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Intersecciones artísticas: exploraciones en las artes

Coords.

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INTERSECCIONES ARTÍSTICAS: EXPLORACIONES EN LAS ARTES

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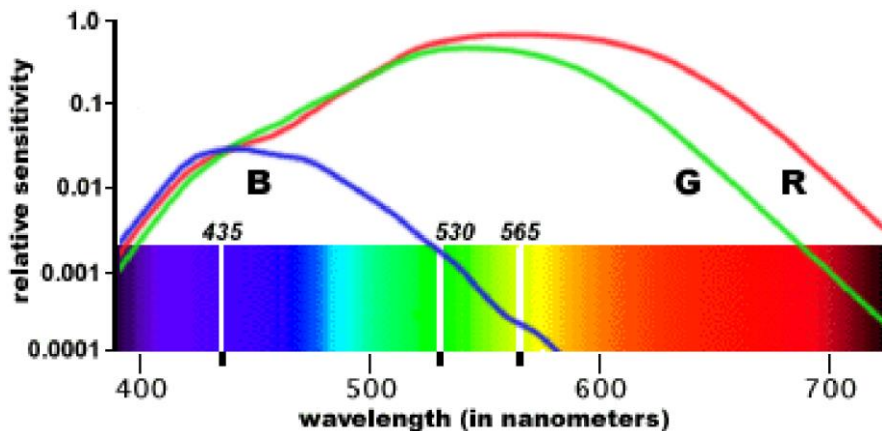
COLOUR IN REALISTIC REPRESENTATION BY DYSCHROMATOPIC PAINTERS

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1. INTRODUCTION

Dyschromatopsia, commonly known as colour blindness, is an anomaly in colour vision due to the total or partial defect of any of the three types of cones of the retina (which are the photoreceptor cells specialized in colour detection; see Fig. 1 for a graphical representation of their spectral sensitivity).

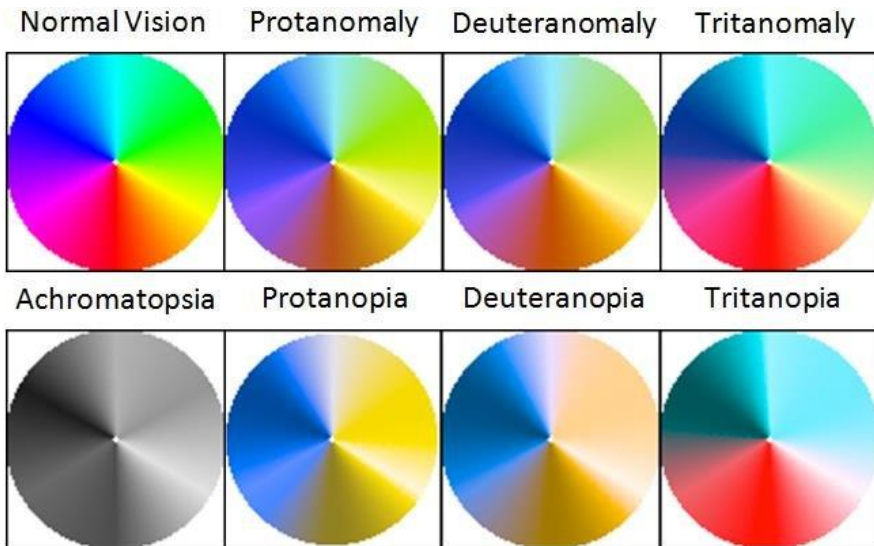
FIGURE 1. *Relative sensitivity curves for the three types of cones long vertical scale, cone spectral curves*



Note: Adapted from Vos & Walraven, 1971
Source: [https://doi.org/10.1016/0042-6989\(71\)90003-4](https://doi.org/10.1016/0042-6989(71)90003-4)

