A Reflective Study in Metaphorical Products Design from the Mapping of Relational Similarity Perspective

Kung-Ling Chang

Dept. of Crafts & Design, National Taiwan University of Arts, Taipei, 220, Taiwan
kling@ntua.edu.tw

Abstract. Cultural materials always have new applications in products design, a designer as an agent that "specifies the cultural properties of a design object ". Metaphors design needs to propose a few observations to transform the ideas into an external form and make on the creative cultural products design. There is a relation between Cultural materials (sources) and products (targets), the designer needs to grasp the main points of discriminating the methods which transfers materials into a product by metaphors. Several categories of metaphors exist, including simile, metaphor, allegory, metonymy and analogy. Three categories out of five categories are most useful metaphors in practice, including simile, metaphor and metonymy, whereas the abstract ideas of metaphors were not easily understood by many beginners, students would rather design easily such as "displacement" and "simile", that caused me to established an operable practice model for beginners. Comprehend the model of an integrated design process in order to enhance the application of cultural materials through design practice and education, the model can be a valuable reference for case study, design practice and reorientation in metaphors of products design.

Keywords: Creative Cultural Products, Metaphor Design.

1   Introduction

A cultural product is related to a cultural material by metaphors with transformation. If a product related to the metaphorical design, it will capture the capacity in the relation between materials (sources) and products (targets), it is a principal point to discriminate which products is the metaphorical design or not. In this regard, the techniques of products design with "Displacement" is easily to memorize and the prefer one for users, but there are lacks of relations between sources and targets. "Feature Transformation" is another technique which transformed the features of external form into a product and it was given another practical applications. "Feature Transformation" is also easily to memorize, but the likeability isn't good in proportion to the memory; the other technique is "Figurative Expression" which is not only easily to memorize but also good in likeability (Chang, 2012). How a material was transformed into a product, the relational-matches is the subject of metaphors. In regard to the transformation, "Figurative Expression" is superior to "Displacement" in significance.

This research based on the references and case studies in metaphors to figure out the viewpoints, the efforts was advanced to the study model of metaphors, to focus on discriminate the categories of metaphors as the efforts.

2   Literature Review

2.1   Displacement and Metaphor

Replacing the external form of the product with another iconic figure without any related is considered to be the "Displacement", the external form of materials (sources) as a replacement for products (targets); There is a relational matter to transform an icon, symbol or an insinuation into a product design with figurative language is considered to be the "Metaphor" (Lin, 2008). Therefore, the quote from sources is related to targets or not, that is difference in terms of discrimination for Displacement and Metaphor.

Table 1. Comparison Sheet：The abstract of Displacement and Metaphor

	Subject matter
Displacement	source: (Lin, 2008) • Transferring the subject to the other and quoting out of context.
	• Replacing the external form of the product with another iconic figure without any related.
Metaphor	source: (Lin, 2008) • There is an inner meaning in the source that is similar to the target.
	• Design with figurative language to transform an icon or symbol into a product design.

2.2   The Concept of Metaphor

Figurative Language is given the interpretation in non-literal meaning. When the semantic interpretation that is ineffective in a literal manner, we utilize the technique of Figurative Language to impart the effect to a target. Figurative Language begin to take effect through utilize the Figurative Language, it can interpret unfamiliar and abstract matters with intimate, concrete and obvious. The effect inspired the language much more significant, expressive and vibrant (Wang, 2011).

There are over twenty categories of Figurative Language exist (Wang, 2011). Many scholars such as Zeng (2012) and XIE (2013) had referred to that the simile, metaphor, allegory, metonymy and analogy are frequently used. In the field of the generalized categories of Metaphors in design, Professor Wang (2011) had referred to the most useful metaphors are including simile, metaphor and metonymy.

2.3   The Chief Categories of Metaphors

1. **Simile.** The target comprises a form generation which employ the form of a source, its appearance, and its property as a new mode. In other words, the new creations resemble the source in formal features.
2. **Metaphor.** The appearance of the target comprises a form generation which employ the features and property of a source in a mild and indirect way. In other words, the relationship between new creations and the source is implied.
3. **Metonymy.** Exchanging the appearance and property of a source for a target, the target possesses some parts from the source to interpret its own property. The appearance and property of source is an emblem of the new creations.

