Colour Information in Design

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ABSTRACT

This study is concerned with identifying which types of colour information are useful in design. An analysis of the literature (299 journal papers and 10 textbooks) identified thirteen types of colour information. The importance of these thirteen types was explored through an online survey (N=62) with participants (identified through LinkedIn with a strong interest in packaging and branding) and face-to-face interviews (N=10) with senior designers and brand managers. The results from the online survey and the interviews were broadly consistent (r^2=0.66) and identified *harmony, perception, meaning, psychology,* and *printing* as being particularly important.

1. INTRODUCTION

Gradually the world would become more colourful (Leeuwen, 2011). In a demonstration of this statement, we can find the proliferation of colour in product categories that were previously largely black or white − e.g., kettles, toasters. In the retail industry, colour in packaging is a key differentiator as most warehouse supermarkets more or less offer the same shopping experience through their formats of stocking and display. Colour conveys products' messages, and influences consumers' attention and their purchase decision-making. Yet despite the importance of colour in design, it has tended to be regarded as secondary. Throughout the design process, a considerable range and volume of information is generated, used, referred to, and consulted with (Baya *et al*., 1992). Useful information in design can assist to save duplication of effort and time and to simulate creative energies (Wodehouse and Ion, 2010). According to the Cambridge Dictionary of Sociology (Turner, 2006), information is defined as uncertainty reduction, patterned abstraction, and knowledge. In the Oxford Dictionary of Environment and Conservation (Park and Allaby, 2013), information is interpreted data which is useful for making decisions or arriving at new facts. In the Oxford Dictionary of Psychology (Colman, 2009), information is knowledge acquired by learning. Synthesising these conceptions of information, this study defines colour information as interpretations, abstractions and knowledge about colour data in various fields, which include natural sciences, technology, art, psychology, cultural studies, history, and design. Colour is a meta-discipline that crosses various academic boundaries such as science, design, art, history and education. Due to the multi-disciplinary nature of colour, it is not clear whether colour information is effectively utilised in the design process. Furthermore, although developing technology makes it easy to access to variety formats of colour information via publications, websites, or mobile Apps, there are many unreliable sources especially on the internet. Colour information is a relatively new area that has not yet been addressed in detail by design research practically or theoretically. In this sense, it is noticeable that there is currently a lack of study on colour as information in design. This study will provide valuable insights for designers and brand managers informing which colour information are useful for their design process.

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2. METHOD

Multiple methods such as analysing literature, online survey and face-to-face interviews with designers and brand managers were carried out to explore which colour information is useful in design. Firstly, 299 journal papers were searched by the keyword 'colour' in Colour Research and Application (CRA) which is a primary journal for colour field for 2011-2013 and ten academic books on colour which could be generally found in library were investigated using title analysis. The title of a document gives a compact summary (Senda and Sinohara, 2002), and the title analysis provides insight into topics of relative current interest (Ruben, 1992). The title terms presented in the 299 journals and the ten books were counted using online word frequency. In the CRA journal, titles predominantly focus on 'harmony', 'measurement', 'printing', 'perception, 'preference' and 'light'. In the ten colour references, titles and contents frequently concern; *design, harmony, theory, printing, art, history, perception, psychology, trend, naming, symbolism, culture* and *preference*. Analysing these terms, thirteen types of colour terms were identified (Table 1). The thirteen types of colour terms are not intended to be definitive or exhaustive. For example, there is no obvious rationale to restrict this survey to hard-copy books or journals and exclude internet sources. Nevertheless, these terms for colour information provide a holistic overview of current topics and relative interest in the colour academic field. Using these thirteen types of colour information, an online questionnaire and face-to-face interviews were conducted to identify useful colour information in the design process. For the online survey, LinkedIn was used as the main online platform to recruit relevant designers and brand managers to participate in the survey. Sixty-two responses were collected for the online questionnaire. For the interviews, ten senior designers and brand managers were interviewed.

In the online survey participants were asked to rate (using a slider bar) on a scale of 0-100 how important each of the thirteen types of colour information were to them in their design work (where 0 = no importance at all and 100 = vital). In the interviews participants were asked whether they considered each type of information to be important (so their responses were binary).

3. RESULTS AND DISCUSSION

Table 1. The thirteen types of colour information used in this study

Colour in art and design: famous artists' or designers' colours.
Colour harmony: colour combinations which arouse a pleasing effect.
Colour history: how a particular colour was developed.
Colour and light: principles of light such as wavelengths and frequencies.
Colour meaning: what is meant by a colour in different cultures or product categories
Colour measurement: measuring properties of colour or using colour measurement devices.
Colour notation: colour numbers or names to describe or communicate colour.
Colour perception: which colours attract consumers' attention.
Colour preference: individual's favourite colour.

Colour printing: the quality of colour printing.	
Colour psychology: behaviour and mental experience on colour.	
Colour theory: supposition or a system of ideas intended to explain colour.	
Colour trend: colours which are on-trend or popular.	

