

Comprehension of Care Label Symbols: Effects of Age, Gender, and Education Level

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Abstract—The use of care labels is more effective and entails lower additional costs for manufacturers compared with using written instructions. Considering that the comprehension of care labels is highly dependent on their symbols, the process of symbol comprehension becomes very important. This study is conducted to shed light on the performance of Turkish people in understanding the current clothing care labels. A questionnaire consisting of demographic questions and questions regarding 11 different care symbols was used to collect data from 120 respondents. Analyses were done to show the effects of age, gender, and education level on their performance in terms of understanding care label symbols. Results indicated that women exerted a better understanding for washing-related label symbols compared with men.

Index Terms—Clothing care label, symbol comprehension

I. INTRODUCTION

STUDIES conducted on care instructions on textile products first started at the end of the twentieth century, when the companies started being more concerned with consumer satisfaction and reducing the production cost at the same time. Even though these labels had first appeared as a volunteer service, over time, they became dependent on some regulations. Current care labels are the combinations of various symbols referring to washing, bleaching, drying, ironing, and dry-cleaning processes that inform the consumers about what to do and what not to do during the cleaning and caring treatments of the purchased products.

Additional caring instructions result in an additional production cost for textile producers. From that point of view, using care labels is more efficient and results in lower additional cost compared with using written instructions. In this way, language differences are no longer a barrier for the international market. In addition, ensuring the suitable and sufficient information about the caring and cleaning processes of the textile product provides the producer with not only the improvement of consumer satisfaction by providing a reliable impression but also the confidence in the liabilities based on mistreatments or other possible

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problems pertaining to the product [1]. Considering that the aim of these symbols is to elongate the life of the product, make it more sustainable, and prevent the possible mistreatments and damages to other products, the existence of these instructions might encourage the consumers to buy the product. This is also affected by the comprehension of the existence of these symbols as an indicator of quality [1]-[4]. As claimed by [1], the more the consumers understand the product information and have the confidence to be able to care for the product after purchase, the more they have the tendency to buy the product with less perturbation about the risks related to the purchased item.

Symbols can be divided into some subgroups, and the ones that include care labels are cognitive/perceptual symbols. Even the perceptual symbols are defined as modal by [5]; they can be assigned as a modal, because in some cases, they do not form any correlation between their structure and perceptual state, meaning “they are linked arbitrarily to the perceptual states that produce them” [6]. The triangle form as a “bleach” symbol can be shown as an example here. In addition to this, it is also asserted that the level of perception and cognition is not a determinate value but can change from one person to another. This change is classified into two subgroups as “people with a high need for cognition” and “people with low need for cognition.” The first group refers to the people who enjoy using up effort for cognitive processes and who try to understand the necessary information via thinking. On the contrary, “people with low need for cognition,” in other words, people who need to receive an oral or visual motivation from outside to get involved in the cognition process, form the second group [1]. These two groups vary in their reactions to visual / schematic perception and spoken perception. This statement also shows that cognition can be perceived as an individual process. Reference [5] also showed that “symbolic concept-building” changes from one person to another.

It is also said that the perception of symbols can change personally; knowing that there are various factors which shape one’s personality, perceptions cannot be considered apart from these constituents such as culture, education, socioeconomic aspects, and so on. This also refers to a common or akin discernment of the members of one culture regarding some symbols. As asserted by [6], in consideration of the fact that cognitive symbols are perpetual across development and change their perceived state with evolution, the members of one culture build up similar simulations of the perceived symbol as their background, and environmental conditions are common. In addition, the effects of the technological development level of one country / region on the comprehension of symbols should not be forgotten due to the changes and additions that

occur in the use of symbols in industrialized cultures [7].

The aim of this study is to shed light on the impact of age, gender, and education level on the performance in understanding the current clothing care labels for Turkish people. The clothing care labeling system in Turkey is administered as confirming the suitability to the standards of the Federal Trade Commission, which in 1997 introduced the assured care symbols instead of written instructions. These symbols were developed by the American Society for Testing and Materials (ASTM). Additional arrangements are also constructed based on international regulations. In Turkey, care labels include the information of durability, washing, dry cleaning, colorfastness, stainlessness, appearance, and absorbency.

This article is organized as follows. In the second section, our methodology, which is based on a user survey, will be discussed. The results of the survey application will be presented in the third section. Our article will conclude with the discussion of the results and some suggestions for future research.

II. METHODOLOGY

The survey method was adopted for the present study. In the questionnaire, respondents explained the meaning of eleven different care symbols, consisting of three washing labels, two machine-drying labels, two normal-drying labels, two bleaching labels, one dry-cleaning label- and one ironing label. These symbols are selected from the last ASTM care label regulation.

