

THE UNIQUE COLOR WORLDS OF PAINTERS WITH COLOR VISION DEFICIENCY

Tsukasa Muraya^{1*}, Yunoka Taniguchi², Yasuyo Ichihara³ and Shoji Sunaga⁴

¹*Chikushijogakuen University, Japan*

²*School of Design, Kyushu University, Japan*

³*Kogakuin University, Japan*

⁴*Faculty of Design, Kyushu University, Japan*

*Corresponding author: Tsukasa Muraya, t-muraya@chikushi-u.ac.jp

ABSTRACT

Background: In previous research about color vision deficiency in artists, color-deficient painters were judged in terms of their painting ability through comparison with the color usage of painters with normal color vision. Researchers have focused on the color usage skills of color-deficient painters in a similar manner to “normal” painters, but have not explored whether color-deficient painters choose colors according to the “normal” color world or a desire to create works in line with their own color worlds. **Objectives:** The purpose of the current study was to obtain insight into how modern artists with color vision deficiency use colors. **Methods:** We conducted in-depth interviews with three award-winning (national or international) professional Japanese painters. We asked them questions related to their attitude toward their color vision and color choice strategies, and qualitatively analyzed the interview responses. The three participants were T. Harada (born in 1954), who mainly uses watercolors and is an internationally renowned creator of picture books; J. Goto (born in 1968), a Japanese-style artist internationally renowned for paintings of ethnic Asians and a creator of picture books; and Y. Kurosaka (born in 1991), who is entering the contemporary art field, mainly uses oil paints, and won one of the biggest national art competitions in 2019. **Findings:** Japanese society has perceived people with color vision deficiencies as unsuitable to be artists because of their lack of color sense. The artists in this study nevertheless made their color vision deficiencies public when they were aspiring to become artists, because they wanted to improve society’s understanding of color vision deficiency and encourage children with such deficiencies who may want to be artists in the future. We found that all three painters felt that the use of colors was important to express their feelings and aesthetic sense, and they disliked choosing colors using a personal computer or a color-measuring device merely to comply with normal color vision. At the same time, they were also keen to ensure that their color usage was not strange to people with normal color vision and used harmonious color combinations in their works for people with all types of color vision. **Conclusion:** Each painter in this study has their own color use strategy. The strategies are not only based on the “normal” color world but also on the painters’ color worlds. The painters are aiming to create original works as professional artists on the basis of their unique color vision.

Keywords: Color vision diversity, Color vision deficiency, Art, Inclusion, Art education

INTRODUCTION

In previous research, color vision deficiency in artists was explored in two ways. The first approach aimed to identify historically famous artists with color deficiency on the basis of their unusual color usage. Their paintings were often nearly monochromatic, relying mainly on variations in lightness. Some artists predominantly used two colors, typically blue and yellow, in their works, and others intentionally created polychromatic paintings with high-contrast color combinations. It was also suggested that color-deficient artists show little interest in coloring their creations [1]. However, there is evidence that artists with color vision can use colors normally through the application of several strategies, such that color blindness does not preclude the possibility of achieving fame [2] [3]. These strategies included checking the color name on the labels of color tubes, developing a regular order for arranging color pigments on the palette, and seeking assistance from individuals with normal color vision with whom they were in close proximity during the creative process [1]. Both approaches evaluate color-deficient artists' ability through comparison with artists with normal color vision. There is evidence that color-deficient painters obtain insight from their unique color worlds that promote originality [4]. However, the nature of this insight has not yet been explored in depth.

Few peer-reviewed papers on this topic have been published in Japan. In Japanese society, color-deficient people have been viewed as inferior. For example, color-deficient children may quickly lose interest in art because of using the “wrong” colors, according to friends or teachers, when making sketches or reproducing a famous picture in art class. Moreover, many art and design departments of universities and design companies ask candidates to complete a color perception test, and ophthalmologists published a poster in 2015 warning color-deficient children that obtaining a job in fields requiring precise color distinguishment would be difficult [5].

