01: Seeing Red

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Do humans visually experience categorical colour properties?

1. A 'subject-determining platitude' about colour

'If someone with normal color vision looks at a tomato in good light, the tomato will appear to have a distinctive property—a property that strawberries and cherries also appear to have, and which we call 'red' in English' (Byrne & Hilbert 2003, p. 4)

It is a 'subject-determining platitude' that '"red" denotes the property of an object putatively presented in visual experience when that object looks red', and likewise for other colour terms (Jackson 1996, pp. 199–200).

Question: Does '"red" denote the property of an object putatively presented in visual experience when that object looks red'?

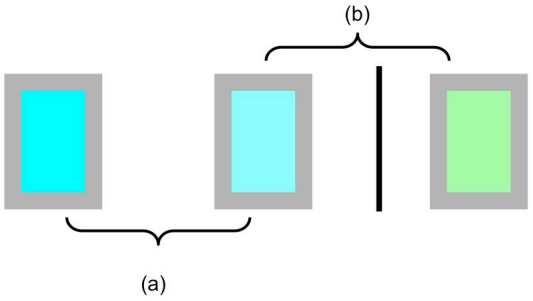
Simplifying assumptions:

1. There is a property denoted by 'red' which some objects have; call this property *red*.

2. If the property *red* (say) is presented in visual experience, then things which have this property thereby differ in visual appearance from things which do not have it.

Question (reformulated): Do red things differ in visual appearance from non-red things?

2. How to Measure Phenomenology



An argument for red visual appearances:

1. The second sequence of sensory encounters, (b), differ from each other more in phenomenal character than the first sequence of sensory encounters, (a), differ from each other.

2. This difference in differences in phenomenal character is a fact in need of explanation.

3. The difference cannot be fully explained by appeal only to perceptual experiences as of particular shades.

4. The difference can be explained in terms of perceptual experiences as of categorical colour properties.

5. There is no better explanation of the difference.

Hypothesis: Red things differ in visual appearance from non-red things.

Against the hypothesis: 'Subjective similarity judgments follow discrimination distance and reflect no influence from lexical category boundaries.' (Kay & Kempton 1984, p. 73)

Predictions:

1. Redness (or, more generally, possession of a categorical colour property) will influence discrimination.

2. Redness will influence similarity judgements.

3. Redness will influence pop-out effects.

4. Redness will influence perceptual grouping.

Evidence on the predictions (see Witzel & Gegenfurtner 2018 for background and a partial review):

Prediction 1 (discrimination). Redness, like other categorical colour properties, has no effect on discrimination of just noticeable differences in colour (Witzel & Gegenfurtner 2013); it does have an effect on speed or accuracy when discriminating larger differences in colour (Witzel & Gegenfurtner 2014a, 2016).

Prediction 2 (similarity). People are asked to judge, for each sequence, which of the two outer things is more similar to the middle thing. Given that visual appearances typically influence judgements of similarity, if things which differ in whether they are *red* thereby differ in visual appearance, we would expect people to judge that the outer thing which is *red* is more similar to the middle thing than the other outer thing (Kay & Kempton 1984; Witzel & Gegenfurtner 2014b).

The 'name strategy': 'We propose that faced with this situation the English-speaking subject reasons unconsciously as follows: "It's hard to decide here which one looks the most different. Are there any other kinds of clues I might use? Aha! A and B are both CALLED green while C is CALLED blue. That solves my problem; I'll pick C as most different." … this cognitive strategy … we will call the "name strategy"' (Kay & Kempton 1984, p. 72).

Prediction 2 (similarity): further evidence. People are asked to the middle object so that it appears to be mid-way between the two outer objects. (What people are in fact adjusting here is the hue of the object, but no mention is made of hue: their instructions are to match differences in appearance.) If things which differ in whether they are *red* thereby differ in visual appearance, we would expect people to compensate for this in adjusting hue. In fact they do not (Witzel & Gegenfurtner 2014b).

Prediction 3 (pop-out). Categorical colour properties alter the relationship between response time and set size in a visual search task (Daoutis et al. 2006).

Prediction 4 (perceptual grouping). people make visual judgements about orientation which reveal how things differing in colour are perceptually grouped. If things which differ in whether they are *red* thereby differ in visual appearance, we would expect this to affect how things are perceptually grouped Webster & Kay (2012).

3. Why Do Some Claim to Visually Experience Red?

Suppose, as argued, it is untrue that humans visually experience red or any other categorical colour properties. Why have so many philosophers have assumed the opposite, and done so without argument?

Some time after learning to use a colour term like 'red' somewhat accurately, humans become faster and more accurate at distinguishing things which differ in whether they have the property denoted by that colour term (faster: Bornstein & Korda 1984; more accurate: Roberson et al. 1999, p. 22–7; not usually immediately: Franklin et al. 2005). In fact, methods highly similar to those which indicate the absence of appearances do reveal that these properties affect speed and accuracy of discrimination (Witzel & Gegenfurtner 2014a). As discrimination of these colour properties depends on pre-attentive processes which are automatic in some of the senses that perceptual processes are (e.g Daoutis et al. 2006), the abilities to discriminate may intuitively give rise to the impression that properties like *red* affect how things appear.

There is mixed evidence that differences in categorical colour properties can trigger evoke a visual mismatch negativity (vMMN) response (Clifford et al. (2010); note that He et al. (2014) have challenged the results arguing that there is no vMMN when you control for irregularities in colour spaces using JNDs. However Zhong et al. (2015) find a vMMN for newly trained categorical colour properties (which (Clifford et al. 2012)) didn't). (There is a potential link to the next topic, Metacognitive Feelings.)

4. Appendix: Do you visually experience red because you call things 'red'?

"surprising it would be indeed if I have a perceptual experience as of red because I call the perceived object 'red'." (Stokes 2006, pp. 324–5).

Argument:

1. Red things differ in visual appearance from non-red things.
2. The capacity to detect the difference in visual appearance between red and non-red things is, or depends on, the capacity to visually discriminate red and non-red things.
3. The capacity to visually discriminate red and non-red things depends on the capacity to label the red things (for example, using 'red').

Therefore:

4. I have a perceptual experience as of red span.italic because span I call the perceived object 'red'.

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