

Highlight shape influences gloss perception

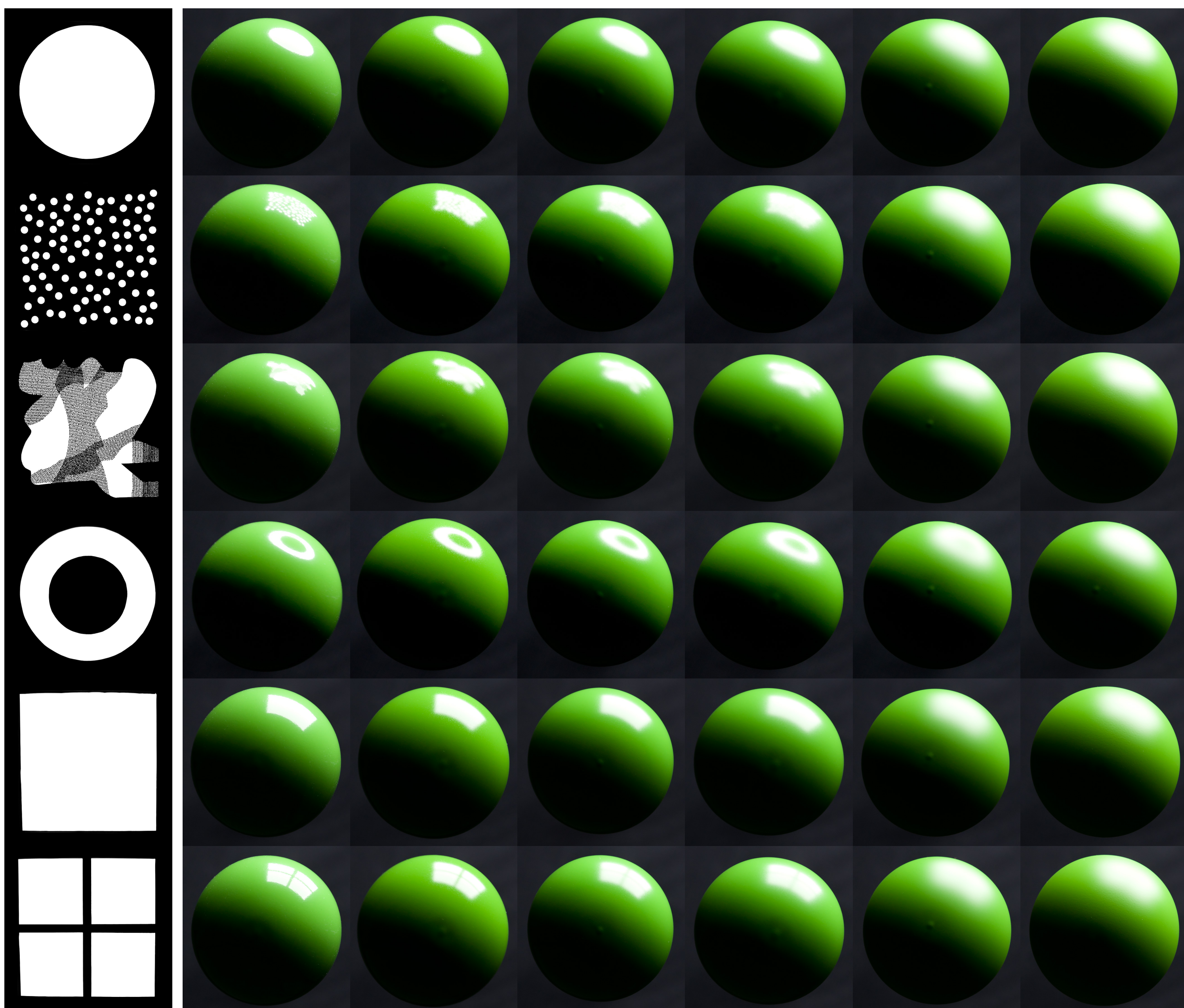
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Introduction