To change this situation, the term “color vision variation” was introduced by the Genetics Society of Japan in 2017 [6]. According to this term, color vision exists on a continuum rather than being divisible into binary normal/abnormal categories. However, this notion has not been fully assimilated by Japanese society; most people still believe that color deficiency prevents people from being an artist or a designer. Nevertheless, there are several color-deficient professional artists in Japan, although it is not clear if they use colors in the same manner as artists with normal color vision by employing certain strategies or intend to create works according to their own color worlds. It is also unclear if they obtain insight for their creations via their unique color vision. This study aimed to determine whether modern artists with color vision deficiency are affected by their limited color vision and how they apply strategies to deal with this. The goal was to provide a basis for evaluating the works of these artists from the perspective of color vision diversity.

METHODOLOGY

We conducted in-depth interviews with three award-winning (national or international) Japanese professional painters (Table 1). Takehide Harada (born 1954) is a painter who combined watercolors and pastels in his works. This internationally renowned creator of picture books has won several major international picture book awards. Jin Goto (born 1968) is a Japanese-style painter who uses natural mineral pigments and is known for his paintings of ethnic Asians. He has also created picture books. Finally, Yu Kurosaka (born 1991) is entering the contemporary art field and mainly uses oil paints. He won one of the biggest national art competitions in 2019. We conducted semi-structured online interviews with Takehide Harada and Jin Goto; Yu Kurosaka was interviewed in person. The main questions concerned how they selected and applied colors, how they deal with their color vision deficiencies, the essence of their works, and how they want those works to be evaluated. The research was conducted from December 3, 2022 to February 7, 2023. We analyzed the interview data using a qualitative method.

Table 1 Basic details of the color-deficient artists participating in this study

Name (year of birth)	Color vision type	Main painting materials	Awards
Takehide Harada (1954)	Deuteranopia	Watercolors, pastels, pencils, etc.	Grand prize, UNICEF the Ezra Jack Keats international picture book Award, 1994
Jin Goto (1968)	Deuteranomaly	Natural mineral pigments (Japanese-style painting)	The White Ravens2014, Internationale Jugendbibliothek München
Yu Kurosaka (1991)	Deuteranopia	Oil paints	Grand prize, Shell Art Award 2019

RESULTS AND DISCUSSION

Overview of the artists' works

Takehide Harada is known for sensitive use of pastel colors (Figure 1). He has published many picture books and has abundant experience in the production of cover illustrations for books authored by famous Japanese writers. He prefers to use watercolors even though pale colors are difficult to distinguish for color-deficient people.

Goto's works use vivid colors and a Japanese painting style (Figure 2), and the main motif is Asian beauty. He has been to several Asian countries, meeting people and looking at scenery directly before trying to reproduce them. Red is a special color for Goto; indeed, red is loved in many Asian countries, and there are many different types of red.

Kurosaka's works are abstract, and some are representational paintings (Figure 3). The character of this young painter's work is changing. He won the grand prize of the Shell Art Award in 2019, which is one of the biggest competitions for young artists in Japan. During the interview, he

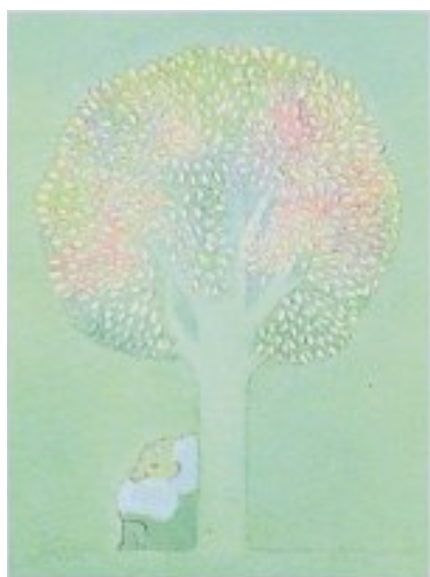


Figure 1. Letters de Pacheral, by Takehide Harada (watercolors and pencils, 7 × 5 cm (cover for a picture book published by Asahi Shimbun in 1999).



Figure 2. Deo Maiju – Chiisana megami (in Japanese)/Kumari – The living goddess (Nepal), by Jin Goto (natural mineral pigments, 60.6 × 50 cm. (from the website of Jin Goto; published in 2010).

described his use of trustworthy colors [7], i.e., colors perceived similarly between those with color vision deficiencies and trichromats, such as blue and yellow. However, his color choices have changed as his color world has developed.