Dyschromatopsia is mostly congenital, affecting an 8% of males and 0,5 % of females. The condition runs along a continuum. The most severe cases, depending on which cone is affected, are protanopia (when the defect concerns the cone that best captures reds), deuteranopia (when the alteration affects the cone that best captures greens) and tritanopia (when the flaw lies in the cone most sensitive to blues); respectively, less severe cases, are called protanomaly, deuteranomaly and tritanomaly. The visual world of protans and deutans are quite similar, affecting the green-red chromatic axis, whereas the yellow-blue axis is perceived normally. The very rare tritans, on their part, in their most extreme form, inhabit a peculiar world of reds, pinks and emeralds. The most radical form of colour vision pathology is the absence of colour discrimination: achromatopsia. For representations of their colour perceptions, see Figs. 2 & 3.

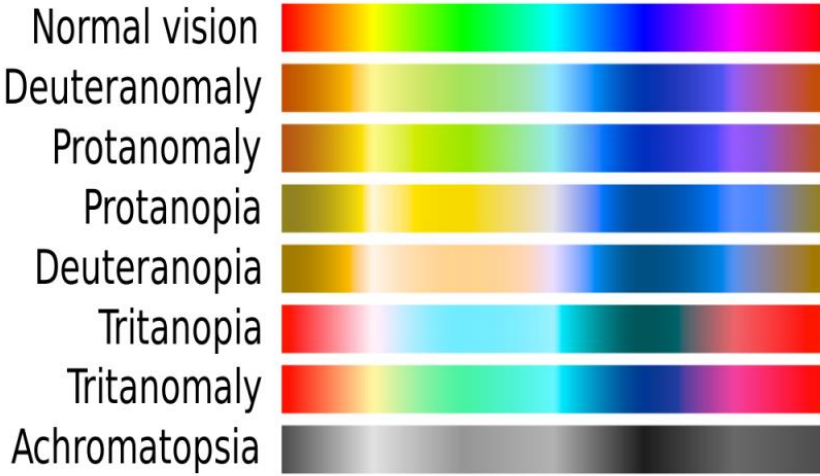
FIGURE 2. A comparison of the visible colour spectrum in common types of colour blindness



Note: Adapted from Melillo et al., 2016

Source: <https://doi.org/10.1109/JTEHM.2017.2679746>

FIGURE 3. *A comparison of the visible colour spectrum in common types of colour blindness*



Note: Adapted from SyntaxTerror, 2022. Public domain. Source: https://commons.wikimedia.org/wiki/File:Color_blindness.svg

The Olympus of painting hosts no dyschromatopsic artists. In the absence of retrospective evidence, there is only consensus about this condition of a few artists of the past, like Nicolo Bambini (1651-1736), Charles Meyron (1821-1868) or Wilhelm von Kugelgen (1822-1877) (Lantony, 2001; Marmor & Lanthony, 2001). Case studies on contemporary artists with anomalies in colour vision have been published, such as Jens Johanssen (Marmor & Lanthony, 2001), Clifton Pugh (Cole & Harris, 2009) or amateur artists (Lanthony, 2001).

In a spirit of continuity with the latter, the present study was directed towards colour blind art students, focussing on the impact of this condition on their painterly production.

2. OBJECTIVES

This research aimed at identifying chromatic distortions in realistic still life paintings produced by volunteer dyschromatopsic art students.

Secondarily, it aimed at collecting their personal accounts regarding various problems encountered in the management of colour in naturalistic painting, as well as their personal inclinations and strategies in their personal painting.

3. METHODOLOGY

The methodology used was a qualitative multiple case study.

As Lanthony (2001) points out, it is not possible to diagnose dyschromatopsia in artists solely by observing their paintings; at most, colour blindness can be excluded, but never affirmed. Therefore, a study of paintings executed by dyschromatopsic persons behaves to start from a diagnostic certitude about this condition.

In previous phases of this research, an anonymous survey identified and recruited dyschromatopsic volunteer students of the Degree in Fine Arts at the Universidad Complutense de Madrid (Iribas Rudín & Robles Haloui, 2023). Four participants (three males and one female) underwent the CAD colour vision test for diagnostic confirmation (Iribas, 2023a), at the Faculty of Optics and Optometry of the Universidad Complutense de Madrid.

