Coloration of Textile Care Symbols Applying Color Images

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ABSTRACT

In this article, a proposal for coloration of textile care symbols is presented for rising the intelligibility of the meaning of symbols and rousing consumers' interest in the care symbols and care labels.

First, the questionnaire survey of the image of JIS safety colors (Red, Orange, Yellow, Green, Blue, White, and Black) was performed by using the ten adjective pairs, necessary to express the meaning of the symbols such as warm – cool, strong (action) – mild (action), with five-point scale. With reference to the results, the various colored symbols were designed by colorization of the additional or number parts of symbols, indicating temperature (numbers in washing symbols), mechanical action (under bar with washing symbols) and so on. Additionally, the symbols were indicated on the computer display as stimulus and evaluated by the method of ranking test. It was confirmed that there are meaning of the symbols easily expressed by color such as temperature, but difficultly expressed such as mildness of mechanical or chemical action.

KEYWORDS: textile care label, colored care symbol, Japanese Industrial Standards

INTRODUCTION

Textile labeling comprises information about the materials used in a textile article and its correct care. The care symbols on the label inform consumers of the appropriate care and treatment of the textile. Correct labeling and careful compliance with the information given on the care label help to ensure a long life for the textile article. They also prevent irreversible damage to the textile article if it is treated in the specified manner.

In Japan, the standard for the textile care labeling had been refined in December 2016 (Figure 1). Japanese Industrial Standards (JIS L0001:2014) adopted the care symbols prescribed by International Organization for Standardization (ISO 3758:2012). However, unfamiliar symbols are difficult to understand for ordinary consumers. Also, many consumers are not interested in these and unfortunately often ignore them.

In this article, a proposal for coloration of textile care symbols is presented for raising the intelligibility of the meaning of symbols and rousing consumers' interest in the care symbols and care labels.

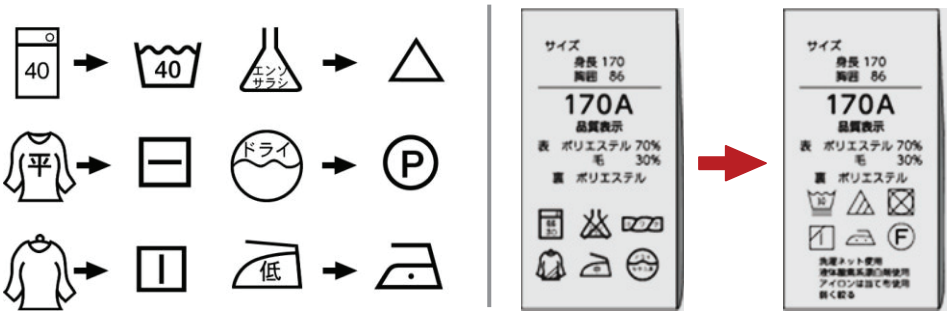

Figure 1: Example of change in care symbols and care labels. (JIS L 0217:1995 ⇨ JIS L 0001:2014)

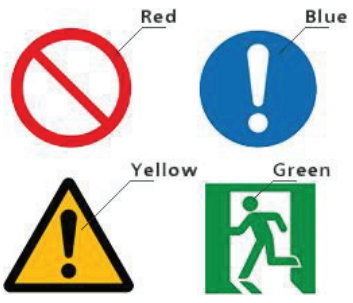

Figure 2: Safety colors usage.

EXPERIMENTAL

1. Survey of Color Image

Table 1 shows the safety colors specified in JIS Z 9101:2005 with Munsell Values for color reproduction except for red purple, meaning radiation, which is not commonly used. These safety colors are widely used in our living scene as shown in Figure 2. As these colors with high saturation, their visibility is high, and people are familiar with these colors and unconsciously know their meaning. Therefore, it is considered appropriate for use these colors to coloration of the care symbols.

To begin with, the questionnaire survey (n = 20) of the image of JIS safety colors was performed necessary to express the meaning of the symbols such as warm – cool, hard (action) – soft (action), and so on. An A4 sized questionnaire paper used for each color, the color square (60 × 60 mm^2) and ten adjective pairs, shown in left and right of Figure 3, with five-point scale are printed on them.