Experiment

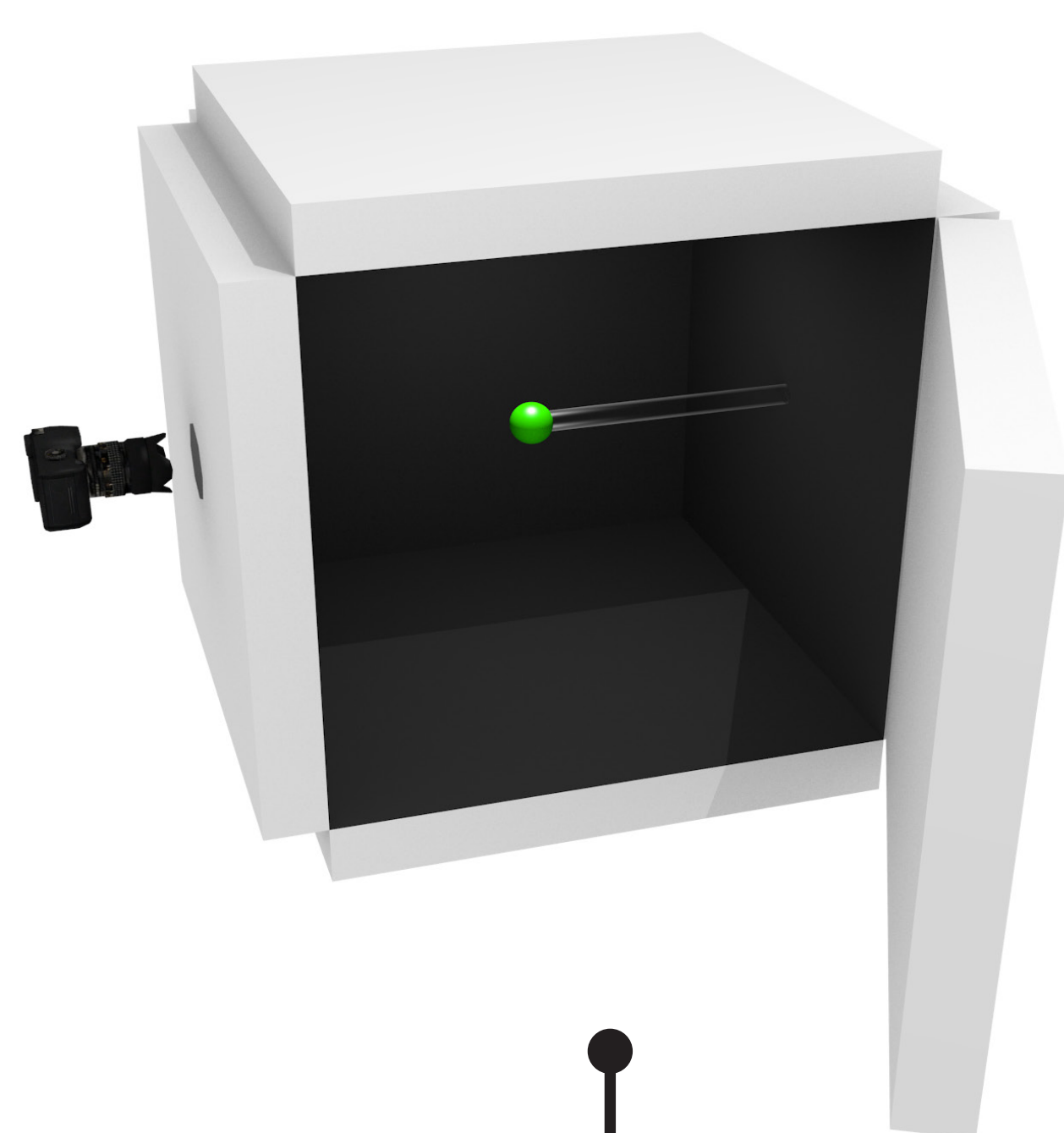
Gloss perception highly depends on the 3D shape and the illumination of an object. We investigate the influence of a specific property of the illumination namely the form of highlight. A diffuse light box in combination with differently shaped masks was used to illuminate spherical stimuli that were painted with various levels of gloss. This resulted in a stimulus set of 6 different highlights (rows in image below) and 6 different gloss levels (columns), a total of 36 stimuli.



We performed three different experiments of which two took place with photographs on a computer monitor and one with real scenes in the light box. The experiment with real scenes was only performed with three highlight shapes.



