METHODS OF PICTOGRAPH DESIGN BASED ON THE FORMATIVE METHODS OF DONGBA PICTOGRAPHS AND TANGUT SCRIPT AND ITS EVALUATION

トンパ文字、西夏文字の造字法に基づくピクトグラムデザイン方法とその評価

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概要: 本研究は、トンパ文字の象形性、絵画性と西夏文字の論理性、システム性を利用し、新しいピクトグラムデザイン方法を探求することを目的とする。トンパ文字、西夏文字を研究対象として、おのおの造字構成法の特徴を分析した。それらの造字構成法から下記のピクトグラムデザイン手法に転化した：象形的な表現法、抽象的な表現法、組み合わせ表現法。提案したデザイン方法の特徴について述べる。また、この方法よって、漢方薬に関するピクトグラムデザインを作成した。作成したピクトグラムの解読性についてアンケート調査を行った。その結果、トンパ文字、西夏文字に基づくピクトグラムデザイン方法の有効性が明らかになった。

Key Words: pictograph design, Dongba pictographs, Tangut script

1. Introduction

Communication through pictographs becomes essential in our daily life nowadays. However, there are still sereval unsatisfying issues remaine unsolved in pictograph design. ① Lots of pictograph designs are short of logicality and systematicness. ②Complicated meaning are difficult to be conveyed by pictograph. ③ Design style of pictograph is monotonous and inflexible images were generally used.

Dongba pictographs maintained high level of hieroglyphic character as the only unique existing pictograph being used today while Tangut script is a writing system full of logical and systematic character. We think that design methods based on the formative methods of Dongba pictographs and Tangut script would produce a set of effective design methods with potential applications for pictograph design.

In this paper, we present our research on the new pictograph design methods based on the formative methods of Dongba pictographs and Tangut script and testified their feasibility with pictograph design application on Traditional Chinese Medicine.

2. Formative methods of Dongba pictographs and Tangut script

2. 1. Formative methods of Dongba pictographs

The Dongba pictographs were developed by the Naxi ethnic group in southwest China 3,000 years ago. It is considered as the only unique existing pictographs in the world today. The formative methods of the Dongba pictographs can be summed up as: hieroglyph; transformation; simple indicatives; adding abstract symbols on hieroglyphs; compound Indicatives; phono-semantic Compound.

2.2. Formative methods of Tangut Script

The Tangut script was an obsolete logographic writing system, used for writing Tangut language in XiXia Dynasty. Tangut characters can be divided into two classes by their structures: simple and composite. The latter are more numerous. None of the Tangut characters are pictographic. There are many types of composite characters such as associative compounds, interconverting characters and symmetrical characters.

3. New pictograph design methods based on the formative methods of Dongba pictographs and Tangut script

3.1. Pictographic representation

1) Depicting the image of an object directly, such as (tree), (leaf). Pictograph of "man" (Fig1) was also designed by depicting the image of a person with concise lines.

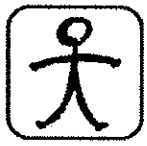

Fig1 man

2) Transforming from the existing images. For instance, (I) represent a man pointing towards himself. It is formed by extending the arm of (man). With this method, "general weakness" (Fig2) was designed by transforming the pictograph of "man".

Fig2 General Weakness

3) Representing an object with the help of correlative objects. Such as the Dongba character (brow) is represented with the help of (eye).

3.2. Abstract representation

1) Using abstract symbols purely to represent formless objects, abstract concept, etc. such as (wind), (center), (cover), (high).

2) Adding abstract symbols on pictographs. For instance, (shock) shows the state of trembling of a worm by adding trembling lines on it. Pictograph of "frequent urination" (Fig3) was designed by adding lines which symbolize the large quality of the urination on the figure of a people with an emphasized penis.