The participants were also interviewed individually, asked about dimensions of their dyschromatopsia, its impact in their painting, their personal style of painting and other issues (Iribas, 2023b).

After this, the next phase consisted in the production of three still life paintings of three respective models, endeavouring a naturalistic depiction of colours. In a painting classroom, each model was set up with deliberately chosen colours to result in two saturated compositions (one with predominant yellow and blue hues [yellow-blue still life]; another with mainly reds and greens [red-green still life]) and a third still life with tertiary (low-saturated) colours [tertiary still life] [Figs. 4, 5, 6 & 7, higher row].

The subjects were provided with canvases and five acrylic paint tubes (white, black, yellow, magenta and cyan), codified with numbers so that the participants would guide themselves by their perception of the colours rather than by their names –the management of named hues could too easily be tied to the colour theory previously studied, and therefore ‘intellectualised’. The restricted tonal range (involving the subtractive primaries) was purposefully intended to make the painters work on their palettes to mix the acrylics in order to achieve their final colours. (No

doubt would it have been easier for them, if offered a wide gamut of colour tubes, to just pick the hue most similar to the observed tone in the model, but that was not the point of the study.)

The volunteers worked in solitude or, if not alone, in silence (avoiding the temptation to ask for advice or compare their perceptions with other subjects'). The number of sessions needed varied, depending on the style and speed of work and the length of each session. The average number of sessions to produce one still life was almost 4.

They painters were invited to take written procedural notes on their impressions, choices and difficulties during the painting process. Needless to say, a fundamental phenomenological gap is unavoidable, because what a dyschromatopsic person may understand by 'colour green' is not necessarily what an average-sighted person understands by that term. The colour blind person may have learned to adapt language to 'fit in', but that does not mean that this person's experience (despite his/her use of colour words) is akin to average perception. For example, an achromatopsic person's experience of 'green' may seem a 'soiled ochre' or even a 'grey' to someone with normal vision.

4. RESULTS

4.1. IMAGE PRODUCTION

The main results of this research are the realistic representations of three different models by four dyschromatopsic painters: two with protanomaly: Paprika Octopus (PO) and Izaro (I), and two with deuteranomaly: Anonymouse (A) and Cicuta (C).

The three images of the first row are photographs of the still life models. They are included in every image to serve as visual references to facilitate a comparison between them and the representation, in the three paintings of the lower row, by each of the four volunteer painters.

FIGURE 4. Above: still life models. Below: *Paprika Octopus* (2023), respective pictorial reproductions of the models. Acrylic on canvas



Note: Photo © Ana Iribas-Rudín, 2023

FIGURE 5. Above: still life models. Below: *Izaro* (2023), respective pictorial reproductions of the models. Acrylic on canvas



Note: Photo © Ana Iribas-Rudín, 2023

FIGURE 6. Above: still life models. Below: Anonymouse (2023), respective pictorial reproductions of the models. Acrylic on canvas



Note: Photo © Ana Iribas-Rudin, 2023

FIGURE 7. Above: still life models. Below: Cicuta (2023), respective pictorial reproductions of the models. Acrylic on canvas



Note: Photo © Ana Iribas-Rudin, 2023

4.2. NOTES AND INTERVIEWS

Alongside with the images, the procedural notes and the interviews yielded information about anecdotal problems encountered (these are dealt with in the form of a selection of quotes in pertinent places within the discussion section).

