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# A Compare Study on the Construction Principles of Chinese Characters and the Product Semantics.

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Both product semantics and construction principles of Chinese characters are techniques using for form creating. Product semantics was used for interpreting product meanings by product designers and was prospered since 1980s. The construction principles of Chinese characters were a set of methods for creating Chinese characters which were generalized by Xushen around 100 AD. Product semantics includes five principles: metaphor, simile, metonymy, allegory, and analogy, while the construction principles of Chinese characters are: physical resemblance principle (Xiang-Xing), indication principle (Zhi-Shi), implication principle (Hui-Yi), principle in combination with shape and pronunciation (Xing-Sheng), principle in combination analogy principle (Zhuan-Zhu), and substitute principle (Jia-Jie). This study described the meaning of these two techniques and compared the similarities and differences between them. The results can be summarized as following:

- 1** the metaphor in product semantics is same as physical resemblance principle in constructing Chinese characters;
- 2** the simile in product semantics is same as the implication principle in constructing Chinese characters;
- 3** the metonymy and allegory were included in the indication principle;
- 4** the metaphor and metonymy can be induced to the principle in combination with shape and pronunciation; and,
- 5** the construction principles of Chinese characters except principle in combination analogy principle and substitute principle, metaphor, simile, metonymy, and allegory were involved in analogy.

# A Compare Study on the Construction Principles of Chinese Characters and the Product Semantics

## Abstract

Both product semantics and construction principles of Chinese characters are techniques using for form creating. Product semantics was used for interpreting product meanings by product designers and was prospered since 1980s. The construction principles of Chinese characters were a set of methods for creating Chinese characters which were generalized by Xushen around 100 AD. Product semantics includes five principles: metaphor, simile, metonymy, allegory, and analogy, while the construction principles of Chinese characters are: physical resemblance principle (Xiang-Xing), indication principle (Zhi-Shi), implication principle (Hui-Yi), principle in combination with shape and pronunciation (Xing-Sheng), principle in combination analogy principle (Zhuan-Zhu), and substitute principle (Jia-Jie). This study described the meaning of these two techniques and compared the similarities and differences between them. The results can be summarized as following: 1) the metaphor in product semantics is same as physical resemblance principle in constructing Chinese characters, 2) the simile in product semantics is same as the implication principle in constructing Chinese characters, 3) the metonymy and allegory were included in the indication principle, 4) the metaphor and metonymy can be induced to the principle in combination with shape and pronunciation, and 5) The construction principles of Chinese characters except principle in combination analogy principle and substitute principle, metaphor, simile, metonymy, and allegory were involved in analogy.

**Keywords: construction principles of Chinese characters, product semantics, design techniques**

## 1. Introduction

Both product semantics and construction principles of Chinese characters are techniques using for form creating. The process for creating a Chinese character was same as the process for creating a product [1]. Product semantics was used for interpreting product meanings by product designers and was prospered since 1980s. The construction principles of Chinese characters were a set of methods for creating Chinese characters which were generalized by Xushen around 100 AD. Product semantics includes five principles: metaphor, simile, metonymy, allegory, and analogy, while the construction principles of Chinese characters are: physical resemblance principle (Xiang-Xing), indication principle (Zhi-Shi), implication principle (Hui-Yi), principle in combination with shape and pronunciation (Xing-Sheng), principle in combination analogy principle (Zhuan-Zhu), and substitute principle (Jia-Jie). The purpose of the current study is to

develop the relationship between construction principles of Chinese characters and Product semantics form the viewpoint of form design to prospect Eastern and Western cultures.

## 2. the construction principles of Chinese characters, and explain on design cases

Chinese characters were the ideogram that created with various rules. In Han Dynasty, around 100 A.D., A famous Chinese characters expert called Xushen who induced the rules of construction principles of Chinese characters into six principles [2]. Each principle was described as following.

2.1 Physical resemblance principle (Xiang Xing): With simple lines, this kind of characters is imitated from the shapes of objects in four ways. The first is to imitate the whole shape of object, such as the character “mountain (shan)” as figure 1. The second is to imitate the some objects to represent the group, such as “grass (cao)”, two branches of grass signifying a thick growth of grass (figure 2). The third is to induce the partial shape to represent the whole shape, such as “cow (niu)”, the shape of that like a cow's head (figure 3). The last one is to add the related object to complete the character, such as “eyebrow (mei)”, with eye under eyebrow (figure 4) [2]. For example, figure 5 is the juicer designed by Phillippe Starck imitated shape from creatures, such as spider, taco, Extraterrestrial (ET).