Table 1. Safety colors used for survey or experiments

		Munsell				*RGB*		
		Hue	*Value*		*Chroma*	*R*	*G*	*B*
Red		7.5R	4	/	15	197	14	10
Orange		2.5YR	6	/	14	249	103	0
Yellow		2.5Y	8	/	14	255	183	0
Green		10G	4	/	10	24	114	13
Blue		2.5PB	3.5	/	10	10	87	157
White		N	9.5		-	255	255	255
Black		N	1		-	14	13	15

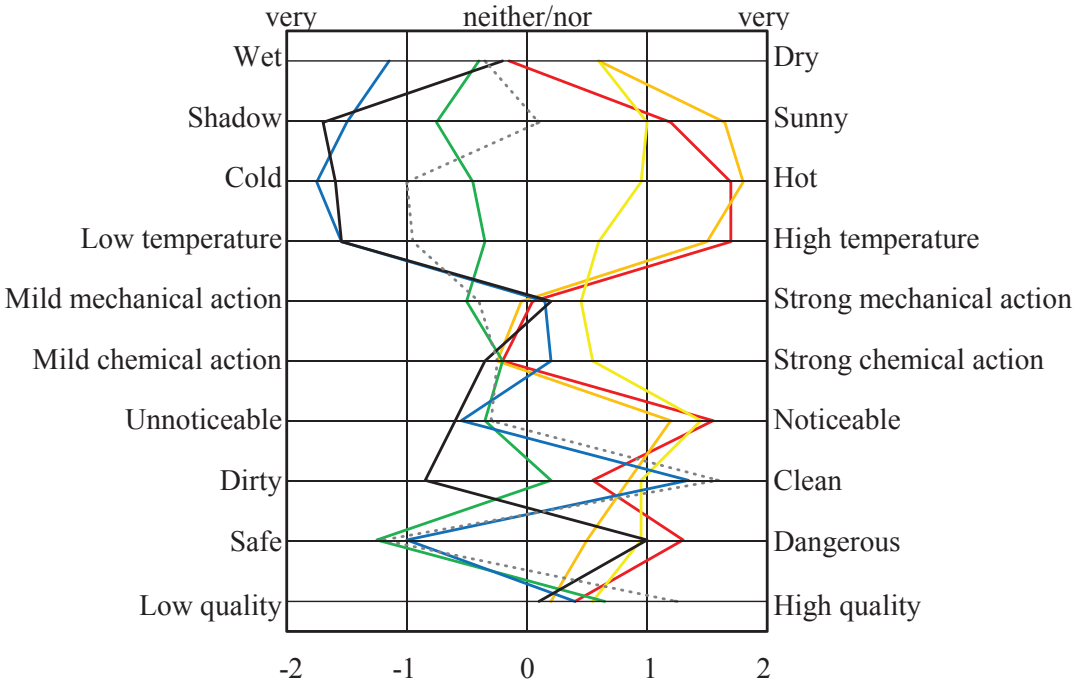

Figure 3: Color image scale obtained.

2. Coloration of textile care symbols

By referencing the results of color image survey, the various colored symbols were designed by colorization of the additional or number parts of symbols, indicating temperature (numbers with washing symbols, dots with ironing), mechanical action (under bar with washing symbols) and so on. Figure 4 shows some of these symbols used for the ranking-test of intelligibility.

Figure 4: Colored care symbols used in ranking test. ([A]; temperature, [B]; mechanical action)

3. Ranking Test of Colored Symbols

As shown in Figure 5, the symbols were indicated in random order as stimulus with an adjective pair on the liquid crystal display (27 in, 1920 × 1080 pixels^2) and evaluated by the method of ranking test. The experimental subjects (n = 7, female university students) sat in c.a. 60 cm front of the computer display, controlled by an original program, under normal illumination of fluorescent light. They judged the intelligibility of the symbol and arranged in the order by the drag and drop operation of the mouse.

After the operation, the symbols were given a point from -1 to 1 according the rank at equal intervals, and analyzed using ranking method.

Figure 5: Stimulus image used in test.

RESULTS AND DISCUSSION

1. Color Image

The result of color image survey is shown in center of Figure 3. Adjective pairs such as hot – cold, sunny – shadow, and dry – wet are easy to express in color. For these, the distinction between "warm" and "cool" colors is directly applied. However, mildness in the mechanical or chemical action is difficult to express in color. Also, in these sense, the sequence is closely resembles the image of dangerous – safe.

2. Evaluation of Colored Symbols

Figure 6 [A] represents an indication as to the temperature. This result reflects very well the results of the image survey. The effect is strengthened by the coloring area, and coloring of the letters is not very effective. Therefore, the result that the whole of the tub colored with red, which is warm color, was optimal for expressing high temperature was obtained.