2.4   The Relations between Sources and Targets

Three Types of the Similarities. Metaphorical product design is a synthesis of the source and the target. We will find the pleasure in metaphor when we figure out the information that the designer's thought on the product. There is a mapping process of transformation learning when we comprehend the new things by familiar things. According to Gentner's (1988) structure-mapping theory, the similarities between the sources and targets that includes Mere Appearance Similarity, Relational Similarity and Literal Similarity. Professor Wang (2011) summarized about the similarities：A relationship between the source and target which called "Literal Similarity" are matched with appearance similarity and relational similarity. A relationship which called "Surface Similarity" or "Mere Appearance Similarity" are matched with features, but unconcerned with logical relation. A relationship which called "Analogy" are matched with relational similarity, but without any feature. "Analogy" and "Surface Similarity" jointly referred to as metaphor.

Relational Similarity

Composing Schema Mapping. The similarity in structural mapping is a representation of components. Compare target with source, to spread out the consist of components in target and source for viewing. For the purpose of acquiring a properly effect of structural mapping, designers could be in the finding of structural properties of a source, and base on the properties to find a properly target to match the expression of the source. Designers will explained a product's components by analogy with that of a source's components.

Behavioral Mapping. The action presents a relationship based on the operation, for developing meanings of sources targeted at products, and contributes to our understanding of the implication preferences of the products. Wang (2011) took "Excalibur" (Toilet brush) as an example which was designed by Philippe Starck, the "Excalibur" and Toilet brush are well-known, but their relationship are unfamiliar. When King Arthur was getting out the sword from the stone that is analogous to the toilet brush will be getting out from the set. There is a relational similarity about limbs movements, the similarity allow the designer make a breakthrough on the mere

appearance similarity problem. Action of closestool wash with "Excalibur" will changing the somber mood into an unusual holy-hearted mood by the technique of Metaphor.

Innate Character Mapping. There is lots of cases could be studied which are about the innate character mapping, it's easily to grasp the innate characters with this kind of sources, designers who transform the sources into the targets will grasp the main characters between, the source's character which is matched with a target and have a properly meaning in value added. Take an example in "barn" and "money box" to explain as follow：A barn owen the innate characters in storing crops, A money box owen the innate characters in storing coins. If the money box was designed with an appearance of barn, the source(barn) and the target(money box) have the same act of keeping something in a place while it is not being used. The money box inherited the value from the barn.

Table 2. Comparison Sheet: Three types of mapping

	Relational Similarity		**Instances**
Types of Mapping	Innate Character Mapping	Storage	**Money Box** The money box inherited the value from the barn.
	Behavioral Mapping	Limbs Movements (Rotate)	**Corkscrew** When a user using this corkscrew who will be associated with the dancing of a dancer.
		Limbs Movements (Take out)	**Excalibur** When a user is getting out the toilet brush from the set that is analogous to King Arthur was getting out the sword from the stone.
	Composing Schema Mapping		**Excalibur/** Toilet brush **Sword /** Brush; **Stone /** Set

3   Methodology

This research based on the references and case studies in metaphors to figure out the model for beginners. Comprehend the model of an integrated design process in order to enhance the application of cultural materials through design practice and education. The model can be a valuable reference for case study and reorientation in metaphors of products design.

The discrimination model (Figure 1) was designed by process in four steps：❶Questions about Relational-Matches, ❷According to the answers of step1 to discriminate the initial similarities, ❸to take the similarities one step ahead by inspection. ❹To categorize the outcome of step3 into a metaphor category.
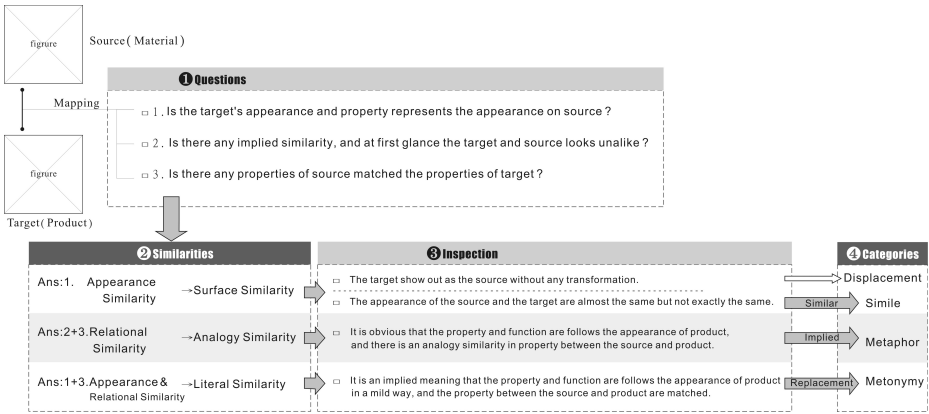
Fig. 1. The discrimination model of Metaphorical products. (Source: Chang, 2013)

