CULTURAL DIFFERENCES BETWEEN CHINESE AND DANE IN CARD SORTING

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- **Abstract:** This study was aimed to find out the culture difference between Chinese and Dane when grouping the wedding related concepts. 20 Subjects (10 Chinese, and 10 Danes) participated in this experiment. 30 local Danish images, 30 local Chinese images, and 20 universal images were used as card sorting materials. Subjects were asked to do 3 card-sorting tasks: user-defined sort, color sort, and wedding sort. Results showed that there was more variability existed among the Chinese users than Dane both in the user defined sort and wedding colors sort, and Chinese users felt more difficult to sort by color, and by wedding objects. In the task of wedding sort, Chinese tended to sort cards by thematic based dimension, and Dane by object based.

1. INTRODUCTION

Eastern and Western cultures differ quite systematically in how they group objects, functions and concepts into categories (Nisbett, 2001&2003; Choi, 1997). In an early study by Abel and Hsu (Abel&Hsu, 1949), Rorschach cards were presented to European Americans and Chinese Americans. The investigators found that Chinese American participants were more likely than their European American counterparts to give so-called "whole-card" responses, in which all aspects of the card, or its gestalt as a whole, was the basis of the response. European American participants were more likely to give "part" responses, in which only a single aspect of the card was the basis of the response. Nisbett found East Asians to be holistic, attending to the entire field and assigning causality to it, making relatively little use of categories and formal logic, and relying on "dialectical" reasoning, whereas Westerners are more analytic, paying attention primarily to the object and the categories to which it belongs and using rules, including formal logic, to understand its behavior (Nisbett, 2001).

Images are the visual language of a culture. What we recognize in our culture may have little or no meaning in another. There is a difference between what is comprehensible and what is acceptable to a culture. Because social norms vary greatly between cultures, what is acceptable in one culture can be objectionable in another. In particular, we need to be careful when designing images (Patricia 1993).

So what does it mean for category between Chinese and Dane? We designed the card sorting experiment to find out the culture difference in category. Card sorting can reveal some clues through information category (James 2001).

2. METHOD

Purpose of this pilot study is to analyze user's information structures for compatibility cross culturally using repeated single criterion picture sorts. Pilot study comprises 10 sessions of experiments from ten subjects.

2.1 Experimental participants

10 Danish users (5 males and 5 females) and 10 Chinese users (4 males and 6 females) participated in our experiment. All participants are residents in each group's country, hold citizenship in group's country, have been born and raised in group's country, have attended school in that country, belong to the sizeable group of the population, and have lived in the country for most of their lives. All participants are aged from 20 to 50.

2.2 Experimental design

Totally 80 wedding theme cards including 30 local Danish images, 30 local Chinese images, and 20 universal images were used as card sorting material. Wedding pictures that can be used to design wedding invitation card will be used for the experiments .Two set of cards will be used in these experiments. Each cultural group has 30 cards that belong to their local culture. Second set of cards consists of 20 cards are common in both Chinese and Danish culture. In these experiments 30 cards will be described Local cards 20 cards will be described as Universal cards.(see Figure 1)

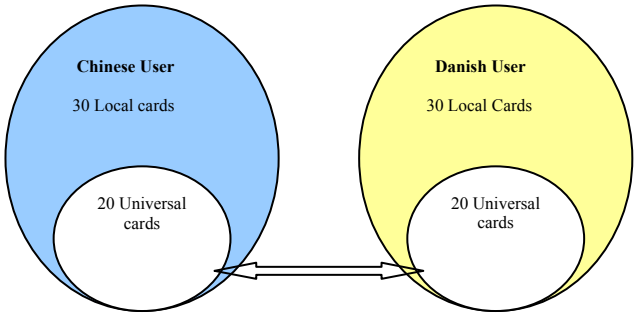

Figure1: Chinese and Danish sample space for wedding invitation cards

We conducted this test in 10 sessions each country. Where one session is for one user and user will perform 6 sorts in one session. Each session will consist of 3 Local and 3 universal sorts.20 cards will be used for universal sorts where as 30 cards will be used for local sorts. Chinese and Danish experiment images shown in Figure2.

Figure2: Chinese and Danish experimental images

There are several sorting techniques which are widely used for card sorting. For this experiment, the approach of repeated single criterion sort will be used. In repeated single criterion sort, the user sorts same

entities repeatedly, categorizing in term of a different criterion each time. The important terminology for these experiments is defined.

