The Semantics of "New" Batik Clothes: *Identifying Users' Perception on the Colors and Patterns of Newly Developed West Javanese Batik Clothes*

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Abstract. Batik is a traditional textile art of Indonesia, in which through its appearance we may excerpt the customs, traditional values, way of life, spiritual meanings, and cultural characteristics of Indonesian people. Previous researches on batik have-for the most part-uncovered and elaborated batik as a solely artifact of art, distancing its relation with those who use it. As results, most of batik research tends to frame batik as an object of preservation and do not elaborate more on the context of batik as an object of perception (of users) or batik as an object of consumption. To address this issue, the paper explores perceptual identification of batik users using *semantic differential method*, evaluating actual users' perception on the element of colors applied on clothes of *West Javanese* batik as object of study. The obtained data will be cross-referenced to identify gender and subject-experience variables. The implication of the findings for the creative process and marketability of batik will be discussed, in hoping to gain applicable knowledge for the preservation as well as new development of *West Javanese* batik design.

Keywords: *perceptual identification; textile colors; West Javanese Batik design.*

1 Introduction

Batik is the name given in Indonesia to the process of applying resist-dyed patterns to the cloth, using the *canting* tool. The art of *batik* is one of many cultural elements peculiar to Indonesia as it has been present in the midst of its people, growing and developing for centuries and represents the cultural legacy of the Indonesian people. Much can be learned from *batik* design---the cultural background, beliefs, customs, the characteristics of people and their way of life, their natural environment, their spiritual values, etc [1]. According to Sylvia Fraser-Lu the word batik is derived from the Indonesian word *ambatik* meaning 'a cloth with little dots' [2]. This root meaning may seen also in other words of Javanese culture, such as *tritik* (Javanese words for a resist process by which designs are reserved on textiles by sewing and gathering before dyeing), *nitik* (batik designs which imitate weaving patterns) and *klitik* (the name of well-known batik design). Semantically, the word 'tik' in Javanese words can be used to refer to drawing, painting and writing.

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Previous researches on batik have—for the most part—uncovered and elaborated batik as solely artifact of arts, distancing its relation with those who use it. As results, most of batik research tends to frame batik as an object of preservation and do not elaborate more on the context of batik as an object of perception [3,4,5,6]. To address this issue, the paper explores perceptual identification of batik users using *semantic differential method*, evaluating actual users' perception on the *visua*l element (colors) and *haptic* element (textures) of *West Javanese* batik as object of study. The obtained data are cross-referenced to identify its implication for the creative process of batik makings, in hoping to gain applicable knowledge for the preservation as well as new development of *West Javanese* batik design.

2 Methodology

2.1 Sample of Batiks as Stimuli

15 newly designs of *Tasikmalayan* batik were used as stimuli and presented to subject on a 30 x 30 cm display attached with their stimulus numbers (S1, S2, …….S15). 14 batik clothes are made of tetoron (S1-S14) and 1 batik (S15) cloth is made of pure-cotton material. All stimuli were randomly selected and provided by the batik makers/craftsmen of Tasikmalaya – West Java Indonesia. The stimuli are presented in Figure 1.

Figure 1 Stimuli of Batik.

2.2 Subjects

15 purposive sampling of actual users of batik clothes were selected and took part voluntarily in this study. They consist of 4 (27%) male and 11 (73%) female; 8 (53.3%) are on the age of 20-30 years old, 6 (40%) are on the age of 30-40 years old, and 1 (6.7%) is on the age of more than 40 years old. All participants had normal or corrected to normal vision, and assumed that none have any type of color deficiency prior to the study.

