1. What is Perceptual Constancy?

The perception of objects as constant in size, shape, color, and other properties despite changes in their retinal image. 

2. A Theory of Color Constancy

Real lines in Figure 3 describe the range of possible perceptual experience given the different stimuli (in this case, the corner of a uniformly coloured wall), suggesting that surface colour and illumination are inseparably experienced and co-determining. The image is normally seen either as uniformly illuminated or as uniformly coloured. It is possible to switch between these experiences in a top-down way (as for ambiguous images), though normally the visual system automatically chooses, perhaps in Bayesian fashion, the most likely interpretation. The capacity for top-down, deliberate interpretive switching creates the false impression of co-determining which cannot occur simultaneously, but the ability to switch at will still creates the illusion otherwise.

3. The Refrigerator Light Illusion

It is possible to see an "apparent" difference in surface colour in a context of varied lighting. This is standardly assumed to be a continuous part of visual experience, albeit not normally noticed. I claim that it is actually an unstable, transitory experience involving a Gestalt-like switch. The continual variation and the false experience (which Russell calls the "appearance") cannot occur simultaneously, but the ability to switch at will still creates the illusion otherwise.

4. Towards a General Theory

The apparent size of an object depends on how far it appears. Size and distance are also co-primitive - to see the size of an object at all is to see it at some distance or other.

The Problem of Constancy:  

Experiential Difference

- On the one hand, perceptual experiences are paradigm cases of intentionally, different perceptual experiences pleasubility have, thereby, different, difficult conditions.

- However, due to perceptual constancy, one and the same object can appear different without appearing to be different.

- Plausibly, a white experience is simply an experience that represents an object as being white. The problem of phenomenal variation arises because objects can look to be white, and yet that whiteness looks different in different lighting (see Fig. 1).

2. Seeing the Light (and Dark)

- Colour is a property not only of objects but also of the illumination.

- The amount (and quality) of illumination is represented explicitly in perceptual experience.

- Several theorists recently argue persuasively for the importance of this in accounting for the apparent remainder (see Matthen, Hilbert, Maclaurin).

The Myth of the Simple Colour Experience

A (putative) definition of "primitive":

- A perceptually represented property is primitive if it is explicitly represented in perceptual experience.

- There is no convincing account of the nature of the experiential remainder?

- Neither surface colour nor illumination are "primitive" in this sense.

- No surface ever looks simply coloured - the experience will also specify some illumination. Surface colour and illumination are only jointly primitive in the above senses.

- Hence, trivially, an un-illuminated object is not visible. This is not only a practical truism; rather, it is a deep phenomenological fact, the neglect of which is, I claim, the root cause of our failure to understand constancy.

Objection: It is completely obvious that we see shadows and shading. How could this be so misleading?

A merely mental remainder?

- A common approach, both in philosophy and psychology.

- The experiential variation is attributed to sensed data, a visual field, a non-representational "qualitative" difference, etc.

Example: Peacocke, Sense and Content (1983)

Imagine that you are in a room looking at a corner formed by two of its walls. The walls are covered with paper of a uniformly grey, brightness and saturation. But one wall is more brightly lit than the other. In these circumstances, your experience can represent both walls as being the same colour: it does not look to you as if one of the walls is painted with brighter paint than the other. Yet is it equally unapparent of your visual experience itself that the region of the visual field in which one wall is presented is brighter than that in which the other is presented.

Some reasons to reject this approach:

- Incompatible with a powerful approach to perceptual experience: the idea that the experiential qualities of a perceptual experience are its intentional contents.

- There is no convincing account of the nature of the postulated mental remainder.

- There is a better alternative (see above).

3. Ambiguity as a Feature of Constancy

Differences in the amount of reflected light can mean either differences in the light absorbed by the surface, or differences in the light received by the surface (or both).

- Just as the conscious (or top-down) manipulation of perceptual experience is possible in the case of ambiguous scenes, it is also possible to see the size of an object at all is to see it at some distance or other.

References


John O’Dea
University of Tokyo

Acknowledgments: The paper on which this poster is based was presented at the Philosophy departments of Monash University, the University of Singapore and the University of Tokyo, and was greatly improved by feedback from participants, especially Jakob Howdy and Ben Blumson.

Fig. 2. Shape constancy: orientation does not usually affect the shape things look to be.

Fig. 3. Colour constancy: the white wall looks different in different lighting conditions.

Fig. 4. The apparent size of an object depends on how far it appears. Size and distance are also co-primitive - to see the size of an object at all is to see it at some distance or other.

Fig. 5. The apparent shape of an object depends on its apparent orientation, and conversely. Shape and orientation are co-primitive in my sense. To see a shape at all is to see it at an orientation.

The experiential variation is its co-determining. The image is normally seen either as uniformly illuminated or as uniformly coloured.