In order to analyze the results in terms of three different categories, sex, age, and education level, a sub-classification has been used. We divided age into three categories as ages between 15 and 22, between 23 and 35, and older than 35. Sex is also construed as male and female. Lastly, education level is categorized as primary school graduates, secondary school graduates, high school graduates, and university graduates/further studies. In this manner, we obtained 24 different groups.

Afterward, five people were randomly selected for each group, which made a total of 120 respondents participating in the survey. As the first part of the analysis, explanations received from the respondents were then separated into three groups: completely correct ones, approximately correct ones, and wrong ones. By *approximately correct answers*, we mean answers which are similar to the ones given either by someone who understands that the symbols refer to washing but who cannot clarify the temperature sign or by someone who understands the bleaching symbols but who cannot understand the meaning of the stripes. As the second part of the analysis, to see whether there are differences among the sub-classes in each categories, which are sex, age, and education level, in terms of understanding clothing care labels, ANOVA analyses have been conducted for every group of care labeling (washing, drying, tumble drying, ironing, bleaching, and dry cleaning). In the ANOVA analyses, only the number of completely correct

answers has been taken into account. If the participants' explanation of the symbols is completely true, then we quantified to know exactly as 1; otherwise, the answer was quantified as 0.

III. RESULTS

As observed in Table 1, the understandability of the washing symbols in care labels is considerably low. The first sign, which indicates washing at a warm temperature, was understood by 21 people compared with 120 participants; only 19 people understood that the sign was related to the washing procedure, and 80 participants made totally wrong or irrelevant interpretations about that sign. To sum up, the first sign was understood correctly by only 17.50 % of all participants and could not be understood by 66.67% of all the participants. The second symbol, which has a meaning of delicate / gentle washing, has the lowest understandability level in these three washing labels of the questionnaire. Only one participant correctly understood the meaning of the symbols; three people were aware that the symbol was related to washing, but they could not figure out the specific meaning it carried; and the rest of the participants (116 people) did not have any idea about that symbol. Consequently, only 0.83 % of the participants understood the meaning of the symbols, and the rest, which forms the 96.67 % of the participants, did not figure out the content of the label. The last symbol of the washing symbols was the hand wash sign, which can be defined as the most understandable sign within the washing signs: 94 people, which forms 78.33 % of the participants, correctly understood the meaning of the sign, and 20 % of the participants made wrong explanations for the sign.

With regard to Table 2, bleaching symbols have a quite low level of understanding by the participants. The first symbol, which indicates that any bleach can be used during the washing/caring procedures, was understood by only 9 of the 120 participants, which means that 90.00 % of the participants did not comprehend the meaning of that label. Only three participants understood the category of the symbol. The second symbol has even worse results than the first one. None of the participants figured out the meaning of that symbol except three people who confirmed that it was related to the bleaching procedure. In total, for this sign, according to the data that had been gathered, 97.50 % of the participants either made wrong or irrelevant interpretations or did not comment on anything.

As observed next in Table 3, only 7 of the participants correctly understood the meaning of the no heat/air drying symbol, which refers to 5.83 % in total. Moreover, 7 people approximately understood the meaning, whereas 106 people, in other words 88.33% of the participants, had wrong interpretations about that symbol. The level comprehending of the normal tumble drying symbol is relatively better than the no heat/air drying symbol with 81.67 % wrong interpretations.

TABLE I
WASHING SYMBOLS RESULTS




Symbol	Meaning	Exactly Correct	% Exactly Correct	App. Correct	Wrong	% Wrong
	Washing at warm temperature	21	17.50	19	80	66.67
	Gentle / Delicate washing	1	0.83	3	116	96.67
	Hand wash	94	78.33	2	24	20.00

TABLE II
BLEACHING SYMBOLS RESULTS





Symbol	Meaning	Exactly Correct	% Exactly Correct	App. Correct	Wrong	% Wrong
	Any bleach can be used	9	7.05	3	108	90.00
	Only non-chlorine bleach should be used	0	0.00	3	117	97.50

TABLE III
TUMBLE DRYING SYMBOLS RESULTS

Symbol	Meaning	Exactly Correct	% Exactly Correct	App. Correct	Wrong	% Wrong
	No heat / air drying	7	5.83	7	106	88.33
	Normal tumble drying	10	8.33	12	98	81.67

As observed in Table 4, none of our participants could understand the meaning of the drip drying symbol, considering the insignificance of approximately understanding the symbol; this symbol can be defined as incomprehensible with a ratio of 90.83 % wrong answers. On the other hand, the do not wring symbol is one of the most understandable symbols according to our questionnaire, with an understandability ratio of 84 over 120 participants.