Figure 1



Figure 2



Figure 3

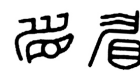


Figure 4



Figure 6



Figure 7



Figure 8



Figure 9

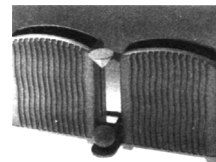


Figure 10



Figure 5

2.2 Indication principle (Zhi Shi): The meaning can be recognized at first sight, but be realized by looking carefully. The constructions include two ways. One is constructed of simple signs, such as the old characters “up (shang) as Figure 6” and “down (xia) as Figure 7” with two lines of different length in the position relatively. The other one is to add the mark base on objects externally, such as the old characters “end (mo)” and “root (ben)”, “end” means the end of the tree with one line across the end of the tree (figure 8), while “root” meaning the root of the tree with one line across the root of tree (figure 9) [2]. For example, the toaster (figure 10) designed by Mr. Cai Fanhang, the outward appearance is constituted by the shape of two toasts, this is a part of physical resemblance principle, and the covering used to express the movement for the steam rise. Simultaneously explains this product can heat up. The middle cone-shape button uses to express the movement for presses, and the tip of button has a fillister for direct

indication the position which the finger contacts.

The main difference between Physical resemblance principle and Indication principle is concrete and abstract. The former one is to imitate from real thing, one shape only mean one thing, such as “sun (ru)” means sun (figure 11), and “moon (yue)” means moon (figure 12). This principle only expressed static state. The other one made shape base on event, and hasn’t refer to object. Such as figure 13 meaning is “a day”, and this principle can express a situation [3].



Figure 11



Figure 12



Figure 13

2.3 Implication principle (Hui Yi): The character constructed at least by two objects. When we observe the elements of characters that are related to each other, then we can understand what it means. This principle mainly was used shape and meaning, as follow: 1.) with two shapes, as “pace (bu)” is constructed of two feet in one pace (Figure 14). 2.) with two meanings, as “shrill (jian)” is constructed of two characters (figure 15), “small (xial)” and “big (da)” [2]. As for the real product, the image telephone (Figure 16) designed by Paul Montgomery, aspect of combinational function union telephone, the camera, and the screen; Aspect of form image consists of ear, eye, and a window.



Figure 14



Figure 15

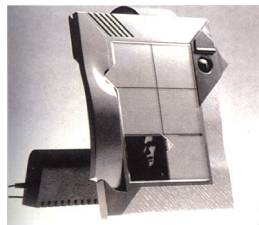


Figure 16

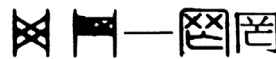


Figure 17

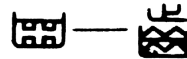


Figure 18



Figure 19

Different from Indication principle, Implication principle was used to combine with two objects and then convey the meaning, not in order to convey the meaning then the character constructed of one object [3].

2.4 Principle in combination with shape and pronunciation (Xing Sheng): This kind of character is combined with shape and pronunciation to convey the meaning and pronunciation, such as “net (wang)” as Figure 17 that combined with the “fishing net”, and pronunciation “die (wang)” [2]. Another example is “tooth (chi)” as figure 18 that combined with the tooth shape in mouth, and pronunciation “stop (chi)”. Take a famous product for example, Whistle kettle (figure 19) designed by Richard Sapper. When the water boils, it can give off sound like the cockerel calls, it has the reminder and the

notice function. Here, metaphor as follows: the handle like cockscomb, the kettle body likes cock's head, the mouth of a kettle likes cock's beak.

2.5 Principle in combination analogy principle (Zhuan Zhu): The characters with the same traditionally recognized components of Chinese characters can be interpreted each other. Up to now, experts have two interpreted of the principle. With the similar shape, some characters have the same meaning. With the similar pronunciation, some characters have the same meaning. Such as “test (kao)” as figure 20 meaning is take the exam and “old (lao)” as figure 21 meaning is old, but during ancient periods both mean old. So that viewpoint on product design it can say different styling created under different timing or different space