2.3 Procedures

Subjects completed an introductory questionnaire containing demographic variables prior to the experiment, which took less than 2 minutes. On separate pages, 11 adjective words that are strongly associated with the appearance of batik clothes were presented to subjects. They are *luxurious, strong, light, thick, formal, modern, soft, cool, comfortable, simple,* and *bright.* According to Osgood et al, the *Semantic Differential* method is a reliable and punctual method to evaluate perceptual responds toward things that need to be explained objectively (object, artifacts, words, concepts) [7,8]. The perceptual responds of subjects are identified and evaluated according to its quality and intensity by using a set of adjective words. In the experiment, SD method was used to evaluate subjects' perceptual responds toward the colors, patterns, and textures of Tasikmalayans' batik clothes.

The procedures for the experiment were conducted in two phases:

1. Each subject was presented with a stimulus (a piece of batik cloth in a 30x30 cm display), viewed it, and associated the visuals with the presented adjective words by associating the perceived visual sensation according to 5 *Likert*-scale responds: strongly agree, agree, n/a, disagree, and strongly disagree.
2. Each subject was presented with a stimulus (a piece of batik cloth in a 30x30 cm display), touched and sensed it, and associated the senses with the presented adjective words by associating the perceived *haptic* sensation according to 5 *Likert*-scale responds: strongly agree, agree, n/a, disagree, and strongly disagree; as had been suggested in the previous textile research on traditional clothes [9].

   To avoid conventions, no indications nor discussions on each given word or question was allowed. The entire procedure took less than 30 minutes to complete.

3 Result and Discussions

3.1 Semantic Attributes of Colors, Patterns, and Textures

Results of descriptive statistics indicate that Stimulus 12 (mean value = 3.727) is perceived to be the most appreciated batik cloth based on the appearance of colors and patterns, while stimulus 10 to be the least appreciated (mean value = 3.054). On the haptic perception, stimulus 13 (mean value = 3.842) is perceived to be the most appreciated batik cloth based on combination of texture and visuals, while stimulus 14 to be the least appreciated (mean value = 2.957).

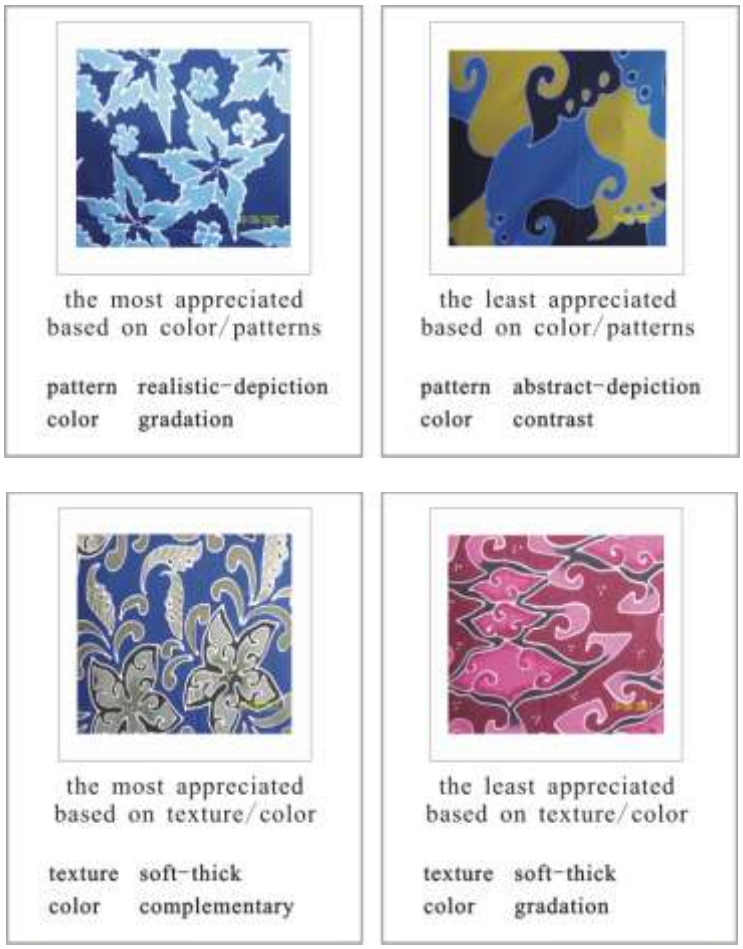

Figure 2 Semantic Interpretation of Batik Stimuli based on Colors and Textures.

