The Need for a Cultural Representation Tool in Cultural Product Design

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Abstract The purpose of the study was to demonstrate the need and usefulness of using a cultural representation tool in cultural product design. In this study, it is believed that culture can be conceptualized with critical cultural elements that define the core features of culture. These elements were called cultural DNAs. To demonstrate the need and the impact of having a cultural representation tool in product design, a between-subject experiment was conducted with 18 student participants majoring in Industrial Design. The participants were tasked with designing mugs that addressed the Confucius culture and were divided into two groups—one was provided with a written representation of Confucius culture (the experimental group) while the other was not (the control group). Results of participants' design outcomes showed that participants who were given a representation tool of the Confucius culture used more types and higher numbers of cultural DNAs in their design. This study also found that the cultural elements used by the experimental group were more relevant with Confucius. Results of this study showed the need of a cultural representation tool in cultural product design.

1 Introduction

At the age of a highly competitive market, organizations are seeking approaches to develop products that are unique and appealing to customers. There are generally two methods used to establish and maintain the uniqueness and worthiness of products. The first method is investigating customer values and integrating them into goods and/or services. The second method is embedding culture attributes with product features. These methods have been recognized important in the product developmental process as they help ensure products hard to be imitated by other companies [1].

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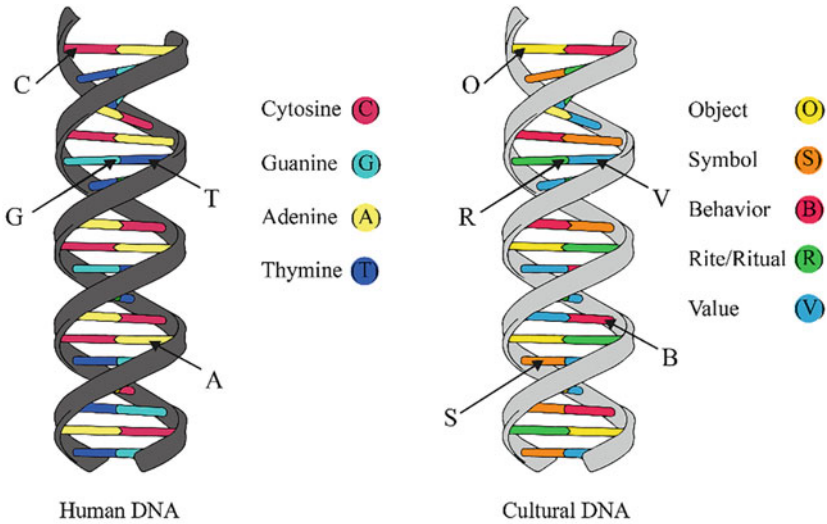e-mail: caitlin7428@gmail.com

Culture is a design element leading to good user experience. Cultural design (from individual to brand products) [2, 3] has been penetrating the consumer markets and can be easily seen in our surroundings. Studies indicated that customers' thoughts and values have profound influence on the success of a product [3]. Customers' cultural backgrounds, aesthetic views, and experiences are correlated with their emotional resonance of products, which affect purchase intentions [4]. According to Röse [5], in the global market, products are more likely to be exported; design will fail if the culture of targeted countries is not considered. In addition, culture-orientation is one essential element for good user interfaces. Consideration of culture in the standard product development lifecycle becomes necessary and imperative.

Efforts have been made globally to develop cultural products to appeal customers. For example, in Taiwan, Lufu (a product design studio) designed a series of Japanese sealing talismans with the attempt to bring good fortune or toward off evil/illness for local customers. The tourist center of the Maokong Gondola (a popular scenic spot with a gondola lift transportation system that carries tourists around the Taipei zoo area) introduced visitors a variety of cat figurines (as the souvenirs). In Japan, Okinawa, the tourist center of the Gyokusendo Cave (a 5 km long cave full of stalactites and stalagmites) introduced crystal balls resembling features of stalactites for promoting tourism. Nevertheless, the above cultural products mostly were not designed to carry/address the right cultural rites/values which could have led to customer confusion. For example, it might be hard for local Taiwanese people to relate Japanese sealing talismans to their daily lives, as well as to understand why cat figurines are used to represent a scenic spot that historically does not contain any piece of cat information. In addition, for Japanese people, they might not be able to see the fit of crystal balls (originated from the western world) to their culture.