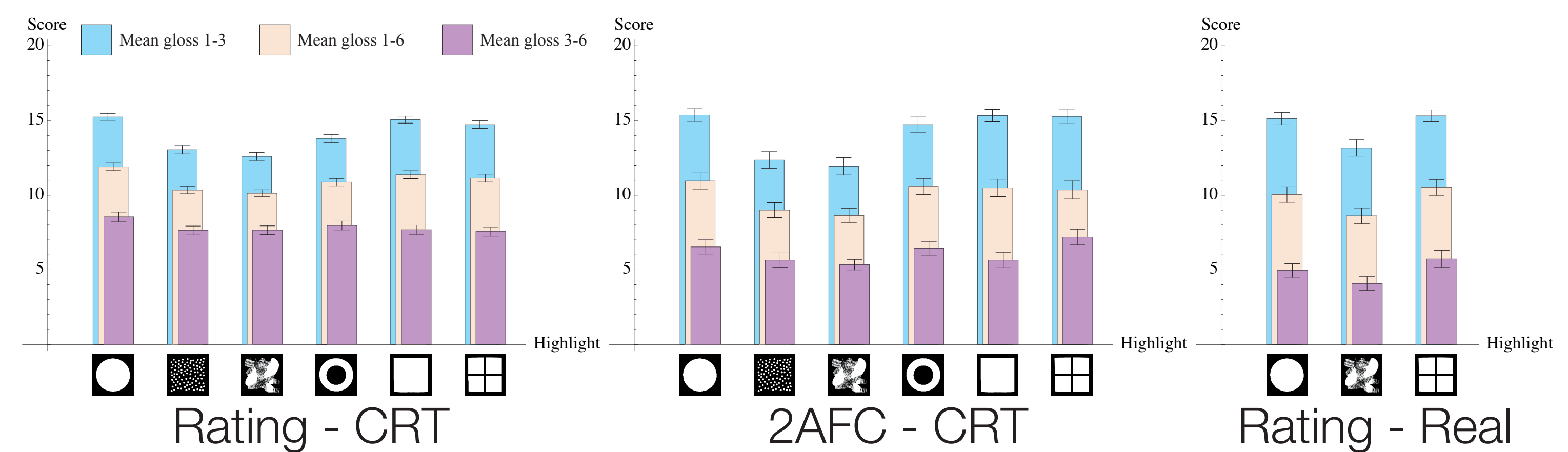
2AFC Comparison task



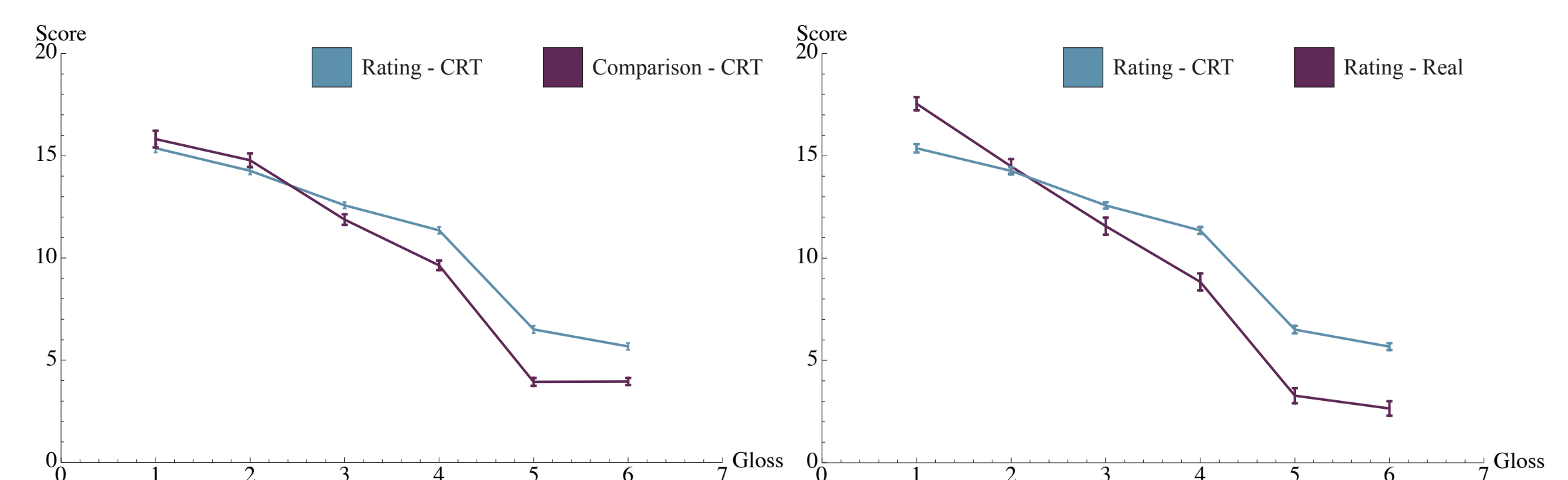
Rating task

Results

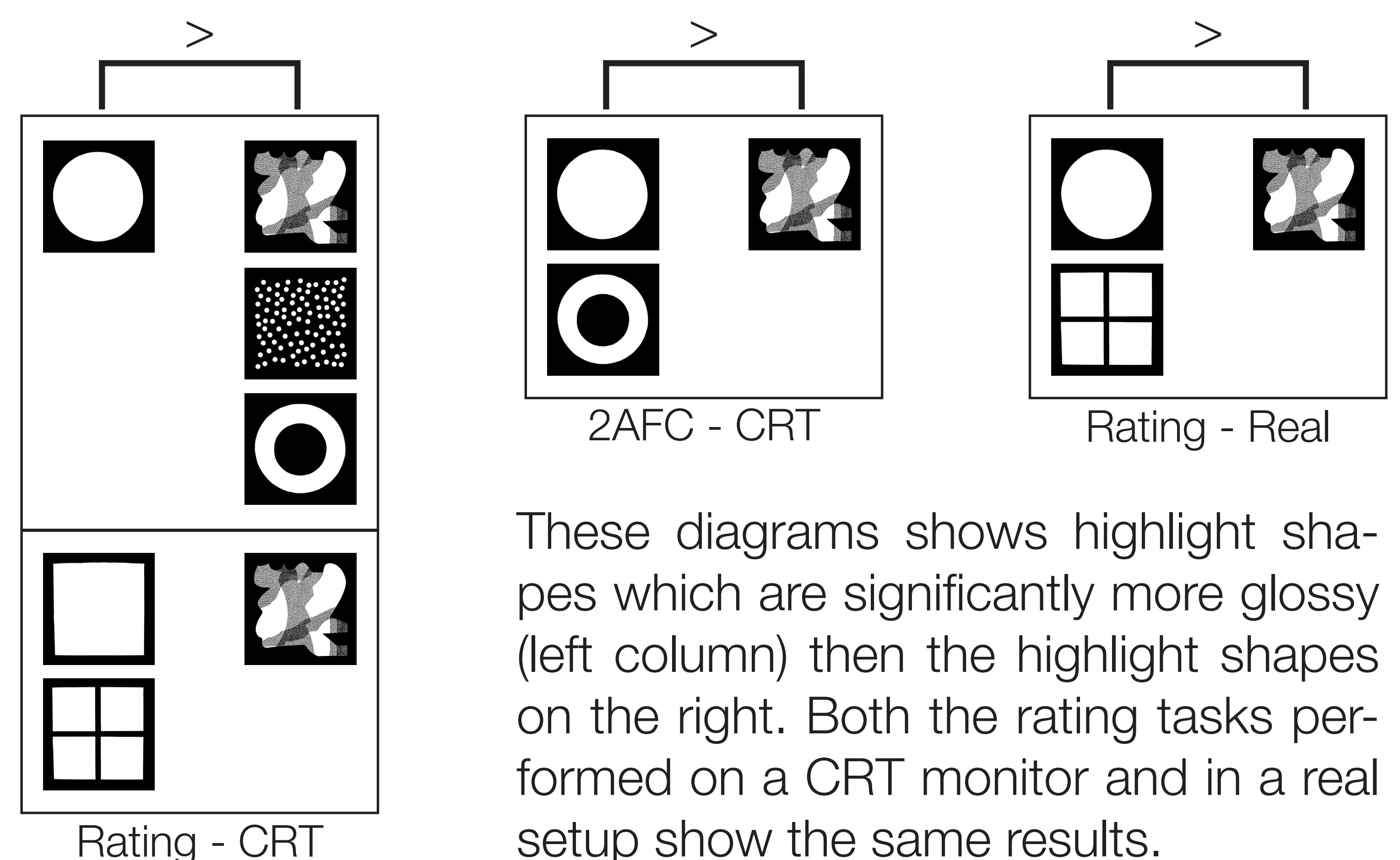
These three graphs show three sets of mean scores for each highlight shape. The error bars show the standard error of the mean.



These two graphs show the gloss score for the six different gloss levels.



The repeated measures ANOVA showed that perceived glossiness is significantly affected by highlight shape for the comparison task, $F(2.176, 32.647) = 5.388$, $p < .01$, for the rating task, $F(2.412, 36.173) = 8.802$, $p < .0005$ and for the rating task performed in the lightbox $F(2, 14) = 20.073$, $p < .0005$.



These diagrams shows highlight shapes which are significantly more glossy (left column) than the highlight shapes on the right. Both the rating tasks performed on a CRT monitor and in a real setup show the same results.

Conclusion

Our results confirm that highlight shape influences gloss perception. Maybe surprisingly, high spatial frequency highlight shapes resulted in a decrease in perceived glossiness.

Acknowledgements

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