Visual Cognition & Visual Awareness II:
Function, Inference, & Modularity

1. What is a Psychological Theory of Vision?
Note that there are two contrasts here – psychology with philosophy, but also psychology with physiology or neuroscience more broadly.

(1) Answers the question how stimulation at the periphery (*sensation*) gives rise to certain mental states, *perceptions*
(2) In the case of vision, principal peripheral stimulation is of the retina, but the pattern of stimulation is very different to how we visually experience the world, how do we explain the transition?
(3) Vision guides our action and helps us succeed in the world, how does it so relate us that we are successful in these endeavours?

What is visual cognition?
Assumptions:
i.) We have (a) psychological capacity (or capacities) in virtue of which we can see objects and the environment around us;
ii.) These capacities involve the manipulation of representations through inference.
iii.) Various structures in the brain, in particular in the visual cortex realise these cognitive capacities

2. Vision and Visual Awareness
Is Vision Always Conscious?
(a) The Case of Blindsight
(b) The Case of Neglect
(c) Milner and Goodale's patient DF

If vision isn't *always* conscious, visual experience is part of the normal or central case
How do psychological explanations of visual capacities explain features of vision as we conceive of it folk psychologically?
Is there a particular problem about explaining *phenomenal consciousness* per se?

The alleged 'hard problem' of consciousness, cf. Chalmers:
Given any account of the physical processes purported to underlie consciousness, there will always be a further question: Why are these processes accompanied by conscious experience? (*The Conscious Mind*, p.106.)

> The heuristic is that dividing edges between adjoining regions get assigned to a shape on just one of their sides… This one-sided heuristic is useful because the important contours in real-world images are usually *occluding* edges, which thus genuinely do belong to an object on just *one* side of the edge. (Driver & Baylis, 1996 'Figure-ground segmentation and edge assignment in short-term visual matching'. *Cognitive Psychology*.)

Constitutive Explanations:
Explaining the properties of one thing in terms of properties of the same thing or other things which make it intelligible why it has those properties
E.g. Explaining the mass or shape of a large object in terms of the masses or shapes of its parts

Mere Causal Explanations:
Explaining the properties of one thing in terms of the properties of another where there need be no such intelligible link - one happens because the other is there. Often easy to see how the same effect could have been brought about in another way

A Contrast:
The Problem of The Explanatory Gap
1. The demand is for an intelligible or constitutive connection between the phenomenal and the neural;
2. In this demand the phenomenal is often conceived of as non-intentional - just as a matter of 'raw feels'
3. Claimed that at best we have a causal link between the neural and the phenomenal

Our Example
1. The phenomenal is most naturally conceived in intentional terms - one has an awareness of surfaces and edges which we take to be in the world before us;
2. We seem to have an intelligible relation between the explanation and the phenomenon

3. Perception as Unconscious Inference
There is a long tradition of thinking vision as involving hypotheses and inferences from 2D to a description of the 3D world around us.
(A) We infer the properties of distal objects from a two-dimensional array of colours and shapes; *that is*, the evidence we have for the description offered of the world underdetermines the perceptual 'hypothesis' we arrive at;
(B) Such inference is sensitive to the knowledge we possess about the world around us;
This is consistent with such knowledge being innate or acquired
(C) Such inference is generally unnoticed or unconscious
Cf. James versus Helmholtz

(1) What is the force of saying that these are *inferences* if they are unconscious?
Outputs are representational in form – descriptions of the environment; we can explain differences in hypothesis through different assumptions in play
(2) What assumptions are we supposed to use to derive our visual hypotheses? (The problem of theory-ladenness or lack of theory-ladenness.)
This is a matter of empirical investigation – given belief-independence unlikely to be acquired knowledge
(3) What propositions act as premisses of these inferences? Should we assume a colour-mosaic, that we are aware of?
Depends on the description of the stimuli on which visual processing depends

4. Modularity of Psychological Capacities
The definition of a cognitive module – domain specific; innately specified; hardwired; autonomous; and not assembled.

Fodor's five marks:
a.) Domain specificity
b.) Informationally encapsulated
c.) Cognitively impenetrable
d.) Mandatory operation
e.) Fast in operation

For many psychologists evidence for modularity comes from:
a.) brain-localisation of function as revealed through:
i.) pathology - *double dissociation*
ii.) functional dissociation in normals
iii.) mapping of normal brain activity

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