Do normal pupil diameter differences in the population underlie the color selection of #thedress?

by

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in

Journal of the Optical Society of America A

Report No: IIIT/TR/2016/-1

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March 2016

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Abstract

The fundamental question that arises from the color conundrum of #thedress is “What are the phenomena that underlie the individual differences in the reported colors when all other conditions like light and device for the display are identical?” A survey of 384 participants showed near-equal distribution into blue/black (b/b) and white/gold (w/g) groups. We looked at pupil size differences in a sample population of 53 individuals from these two groups and a group that switched from w/g to b/b. Our results showed that the w/g and switch groups had significantly lower pupil size than the b/b group (w/g<b/b

, p-value=0.0086), suggesting a possible difference in light perception influencing pupil size. A standard infinity focus experiment was then conducted on 18 participants from each group to check if there is bimodality in the population, and we found a statistically significant difference (w/g<b/b, p-value=0.0132). In a third experiment, to check whether increase in retinal illuminance will trigger a change in color in the w/g group, 6 participants were administered dilation drops that increased the pupil size by 3–4 mm, but the participants did not report a switch. The results suggest a population differenc