4   Design for the Products of Roof Truss by Metaphors

The practice of this task choose the "Chinese Roof Truss" to be a source with a range of products. The source is a traditional wooden truss that belong to the Lin An-Tai old homestead. This old house was built in 1783~1785 and extended in 1822~1823(Wang, 2006).

There is a removal event of the Lin An-Tai old homestead in 1978, the urban planning was given precedence over the preservation of the Lin An-Tai Old House. In order to relocation preservation, the bricks, rocks and all the members of wooden structure were took apart and marked. The Lin An-Tai old house was rebuild in 1987. There was an interval of nine years between the removal and the rebuild.

Fig. 2. The panorama view of the Lin An-Tai old homestead before the removal

Fig. 3. The old house was in a removal proceeding

Fig. 4. Nowadays, the relocation preservation of the Lin An-Tai old homestead

There were three targets of products which were designed with the same source. However, the three targets of products were set in different logical relation. These results serve as the reference material for the requirement comparison among the simile, metaphor and metonymy. Therefore, principles of the standards for the tasks were as follow:

1. In order to augment the differential effects in the practice, the source and the target must be set in different category domain.
2. In order to compare the three different targets which are all related to the same source, the three targets must be as the different kind of products.

4.1   The Development Process of Simile Design

The characteristic of "Simile design" of the mapping between a source and a target belongs to "Appearance Similarity", and be unconcerned with "Relational-Matches". The target comprises a form generation which employ the form of a source, its appearance, and its property as a new mode. The appearance of the source and the target are almost the same but not exactly the same.

Table 3. Design for the product by simile

Design for the product of roof truss by simile				
Source ↑ Relations ↓ **Target**		Similarities	Appearance Similarity	
			Mapping	There is unconcerned with any "Relational-Matches"
Explanation	The roof truss transforms into the structures of the clothes hanger, the members of truss provide for functioning well on the hanger, its interval between the members of truss brings convenience for items of accessories to hangs on. Designer：Kung-Ling, Chang			

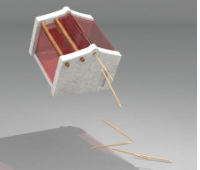## 4.2   The Development Process of Metaphor Design

The characteristic of "Metaphor Design" of the relation between a source and a target is implied. The appearance of the target comprises a form generation which employ the features and property of a source in a mild and indirect way. The characteristic of "Metaphor Design" involves in part-ownership in analogy.

The source and the target aren't within the similar category. However, the implied meaning is established in the added value by matches of the source and the target (between-category similarity).

4.3   The Development Process of Metonymy Design

The characteristic of "metonymy design" of the mapping between a source and a target which called "Literal Similarity" are matched with appearance similarity and relational similarity.

Table 4. Design for the product by metaphor

Design for the product of roof truss by metaphor				
Source ↑ Relations ↓ **Target**		Similarities	Relational Similarity	
			Mapping	**Beams/** removal proceeding **Toothpicks/** removal proceeding
Explanation	• Taking out the toothpicks is analogous to the beams will be getting out from the roof. It seems to be designed by simile on external form of a house. But, there is a meaning when the user was taking out the toothpicks from the can that is analogous to the beams will be getting out from the roof. There is a relational similarity about limbs movements, the similarity allow the designer make a breakthrough on the mere appearance similarity problem. Designer：Kung-Ling, Chang			

"Metonymy Design" emphasize an existing relationship between a source and a target. "Metonymy Design" exchanging the appearance and property of a source for a target. "Replacing" is a technique of expression within the radius of their relationship, the target possesses some parts from the source to interpret its own property.

