

IMPRESSION RATINGS OF COLORS PERCEIVED BY COLORBLIND PEOPLE

Special thanks to Kazuyuki Natori and Kayo Hamano, co-researcher of this study

- Preliminary study on influence of color on impressions formed by colorblind people -

Scales	Fac.1	Fac.2	Fac.3	Communality
Beautiful - Unbeautiful	0.91	0.09	-0.04	0.84
Conspicuous - Inconspicuous	0.91	0.12	-0.21	0.88
Like - Dislike	0.89	0.06	-0.06	0.80
Vibrant - Somber	0.86	0.18	-0.10	0.78
Bright - Dark	0.74	0.40	-0.14	0.73
Loud - Modest	0.74	0.27	-0.42	0.79
Hard - Soft	-0.15	-0.89	0.10	0.83
Warm - Cool	0.15	0.86	-0.02	0.77
Tranquil - Restless	-0.17	-0.07	0.97	0.98
Factor coefficient(%)	48.28	20.46	13.47	82.21

Factor Coefficient

(1) Protanopia

Fac1: Beauty
Fac2: Warmness
Fac3: Tranquility

Scales	Fac.1	Fac.2	Fac.3	Communality
Beautiful - Unbeautiful	0.88	0.25	-0.19	0.87
Like - Dislike	0.87	0.13	0.15	0.79
Vibrant - Somber	0.76	0.19	-0.51	0.87
Bright - Dark	0.69	0.37	-0.39	0.77
Conspicuous - Inconspicuous	0.67	0.27	-0.55	0.82
Loud - Modest	0.61	0.35	-0.58	0.83
Hard - Soft	-0.20	-0.87	0.19	0.84
Warm - Cool	0.25	0.85	-0.22	0.83
Tranquil - Restless	-0.04	-0.22	0.88	0.83
Factor coefficient(%)	38.96	21.96	21.84	82.76

Factor Coefficient

(2) Deuteranopia

Fac1: Beauty
Fac2: Warmness
Fac3: Tranquility

Scales	Fac.1	Fac.2	Fac.3	Communality
Loud - Modest	0.92	-0.06	0.26	0.91
Conspicuous - Inconspicuous	0.90	-0.10	0.27	0.88
Vibrant - Somber	0.87	0.01	0.20	0.80
Tranquil - Restless	-0.83	0.28	0.22	0.82
Hard - Soft	0.14	0.89	0.04	0.82
Bright - Dark	0.48	-0.77	0.02	0.82
Warm - Cool	0.21	-0.56	0.45	0.56
Beautiful - Unbeautiful	0.52	-0.17	0.70	0.78
Like - Dislike	0.01	0.04	0.93	0.87
Factor coefficient(%)	40.65	20.32	19.84	80.80

Factor Coefficient

(3) Normal

Fac1: Tranquility
Fac2: Brightness
Fac3: Beauty

In Japanese
(hadena - jimina)
(medatsu - medatanai)
(azayakana - kusunida)
(ochitukinouru - ochitsukinonai)
(katai - yawarakai)
(akarui - kurai)
(atatakai - tsumetai)
(utsukusii - utsukusikunai)
(sukina - kiraina)