On the other hand, Figure 6 [B] represents an indication as to the mildness (or strength) of mechanical action. In judgment of only color obtained by the color image survey, the strength of mechanical force is close to the image such as safety and danger. However, when color is applied to a symbol, the strength of the mechanical force is replaced by the intensity of motion. And the same color trend as warm – cool is recognized. More noteworthy is that the influence of color was more apparent than the number of underscores. Especially, there are many subjects misunderstanding that the number of under bars increases as intensity increases, and large variance in result value is recognized.

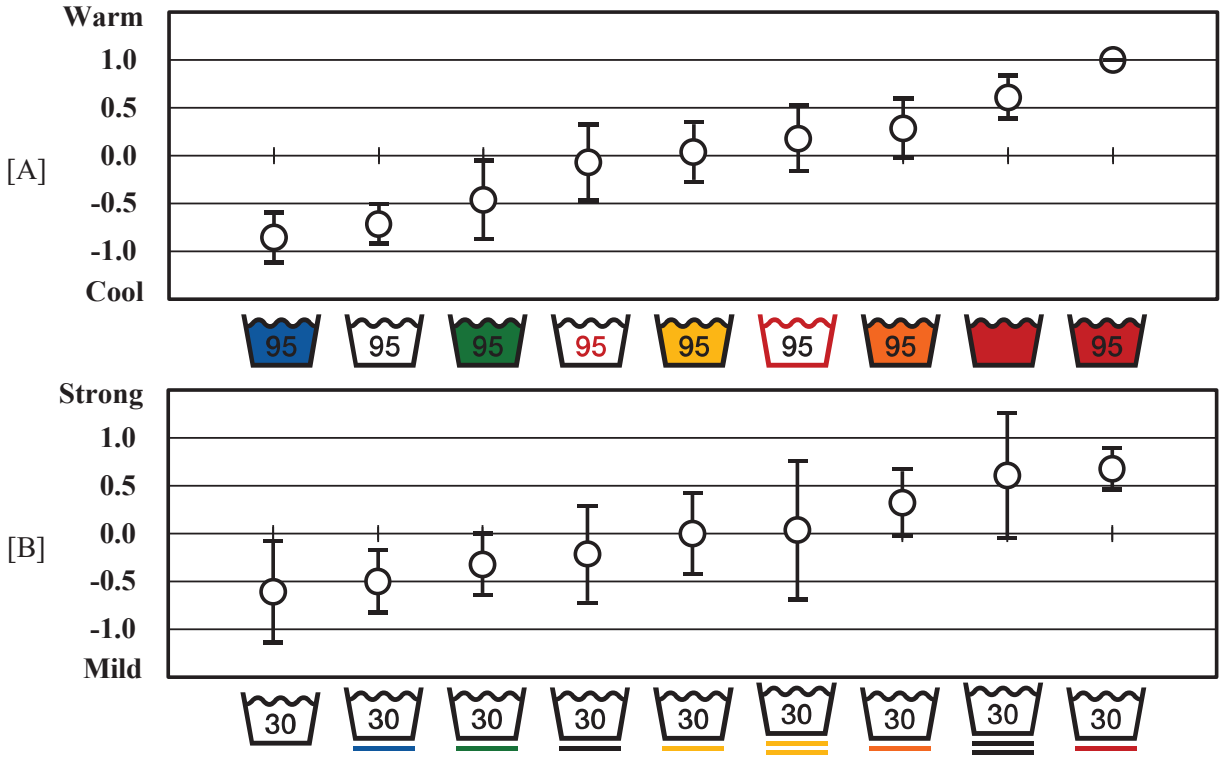

Figure 6: Results of ranking test.

CONCLUSION

In this article, a proposal for coloration of textile care symbols is presented for rising the intelligibility of the meaning of symbols and rousing consumers' interest in the care symbols. As with many previous studies, it was confirmed that the effect of color is extremely large, and that there is an influence also on the part etc. Figure 7 shows an application example of the obtained experimental results. Although leaving problems on visibility and manufacturing cost, colorization of symbols is expected to encourage understanding of the symbol's meanings. From now on, by examining lightness and saturation, it is expected that more effective coloring can be proposed.

Figure 7: Proposal for Coloration of Textile Care Symbols.

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