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日本色彩学会誌

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日本色彩学会
THE COLOR SCIENCE ASSOCIATION OF JAPAN

日本色彩学会第43回全国大会要旨集

会期：2012年 5月 25日-27日
会場：京都大学吉田南キャンパス

照明新時代シンポジウム：5 件
口頭発表：51件
ポスター発表：35件
International Symposium：6 件
International Conference：23 件

会場案内
プログラム

MI 1

色

協会認定 パーソナルカラーアドバイザー

7/8 Sunday

11/18 Sunday

2012年 7月 8日（日）
第19回 モジュール１（初級・中級）マークシート
第15回 モジュール２（上級）マークシート

2012年 11月18日（日）
第19回 モジュール１（初級・中級）マークシート
第15回 モジュール２（上級）マークシート

第４回 モジュール３（技能認定試験 ・一部筆記）～モジュール３は年1回
モジュール２合格者に向けて実施・・・2012年４月１日（日）

最上級資格所得者に対し協会より
パーソナルカラーアドバイザーの称号を認定します。

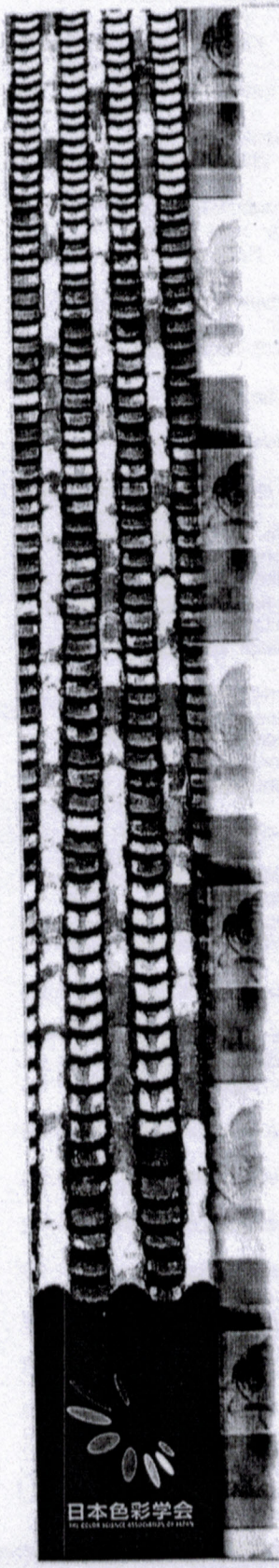
特定非営利活動法人（NPO）
日本パーソナルカラー協会

URL：http://www.p-color.jp
e-mail：info@p-color.jp

色彩技能パーソナルカラー検定

色の理論を実戦の場に活かす検定です！

No.530



日本色彩学会
第43回全国大会 京都 '12

2012年5月25日(金)－27日(日)
京都大学吉田南キャンパス（主会場）
＜そのほか 京都大学百周年時計台記念館＞

25日
冷泉邸見学会
シンポジウム：照明新時代～色彩のサイエンスとデザイン

26日
研究発表：口頭・ポスター　　カラーデザイン発表：口頭・ポスター
国際コンファレンス：ポスター・ショートプレゼン　　企業プレゼン
総会
特別講演：日本人の色彩－冷泉流歌道と年中行事をめぐって
冷泉為人氏（財団法人冷泉家時雨亭文庫 理事長）
懇親会　＜関西日仏学館＞

27日
国際シンポジウム：Color Science for Our Better Life
国際コンファレンス：口頭・ポスター
研究発表：口頭・ポスター
式典

◆ 企業展示・カラーデザイン作品展示・研究会特別展示：26－27日
研究発表：109件（国際コンファレンスを含む）

THE COLOR SCIENCE ASSOCIATION OF JAPAN
THE 43rd ANNUAL MEETING

May 25 (Fri)－27 (Sun), 2012
Kyoto University (Yoshida South Campus)

● **International Symposium** ＜May 27 (Sun)＞
"Color Science for Our Better Life"
Guest Speakers : Prof. Haisong Xu of Hangzhou University, China, Prof. Miho Saito of Waseda University, Japan, Prof. Lee Tien-Rein of Chinese Culture University, Taiwan, Prof. Young In Kim of Yonsei University, Korea, Prof. Pontawee Pungrassamee of Chulalongkorn University, Thailand, and Prof. Ken Sagawa of Japan Women's University, Japan.