Color choices

All three painters said that color was one of the most important elements of their works, such that they paid considerable attention to it. However, they do not use color measurement devices or rely heavily on color names when choosing colors, and dislike using colors merely because they are considered “correct” by trichromats (e.g., red sun or green trees) if they feel those colors are not in accordance with their feelings.

None of the painters aimed to use colors in the same way as trichromat painters, owing to a desire for originality as professional artists. This does not accord with previous research on the color usage tendencies of color-deficient artists. The artists in this study fought against feelings of inferiority regarding their lack of color sense, but subsequently established their own strategies to express their color worlds. Harada could not distinguish among some pale colors used in his

works. He concentrates when using colors and eschews the use of “correct” colors that are unfamiliar to him for fear of losing the richness of his works. He also uses colors mixed inadvertently on his pallet. Kurosaka uses the same strategy of applying inadvertently mixed colors, but he masks the color names printed on tubes of paint and moved his atelier from Tokyo to a village rich in nature to escape from the color world of trichromats and trying to systematize his own color world. Goto used the “okikae” skill in his works, i.e., he used colors to express motifs in an idealized way, where this technique arose from the limited color variation of natural minerals. In Japanese-style painting, adherence to real-world appearances is not required; painters can choose their own colors. Therefore, Goto could express his own color world according to his firsthand impressions of Asian countries. He also doubted that there was a marked difference in color sense between himself and those with normal color vision viewing his paintings, but he did not focus on this issue and sought to create original works as a professional painter.

Insights arising from color vision

Despite his love of drawing, Harada despaired about pursuing a career in art when he noticed social oppression of the color blind in his youth. He had been afraid of using color, even after being awarded several notable prizes, given his bad experiences in relation to his color usage. He could not distinguish some colors in his works and could not be sure about how people perceived his color usage. Therefore, he sometimes asked his family to appraise his color usage, especially when using a new color, and the answers from his family were always to the effect of “not strange.” This indicated that his color usage was harmonious and not discomforting for trichromats. Harada believed that the actual color world must be more beautiful than his own color world, but he knew he would never be able to perceive the former. This instilled a sense of loss and fueled his desire to use idealized colors; his sense of loss and this desire in fact arose from his particular type of color vision.

Goto stated that he did not have many bad experiences regarding his color use because his color vision deficiency was not severe. However, his teacher in art school said that he used red excessively when drawing leaves. Although not traumatic, this experience prompted him to pay more attention to others’ perceptions of colors and to adjust color usage such that trichromats



Figure 3. Between night and morning, by Yu Kurosaka (145.5 × 97 cm; published on the idemitsu website in 2019).

viewing his work would not perceive it as strange. Goto remains unsure about how different his color world is from those of others, and he also believes that originality is the most important trait of the professional artist. Goto exploits his particular color vision as a means of achieving originality, believing that color vision deficiency is actually a strength in this respect. He also expressed the hope that his use of color would help children who love to express themselves through painting to achieve the confidence needed to pursue a professional art career.

Kurosaka used to have an inferiority complex regarding his use of colors, but his complex gradually dissipated after winning a major art competition in 2019. He revealed his color vision deficiency to the public for the first time during interviews with mass media following his victory. His interest in color use and color deficiency increased in line with his suspicion that his color usage was strongly affected by the trichromat color system. Thus, he challenged himself to create art works free from the influence of his school education. Kurosaka was unhappy that society was based only on the trichromat color world, so he resolved to systematize his own color world through his creations. He also wanted his audience to question whether they truly see the world according to their own senses or merely as prescribed by society. To that end, some of his color choices were designed to evoke a degree of discomfort in those viewing his works.

General discussion

All three artists interviewed in this study exploited their particular color vision when creating works of art. Harada experienced a sense of loss in relation to his inability to sense the actual color world, which he believes is likely more beautiful than his own color world, and thus purposed to express beauty through idealized motifs. Goto, meanwhile, aimed to convey his impressions of Asian countries according to his unique color sense and skills. He believes his color vision enhances the originality of his works and therefore focuses on using colors according to his own preferences. Finally, Kurosaka's works encourage the viewer to consider society's influence on color perceptions by evoking a degree of discomfort.