Thus, without the integration of culture elements in product design, customers would have difficulties to understand or interact with cultural products [6]. As noted by Boztepe [7], customers are not able to effectively perceive the meanings and values of cultural products Therefore, helping designers integrate cultural elements and meanings into product design becomes essential.

The purpose of this study was to demonstrate the need of a cultural representation tool in product design. In this study, we presumed that culture can be conceptualized with/described by differing levels of cultural elements [8]. These cultural elements were considered critical that form culture and we called them cultural DNAs. A between-subject experiment was conducted with two groups of student participants (one was provided with a representation of cultural DNAs while the other was not) to investigate the differences of their mug design that addressed Confucius culture. Results of this study demonstrated the need to take into account cultural attributes in cultural product design.

Cytosine (C)

Guanine (G)

Adenine (A)

Thymine (T)

Object (O)

Symbol (S)

Behavior (B)

Rite/Ritual (R)

Value (V)

Human DNA

(A nucleic acid containing the genetic instructions used in the development and functioning of all known living organisms)

Cultural DNA

Fig. 1 The human DNA versus cultural DNA

2 Decomposition of Culture: Cultural DNAs

This study utilized the Onion Model [8] as a framework to analyze culture. The Onion Model helps designers decompose culture using the following four layers:

- First, the *objects and symbols* are the tangible elements with the meanings of individual recognition.
- Second, the *behavior* depends on environmental stimulation or other interactive persons in response to individual actions.
- Third, *rituals/rites* demonstrate symbolic values with a series of actions/behaviors which contain the cultural representations of various forms and enrich the conveyed effects during the interactive processes.
- Fourth, *values* are the shared meanings, assumptions, and ideas of a crowd that show traditions and pursuits. Based on the above cultural levels, researchers/designers can clearly define/analyze the characteristic features of a target culture.

In this study, the cultural layers and elements described by the onion model were used to represent cultural DNAs as they are carriers of genetic information of culture (conceptualized in Fig. 1).

3   Method

3.1   Participants

Purposeful sampling was used in this study. Eighteen undergraduate students who majored in Industrial Design were recruited as participants. Nine participants were randomly assigned to the experimental group while the other 9 participants were randomly assigned to the control group. Each participant was required to have completed basic training of hand drawing and sketching in school.

3.2   Equipment

Before the experiment, the researchers provided each participant with A4 papers, makers, and color pencils. Participants in the experimental group received a paper sheet containing a written cultural representation of the Confucius culture (obtained from semi-structured interviews with 30 random participants), which contained cultural DNA information at the levels of objects/symbols, behavior, rituals/rites, and values. Participants in the control group were not provided with the information given to the participants in the experimental group. Participants in the experimental group were told that they did not have to use the provided information to do their design. Participants in both groups were supplied with laptops and were allowed to freely use them to support their brainstorming process.

3.3   Variables

The independent variable was the provision of a written cultural representation (containing two levels: Yes vs. No). The dependent variable were the types and numbers of cultural DNA elements utilized by participants in their sketches.

3.4   Task and Procedure

The task of the experiment was to design a mug that reflected Confucius culture. Prior to the experiment, the researchers ensured that participants understood the goals of the study. All participants were instructed to use the provided pencils and drawing tools to generate at least 5 ideas within 3 hours.

To ensure the quality of the design outcomes, participants were required to (1) name each idea, (2) provide descriptions on the design features of every idea; (3) indicate and explain the used cultural DNAs; (4) add colors and textures to their design. Participants were not allowed to talk to other participants. Both groups of participants performed their design activities in separate conference rooms. To com-

pensate the participants, this study gave each participants a movie ticket after they completed the tasks of the experiment.