Table 1 SD analysis on colors and patterns.

	luxurious	light	modern	strong	soft	thick	cool	formal	simple	comforta	bright
1	2.93	3.60	3.07	3.80	3.67	2.40	3.93	2.87	3.60	3.93	3.40
2	3.60	3.60	3.40	3.60	3.53	2.40	3.67	3.40	3.40	3.53	3.27
3	2.53	3.67	2.93	3.47	3.80	2.33	3.53	3.33	3.60	3.87	2.40
4	2.73	3.80	3.40	3.00	3.87	2.27	3.60	2.67	2.93	3.73	3.67
5	2.87	3.40	3.00	3.33	3.67	2.47	3.80	2.73	3.93	3.73	2.93
6	2.80	3.93	3.33	3.33	3.93	2.20	4.27	3.33	3.53	4.27	3.93
7	3.27	3.80	3.07	3.80	3.93	2.53	3.73	3.33	3.93	3.93	3.07
8	2.40	3.53	2.73	3.20	3.80	2.33	3.53	2.67	3.13	3.60	4.27
9	3.13	3.60	3.13	3.47	3.67	2.53	4.13	3.40	3.40	3.93	2.67
10	2.47	3.20	2.80	3.60	3.53	2.53	3.00	2.20	3.13	3.13	4.00
11	2.60	3.53	2.87	3.07	3.53	2.53	3.87	2.33	3.27	3.80	2.73
12	3.87	3.93	3.87	3.60	3.60	2.93	3.87	3.60	3.20	4.07	4.27
13	3.60	3.60	4.00	3.87	3.87	2.87	4.00	3.60	3.20	3.80	3.87
14	2.73	3.20	2.33	3.67	3.40	2.80	3.07	2.80	3.20	3.33	3.40
15	3.13	3.73	3.20	3.53	3.67	2.73	4.13	3.13	3.60	3.93	2.20

Table 2 SD analysis on colors and textures.

	luxurious	light	modern	strong	soft	thick	cool	formal	simple	comforta	bright
1	2.80	3.47	2.80	3.33	3.67	2.53	3.80	2.80	3.27	3.93	3.80
2	3.53	3.40	3.33	3.67	3.67	2.87	4.00	3.53	2.93	4.00	3.47
3	3.00	3.13	3.27	3.73	3.60	2.93	3.33	2.67	3.47	3.47	2.20
4	3.33	3.93	2.93	3.13	3.27	2.53	3.40	2.87	3.20	3.33	3.47
5	2.87	2.93	3.00	3.27	3.20	2.73	3.33	2.93	3.40	3.67	2.93
6	3.40	3.93	3.47	3.60	3.60	2.53	4.20	3.20	3.47	4.07	3.53
7	3.47	3.20	3.07	3.53	3.60	3.13	3.93	3.67	3.67	3.67	3.13
8	2.27	4.00	2.53	3.07	3.60	2.47	3.27	1.93	3.00	2.93	4.47
9	3.07	3.47	3.07	3.27	3.67	2.67	3.93	3.67	3.33	3.60	2.33
10	2.33	3.07	2.67	3.67	3.20	2.73	3.07	2.27	2.80	3.27	4.07
11	2.60	3.27	2.73	3.73	3.27	2.60	3.47	2.60	3.07	3.47	3.53
12	3.40	3.60	3.60	3.67	4.13	2.80	4.13	3.60	3.13	4.07	4.40
13	4.07	3.67	3.93	3.87	4.13	3.07	4.13	4.33	3.07	4.27	3.73
14	2.13	3.47	2.40	3.73	3.27	2.73	3.40	2.80	2.47	3.33	2.80
15	2.67	3.53	3.13	3.40	3.47	2.47	4.33	3.47	3.33	3.67	2.07

