

Appendix 8: Seeing is believing

Online supplement for “The Making of an Expert Engineer” by James Trevelyan

Colour images with permission of the original researchers.

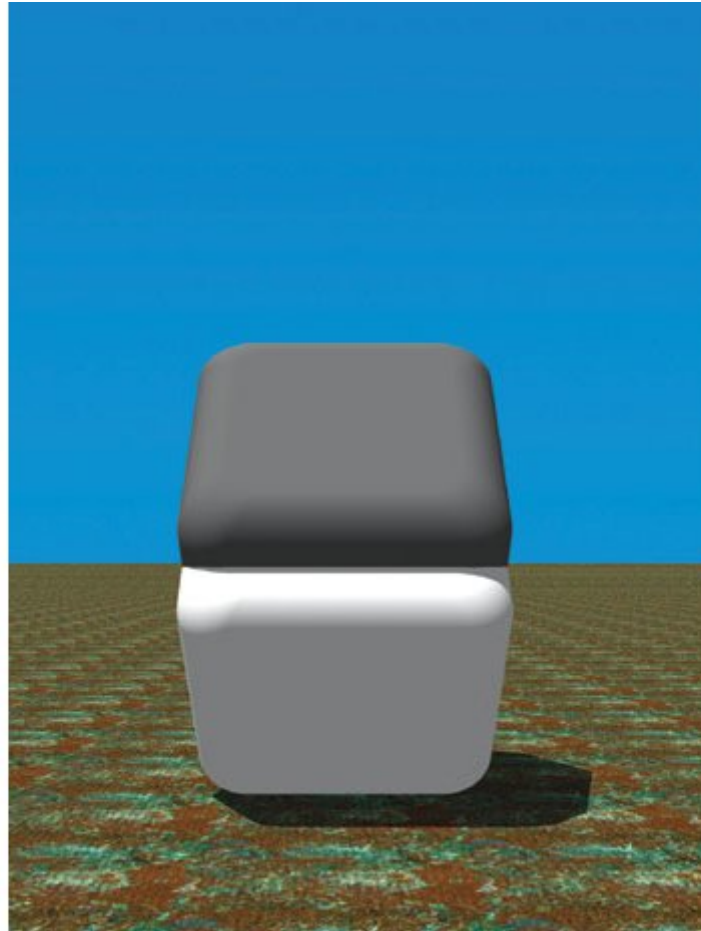


Figure 6.2a: Cornsweet illusion as presented by Purves *et al* (1999), reproduced by permission of the authors.

The flat surface of the upper tile appears darker than the shaded surface of the lower tile, whereas in fact they are the same shade of grey, as shown in the following squares sampled from the image above:

Image samples taken from the flat surface of the upper tile (left) and from the lower tile (right).



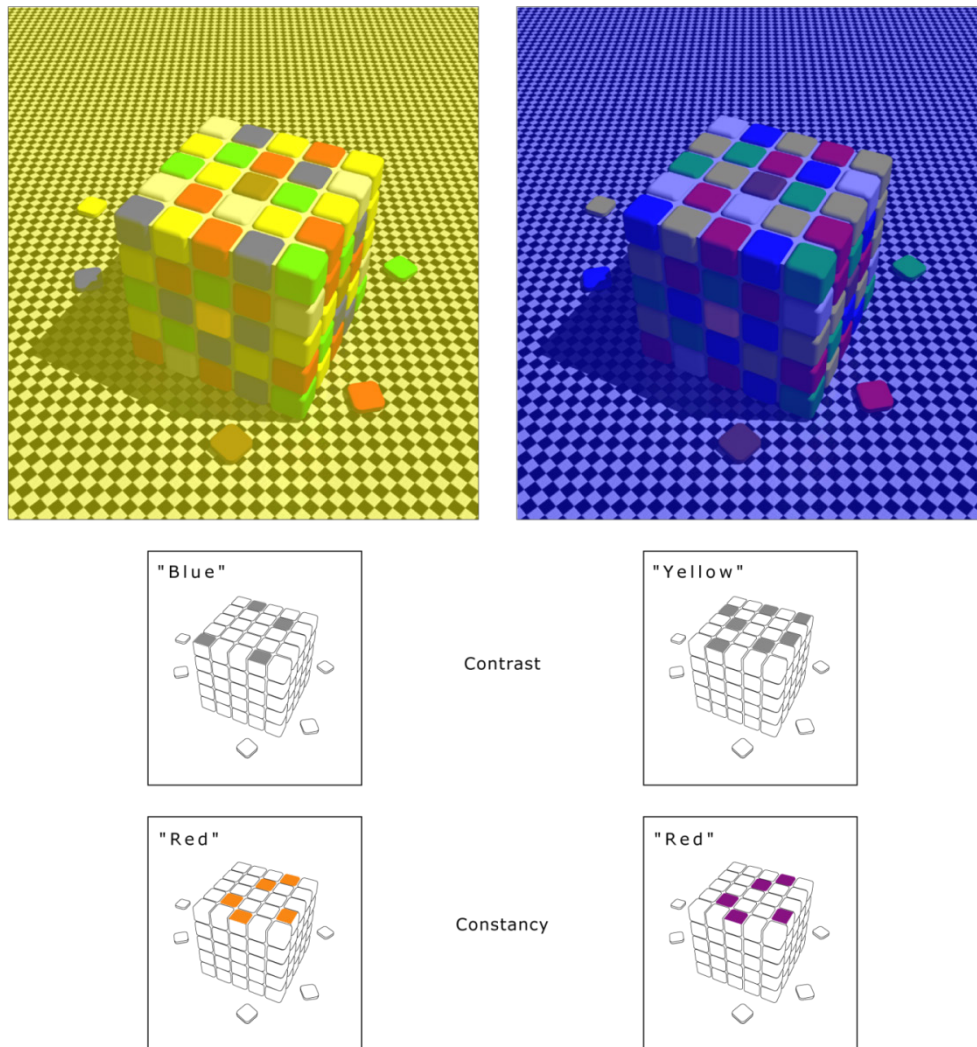


Fig 6.2b Seeing is shaped by our beliefs.

This illustrates the effects on colour perception when the same or differently reflective surfaces appear in scenes that appear to be illuminated by different light sources. The top panels depict the same scene with yellowish illumination on the left and bluish illumination on the right. As indicated by the key below, the blue tiles on the top of the cube in the left panel have, in reality, the same grey colour as the yellow tiles on the cube in the right panel. Conversely, the red tiles on the left cube appear similar to the red tiles on right cube, even though their colour is very different. This latter comparison is a powerful demonstration of colour constancy. What we see is more consistent with what we *believe* we are seeing than the actual colours in the images. (Reproduced from (Lotto & Purves, 2002) by permission.)

References

- Lotto, R. B., & Purves, D. (2002). The empirical basis of color perception. *Consciousness and Cognition*, 11, 609-629. doi: S105 3-8100(02)0001 4-4
- Purves, D., Shimpi, A., & Lotto, R. B. (1999). An Empirical Explanation of the Cornsweet Effect. *The Journal of Neuroscience*, 19(19), 8542–8551. doi: 0270-6474/99/198542-10\$05.00/0