● **International Conference: 23 presentations**

主　催：日本色彩学会
運　営：日本色彩学会第43回全国大会実行委員会（担当：日本色彩学会関西支部）
連絡先：〒541-0048 大阪市中央区瓦町4-3-14-1002（辻埜）
e-mail: zenkoku2012@color-science.jp
Tel. 06-6231-4071 Fax. 06-6231-4073
http://www.color-science.jp/zenkoku2012/index.html

CONTENTS

The color constancy in a 3D space perceived stereoscopically

Chanprapha Phuangsuwan* — **Chulalongkorn University, Thailand**
Hiroyuki Shinoda — **Ritsumeikan University, Japan**
Kitirochna Rattanakasamsuk — **Ritsumeikan University, Japan**
Mitsuo Ikeda — **Chulalongkorn University, Thailand**
Pichayada Katemake — **Chulalongkorn University, Thailand**

Keywords: photographs, color constancy, space recognition, stereoscope.

1. Introduction

It is understood that the color constancy does not hold in a photograph. A reddish photograph taken under an incandescent lamp appears reddish. According to the concept of the recognized visual space of illumination RVSI proposed by Ikeda[1] the space recognition is the "must" for the color constancy. Poungsuwan (Phuangsuwan) et al.[2] showed indeed the color constancy took place in a photograph if we can perceive a 3D space in the photograph by a technique called a D-up viewer observed by only one eye. In this paper we employed another technique of a well known stereoscope[3] to obtain a 3D space perception and showed the color constancy in a photograph.

2. Experiment

We built a stereoscope apparatus in which a subject could look at photographs P_L and P_R by respective eyes via mirrors ML and MR, respectively as shown in Fig. 1. When the photographs P_L and P_R were taken for one scene at two locations corresponding to two eye positions the subject could see a 3D scene on FP.

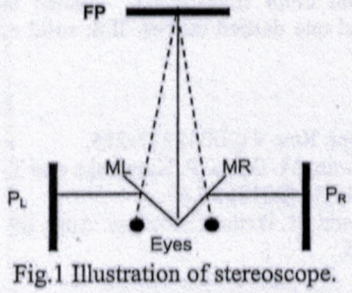


Fig.1 Illustration of stereoscope.

The experimental room was decorated as a normal living room as shown in Fig. 2(a). There were three fluorescent lamps at the ceiling and two lamps were covered with orange filters or with blue filters depending on experiment. The white light and the colored light were mixed by different ratios to make eleven different color of illumination. For each illumination two photographs of the room were taken at the eye positions of a subject, the distance of the positions being 6 cm laterally.

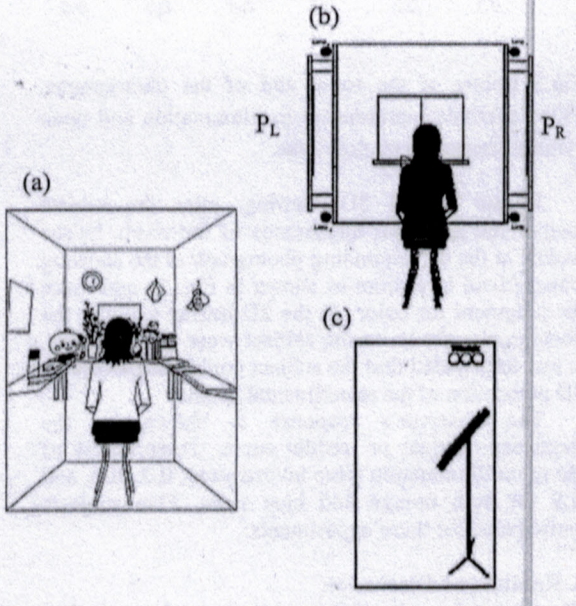


Fig.2 Experimental room (a), stereoscope (b), and normal 2D viewing arrangement (c).

We used the white area of the front wall to measure the color of the room and to check the color reproduction on photographs. The CIExy chromaticity coordinates of the white area taken under 11 illuminations are shown in Fig 3 by diamonds for blue illumination and by circles for orange illumination. The room illuminations are denoted by for example ILo3, which means the third orange illumination starting from the white point. The symbol ILb was use for blue illumination.

Three experiments were conducted: normal 2D viewing, 2D mirror viewing, and 3D viewing. In the 2D mirror and 3D viewing, the experimenter set the illumination to either of ILo3, ILo6, and ILo9 in the case of orange region experiment, asked a subject to enter the room and to memorize the color appearance of the room. Immediately after that the subject was asked to move to the stereoscope apparatus as shown in Fig. 2b, to look at the photographs through the

mirrors, and to judge the color appearance of the photograph. He/she was asked to report "whiter" or "redder" compared to the color appearance of the room.