Table 5. Design for the product by metonymy

Design for the product of roof truss by metonymy				
Source ↑ Relations ↓ **Target**		Similarities	Appearance Similarity &Relational Similarity	
			Mapping	**Truss/** load-bearing **Rack/** load-bearing
Explanation	The chopsticks rack was designed as a wooden truss. Putting the chopsticks on the rack is analogous to putting the beams on the truss. Users will have an association with building a house. Designer：Kung-Ling, Chang			

5   Results and Discussion

5.1   Simile Product Design Reviews: Clothes Hanger

According to the "Questions" on step❶ in the discrimination model(figure1), the clothes hanger is answer to the description of Option-1:

O-1: Is the target's appearance and property represents the appearance on source？

It's sure on "Option-1", the hanger's appearance and property represents the appearance on roof truss. The members of truss provide for functioning well on the hanger, its interval between the members of truss brings convenience for items of accessories to hangs on. Organizing the categories is based on the choosing of individual steps, the classification in this model belongs to "Simile".

5.2   Metaphor Product Design Reviews: Toothpicks Can

According to the "Questions" on step❶ in the discrimination model(figure1), the toothpicks-can are answers to the descriptions of Option-2 and Option-3:

O-2: Is there any implied similarity, and at first glance the target and source looks unlike？

It's sure on "Option-2". Compared with simile design, the can's appearance is designed in a mild way. There is an implication for users on the hole of gable.

O-3: Is there any properties of source matched the properties of target？

There is a meaning when the user was taking out the toothpicks from the can that is analogous to the beams will be getting out from the roof. Organizing the categories, the classification in this model belongs to "Metaphor".

5.3   Metonymy Product Design Reviews: Chopsticks Rack

According to the "Questions" on step❶ in the discrimination model (figure1), the chopsticks rack are answers to the descriptions of Option-1 and Option-3:

O-3: Is the target's appearance and property represents the appearance on source？

It's sure on "Option-1", the rack's appearance and property represents the appearance on roof truss.

O-3: Is there any properties of source matched the properties of target？

In the field of behavioral mapping, the beams and the chopsticks are matched by their properties. Putting the chopsticks on the rack is analogous to putting the beams on the truss. Organizing the categories, the classification in this model belongs to "Metonymy".

5.4   A Metaphorical Method for Cultural Product Design Model

Metaphor and Metonymy are both involves in relational similarity. As a technique of expression, Metaphor is manipulated with "Behavioral Mapping", Metonymy is manipulated with "Innate Character Mapping", and therefore concerned with the scenarios in the removal event of the Lin An-Tai old homestead. Keep moving forward to give the explanations with the models that were showed in Figure 6&7, the model gave an opportunity to rethink the metaphorical product design from the mapping of relational similarity perspective, this model(Figure 5) is a metaphorical method for cultural product design that base on the mapping of relational similarity, it will provide an operation mode in design practice for designers.
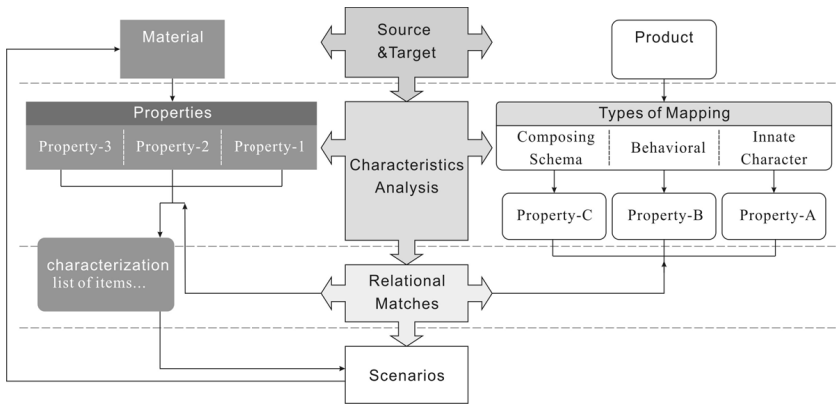