4   Results and Discussion

Results of the study are shown in Tables 1 and 2. Participants in the control group drew 52 sketches; participants in the experimental group drew 46 sketches. For both groups, the most used cultural DNAs were objects and values, suggesting that objects and values were the most easily captured cultural DNAs to be integrated into product design.

Table 1 also shows that the cultural DNAs used by participants in the control group were not necessarily relevant to the Confucius culture. The DNAs that were irrelevant to the Confucius culture were identified by researchers and were confirmed by the participants. Comparing the results with those in Table 2, it suggests that participants in the experimental group were more able to use adequate and relevant DNAs to address culture.

Moreover, participants in the control group tended to use fewer number of symbols, behaviors, and rites in their sketches than those in the experimental group. This suggests that participants in the experimental group were influenced by the provision of cultural DNAs, and that participants in the control group were less able to catch cultural DNAs at the level of symbol, behavior, and rite due to the limited relevant information of cultural symbols, behavior, and rites on the Internet.

The statistical analysis (the Mann-Whitney U test) on the average numbers of DNAs per sketch between the two groups indicated that participants in the experimental group averagely used higher numbers of DNAs in their sketches ($U = 108.5$, $p = 0.046$) than the control group did. This suggests that the representation tool of culture inspired participants and made them use more cultural DNAs in the design process.

5   Conclusions

The purpose of this study was to demonstrate the need and usefulness of using a representation tool of culture in cultural product design. In this study, the cultural elements that form and construct culture were called cultural DNAs. A between-subject experiment was conducted with two group of student participants (one was provided with a representation tool of cultural DNAs while the other was not). The aim was to investigate the differences of participants' mug design and to study the effectiveness of the tool. Results of the analysis of participants' design sketches showed that participants who were given the representation tool could integrate higher numbers of and utilize relevant cultural DNAs in their design. The outcomes of this study indicated the need to provide designers with a representation tool to

Table 1 Control (C) group: The number of cultural DNA elements

Participant	O	S	B	R	V	Total # of DNAs	Total # of sketches	Total # of DNAs irrelevant to the Confucius culture	Average # of DNAs per sketch
C1	6	0	0	0	0	6	5	3	1.20
C2	4	0	0	0	0	4	4	1	1.00
C3	6	0	0	0	3	9	6	0	1.50
C4	6	0	0	0	4	10	6	0	1.67
C5	6	1	0	0	0	7	6	3	1.17
C6	3	0	0	0	1	4	5	1	0.80
C7	2	0	0	1	3	6	5	0	1.20
C8	6	0	0	1	3	10	5	0	2.00
C9	11	0	0	0	7	18	10	0	1.80
Total # of DNAs	50	1	0	2	21	74	52	8	
Average # of DNAs	5.56	0.11	0	0.22	2.33				

Note: O = Object, S = Symbol, B = Behavior, R = Rite/Ritual, V = Value

Table 2 Experimental (E) group: The number of cultural DNAs

Participant	O	S	B	R	V	Total # of DNAs	Total # of sketches	Average # of DNAs per sketch
E1	2	2	1	1	2	8	5	1.60
E2	5	2	1	3	0	11	5	2.20
E3	5	0	2	1	1	9	6	1.50
E4	4	0	1	1	2	8	5	1.60
E5	3	0	0	0	3	6	5	1.20
E6	4	0	0	0	4	8	5	1.60
E7	7	1	0	2	4	14	5	2.80
E8	5	2	0	1	3	11	5	2.20
E9	5	0	1	0	5	11	5	2.20
Total # of DNAs	40	7	6	9	22	84	46	
Average # of DNAs	4.44	0.78	0.67	1	2.44			

Note: (1) Participants in the experimental group did not use any cultural elements irrelevant to the Confucius culture; (2) O = Object, S = Symbol, B = Behavior, R = Rite/Ritual, V = Value

support them perform cultural product design. Future studies are needed to investigate whether or not real customers would prefer the design outcomes generated from using the cultural representation tool.

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