考

Figure 20

老

Figure 21

北

Figure 22

背

Figure 23



Figure 24

2.6 Substitute principle (Jia-Jie): Referring to the terms which has pronunciation but with no written words for it in a language, thus it borrows the terms which has the same pronunciation for record. Such as “North (bei)” as figure 22 was supposed to be drawn from two people going back to back, meaning “the back of the body” (figure 23), it was then borrowed to point out direction “North”, then figure 23 was created to substitute “North”, therefore, “North” as figure 22 is a borrowed term. The main objective is to borrow the already created character of the same pronunciation to substitute the non-created character. Basis for design, it is to borrow other objects in order to achieve the goal it wanted to achieve. Such as the coffee pot (figure 24) designed by Aldo Rossi, it is mainly taking the real size

### 3. Product Semantics

A product is an inter-media between designers and end-users conveying thought of designer to users. It is also an interpreter of technology transmitting product function and procedure to users. The main objective of the product semantics is to enhance the self-interpretation of the products and to communicate with designers and consumers. The Product Semantics contains the various fields, including physics, physiology, psychology, society, and culture. In practical, this study generalized several treatises [4, 5, 6, 7] and induced the product semantics in five categories, among them are: metaphor, simile, metonymy, allegory, and analogy. The meanings of them can be described as following:

- 3.1 Metaphor : Used A is B analogy technique. When in reality it refers to a certain object, while the meaning of the styling refers to other objects, thereby describing the similarities, but the used mark is not the vital characteristic property, such as the corkscrew (Anna G.corkscrew) designed by Alessandro Mendini in 1994 in figure 25 below. The styling of this corkscrew utilizes the dancing action of ballerina for its product symbolization mark, applying the “turning” action of a ballerina while dancing for the required action for the corkscrew, in other words, the common property of the turning action between the dancer and the corkscrew. Via operating this product, consumers will more or less thought of the hidden implication of the dancer turning around, therefore this product possess the characteristics of metaphor.
- 3.2 Simile : Used A is like B analogy technique, which is the method of pointing out the implication with no intention of hiding, between the product and the used mark, there is a certain characteristic which is the vital characteristic property, such as the biscuit boxes(Mary biscuit boxes) designed by Stefano Giovannoni in 1995 for Alessi in figure 26 below, this product has a biscuit-like styling on top of it and the box has a scent to annotate biscuit box, this product utilizes the obvious appearance of biscuits directly as its product symbolization mark, also, the characteristic of “Smell of biscuits” is also the common property between them, this belongs to the direct obvious method.
- 3.3 Metonymy : This is the borrow method, if there is a relation between the two objects, then, utilize one object to describe another object. When describing between objects, take a portion of the elements of a theme to describe the body, such as the design of the chair named Dadada by Philippe Starck in 1993 in figure 27 below. It applies the concept of the forward and backward rocking action when riding horses to the chair, allowing those who sit on the chair to more or less experience the fun of rocking when riding horses. This design utilizes the element of a saddle for the product symbolization mark. Saddles are part of the element of the equipments, simplifying the styling of riding horses to allow the users to more or less experience the fun when riding horses through the unique form of the chair, this type of taking a portion of an object to describe a product, yet is able to express the complete concept is the method of metonymy.
- 3.4 Allegory : Uses the property similarities of objects to express the designers meaning of styling, where the actual object is not seen, the only way to understand the designers meaning is from the similarities between the objects. When applying allegory on product styling, there is no direct relation between the product and the used mark, but on certain characteristic or the using environment will surprisingly reveal the concept that the designer wanted to express, such as the gas-Lighter named Fire-bird designed by Guido Venturini in 1993 in figure 28 below. This product utilizes male reproductive organs for annotation, and uses reproductive organs to describe the source of the fire comes from the excitement experienced by males, and the impulse is like the raging fire that can not be ceased, but due to the fact that sex has always been a private part of

people which do not go public easily, thus using the reproductive organs seems ironic from a moral point of view.

3.5 Analogy : Analogy is a simple association or comparison between equal objects under common recognition of human beings, thereby achieving the comparing effects. There is no direct relation between the product and the used mark for the styling of the product, such as the fruit container (Fruit mama) designed by Stefano Giovannoni in 1993 in figure 29 below, this product when understood is the application of the mark of the elements of hands and trees. Utilizing the concept of the symbol of hands grabbing fruits or the trees grown with fruits to describe the product, from the property to think of the similar function of grabbing and hanging, to come up with the mark of hand and tree.