4.2.2. FREE PAINTING

Also, the participants shared their preferences when painting freely. When asked about this, half of the painters (Anonymouse and Cicuta) stressed their drawing talents, where they felt confident. Other strengths mentioned were non-chromatic, such as gesture, use of matter, construction in planes, volume and structure, said Cicuta, who, despite the colour blindness, said to be primarily a painter. Regarding the issue of colour use in free painting, there was a preference for monochrome or achromatic painting in three of the four artists (Paprika Octopus, Izaro and Cicuta). When dealing with several colours, they said their works were regarded as unharmonised (“disparate”, according to Paprika Octopus; “colours can clash”, according to Cicuta). Tonal composition would be too hard a task to fulfil successfully according to normal standards, but their colours were regarded as original by their peers (Cicuta mentioned that a classmate, finding the colour combinations very interesting, took a picture of his palette; Anonymouse mentioned that easel neighbours suggested to leave the very personal colours uncorrected). Izaro opted to choose primary colours, and Paprika Octopus and Cicuta, to work in planes of colour, thus avoiding the blending of different tones. Cicuta said that, when working realistically with an external model, his colours became soiled, resulting often in tertiary hues (earth tones).

It is worth mentioning that Anonymouse saw it as a fundamental achievement to have transitioned from a struggle to try to paint colour “like normal people see”, thus faking the experience of colour, to the current position, which is embracing one’s personal way of seeing and manifesting it in the painting.

On the other hand, Cicuta was the keenest participant on trying to keep learning to distinguish subtle colour hues, by observation and experimentation. Although that process was painful and difficult, Cicuta considered to have made progress in the colour perception thanks to years of practice.

5. DISCUSSION

5.1. ATTITUDES

Regarding the painters' attitudes, it would seem that Anonymouse and Cicuta would find themselves in opposite positions. Whereas Anonymouse took pride in having a special way of seeing, reversely, with a permanently inquisitive spirit, Cicuta struggled to understand colour, believing to be able to make progress, as if there were such a thing as a real colour out there, waiting to be understood.

The three colour dimensions (value, hue and saturation) produced in the paintings are discussed below, especially where they differ from normal vision.

5.2. ASPECTS OF COLOUR

5.2.1. VALUE

Since, for colour blind people, the ability to perceive luminosity is relatively unaffected, usually the light value of the colours does not present significant deviations from the model.

Nevertheless, contrast can be enhanced, which means that the difference between dark and light values can be excessive. This is, in fact, the case in several instances, notably in Izaro, where all paintings have some degree of excess of light in the representation of the lighter objects of the models. One striking example is also the excess of light in Cicuta's lower-left bottle in the red-green still life.

Several subjects increased the value of the yellowish greens (red-green still life), a consequence of exaggerating the proportion of yellow in the paint (this is consistent with the experience of yellow wavelengths as lighter than in normal vision, both for protan and deutan).

The darker elements were a greater challenge than the lighter ones as regards the identification of hues, so the darker bottles were represented with tonalities different from the models'. In the yellow-blue still life, Paprika Octopus painted the purple bottle to the left in a warmer hue, and Anonymous represented a colder hue, sliding towards blue. In the red-green still lives of both subjects, the red bottle to the right veered towards a cooler hue.

As expected, the pastel colours (i.e., with a notable proportion of white in the mixture) of the models were a challenge, given the loss of character entailed. To solve this problem, painters resorted to different strategies, either saturating the colours in excess (as in the case of the yellow of the background cloth in the yellow-blue still life by Paprika Octopus), desaturating them (as in the salmon-pastel bottle of the red-green model of the same author) or perceiving a different hue, usually colder (e.g., in the light elements of the tertiary still life).

As a curious note, in the tertiary still life by subject Anonymouse, two extraordinary similar colours (the box under the glass bottle at the centre and the greenish cloth) have very different representations in their light value. Asked about this, once the painting was finished, he said that his depiction of the cloth was too dark.

5.2. HUE

This is the colour aspect where the subjects manifested less security. They said things like "I can't see the subtle hues of unsaturated colours" (Paprika Octopus); "I really haven't grasped the topic of colour; all revolves around hue" (Izaro); "I painted a green dog thinking it was another colour" (Anonymouse); "It's hard for me to distinguish hues and in that quest, colours end up very soiled" (Cicutu).

The most striking feature, shared by all the participants, was their confusion with emerald green and grey. This green hue was depicted as grey; this was especially visible in the emerald green cloth in the red-green still life (best noticeable in Paprika Octopus and Izaro's paintings). In the painting of the yellow-blue model, Anonymouse, who had the strongest condition, represented a grey clay vessel with green.