Criterion: A criterion is the attribute used as the basis for sort when using the sorting technique. For example the criterion may be 'wedding' or 'wedding colors'. The criterion provides the base of sorting things into categories.
Category: A category is a group into which things may be classified using criteria. For example, the categories under criterion of 'wedding colors' may be 'red', 'pink', 'gold'.

2.3 Experimental tasks

Each participant were asked to sort wedding card into folders "in a way that would help you retrieve them quickly if you were making a wedding card."

2.4 Experimental procedure

First of all, participants were asked to imagine you are working in a company and you have to sort these pictures into file folders in such a way that you will be able to search and find them easily next time you want to design a wedding card. Next, sort the cards into different categories that you feel are related to each other. The following is the regulations:

- There is no restriction of the number of categories you make.
- Each different card can be placed into only one category
- Give a name to each category you make.

Example (see the Figure 3):

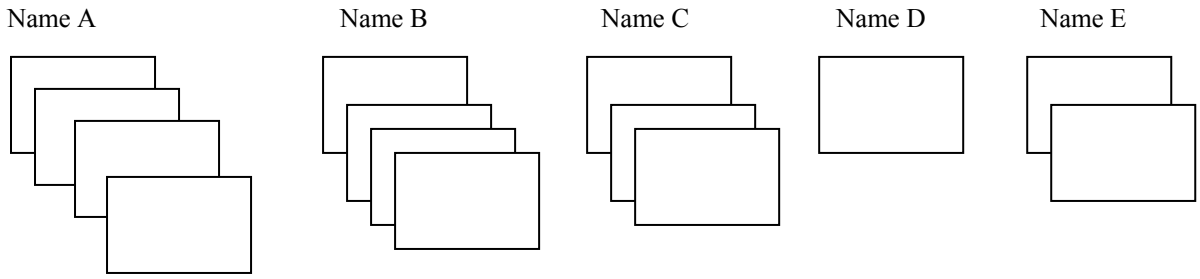

Figure3: Sample of cards after sorting

Each participants need to finish 6 sorts.
Universal (20 cards of pictures)
Universal Sort 1:
Criteria: wedding
Categories: In Universal Sort 1, the subject defines and names his/her own categories and sorts cards into them. When sorting is done, the subject writes down the name of each category he/she created. Experimenter and subject discuss what is the appropriate English name for each category created by the subject.
Universal Sort 2:
Criteria: wedding
Categories: In Universal Sort 2, the experimenter provides the following categories for the subject to use: Flowers, Rings, Hearts, Light, (object-oriented categories) and "Two people together" and "Love" (wedding theme categories). The experimenter writes each category name on a sticky note or piece of paper and places them in front of the subject with the cards to be sorted. The experimenter tells the subject that she can make more categories if she wishes to do so, but only categories related to wedding themes.
Universal Sort 3:
Criteria: wedding colors

Categories: In Universal Sort 3, the experimenter provides the following categories for the subject to use: Red, Pink, Gold, Blue, Violet, Silver. The experimenter writes each category name on a sticky note or piece of paper and places them in front of the subject together with the cards to be sorted. The experimenter tells the subject that she can make more categories if she wishes to do so, but only categories related to colors.

Local (30 cards)

Local Sort 1:

Criteria: wedding

Categories: In Local Sort 1, the subject defines and names her own categories and sorts cards into them. When she is done sorting, the subject writes down the name of each category she created. Experimenter and subject discuss what is the appropriate English name for each category created by the subject.

Local Sort 2:

Criteria: wedding

Categories: In Local Sort 2, the experimenter provides the following categories for the subject to use: Flowers, Rings, Hearts, Light, (object-oriented categories) and "Two people together" and " Love", (wedding theme categories). The experimenter writes each category name on a sticky note or piece of paper and places it in front of the subject with the cards to be sorted. The experimenter tells the subject that she can make more categories if she wishes to do so, but only categories related to wedding themes.

Local Sort 3:

Criteria: colors

Categories: In Local Sort 3, the experimenter provides the following categories for the subject to use: Red, Pink, Gold, Blue, Violet, Silver. The experimenter writes each category name on a sticky note or piece of paper and places them in front of the subject together with the cards to be sorted. The experimenter tells the subject that she can make more categories if she wishes to do so, but only categories related to colors.

2.5 Results

The basis for the analysis introduced in this paper is a definition of a distance function (or metric (Rudin, 1976)) on card sorts that measures how far apart two card sorts are. The distance function is edit distance (Katherine, 2005): the minimum number of operations needed to convert one card sort into another. The basic operation is to move an item from one group to another.

