Integration of Characteristics of Culture into Product Design: A Perspective from Symbolic Interactions

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Abstract. Cultural insight has become essential for improving designs for global and regional markets. However, little work is done on how to dissect culture and incorporate culture characteristics into design activities to create emotional engagements between products and users. This study, therefore, developed a cultural design model to address this problem. The cultural design model was built based on the notion that meaning evolves from social interactions with objects/symbols in the environment and with people. In the model, the theoretical components of Symbolic Interactions and O'Brien's and Toms' user engagement attributes were adopted and were used to analyze culture and transform cultural characteristics into product design features, as well as to "enable user experience." The effectiveness of the cultural design model was verified through a case study with two groups of Industrial Design students on designing tea cups for Taiwanese tea culture. Results of the study provided evidence of the proposed cultural design model in assisting with cultural design activities.

Keywords: Culture, Symbolic Interactions, Design.

1 Introduction

Design changes culture and at the same time, is shaped by culture [1]. The interest in designing for culture is growing in industry and academia. Cultural insight has become essential for improving designs and product sales in both the regional and global markets. Observing the design of artifacts produced and consumed in our society often reveals cultural situations, people's lives, and how people communicate [2]. It is culture that gives product meaning, as well as provides the rituals and values where artifacts are used [3].

Studies on products and interfaces have indicated that interfaces showing characteristics relevant to culture increase product usability and performance. For instance, Smith and Chang [4] incorporated cultural fingerprints as a diagrammatic means in improving the acceptability of website design. Smith, Dunckley, French, Minocha, and Chang [5] presented a process model for developing usable cross-cultural websites. They

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introduced the concept of cultural attractors (e.g., color combinations, trust signs, use of metaphor, etc.) to define the interface design elements of a website that reflect the signs and their meanings to match the expectations of a local culture. Moreover, Moalosi, Popovic, and Hickling-Hudson [2] integrated socio-cultural factors (including social practice factors, material factors, emotional factors, and technology/design factors) into the conceptual design phase to generate culturally oriented products.

The above studies demonstrated the potential for using cultural dimensions/attributes/characteristics for designing innovative products and interfaces. However, most of them did not investigate how to create "emotional engagements" between products and intended users. This study, therefore, was based on the notion that understanding what and how cultural norms and values can be integrated into product design [2] is not sufficient to successful cultural product design. Rather, cultural product design should take an additional consideration, i.e., engaging user experiences. In this study, we describe the development of a cultural design model from the theoretical components of Symbolic Interactions [6] and O'Brien's and Toms' user engagement attributes [7], with the intention to not only help designers transform culture characteristics into product design features, but also engage users in product use. This study also conducted a case study (consisting of tea cup design) to demonstrate the effectiveness of the model. The aim of this paper is to look at cultural product design from symbolic interactions and take cultural product design to the level of enabling user engagement.

2   Literature Review

2.1   Basis/Philosophy for the Development of Models of Culture

Culture is viewed and defined differently by researchers. It is associated with people, and its content involves a wide range of phenomena, such as norms, values, shared meanings and patterned ways of behaving [8]. Simply put, "*culture is communication, and communication is culture*" [9]. It "*includes race and ethnicity as well as other variables and is manifested in customary behaviors, assumptions and values, patterns of thinking and communication style*" [10]. More specifically, culture is the socially transmitted knowledge and behavior shared by some group of people [8]. In the literature, models of culture were proposed to understand culture [9, 11-13]. They are typically developed based on a level of culture and/or philosophies of metamodel(s) of culture.

- **Levels of culture** correspond to layers of mental programming carried by each individual [14]. For example, a national level corresponds to one's country; a social class level corresponds to a person's educational training and income; a level on cognitive style corresponds to an individual's ethnicity, etc. Therefore, cultural differences exist according to nation, region, religion, gender, generation, and social class, etc.
- **The metamodels of culture** [14] define different layers of culture and provide perspectives to look at culture. For example: the Onion Model is made of three

