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Effective Colour Communication

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ABSTRACT

Experimental data on describing colour samples was obtained from sixteen participants from design and chemistry/engineering backgrounds. Design participants tended to use more creative and imaginative terms, as well as a wide range of semantic fields (a term borrowed from linguistics). On the other hand, participants from chemistry/engineering backgrounds described samples objectively and more precisely. They used a limited number of semantic fields. In terms of describing the process of changing the appearance of one sample to another, participants from chemistry/engineering used technical terms and described the process more systematically in comparison to the design participant group. Participants from the design background were less likely to explain the process of changing the appearance of a sample. They tended to stay focused on the difference between samples. This research provides evidence that people from different disciplines who need to collaborate in colour design use different colour vocabularies.

Keywords: *Language, Describing colour, Semantics, Colour association*

INTRODUCTION

In the area of colour design there are two main groups of professionals that use colour and need to collaborate. These are designers and chemists. Designer colourists tend to respond emotionally to colours and materials. These colour specialists analyse colour trends, preferences, and patterns in order to predict customers' future needs and market demand [1]. Their role also involves consulting with clients, considering budgets, and developing painted colour applications for surface materials. Colour development also requires people with a chemistry background. Colour chemists tend to work in laboratories, mixing pigments and thinners in measurable quantities to create new colours [2]. They also test paint strength and durability to achieve the best functionality.

Collaboration between these two groups of colourists is inevitable throughout the colour design process from creating new colours to final product applications. This is because both

functional and aesthetic aspects need to be balanced for colour design success. However, these groups of colourists often face communication difficulties. This may be because of a lack of shared and common understanding about different ways of describing colours, and because of different disciplinary backgrounds. The goal of this research is to investigate colour communication differences between two groups of participants – one from design and the other from chemistry/engineering.

METHODOLOGY

Sixteen students took part in an experiment to describe the appearance of twelve samples. These students were divided into two groups comprised of eight from a design background and eight from a chemistry/engineering background.

Six alphabetically coded pairs of colour samples were used. Each sample within a pair differed from the other as follows. Pairs A, B, and C differed in colour; pairs D, E, and F differed in gloss, texture, and colour (Figure 1). For each pair of samples, the samples were shown individually and then as a pair. Participants were asked to describe each sample and then the process of adjusting the first sample from each pair to make it look like the second in the pair. The word 'colour' was not mentioned by the experimenter during this process as it might influence participants to describe and talk about colour only.

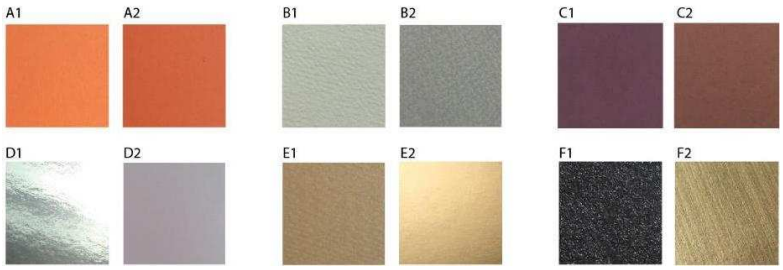

Figure 1: Pairs of samples used for the experiment.

RESULTS AND DISCUSSION

1. Evocative and emotional terms

Participants from a design background used evocative and emotional terms such as "reminds me", "it makes me think", "feel", and "it's saying to me" more often in comparison with participants from chemistry/engineering (Figure 2 and 3). Even though three participants from chemistry/engineering used emotional terms, they were still likely to describe what they were looking at objectively, focusing on the present time (Figure 4).

Disciplinary Background	Design	Chemistry/Engineering
Used Emotional/Evocative Terms	Frequency	Frequency
Feel	88	77
Reminds me	5	8
Makes me think about	46	0
It's saying to me	11	0
Total	**150**	**85**

Figure 2: Frequency of emotional and evocative terms.