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ABSTRACT

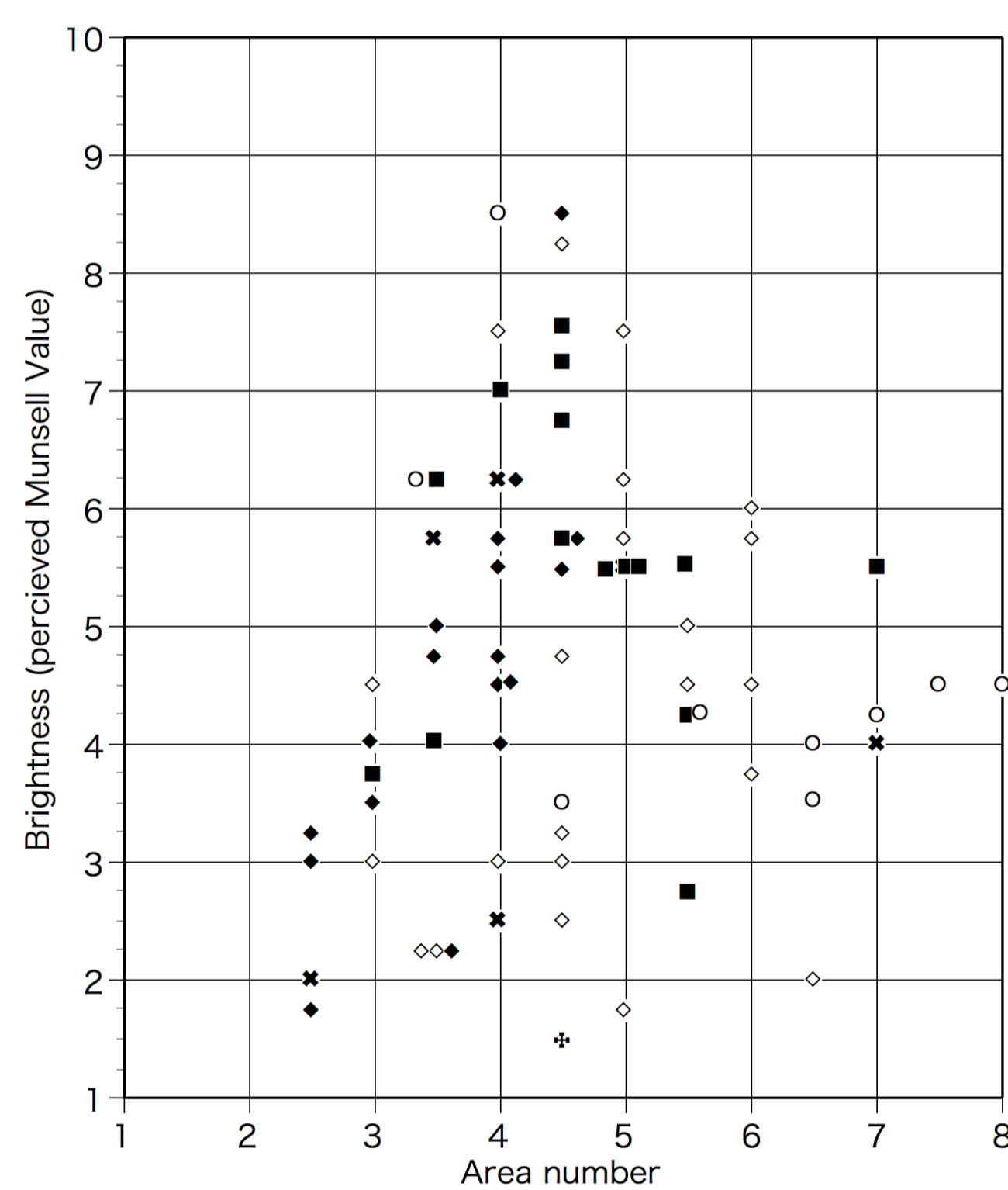
An experiment in which colorblind subjects were asked to rate their impressions of color chips was conducted.

Although the number of subjects was small, the results suggested that the structures of the impressions could be expressed by the difference in factor coefficients among people with protan and deutan colorblindness and those with normal color vision. The factors obtained were beauty, warmness, and tranquility for the former, and beauty, brightness, and tranquility for the latter.

Another remarkable difference was that the former preferred vibrant colors, but the latter disliked them or did not prefer any association with them. The difference between protanopia and deuteranopia is not in the structure but the impression obtained from colors. For example, a protan perceives beauty when the color is dark, but a deutan perceives beauty when the color is bright and yellowish.