Although the yellow-blue axis remained normal, in practice there was a confusion in the tonal attribution of colours in the range between ultramarine blue, indigo, violet, purple and, in some cases, purple-magenta. Particularly salient in the magenta confusion is Izaro's depiction of the tones of the boxes in the tertiary painting, where the purple box is painted grey and blue boxes of various hues are painted in the magenta-purple range. Less spectacular but still noticeable is the veering of an original violet towards warmer or colder hues (notably the bottle to the left in the yellow-blue still life, in all the painters).

Reds were quite preserved and most magentas, if light (the darker tones could veer towards purple, as in Izaro's red-green painting). Darker reds suffered tonal glidings, as did dark greens (this is noticeable in the central glass vessel and the top right bottle in the tertiary still lives by Paprika Octopus, Cicuta and Anonymouse).

Two tones neighbouring yellow (orange and yellowish green) increased their proportion of yellow. In the yellow-blue still life by Paprika Octopus, the yellow-ochre foreground cloth was represented by a startling green. In the yellowish greens and oranges of the red-green model (lying bottles, left and central), the representations by Paprika Octopus and Anonymouse veered away from the originals, increasing their proportion of yellow. Surprising as it may seem, if the sensitivity to the light spectrum of protanopes is taken into account, the confusion between orange-yellows and greens becomes justifiable.

In the tertiary still lives, the tonal gliding towards different hues is also evident. In Paprika Octopus, Anonymouse and Cicuta, the tonality became dominantly green, whereas in Izaro's representation of the big greenish cloth, warm tones took the lead. Given the uncertainty of these tertiary colours, it may be only logical to try to depict them with equally uncertain colours (be they warm or cold).

5.3. SATURATION

The differences in the representation of colours depend on their saturation. Hence, the rendering of pure colours becomes much easier than when they are tertiary (desaturated). Therefore, generally speaking, the

areas with less chromatic distortion belong to the yellow-blue still lives, followed by the red-green paintings, whereas the painted colours with the greater tonal difference from the model belong to the tertiary still lives.

On another note, it is striking that some tertiary colours were represented with an exaggerated saturation, as in Cicuta's, but especially Paprika Octopus's rendering of the tertiary model. Asked about this, this subject answered that the intention was indeed trying to faithfully reproduce the colours, with no expressive intention, even that the perception of the model was as more vividly saturated green than in the painting!

Lighter elements posed a problem for the identification of colours. In some instances, the colours were desaturated to the point of achromaticity, as in the lighter elements of the tertiary painting by Izaro. Some other light colours were excessively saturated, as was the case, in the red-green still life, of Anonymouse's representation of the pastel bottle and Cicuta's triangle at the right edge of the composition.

6. CONCLUSIONS

Colour blindness entails distortions in the perception of colour and carries with it inevitable consequences in how dyschromatopsic painters represent colours when trying to render them realistically. The distortions affect the three dimensions of colour: value, hue and saturation.

This paper offers a case study of eloquent chromatic distortions in the still-life realistic paintings by four dyschromatopsic artists, two with protanomaly and two with deuteranomaly, respectively. In the pictorial production by the four subjects, the greater distortion in comparison with normal vision has been in the green tones. One of the most striking confusions happened between greenish blue and grey, to the point that these greens were represented as grey and, in one of the cases, the grey was represented in greenish-blue. Other hues have also been affected (e.g., the orange and certain greens gained yellow, and the range between purples and ultramarine blues was confusing). When colours present in the models had a relatively low prominence, either because of lightness (pastel colours, achieved by adding white), because of

darkening or because of desaturation, their tonal representations by the painters diverged further from the model. Also, there was a predominant tendency to increase the saturation of certain colours, especially green, which could be attributed to an effort to identify them better through this manoeuvre.