Against this background, all three artists used strategies different from those of earlier color-deficient artists, who tried to adjust their color usage for compatibility with the color worlds of trichromats. As such, they do not rely on color names or color-measuring devices. Harada and Kurosaka even utilize colors inadvertently mixed on their palettes. All three artists aim to exploit their own unique color worlds in their works, rather than conforming to "normal" color use. Their harmonious use of colors can be both appealing and interesting for trichromats. After a period characterized by feelings of inferiority or doubt about their own color vision, all three artists embraced their color worlds as a means of achieving originality as artists. Moreover, they encourage children hoping to pursue careers as artists to have confidence in their own color worlds and continue to express their imagination and skills accordingly, rather than conforming to trichromatic-based painting. Society may now be ready to embrace color vision diversity because of the efforts of color-deficient artists.

CONCLUSION

The purpose of the current study was to gain insight into how modern color-deficient artists deal with their limitations and deploy colors. All three artists interviewed use specific strategies to apply colors in their works, different from those documented in previous studies. They reported being conscious of the color worlds of trichromats but did not aim to use colors in conformity therewith. All of them stated that color is an important element of their works and only use colors compatible with their feelings. Thus, they aim to use colors that, while not fully adherent to the color world of trichromats, are nonetheless still attractive to them. Recently, the idea of color vision diversity has entered into the consciousness of Japanese society but the concept remains difficult to understand; people tend to believe that everyone shares the same color world. Color-deficient artists have shown us that each color world has its own sense of harmony, and the works of such artists can convey beauty in a unique manner.

ACKNOWLEDGEMENTS

This work was supported by JSPS KAKENHI Grant Number JP 21H04342. We thank Michael Irvine, PhD, from Edanz (<https://jp.edanz.com/ac>) for editing a draft of this manuscript.

REFERENCES

1. Lanthony, P. (2001). Daltonism in painting. *Color Research & Application, Supplementary Volume 26*, s12-s16.
2. Marmor, M. F., & Lanthony, P. (2001). The dilemma of color deficiency and art. *Survey of Ophthalmology*, 45(5), 407-415.
3. Barry, L. C., Ross, W. H. (2009). Colour blindness does not preclude fame as an artist: celebrated Australian artist Clifton Pugh was a protanope. *Clinical and Experimental Optometry*, 92(5), 421-428.
4. Marmor, M. F. (2016). Vision, eye disease, and art: 2015 Keeler Lecture. *Eye*, 30, 287-303.
5. Japan Ophthalmologists Association. Shikikaku kensa no susume (in Japanese). https://www.gankaikai.or.jp/colorvision/20151005_poster.pdf (accessed 19 February 2023).
6. The Genetics Society of Japan. Idrngaku yougo kaitei nitsuite (in Japanese). https://gsj3.org/wordpress_v2/wp-content/themes/gsj3/assets/docs/pdf/revisionterm_20170911.pdf (accessed February 19, 2023).
7. The Asahi Shimbun Digital. Shikikakushougai aru gaka ga kataru “Shinrai suru enogu” sono iro towa (in Japanese). <https://www.asahi.com/articles/ASMDK3GK3MDKUCVL002.html> (accessed September 10, 2023).
8. Harada, T. (1999). Letters de Pacheral (watercolors, pencils, 7 × 5 cm; picture book cover published by Asahi Shimbun).
9. Goto, J. (2010). Deo Maiju – Chiisana megami (in Japanese)/Kumari – The Living Goddess (Nepal) (natural mineral pigments, 60.6 × 50 cm; published on the website of Jin Goto [<https://gotojin.wixsite.com/website/works>]) (accessed September 10, 2023).
10. Kurosaka, Y. (2019). Between night and morning (145.5 × 97 cm; published on the idemitsu website [https://www.idemitsu.com/jp/enjoy/culture_art/art/2019/winner_interview.html]) (accessed 10 September 2023).