Further, result of SD analysis show that out of 15 samples of batik, there are certain patterns and colors that are perceived differently by subjects (see table 1). Stimulus 12 presents the most appreciated image on *luxury*, *lightness, thick/bold*, *formality*, and *brightness.* Stimulus 13 presents the most appreciated image on *modernity*, *strength*, and *formality.* Stimulus 6 presents the most appreciated image on *softness*, *coolness*, *simplicity* and *comfort*. Thus, when adopting the presented visuals of batik clothes, subjects tend to associate *luxury* with *formality*, *modernity* of appearance with *strength*, *coolness* and *simplicity* with *comfortability*. SD analysis also shows that certain combination of colors and textures are perceived differently too (see table 2). When adopting the presented textures through touching and sensing, subjects tend to appreciate the stimulus 13 for the image on luxury, modernity, strength, formality, and

comfortability. Stimulus 8 presents the most appreciated images on lightness and brightness. Stimulus 7 presents the most appreciated images on softness, thickness, and simplicity. Stimulus 15—the only cloth with different type of fabric—is mostly appreciated for its *coolness*. This indicates that differences in fabric influence users' perception on the coolness feeling of the texture and not its comfortability sense. Thus, when related to the comfortability of a batik cloth, users tend to associate it directly with how it fits the appearance of users when wear it.

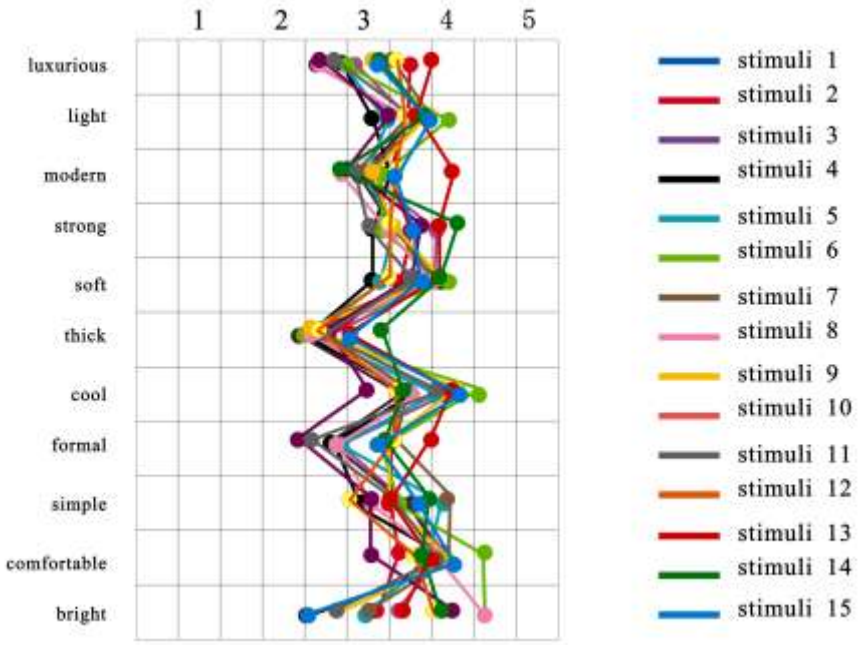

Figure 3 Composite results of semantic attributes.

Those results can be applied on the perceptual space to identify tendencies of batik stimuli under study, so that it can be used as referential basis to develop batik clothes further. Composite results of SD image graph shows that each stimulus is perceived differently by users. This confirms assumption that certain patterns and colors are perceived differently by subjects [10,11]. Results indicate that differences in fabric influence users' perception on the coolness feeling of the texture and do not significantly relate to its comfortability sense. Thus, when related to the comfortability of a batik cloth, users tend to associate it directly with how it fits the appearance of users when he/she wears it. The complete perceptual spaces of color/patterns are presented Figure 3.

