goal of rough set analyses is to specify the different configurations of the causal variables that produce the outcome variable. And the goal of logical minimization is to represent the data in a rationally constructed shorthand manner as the Table 6 below demonstrates [22,23]. The sets shown in this table were minimized by contraction technique for interpretation by the following complementary rules were applied based on decision class weights (0.9), (0.6), and (0.444) respectively : 1) If [known language] exists in corporate logo Then ["Familiar- Favorable" Image] exists, 2) If [Solid sense present] And [known language] exist in corporate logo Then ["Traditional-Consistent" Image] exists, and 3) If [Logo Entirety Active]

And [Italic Sense Present] And [White Color Processing Present] exist in corporate logo Then ["Creative-innovative" Image] exists. Extracted sets indicated that in order to impart the image of "Familiar- Favorable" in logo design it is important that the language character used in logo attributes to be known by the consumer. Moreover, the image of "Creative-Innovative" correlates directly with [Logo Entirety] and [Logotype], and not necessarily with [Logo Mark], it reveals that "Creative-Innovative" image in logo design can be imparted by the combination of logo attributes used in logo design not by concentrate on a specific attribute such as active sense in Coca Cola or thickness sense in FedEx logo.

Table 6. Contraction

Decision Class	c	Logo Mark		Logo Entirety				Logotype (Font)									
		Present-Absent		Active-Inactive		Solid Sense		Thickness		Italic Sense		Baseline Change		White Color Processing		Language	
		Present	Absent	Active	Inactive	Present	Absent	Thin	Thick	Present	Absent	Present	Absent	Present	Absent	Known	Un-known
Traditional Consistent	2					0.6										0.6	
		0.6			0.6			0.6			0.6						
										0.6		0.6		0.6	0.6		
Familiar Favorable	1															0.9	
Innovative Creative	3			0.444						0.444				0.444			
		0.444			0.444				0.444								

6 CONCLUSION & FUTURE WORK

Inspection of the factor loadings in both surveys prioritized three influential images significantly and substantially different from zero value "Familiar-Favorable", "Creative-Innovative", and "Traditional-Consistent". This clarifies that logo design characteristics are captured by the same factorial structures and also strongly outperforms simultaneous basics for Arabic logotypes design industry in commercial sectors with three dimensions: 1) Familiarity, 2) Creativity, and 3) Traditionalism. Respectively, the analyses of clusters as well as average scores comparison in survey I and Survey II confirmed that English alphabetic logotypes are familiar to Japanese people than Arabic alphabetic logotypes most likely due to the influence of American culture. Also since rough sets analyses linked between

familiarity in logo image with the familiarity of language used in logo design to be recognized by Japanese, it suggests that the familiarization of Arabic language to Japan consumers is important to promotion Arab corporate and products in Japan marketplace. But in spite of the unfamiliarity in Arabic language, Arabic alphabetic logotypes seem to impart a strong image of creativity for Japanese people, perhaps because of hidden similarity between Arabic alphabets and Japanese characters. Future research can extend our findings in several meaningful ways for upcoming 2020 Olympic. Most notably a cross-cultural research between Arab and Japan investigating Arabic and Japanese language calligraphy psychological influence on one's personality traits.

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