Fig3 Frequent Urination

3.3. Combining meaning-presented components

1) Graphical aggregate is to combine the components' meanings simply. As is the situation of the character (to lean against a stone), which is composed with the pictographs of (sit) and (stone)

Fig4 Bruise

2) Adding new component on the basic one. For instance, basic character (thin) plus radical (tree) makes (thorn); (thin) plus radical (metal) makes (needle). With this method, pictograph of "pregnancy"

(Fig6) was designed by adding a child on the pictograph "empty abdomen" (Fig5).


Fig5 Empty abdomen


Fig6 Preganey

3) Replacing some components of the character with other components, as the Tangut character (forget) is composed by replacing the left part of (heart) with the right part of (non-existence).

4. Characteristic design methods from the formative methods of Dongba pictographs and Tangut script

4.1 Using combination methods to express meanings

1) Taking advantage of orientation. For instance, (kick) is presented by two people who are lifting up their feet in opposite directions, while (follow) is presented by two people who are walking in the same directions. With the same method, pictographs for "bad appetite" (Fig7) and "good appetite" were designed (Fig8).


Fig7 Bad Appetite


Fig8 Good Appetite

2) Taking advantage of size. For instance, the Dongba character (father and son) is composed by (father) and (people, son). is presented in smaller size to indicate his lower status.

3) Taking advantage of the relative position. For instance, (hold in the arm) depicts a woman and a baby in her arms; (give birth to) depict a baby underneath a woman.

4.2 Systematic representation

1) To make meaning group. That is to say, to create similar forms for pictographs with similar meaning or to make pictographs in the same domain containing same components. For instance, Tangut characters with the radical (metal) means that their meanings are related with metal, such as (pan), (saw), (knife) and (tin).

2) To make meaning network. We can first design several basic meaning components and then compose them together. Such as in characters composed with components (mouth) and (water). (mouth) is formed by combining the radicals (mouth) and (human). Putting two mouth radicals together makes (lips). Changing the human radical into water radical makes (spittle); and by inserting the water radical into , (saliva) is created.


Fig9 Eye Mucus


Fig10 Ear mucus

With the method of systematic representation, series of pictographs about the diseases in the eye, ear and nose by using the symbols of eye, ear, nose, liquid, mucus, pressure, etc. had been designed.


Fig11 Eye Swelling


Fig12 Pressure in Ear


Fig13 Tearing


Fig14 RunnyNose

5. Questionnaire and analysis

A questionnaire about the readability of the pictographs we designed for the Traditional Chinese Medicine had been carried out. The questionnaire was divided into three sections. Anticipants were asked to write the meaning of the unknown pictographs in questionnaire I, to answer if they think the design concepts had been properly represented in questionnaire II, and to select the most suitable design for the same concept in questionnaire III.

Table1. Result of the questionnaire II

item	Represented clearly	Can not say which	Do not represented clearly
man; woman; child	100%	0%	0%
pregnancy	100%	0%	0%
bad appetite; good	100%	0%	0%
corn	85%	10%	5%
runny nose; tearing	85%	15%	0%
lumbago	80%	5%	15%
bruise	80%	15%	5%
tinnitus	80%	20%	0%
high fever	75%	20%	5%
general weakness	65%	15%	20%
intoxicated	60%	20%	20%
insect bite	50%	30%	20%
medicine for nose; medicine for eye; medicine for ear	50%	25%	25%
photophobia	45%	35%	20%
pain; throbbing pain	10%	40%	50%
Average	71%	16.7%	12.3 %

The result of the questionnaire proved that the pictographs of Traditional Chinese Medicine were considered readable by most of the respondents. According to the evaluation about the pictographs, relationship between the readability and design method of the pictographs had been investigated. The methods of pictographic representation and systematic representation are proved to be effective to create readable pictographs, while representing abstract meaning with abstract form is the most difficult point.

6. Conclusion

Based on the pictograph design application on Traditional Chinese Medicine and the result of the questionnaire, conclusion can be drawn that pictograph design based on Dongba pictographs and Tangut script comprises a set of effective design methods.

On this basis, we can extend these theories to other fields of modern design such as signs, graphics, and information designs. The huge potential of the formative methods of the ancient Asian character is awaiting further development.

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