Table 1 showed edit distance of universal sorts about 3 different criteria between Chinese and Dane. In the user-defined categories, Danish edit distance average is 3.27, max distance is 6, min is 0, Chinese's edit distance average is 5.38, max distance is 10, min is 1. In the experimenter-defined "wedding" categories, Danish edit distance average is 4.2, max distance is 10, min is 1, Chinese's edit distance average is 4.27, max distance is 8, min is 1. In the experimenter-defined "wedding colors" categories, Danish edit distance average is 6.44, max distance is 13, min is 2, Chinese's edit distance average is 8.78, max distance is 13, min is 3. It's found there are more variability among the Chinese users than Danish users.

Table1. Edit Distance of Universal Sorts

Criteria	User Defined Sorts		Wedding		Wedding Colors	
Country	Danish Sort 1	Chinese Sort 1	Danish Sort 2	Chinese Sort 2	Danish Sort 3	Chinese Sort 3
Average	3.27	5.38	4.2	4.27	6.44	8.78
Max	6	10	10	8	13	13
Min	0	1	1	1	2	3

In the user-defined categories, 5 Chinese users use "other" category, only 2 Danish users use "other" category, it's showed there are greater use of "other" category in Chinese users.

In the wedding colors sort, there was one extreme object oriented user on the Danish side (S10) and one on the Chinese side (S2). Likewise there was an extreme background/holistic user on the Chinese side (S8) and one on the Danish side (S3).

In the Wedding sort, there appear to be differences between Chinese and Danes in the use of object based vs. thematic based categories.

Table 2 showed edit distance of local sorts about 3 different criteria between Chinese and Dane. In the user-defined categories, Danish edit distance average is 12.4, max distance is 20, min is 4, Chinese's edit distance average is 12.42, max distance is 19, min is 6. In the experimenter-defined "wedding" categories, Danish edit distance average is 9.87, max distance is 15, min is 4, Chinese's edit distance average is 14.33, max distance is 21, min is 8. In the experimenter-defined "wedding colors" categories, Danish edit distance average is 11.84, max distance is 17, min is 9, Chinese's edit distance average is 12.07, max distance is 18, min is 5. From the result, we found the local distance between Chinese and Danish user are bigger than universal distance. We think maybe because some of the local pictures aren't fit to sort into category. As we used 20 pictures for universal sorts and 30 pictures for local sort, so there is more probability of diversity.

Table2. Edit Distance of Local Sorts

Criteria	User Defined Sorts		Wedding		Wedding Colors	
Country	Danish Sort 1	Chinese Sort 1	Danish Sort 2	Chinese Sort 2	Danish Sort 3	Chinese Sort 3
Average	12.4	12.42	9.87	14.33	11.84	12.07
Max	20	19	15	21	17	18
Min	4	6	4	8	9	5

According to Nisbett's theory, we can make probe sorts for Eastern and Western culture by thinking that subjects should make categories like this and then we can compare edit distance of our study results from our probe sort which we made. From result, we found they are consistent with Nisbett's theory on the whole.

Table3 Edit Distance of Universal Sorts from Prospective Probes Sorts

Criteria	User Defined Sorts		Wedding		Wedding Colors	
Country	Danish Sort 1	Chinese Sort 1	Danish Sort 2	Chinese Sort 2	Danish Sort 3	Chinese Sort 3
Average	3.6	3.3	4	3.8	5.6	8.5
Max	7	6	8	5	11	13
Min	1	1	1	3	3	5

3. CONCLUSION AND DISCUSSION

In the universal sorting task, we found more variability among the Chinese users in the user defined sort and wedding colors sort and greater use of "other" category in Chinese users. There had some overlaps in styles, in the Wedding Colors sort, there was one extreme object oriented user on the Danish side (S10) and one on the Chinese side (S2). Likewise there is an extreme background/holistic user on the Chinese side (S8) and one on the Danish side (S3). In the Wedding sort, there appear to be differences between Chinese and Dane in the use of object based vs. thematic based categories.

In the local sorts, from the result, we found the local distance between Chinese and Danish user are bigger than universal distance. We think maybe because some of the local pictures aren't fit to sort into category.

From the probe sorts which we defined, we found they are consistent with Nibett's theory on the whole.

Form this pilot study, we found some questions to improve in formal experiment:

1) Some images don't fit to sort into category.
2) The 15th picture in university images isn't good to pick up, our original thought maybe consider the ring as object and the two hearts as background, but the ring is too small to notice it to user.
3) Some local images don't represent their native culture indeed.

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