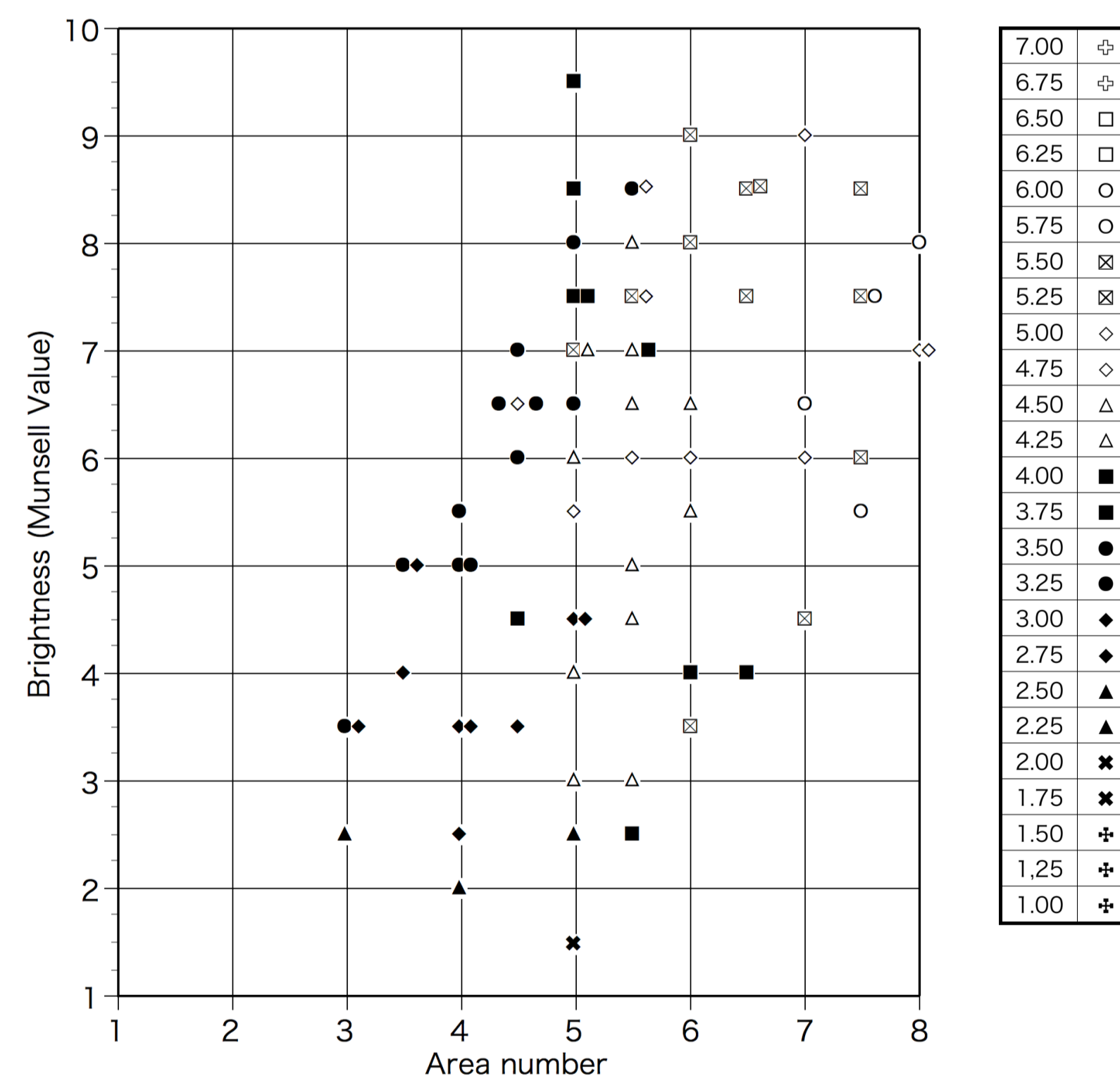
Keywords: Color vision defect, Dichromatism, Impression, Color universal design