The present study was carried out with a small sample, so it would be interesting to try to replicate the findings at a greater scale. The diagnoses have been protanomaly and deuteranomaly. Although the chance to find tritan artists are virtually inexistent, it would be a landmark to study such paintings. Since the subjects' diagnosis are mild, a further study could include painters with more severe conditions (protanopia, deuteranopia, even tritanopia), which would yield more spectacular results, further estranged from normal vision.

7. REFERENCES

- Cole, B. L., & Harris, R. W. (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
- Iribas Rudín, A. (2021). ¿Necesitamos orientación para optimizar la enseñanza universitaria de Bellas Artes al alumnado daltónico? (Do we need orientation to optimize university Fine Arts teaching to colour blind students?) In M. M. Molero Jurado et al. (Eds.), *Actas del III Congreso Internacional de Innovación Docente e Investigación en Educación Superior: Cambios en el proceso de enseñanza-aprendizaje de las Áreas de Conocimiento. 15-20 de noviembre de 2021* (Proceedings of the III International Conference on Teaching Innovation and Research in Higher Education: Changes in the teaching-learning process in the areas of knowledge) (p. 278). Asociación Universitaria de Educación y Psicología
- Iribas Rudín, A. (2022). Proposal of a project on colour blindness at the Faculty of Fine Arts, UCM. In A. M. Calilhanna (Ed.), *Conference proceedings CIVAE 2022. 4th Interdisciplinary and Virtual Conference on Arts in Education* (pp. 418-421). Adaya Press
- Iribas Rudín, A., & Robles Haloui, E. (2023). Encuesta sobre daltonismo, Facultad de Bellas Artes, UCM (Survey on colour blindness, Faculty of Fine Arts, UCM). In A. Flaño Romero (Ed.), *Investigaciones Daciu 2022-2023* (Daciu research 2022-2023) (pp. 379-383). Fundación Avanza & Gesernet. <https://doi.org/10.60096/fundacionavanza/2062022>

- Iribas Rudín, Ana Eva (2023a). *Bodegones-modelo, codificación cromática, producción pictórica, notas procesuales y test de visión cromática de artistas con discromatopsia* (Model still lives, chromatic coding, pictorial production, process notes and colour vision tests of dyschromatopsic artists). [Dataset.] <https://hdl.handle.net/20.500.14352/92402>
- Iribas Rudín, Ana Eva (2023b). *Encuesta sobre daltonismo en la Facultad de Bellas Artes UCM y entrevistas a alumnado daltónico del Grado en Bellas Artes UCM* (Survey on colour blindness at the Faculty of Fine Arts, UCM and interviews with colour blind students of the Degree in Fine Arts UCM). [Dataset.] <https://hdl.handle.net/20.500.14352/92400>
- Lanthyony, P. (2001). Daltonism in painting. In C. R. Cavonius; K. Knoblauch; B. Lee y J. Pokorny (Eds.), Proceedings of the XV Symposium of the International Colour Vision Society [special issue], *Colour Research and Application*, 26 (51), 512-516
- Marmor, M., & Lanthyony, P. (2001). The dilemma of color deficiency and art. *Survey of Ophthalmology*, 45 (5), 407-415
- Melillo, P.; Riccio, D.; di Perna, L.; Sanniti di Baja, G.; de Nino, M.; Rossi, S.; Testa, F.; Simonelli, F. & Frucci, M. (2016). Wearable improved vision system for colour vision deficiency correction. *IEEE Journal of Translational Engineering in Health and Medicine*, 5, 1-7, Art no. 3800107. <https://doi.org/10.1109/JTEHM.2017.2679746>
- SyntaxError, 8 June 2022 *A comparison of the visible colour spectrum in common types of colour blindness*. Public domain image. Source: https://commons.wikimedia.org/wiki/File:Color_blindness.svg
- Vos, J. J. & Walraven, P. L. (1971). On the derivation of the foveal receptor primaries. *Vision Research*, 11(8): 799-818. [https://doi.org/10.1016/0042-6989\(71\)90003-4](https://doi.org/10.1016/0042-6989(71)90003-4)

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