Design Participant 1	***To me it's saying*** hey I'm bling-bling, I attract attention, I am shiny, I am expensive, don't touch me just look at me. (sample D1)
Design Participant 2	***I feel*** this one is more soft, hair colour, a golden hair colour, blondie, some traditional architecture. (sample E2)
Design Participant 3	***It makes me feel*** a little bit cool. (sample D1)
Design Participant 4	This colour is very warm, and ***makes me feel*** full of energy. (sample A1)
Design Participant 5	***It makes me think***. Just think my grandpa, yes ***it's like*** his clothes a little bit. (sample E1)
Design Participant 6	***It looks like*** shiny and a little bit elegant. (sample F2)
Design Participant 7	It is very confusing for me. ***It looks like*** skin colour. (sample E1)
Design Participant 8	***It makes me think about*** old things, old furniture, ***makes me think about*** 1960's (sample C1)

Figure 3: Examples of emotional/evocative language uses from design participants.

Chemistry/Engineering Participant 2	***It feels like*** a gold, golden foil, golden foil. (sample E2) It's black and ***it feels a little bit*** reflective. (sample F1)
Chemistry/Engineering Participant 4	***It looks like*** paper pulp with a beige pigment to it (sample E1)
Chemistry/Engineering Participant 5	I ***think it's just*** smooth, no rough surface. (sample C1) I ***think this looks like*** the first sample. (sample B1)
Chemistry/Engineering Participant 8	***It reminds me of*** rice paper that crinkly texture. (sample B1)

Figure 4: Examples of emotional/evocative language used from chemistry/engineering participants.

2. Associations of sample colour with images and memories

Design participants expressed their responses using adjectives about feelings and memories. These are also closely connected with evocative and emotional language uses that are mentioned above. Lawson (2004, p.93 as cited in Bartlett, 1932) says that "evocativeness of words is a function of our long-term memory which is conceptual and schemata based" [3]. The author also states that designers acquire higher levels of sophistication and elaboration in schemata for concepts they deal with [4].

Design Participant 1	Yet, still ***calming colour*** which is ***not loud***. (sample B2) The colour is ***not too busy***. (sample B1)
Design Participant 2	You know the warm colour always reminds me of ***food like tomato, McDonald***. (sample B2)
Design Participant 3	It looks like ***wood and natural paper***. (sample E1) It still feels a little bit ***luxury*** (sample F1)
Design Participant 4	This colour is ***out of fashion***. (sample C1) A ***village***, some ***mountains and trees, green trees***, and it makes me feel that I am in a ***very good environment***. (sample E1)
Design Participant 5	It is more similar to ***sunset***. It is like that is ***a girl***. (sample A2) It makes me feel like ***I am going to die***, if I see this colour everywhere ***I feel as if I die***. (sample D2)
Design Participant 6	This one is a little bit like ***a tissue***, it is ***being wet and being dried*** kind of. This one is easy to be ***destroyed by water***. (sample B1)
Design Participant 7	It looks like ***Hungarian decoration***.(sample F2) It looks like ***skin colour***. I think, so, but ***unhealthy people's face*** colour. (sample E1)
Design Participant 8	This colour makes me think about ***poor places, not well organised places***, like in the very ***dirty, dirty underground*** or a ***dirty village*** (sample E1)

Figure 5: Examples of association in colour samples from design participants.

Design participants associated samples with a range of images (Figure 5). There has been a crucial place for imagination in considerations of creative behaviour and the formation of ideas [5]. For them, what they are feeling at the time may be important. For this reason, some of

them did not mention the names of colours at all. Interestingly, for C2 (brown colour sample), no design participants mentioned the name of the colour while all chemistry/engineering participants did (Figure 6). Design participants were three times more likely to use terms associated with feeling/memory than the other group (Figure 7).

Participants' responses from design background		Participant's response from chemistry/engineering background	
D1	natural, earthy, blend with environment, calmness, smooth, made of card, wood paper pulp	C1	***burnt umber***
D2	chocolate, coffee, forest, feels like Africa, cosmetic foundation, hair	C2	***brown***, soil, leather, bricks
D3	wood, fence, good for clothes	C3	robust, rigid, matte, ***black finish***
D4	out of fashion, elder people like it, earth	C4	***brownish***, smooth
D5	wall, Lisbon city, buildings in Lisbon	C5	matte, ***brownish red***, earthy, pottery, smooth looking, ***browny beige***
D6	same as C1 just colour different	C6	***brown***, tan, between brown and orange, more brown side, not reflective, quite opaque
D7	buildings, house, wall	C7	wood, natural, soft, ***brown***, matte
D8	boring, autumn, sadness, old style, old building, rough, very cheap	C8	cognac, rust, ***orange***, ***slight orange***, ***mostly brown***, shoes

Figure 6: Participants' language uses in terms of sample C2.