bluish ← neutral → yellowish

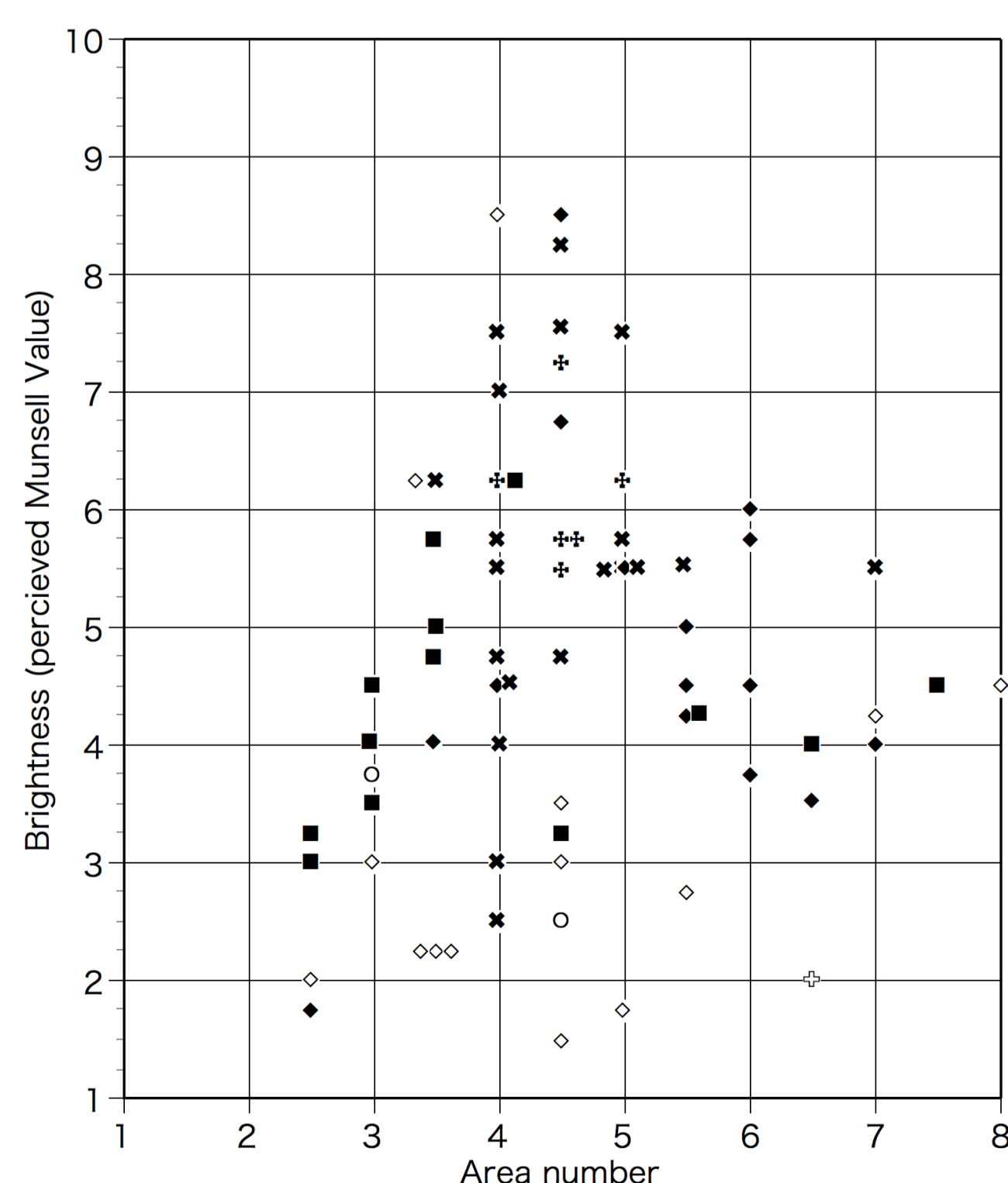


(1) Warmness ratings by a protan

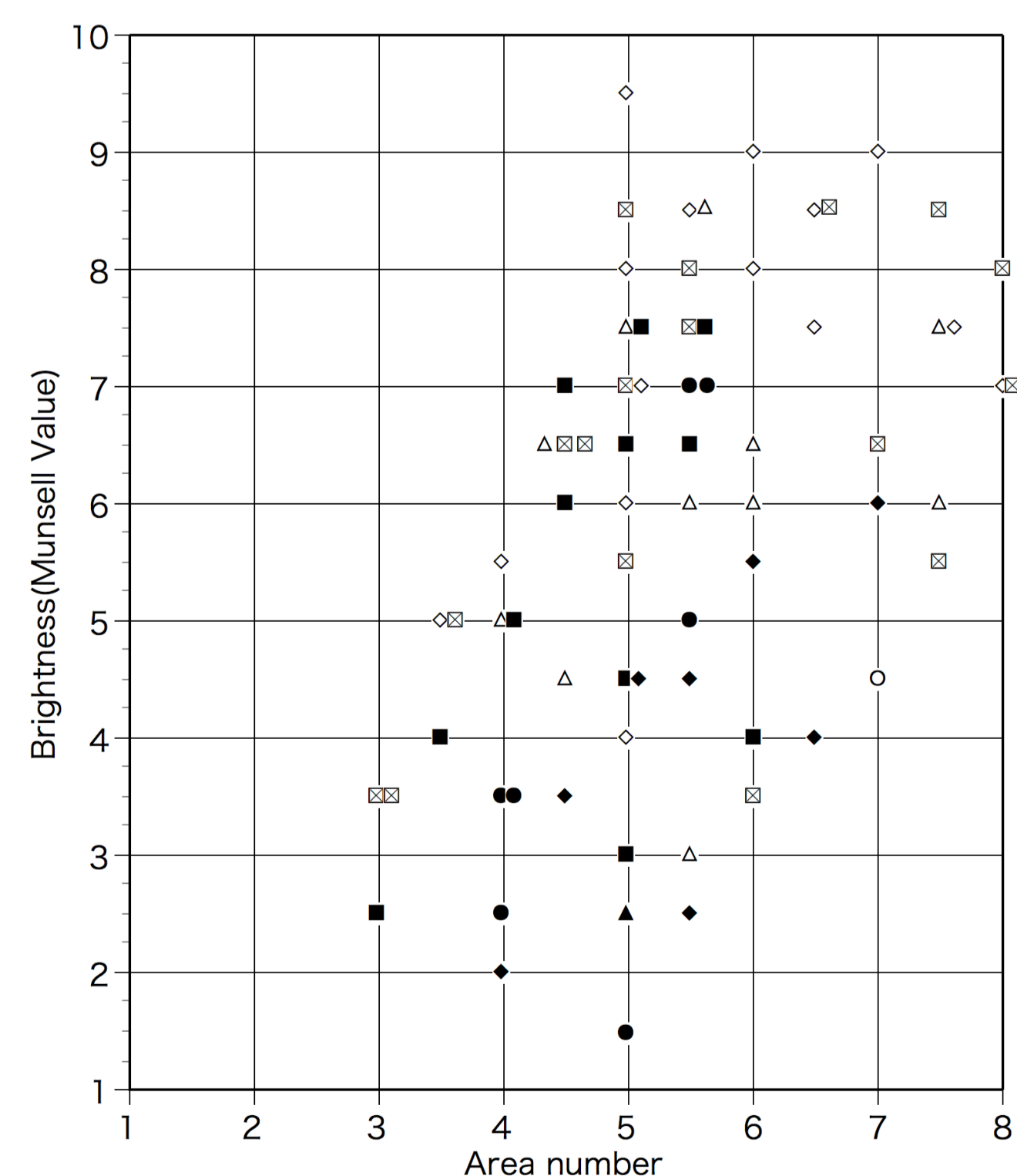
bluish ← neutral → yellowish



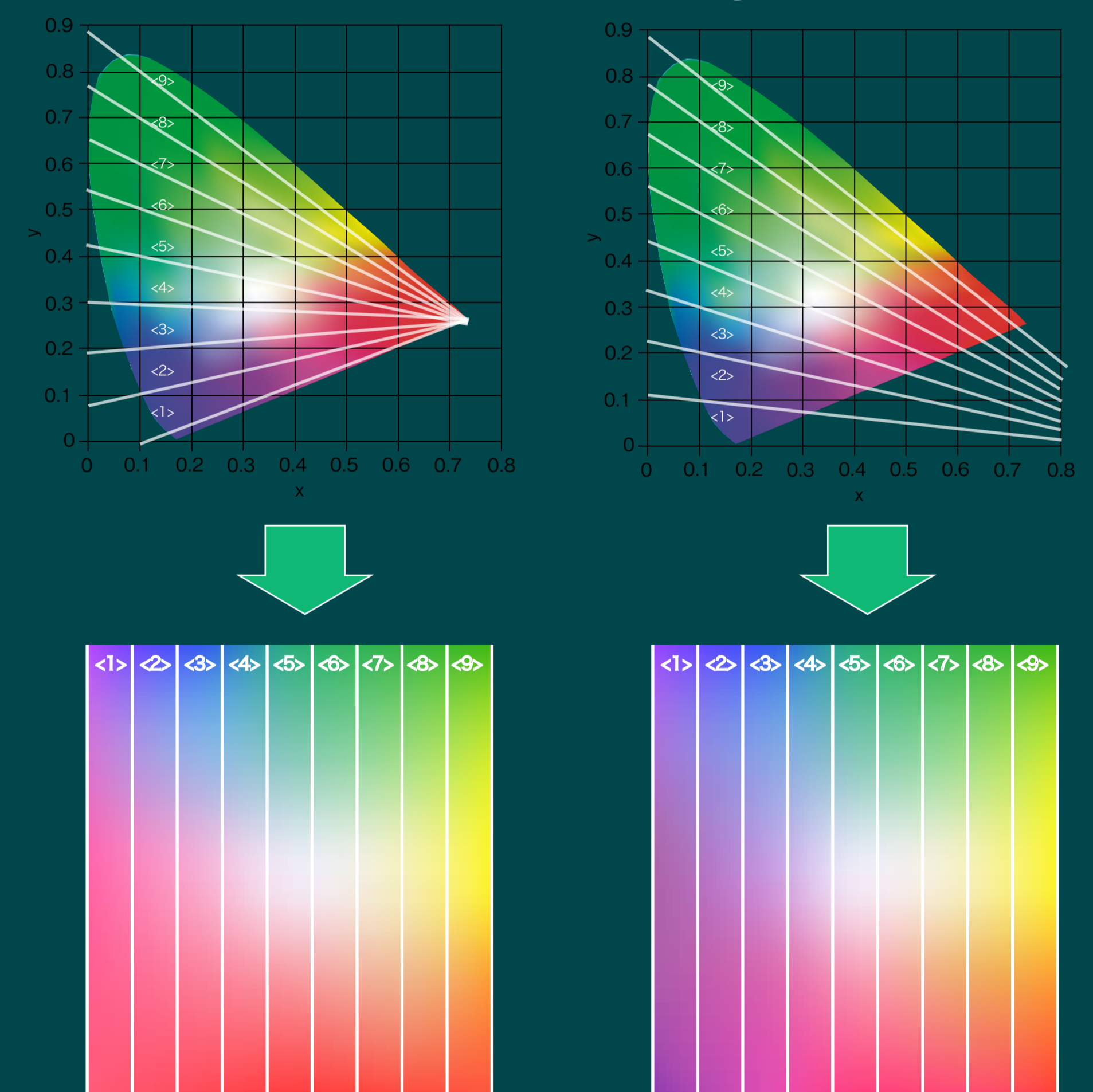
(2) Warmness ratings by deutans



(3) Beauty ratings by a protan



(4) Beauty ratings by deutans



Protanopia

Deuteranopia

The idea of area number that indicates the similar chromaticness for colorblind people

Deutan subjects judge warmness according to the hue of a color roughly. Protan shows similar tendency, even through overlapping on the distribution occurs.

A protan subject perceives dark colors as beautiful. Deutan subjects perceive the brightest colors as beautiful, particularly yellowish ones. Moreover, the most saturated colors at the edge of the distribution are felt as beautiful by the subjects. However, there are several colors that are felt as beautiful at the center of the distribution. Such interpretations are complicated.

Additional data obtained by the experiment in progress (more than ten subjects) should tell the tendency clearer.