3.2 Perceptual Matrices

Results of 1st factorial analysis (initial *eigenvalue* of 80.145; factor loading ≧ 0.65) indicate that when subjects adopting the presented visual of colors and patterns of the batik cloth, there are three significant factors that influence their decisions. They are:

1. Factor 1: luxurious, strong, thick, and formal, therein referred to as *formality*
2. Factor 2: light, modern, soft, cool, and comfort, therein referred to as *comfortability*
3. Factor 3: simple and bright. therein referred to as *simplicity*

Results of 2nd factorial analysis (initial *eigenvalue* of 80.568; factor loading ≧ 0.70) indicate that when subjects adopting the presented visual of colors and textures of the batik cloth, there are three significant factors that influence their decisions.

1. Factor 1: luxurious, modern, soft, cool, formal, and comfortable, therein referred to as *coolness*
2. Factor 2: light, strong and thick, therein referred to as *strength*
3. Factor 3: simple and bright, therein referred to as *simplicity*

Table 3 Factor analysis on colors and patterns.

Rotated Component Matrix[a]

	Component		
	1	2	3
Luxurious	.894	.139	-6.03E-02
LIGHT	.318	-.722	.457
MODERN	.918	.182	-3.99E-02
STRONG	.261	.824	.238
SOFT	.844	7.509E-02	.316
THICK	.312	.849	-5.62E-02
COOL	.973	-.135	-.128
FORMAL	.865	.208	-.224
SIMPLE	.403	-.206	-.705
Comfortable	.890	.187	-5.15E-02
BRIGHT	4.637E-02	-.128	.837

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Table 4 Factor analysis on colors and textures.

Rotated Component Matrix[a]

	Component		
	1	2	3
Luxurious	.420	.853	-.109
LIGHT	.927	3.469E-02	-5.97E-02
MODERN	.706	.493	-.353
STRONG	-.109	.815	.211
SOFT	.769	-.232	3.759E-02
THICK	-.208	.932	-9.74E-02
COOL	.846	.107	.259
FORMAL	.639	.659	2.842E-02
SIMPLE	.221	8.911E-02	.874
Comfortable	.907	3.487E-02	.247
BRIGHT	9.096E-03	6.068E-02	-.845

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The results of factorial analysis can be diagrammed on perceptual matrices to identify which stimuli of batik clothes that have higher probabilities to be developed and marketed further. These matrices provide objective explanation

of why should one particular element and/or aspects of batik cloth need to be explored and how it relates to users' perception of viewing and sensing it.

Figure 4 Image chart A: color and pattern.

Image chart analysis on both visual and haptic perception of clothes (figure 2 and 3) shows that stimuli which perceived to have positive *formality* and *comfortability* factors are those that use semi-realistic floral pattern instead of fully abstracted pattern, and those that applied complementary colors (in gradation) as opposite to those in contrast one. This indicates that in order to make "marketable" clothes of newly developed Tasikmalayan's batik, one should carefully consider not too exploit the pattern into a fully abstract painting because users relate the clothes more on the traditional realistic-depiction of flowers and leaves throughout the appearance of Tasikmalayan's batik clothes.