Disciplinary Background	Design	Chemistry/Engineering
Used Associated Terms	Frequency	Frequency
Look(s) like	35	14
Think	125	35
Total	**160**	**49**

Figure 7: Frequency of terms of association.

3. Suggestion of possible application

Participants from a design background also described samples in terms of possible application (Figure 8). However, none of the participants from chemistry/engineering did so.

Design Participant 2	Packaging ***design especially the luxury brand***. (sample E2)
Design Participant 3	Maybe this is ***good for clothes***. (sample C2)
Design Participant 6	It makes me feel like the ***package for the wine*** kind of. (sample F2)
Design Participant 7	When I ***design for … sophisticated design***, I will ***use that kind of grey colour***. (sample B1 & B2)

Figure 8: Example sentences of possible applications

4. Expression of personal preferences

Five out of eight design participants expressed their personal preference whereas only one person from chemistry/engineering showed a preference (Figure 9).

Disciplinary Background	Design	Chemistry/Engineering
Used Terms	Frequency	Frequency
I like	10	1
I do not like	10	0
Total	**20**	**1**

Figure 9: Frequency of preference terms.

5. Describing how to change one sample to the other

In terms of describing how to change the first sample in a pair to look like the second, design participants often ignored this. Some of them focussed on differences between samples and their own feelings instead of a practical method of making samples the same. In contrast, all of the chemistry/engineering participants explained how to make the sample in each pair match. The terms used by them to answer this question contrasted with the responses of design participants. They used technical terms and explained the process systematically (Figure 10).

Participants' responses from design background		Participant's response from chemistry/engineering background	
D1	OK. I can try it to ***add a colour*** to it. (sample A1 & A2). ***I wouldn't change***. (sample F1 & F2).	C4	***Electro-coat*** with some gold. (sample F1 & F2)
D2	E2 gives me a bit more ***feeling of richness and luxury***, the other could be replaced. (sample E1 & E2)	C7	There is a ***very scientific way of*** it. Because I can see this one is probably ***copper***, so this one probably another kind of ***iron*** base metallic. You put in different sign of the ***power like plus(+) sign*** and ***minus(-) sign***. (sample F1 & F2)
D4	Actually, I will ***add grey*** to the B1. (sample B1 & B2)		
D5	***Add sticker*** to change the textile. (sample E1 & E2)		
D7	There is ***no change*** for me. (sample F1 & F2)	C8	I know that would ***absorb some of the reds wavelengths***. (sample A1 & A2)

Figure 10: Sentence examples of participant strategies for transforming samples.

6. Trying to touch (behavioural characteristic)

Various scholars claim that moving the body in natural ways and touching things help the way they engage emotionally with tasks and affects how what is being evaluated is perceived [6-8]. It was observed that three out of eight design participants tried to touch or asked to touch samples although they were asked not to. However, they described samples as if they had touched them. In contrast, none of the participants from chemistry/engineering ask to touch samples.

CONCLUSIONS

Traditionally, scientists tend to value objectivity and methodological precision, whereas designers and artists tend to value creativity and might express their ideas more subjectively. Language used by design and chemistry/engineering students probably reflects the emphasis and values within their different disciplines.

The concept of the semantic field borrowed from linguistics is helpful here. Semantic fields is defined as "one way of imposing some order on vocabulary is to organise it into 'fields' of meaning. Within each field, the lexemes interrelate, and define each other in specific way" [9]. A wide range of semantic fields of natural features, feelings, emotions, colours, and temperature were used by design participants. They used sematic fields creatively and imaginatively in their description. On the other hand, participants from a chemistry/engineering background used a more limited range of semantic fields focusing heavily on colour. They used more precise language and terms in their description.

The examples of language use collected in this study provides evidence that people from a design background use a more abundant vocabulary than people from a scientific background. These comparisons are not intended to suggest negative or positive judgements by the researchers but to describe the different values of these participants. The results of this research offer additional ways of understanding different approaches in describing colours. The research provides justification for further study of communication between colour-using professionals in the work place.

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