layers (i.e., symbol, hero, and ritual) around a core (i.e., value). All three layers can be trained and learned through practices except for the core. The Pyramid Model is composed of three layers (from top to bottom: personality, culture, and human nature). The model states that culture should be distinguished from human nature on one side, and from an individual's personality on the other. The Iceberg Model is consisted of two layers, the layers above/below the waterline. The layer above the waterline is 10 percent of the iceberg, representing observational behavior of a culture (e.g., actions, thoughts, and words). The layer below the waterline is the major and invisible part of the iceberg, representing beliefs, values, and assumptions of a culture. The Objective and Subjective Model identifies two layers of culture, subjective and objective culture. Subjective culture (e.g., similarities and differences in power and authority) is difficult to measure as it operates outside of conscious awareness. Objective culture (represented with arts, crafts, literature, social customs, and political structure, etc.) is what is real and concrete and is an externalization of subjective culture.

One of the most-used models of culture is Hofstede's cultural model [11]. It conceptualized culture as programming of the mind. The model, examining culture at the level of country, states that people react differently based on the different cultural values they hold. All of the dimensions in Hofstede's model fall under the scope of subjective culture (including power distance, masculinity and femininity, individualism and collectivism, uncertainty avoidance, and time orientation).

2.2   Interpretation of Culture with Symbolic Interactionism: A Communication Perspective

Symbolic Interactionism, originated in sociology, refers to the way we (learn to) interpret and give meaning to the world though our interactions with other people [6]. In Symbolic Interactionism, reality is composed of objects (or symbols), each of which carries a meaning. Meaning evolves from social interactions with objects/symbols in the environment and with people. In other words, people interact by interpreting another's act based on the meanings produced by their interpretations.

Blumer, one of the pioneers of Symbolic Interactionism, proposed that symbolic interaction is a communicative process involving five elements: the self, the act, social interaction, objects, and joint action. These interrelated elements constitutes a system that explains the idea of culture [16], as culture is constructed, learned, interpreted, and transmitted among a group of people where meanings are given/shared in supporting social interactions.

Blumer explained the five elements of symbolic interaction as follows: the self (the way that one person acts in relation to the attitudes of others) can become an object/symbol of self-indication ("*a moving communicative process in which the individual note things, assesses them, gives them a meaning, and decides to act on the basis of that meaning*") [16]; individual action is yielded from the process of self-indication; joint action (e.g., rites and norms) consists of aligning individual actions through a process of interpretation of others' actions; social interaction means people interact by interpreting another's act based on the meanings produced by their interpretation.

3   Development of a Cultural Design Model

The cultural design model explained in the following includes a three-stage design process (Figure 1) to designing for culture.
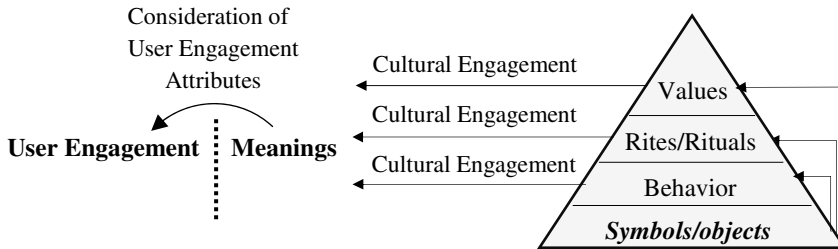

Fig. 1. The cultural design model

3.1   Analysis, Translation, and Engagement

In this study, culture is viewed through the lens of social communication and symbolic Interactions. Culture, at the same time, can be explained by layers in metamodels of culture. Thus, the theoretical components of Symbolic Interactionism and the philosophies of metamodels of culture were used to form the basis for analyzing culture. The decomposition/analysis of culture can be achieved by identifying the following four levels (from bottom to top) of cultural characteristics:

- **Level 1- Symbols/objects** represent tangibles that carry meanings agreed among individuals in a culture. They reflect objective culture and "the self" and "objects" in Symbolic Interactionism.
- **Level 2 - Behavior** is the actions of an individual in responding to stimuli or others. It reflects objective culture and "act" in Symbolic Interactionism.
- **Level 3 - Ritual/Rite** is a set of actions/behaviors performed by individuals to express the symbolic values. It represents a planned set of activities that combines various form of cultural expressions and that often has both practical and expressive consequences [17]. According to Hartley [15], rites allow for social interactions in different levels, and have multiple consequences; rites can serve as an entry point for new comers. Rituals/rites reflect objective culture and "act", "joint action," and "social interaction" in Symbolic Interactionism.
- **Level 4 - Values** are a synthesis of shared meanings, assumptions, and ideals among people that reflects traditions and are worth striving for [18]. They reflect subjective culture.