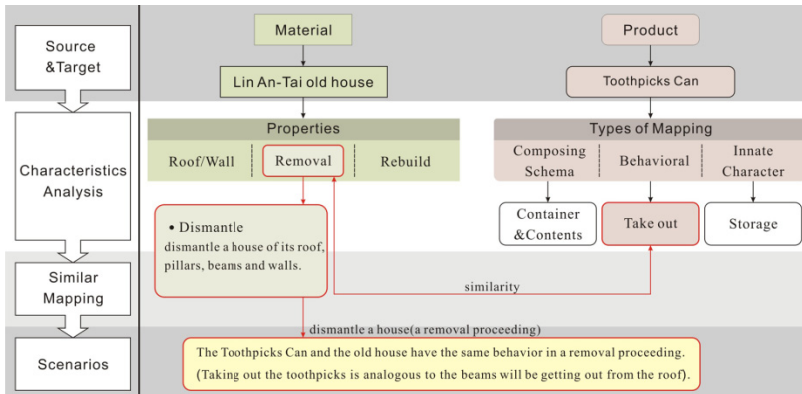**Fig. 5.** A cultural product design model with a metaphorical method

Fig. 6. Rethinking of metaphor product design from the mapping of relational similarity perspective
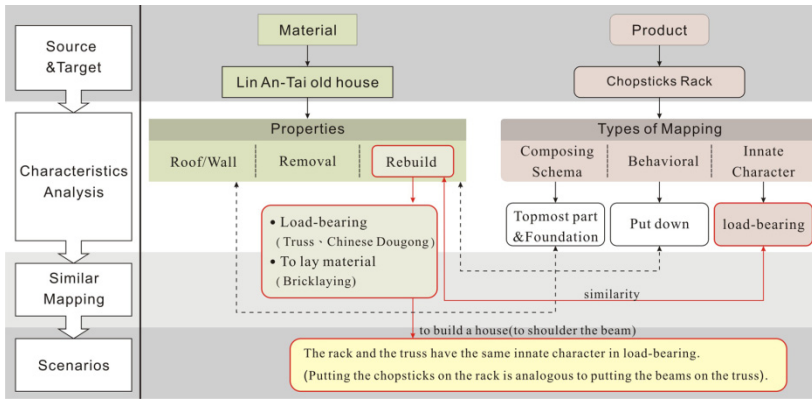
Fig. 7. Rethinking of metonymy products design from the mapping of relational similarity perspective

5.5   Discussion

The discrimination model presents a process, based on metaphor theory, for developing guidelines for categories and understanding. This model is clearly unfit to hold all categories of metaphors. However, it is deals with the essentials of understanding in metaphors. Therefore, the results of the discrimination is in proportion to a chief category of metaphors. A result possibly involves another categories of metaphors.

The classification of toothpicks can in the discrimination model belong to "Metaphor", but this work involves in portion of the characteristic in analogy. The characteristic of analogy is ignored in the model.

Giving an investigation into the discrimination model for "Allegory", the results will belong to "Metaphor". "Allegory" is a kind of implied meaning that is similar to "Metaphor", it is thus evident that the discrimination model is capable of widely used in metaphors, even though the characteristic of analogy and allegory is ignored. Taking the model further to follow up the investigations, this research will attempt to add the "Questions" in step❶ for better use value.

6   Conclusion and Suggestion

A new product employs the new function of practical application that is not to be compared with the function of a source. The source and target are quite different from each other in practical applications. Nevertheless, a new product need to makes users more able to identify a target with a source. Beyond mere appearances, behavioral mapping and Innate character mapping bring about the link in scenarios that may awaken some of user's special feelings, consonance and memories.

This research established an operable model to transform the main aspects into a comprehensible process, the model can be a valuable reference for case study, for designers be good at using symbols and using implications in products design.

   Up to now, Relational Similarity is the topic for discussions, but the Composing Schema Mapping is still not going to have a discussion. Composing Schema Mapping is a manipulation which about the similarity and the analogy of features, composing an integral whole product. Composing Schema Mapping will be a subject in design practices of my works. Composing Schema Mapping should be a technique to transform the cultural materials into a new form with contemporary techniques and materials, that creates new images and new tectonics, especially in architecture or space design. If this works can be well done, the cultural materials will not only be a figure which be put on products or be placed in architecture.

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Other URLs of Interest:
National Repository of Cultural Heritage,
http://newnrch.digital.ntu.edu.tw/prototype/index.php