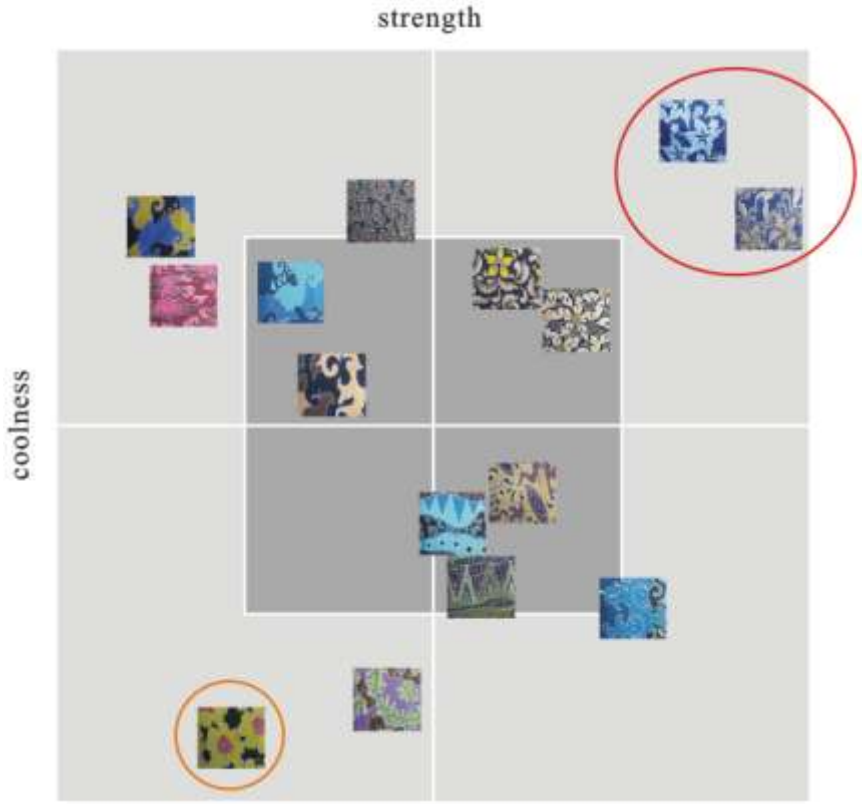

Figure 5 Image chart B: color-texture.

In addition, image chart analysis on haptic perception of clothes (figure 3) also shows that stimuli which are perceived to have positive *coolness* and *strength* factors are those that also perceived to be visually attractive. Both charts show that batik clothes that depicted mostly on semi-realistic floral pattern and applied complementary colors (in gradation) are more *preferred* by users. This indicates that users tend to look for identifiable and recognizable elements within the clothes to assure their familiarity on Tasikmalayan's (or other types of) batik clothes despite of differences on the fabrics (as shown in the analysis of haptic perception).

4 Conclusions

Based on the continuous analysis on the presented stimuli, it can be concluded that:

1. When adopting visuals (colors and patterns) of batik clothes, users tend to appreciate the more realistic-depiction of floral patterns and gradational

used of colors than those that depicted in abstracted figures and contrasted colors. Therefore, batik clothes that made in realistic-depiction of floral patterns and applied gradational colors instead of contrast one have higher possibility of being commercially success and accepted by users.

2. Differences in fabric influence users' perception on the coolness feeling of the texture and ds not significantly relate to its *comfortability* sense. Therefore, when subjects value the *comfortability* of a batik cloth, he/she tends to associate it directly with how it fits the appearance when he/she wears it. Thus, appearance of clothes play important role in determining how it attracts users (or potential consumers) and urges their interests toward the clothes.
3. Aside of similarities in the adopted factors (*simplicity*) users tend to consider the *formality* and *comfortability* aspect of appearance when batik cloth is viewed and wore, and consider more on the *coolness* and *strength* aspects of fabric when a batik cloth is touched and sensed.
4. When developing new Tasikmalayan's batik, one should carefully consider not too exploit freely into the forms of abstract patterns because sample of users (as probable consumer of batik clothes) appreciate more on the relation with traditional realistic-depiction of flowers and leaves throughout the appearance of Tasikmalayan's batik. Thus, users tend to look for identifiable and recognizable elements within the clothes to assure their familiarity on Tasikmalayan's batik clothes.
5. This study has successfully highlighted the use of semantic differential method to investigate the suitability of applying certain design elements of the newly developed batik clothes. It can therefore be suggested that by understanding the objective elements of batik designs we can organize and use the knowledge to make the newly developed Tasikmalayan's batik clothes more useful, appreciated, and hopefully commercially successful.

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