Design can be linked to culture through the incorporation of cultural values in products [2]. With respect to designing for culture, therefore, addressing cultural values becomes important. Moreover, meanings are conveyed and adjusted among people based on what they have been informed in the social context [19]. This suggests that

symbols and objects in a culture may not necessarily yield meanings by themselves. It is through social behavior and interactions where meanings would take place. Thus, in our proposed cultural design model, addressing cultural symbols/objects in product design is not sufficient. To enable user engagement so that cultural meanings are yielded during user-product interactions, as demonstrated in Figure 1, transforming cultural characteristics in other cultural levels as well becomes essential.

3.2   Catalyst to Enable User Engagement

Bannon [20] noted that the emphasis of product design is not effectiveness and efficiency, but how well a product is able to provide users with good experiences. To be able to enable user engagement with products, our proposed cultural design model adopts O'Brien' and Toms' model of user engagement (Figure 1). It includes the following five elements that should be also integrated into product attributes in the design process:

- **Focused attention** refers to users' perceptions of time passing and their degree of awareness about what was taking place outside of their interaction with the product.
- **Perceived usability** pertained to the emotions experienced by users during their interactions with the product.
- **Aesthetics** refers to users' overall aesthetic impressions of the product's attractiveness and sensory appeal pertaining to specific product features.
- **Endurability** refers to users' likelihood to perceive experiences of product usage as "successful," "rewarding," "worthwhile," and working out as planned.
- **Involvement** refers to users feeling of being drawn into and involved in the use of the product.

4   Case Study

To verify the effectiveness of the model, we conducted a between-subject comparative case study on the tea cup design.

4.1   Participant

Nineteen college students majoring in Industrial Design (sophomore year, mean age=19) were recruited to perform idea-sketching on the topic—Designing tea cups for Taiwanese tea culture. Nine students (three males and six females) participated in the control group. Ten students (five males and five females) participated in the experimental group.

4.2   Procedure

Participants in the experimental group were given the cultural design model to support idea-sketching. Participants in the control group were not given any assistance in their idea-sketching activities. Every participant was allowed to use the Internet to collect any information needed for his/her designs. In this study, all participants were

given drawing tools and instructed to use one and half hour to perform idea-sketching on the design topic.

After the idea-sketching, participants were instructed to select two of their best ideas. Interviews were conducted with the participants (by two researchers in separate groups) to understand participants' thoughts, ideas, tea culture characteristics, and user engagement elements of their selected sketches. Interviews were audio-recorded and notes were taken for later data analysis.

In the study, the demonstrated Taiwanese tea culture characteristics were developed by former semi-structured interviews with six subject matter experts (two females and four males) who have more than 30 years of tea-drinking experiences. The abstracted tea culture characteristics are as follows:

- **Values —** share, interaction, nature, health, art, tradition, value-added, elaboration, passing down, and experience, etc.
- **Ritual/rite —** behave politely and gently when receiving the tea cup and savoring tea, respect seniors around the tea table, savoring tea with gentle movement, and appreciate the tea with both hands holding the tea cup, etc.
- **Behavior —**review the dried tea leaf to determine the right amount of tea to be measured and the right water temperature to be applied, smell the aroma seeping from under the tea cup, sip the tea to appreciate it's aroma, flavor, taste, and fine finish, warm the pot/cups to ensure the water temperature and tea quality, and savoring the aftertaste of the tea in the mouth and throat, etc.
- **Symbol —** appreciation, respect, calm, not being inclination to either side, and warm-heartedness, etc.
- **Object —** tea boat, tea scoop, tea pitcher, tea towel, brewing teapot, pouring teapot, aroma cups, drinking cups, saucer, preparation tray, pewter tea container, tea packaging, and tea table, etc.