Figure 1 represents the results of the online survey. The figure shows the mean score for importance for each information type. The error bars show ± 1 standard error of the mean. Without performing formal statistical analysis (which will be presented in a future paper) it is clear that the standard deviations of the mean are small compared to the differences in mean scores in many cases. *Printing* gave the strongest response. *History* gave the weakest response. *Printing, harmony, meaning, psychology* and *perception* are all important. *Notation, theory, preference* and *trend* are of lesser importance. The others seem not important at all.
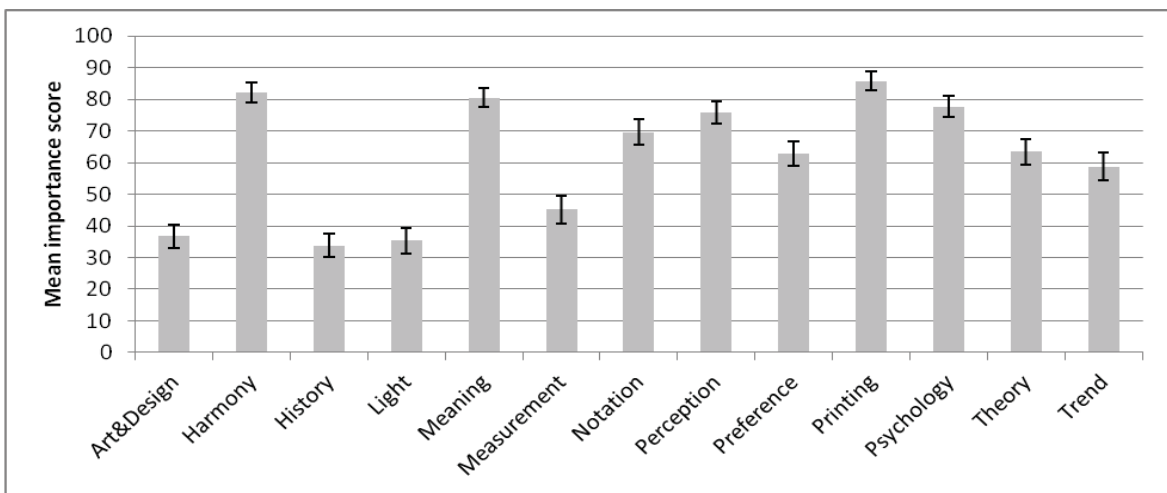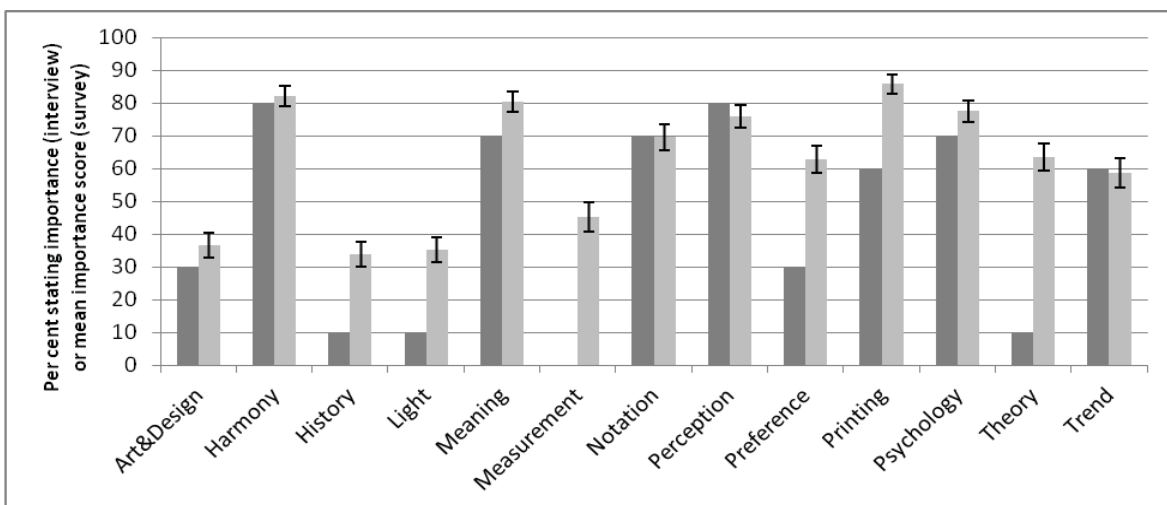

Figure 1: The result of online survey.

Figure 2: The result of face to face interview (dark grey) and the result of online survey (light grey).

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Statistical analysis of the interview responses is more difficult partly because the sample size was low (N=10) and partly because the responses were binary rather than interval data. Nevertheless, if the per cent of participants who state that a colour information type is important is calculated (Figure 2) then it can be seen that *harmony, perception, meaning, notation* and *psychology* gave the strongest response.

If the per cent importance (from the interviews) is compared with the mean importance scores (from the surveys) then there is strong agreement (see Figure 2) between the two studies ($r^2 = 0.66$). Taken together, if the average of the per cent importance and the mean importance scores is calculated then the following types are deemed to be important *harmony, perception, meaning, psychology,* and *printing* because the mean is greater than 70%.

4. CONCLUSIONS

This work sought to identify the types of useful colour information in the design process. A review of the literature identified thirteen terms for further study. Results from an online survey (N=62) and interviews (N=10) showed strong agreement with *harmony, perception, meaning, psychology,* and *printing* identified as areas of importance in the design process.

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