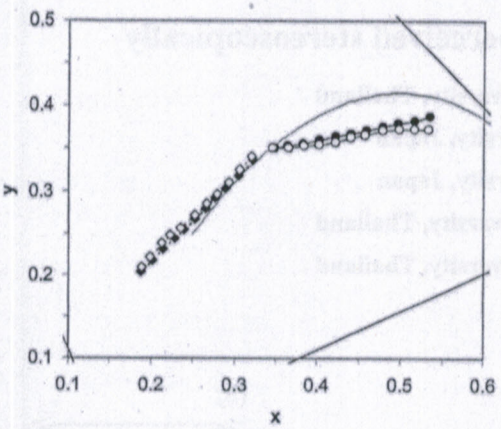


Fig.3 Colors of the room and of the photographs. Filled symbols represent room illumination and open symbols represent photographs.

In the normal 2D viewing, after the subject memorized the color appearance of the room, he/she looked at the corresponding photograph at the showing stand placed in a room as shown in Fig. 2c and made the judgment for color. In the 2D mirror viewing the photographs shown to the subject were exactly same. It was anticipated that the subject could not perceive a 3D perception of the experimental room.

The observer's response is shown by the frequency-of-bluer or -redder curve. Three colors of the room illumination were investigated, IL3, IL6, and IL9 for both orange and blue sides. Five subjects participated for these experiments.

3. Results and Discussion

The averaged results of five subjects are shown in Fig. 4. The abscissa of positive side shows the distance from the white wall on the photograph Po1 taken under ILo1 to the white wall on other photographs on the u'v' diagram. The abscissa of negative side gives the corresponding distance in the case of blue illumination. Short bars indicate the color of the real room under three illuminations investigated. The ordinate shows the percentage of responding "redder" or "bluer". The results from the normal 2D viewing condition show that subjects chose much whiter photographs than the color of real room. In fact for ILo3, even Po1 appeared to subjects whiter than the experimental room lit by ILo3 and the response curve was unable to get. The results in Fig. 4 imply that the subjects had white impression for the experimental room, which shows nothing but the color constancy for the real room and not the color constancy for photographs. The 2D mirror viewing gave a similar result as the normal 2D viewing.

With the 3D viewing the frequency curves scattered toward right and left meaning they chose redder and bluer photographs respectively. The color of the photographs that subjects chose, however, did not match exactly with the color of the real room shown by vertical bars on the abscissa, particularly in the orange side. This indicates that our visual system adapts to the illumination and the color constancy partially took place in photograph but not exactly under some illumination conditions.

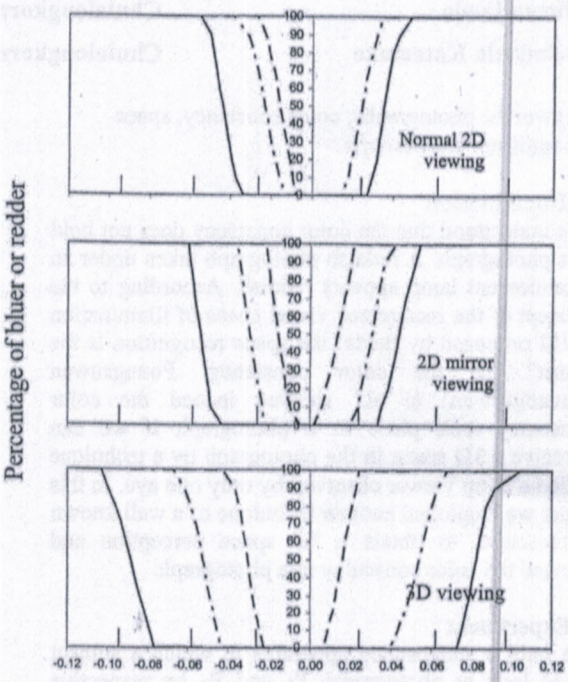


Fig.4 Averaged probability-of-bluer or –redder curves obtained from 5 observers. The solid bars represent the illumination color investigated. Dashed curves, IL3; one dotted one dashed curves, IL6; solid curves, IL9.

References

1) M. Ikeda: Opt. Rev. 4 (2004) 217-225.
2) C. Poungsuwan, M. Ikeda, P. Katemake and T. Obama: J. CSAJ 34 (2010) 36-37.
3) H. Shinoda and M. Ikeda: Color Res. Appl. 29 (2004) 187-195.

This work was done while Phuangsuwan stayed at Ritsumeikan University as a visiting graduate student.