5   Results and Discussions

The ideas selected by the participants are shown in Table 1 and Table 2. From the interview with the student participants, we understand that, among the selected/preferred tea cup ideas, participants in the control group overall integrated higher numbers of objects and symbols (Figure 2), whereas participants in the experimental group integrated higher numbers of behavior, rites, rituals, and even values (Figure 2).
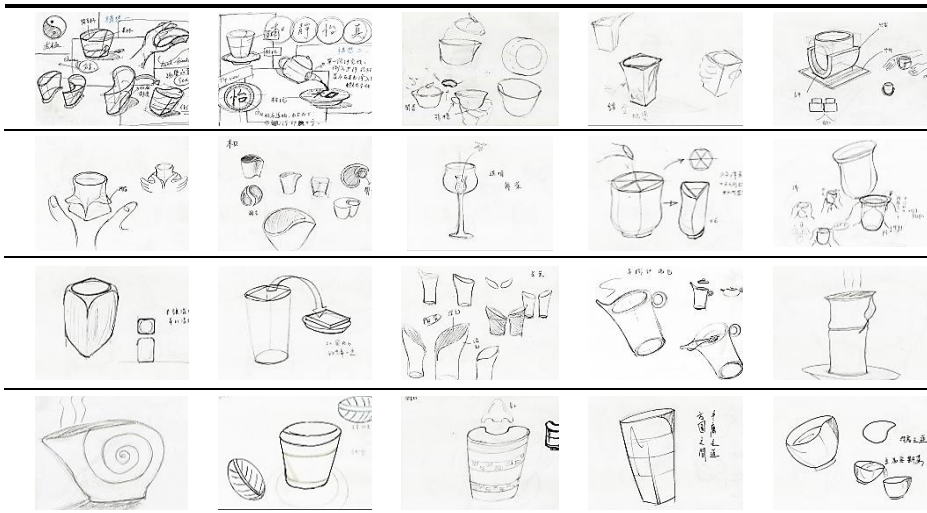
Table 3 shows the average numbers of tea culture characteristics integrated in each selected idea. In average, participants in the experimental group incorporated more cultural characteristics (especially cultural values and behavior) into one idea than their counterparts. On the other hand, participants in the control group emphasized less on culture behavior, rites/rituals, and values, but more on cultural symbols/objects on tea cup design. These results suggested that our proposed design model is effective in helping designers perform cultural product design. This is because, from the perspective of Symbolic Interactions, simply transforming cultural symbols and objects into product design features may not necessarily engage users into the cultural meanings that are typically yielded in the context of social interactions and communications in a culture.

In addition, with respect to user engagement, among the selected/preferred tea cup ideas, participants in the experimental group tended to incorporate more user engagement attributes in their product design features than their counterparts (Figure 3). Table 3 shows similar results with Figure 3. From Table 3, we know that, in average, participants in the experimental group integrated higher numbers of user engagement attributes (especially aesthetics, perceived usability, and involvement) into one idea than their counterparts. These results demonstrate the effectiveness of our proposed cultural design model in helping designers engage intended users through product design features.

Table 1. Eighteen ideas selected by participants in the control groups

Table 2. Twenty ideas selected by participants in the experimental groups
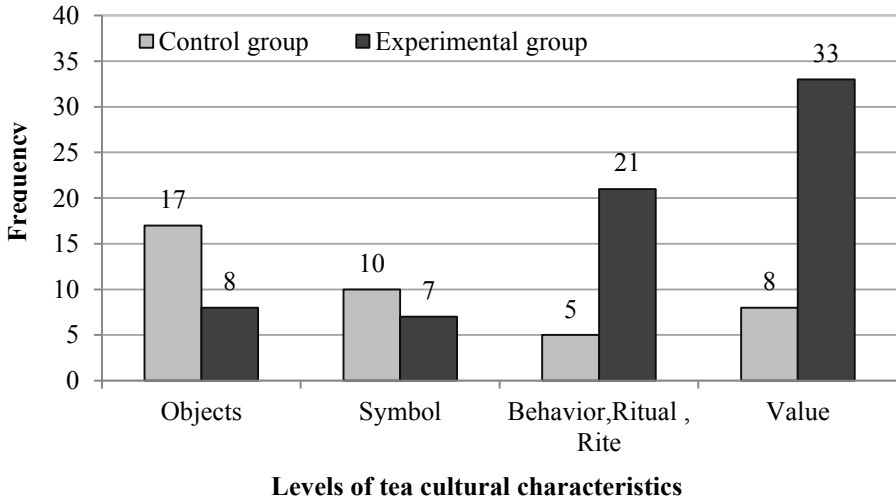
Levels of tea cultural characteristics