Figure 25



Figure 26



Figure 27



Figure 28



Figure 29

#### 4. Compare to the construction principles of Chinese character and Product Semantics

Physical resemblance principle is to imitate biology or the appliance external form, and metaphor is the analogy technique of two similar objects, that is A is representing B to describing similarity. One example (figure 5) described above is a juicer that imitates creation designed by Phillippe Starck. Another one is the concept of the Coke Cola bottle which comes from of a woman's body, the proportion with the shape fitting the hand while holding. The other is the chair "First" (Figure 30) designed by Michele de Lucchi. Two balls are set on the armrest representing as two planetoids and the circular armrest is like representing like the orbit. The overall shape is like the planetoid around a big planet, imitating the Universe is one kind of attributes to natural phenomena imitation.

The main indication principle is to make shape in cause of events, using the mark instructed explains some things the movement, the idea and the condition. It explains that metonymy and allegory is similar, the metonymy applies part of mark to annotation of the product, and it may have feature of the product nature. Allegory meaning between the product and be borrowed mark doesn't connect. Actually, in a point or the use situation be disclosed the concept the designer wants convey accident. As the previously mentioned toaster (figure 10) designed by Mr. Cai Fanhang, the outward appearance constitutes by shape of two toasts, this is a part of physical resemblance principle, and the covering used to express the movement for the steam rise. Simultaneously explained this product can heat up. The middle cone-shape button uses to express the movement for presses, and the



tip of button have a fillister for direct indicate the position which the finger contacts. Figure 31 is the book computer which designed by David Gresham, correspond the books storage knowledge intention of the computer storage function at the same time, and the shape of put the books on the bookshelf takes one of modelling consideration essential factors. Figure 32 is a radio which designed by Robert Nakata , mainly is abstract with the music mark and the piano condition expounded product in the audio control by the more and more big dot, instructed the volume gradually increases directivity.



Figure 30

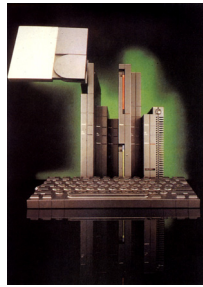


Figure 31

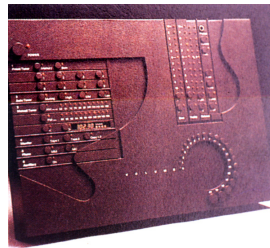


Figure 32



Figure 33

Implication principle is composing two or more Chinese characters to create a new Chinese character. In the product design field, it is a product that combined different functions of various products. it means consist of singular function or shape unifies by some kind of form, then, becomes an aggregate. Simile is a kind of analogy technique use A (or a+b) is like C, then, becomes an aggregate. Simile is direct and clear expression way, doesn't hide the meaning. Therefore, Implication principle and Simile is similar. For example front proposes image telephone (Figure 16) designed by Paul Montgomery, aspect of combinational function union telephone, the camera, and the screen; aspect of form image consists of ear, eye, and a window. Figure 33 is the Cheese board designed by Michael Graves for Alessi, this product annotation attribute mark the product using the cheese potholes appearance, the handle above the product, presents by a lovable mouse shape, directly presents the mouse and the contour of the cheese, and mouse's shape acts as this product's handle, therefore Simile also is Implication principle.

The principle in combination with shape and pronunciation in philology, the shape represents object the type and the shape, the sound expresses the object sends out sound. Use as the product designs straight thinks is adds the sound on to the product, by way of strengthens the product impression, or as one kind of warning function. For example front propose whistle kettle (Figure 15) designed by Richard Sapper, When the boiling water boils, it can send out like the cockerel sound which calls, has the reminder and the notice function. Here, metaphor as follows: the handle like cockscomb, the kettle body likes cock's head, the mouth of a kettle likes cock's beak. And the metonymy is to when boils can make the sound like the chicken cries. Therefore, the principle in combination with shape and pronunciation in philology contain metaphor and metonymy.

Analogy use associate with the same class of something in thinking, or compare, therefore, the construction principles of Chinese characters except principle in combination analogy principle and substitute principle, metaphor, simile, metonymy, and allegory includes analogy.

## **5. Conclusion and Suggestion**

This study described and explained the meaning and procedures of the construction principles of Chinese characters and Product Semantics with practical products and discussed the similarities and differences of these two principles. The results can be summarized as following: 1) the metaphor in product semantics is same as physical resemblance principle in constructing Chinese characters, 2) the simile in product semantics is same as the implication principle in constructing Chinese characters, 3) the metonymy and allegory were included in the indication principle, 4) the metaphor and metonymy can be induced to the principle in combination with shape and pronunciation, and 5) The construction principles of Chinese characters except principle in combination analogy principle and substitute principle, metaphor, simile, metonymy, and allegory were involved in analogy.

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