As observed in Table 5, 103 of the participants did not know the symbol, whereas 13 of the participants made correct explanations for the dry-cleaning label.

In the last care label symbol group, shown in Table 6, the ironing label, contrary to our prediction, obtained a low degree of understandability. Only 24 participants correctly understood the symbol, and 71 participants, who refer to 59.17 % of the total, were unaware of this symbol.

In Table 7 results of the ANOVA analyses are presented. As seen from the table, there was a statistically significant difference at $p < 0.05$ level in recognizing the washing labels for gender groups, in recognizing drying labels for different age groups and in recognizing ironing labels for gender groups. There aren't any differences found among sub-classes in terms of recognition of different groups of care labels.

With regard to the recognition of the washing labels, female respondents ($M = 1.12$, $SD = 0.58$) had a higher mean score than male respondents ($M = 0.82$, $SD = 0.57$). Similarly, for the ironing labels, women ($M = 0.32$, $SD = 0.47$) scored higher than men ($M = 0.08$, $SD = 0.28$). For the drying labels, the 23–35 age groups scored highest ($M = 0.80$, $SD = 0.41$), followed by the > 35 age group ($M = 0.75$, $SD = 0.44$) and the 15–22 age group ($M = 0.55$, $SD = 0.50$), respectively.

TABLE IV
TUMBLE DRYING SYMBOLS RESULTS



Symbol	Meaning	Exactly Correct	% Exactly Correct	App. Correct	Wrong	% Wrong
	Drip drying	0	0.00	11	109	90.83
	Do not wring	84	70.00	0	36	30.00

TABLE V
DRY-CLEANING SYMBOLS RESULTS


Symbol	Meaning	Exactly Correct	% Exactly Correct	App. Correct	Wrong	% Wrong
	Dry-cleaning is necessary	13	10.83	4	103	85.83

TABLE VI
IRONING SYMBOLS RESULTS


Symbol	Meaning	Exactly Correct	% Exactly Correct	App. Correct	Wrong	% Wrong
	Ironing at medium temperature	24	20.00	25	71	59.17

TABLE VII
ANOVA RESULTS

ANOVA	Washing Labels			Bleaching Labels			Tumble-drying Labels		
	Gender	Age Interval	Education Level	Gender	Age Interval	Education Level	Gender	Age Interval	Education Level
df	1	2	3	1	2	3	1	2	3
F	8.000	0.765	0.263	0.111	2.333	0.407	0.909	0.255	0.424
Sig.	0.006*	0.468	0.852	0.740	0.102	0.748	0.343	0.776	0.736

ANOVA	Drying Labels			Dry-cleaning Labels			Ironing Labels		
	Gender	Age Interval	Education Level	Gender	Age Interval	Education Level	Gender	Age Interval	Education Level
df	1	2	3	1	2	3	1	2	3
F	1.532	3.574	1.475	0.087	1.391	1.246	10.316	2.053	0.982
Sig.	0.219	0.032*	0.226	0.769	0.254	0.297	0.002*	0.134	0.404

IV. CONCLUSION

The results revealed that Turkish people generally do not understand or know the meaning of clothing care labels. This is shown by more than 50 % wrong explanations that are given to the care symbols presented except “hand washing” and “do not wring.” The most understood care symbols are hand washing, do not wring, and ironing at medium temperature, respectively, if both exactly and approximately correct answers are taken into account. These are the only labels that have a higher analogy to the related process symbolized. The least understood symbol groups are tumble-drying, bleaching, and dry-cleaning related symbols. These results are somewhat consistent with the fact that tumble drying is highly unaccustomed in Turkey, and bleaching and dry cleaning are only applicable for specific clothing or textiles, for example, suits for dry cleaning and white linens for bleaching. In addition to that, care symbols that are designed to provide detailed information regarding the related caring processes, similar to the ones such as “gentle / delicate washing” or “only non-chlorine bleach should be used,” have been understood by relatively low numbers of respondents, compared with more common symbols in the same caring process group. These results emphasize the importance of analogy in symbol design.

ANOVA results showed that gender makes a significant difference in terms of understanding the washing and drying care labels; however, ANOVA results, except the gender- and age-related ones for washing and the gender-related ones for drying care symbols, are not reliable, as the normality assumption is violated by the low numbers of exactly correct answers. In general, as shown by the washing and drying care results, it is expected that the number of correct answers received from female respondents for every care symbol group is relatively higher. So, further research that is conducted with higher numbers of respondents is needed.

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