Fig. 2. Frequency distribution for levels of tea cultural characteristics addressed in participants' selected sketches

Table 3. The average numbers of tea culture characteristics/user engagement attributes integrated in one selected idea

| Level in the Culture Model	Average Number of Culture Characteristics in One Idea		User Engagement Attribute	Average Number of User Engagement Attributes in One Idea	
	Control Group	Experimental Group		Control Group	Experimental Group
Symbol/Object	1.5	0.75	Focused Attention	0.28	0.55
Behavior	0.17	0.78	Perceived Usability	0.28	0.85
Rite/Ritual	0.06	0.39	Aesthetics	0.11	1
Value	0.44	1.65	Endurability	0.06	0.56
			Involvement	0.28	0.78
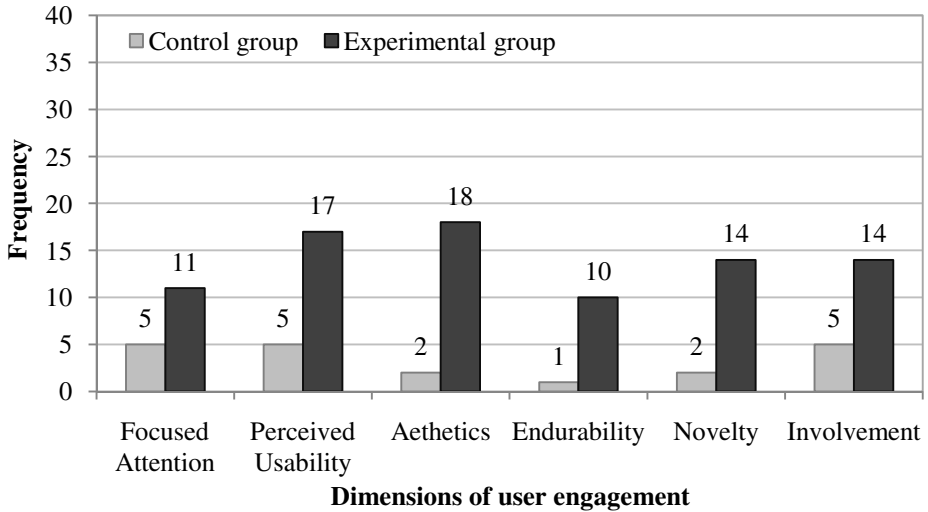
Fig. 3. Frequency distribution for the dimensions of user engagement addressed in participants' selected sketches

6   Conclusions

The purpose of this study was to develop a cultural model from the perspective of Symbolic Interactions. To engage users into an intended culture and product usage, our model suggested designers integrating user engagement attributes, as well as culture characteristics located at the level of "Symbols/objects" and those at other levels into product design. This study conducted a case study on tea cup design to demonstrate the effectiveness of the model. Results of the study showed that participants who were presented with the cultural design model addressed higher number of tea culture characteristics in their design, especially from the levels associated with cultural behavior, rites, rituals, and values. Participants who did not receive the cultural design model seemed to generate ideas from symbols and objects used in the tea culture, with less emphasis on tea cultural characteristics located in other levels. Results of the study also showed that our cultural design model inspired participants to integrate user engagement attributes in their product design features and usage.

In this study, we do not contend that a design idea has to address all cultural characteristics identified in the cultural design model, meaning that the number of cultural characteristics used in a design cannot be used to determine the quality of a design. However, we did find that, when selecting ideas, participants preferred ideas addressing a larger number of tea culture characteristics. The outcome of the study is limited with the amount of time given to participants to understand the tea culture and to perform design activities in demonstrating the efficacy of the cultural design model. Future studies are needed to address the limitations. It is our hope that through this study, the methods and tools for designing for culture can be advanced.

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