

and moral claims. Perhaps this is what ought to be taught alongside evolution in America's public schools.

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doi:10.1016/j.tics.2005.12.001

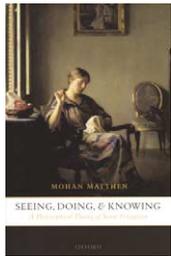
Book Review

Coloured thoughts on perception

Seeing, Doing, and Knowing: A Philosophical Theory of Sense Perception by Mohan Matthen. Oxford University Press, 2005. £40.00/\$74.00 (xxii + 362 pages) ISBN 0 19 926850 9

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This book advertises itself as belonging to 'the new philosophy of vision' (pp. 1–3) – philosophy motivated not by the problem of scepticism (i.e. how can we justify our belief that we have perceptual knowledge of the external world?), but by scientific knowledge of how we use perception to guide action and find out about things in the world.

According to the old philosophy, perception comprises both non-cognitive 'raw sensations' and cognitive judgments that attribute sensory qualities to objects. Drawing from visual science, Matthen argues that this view is mistaken: instead, sensory experience reflects the results of sensory classification and categorization, and as such is already cognitive. Sensory systems sort objects into sensory classes, and create ordered relations of similarity and dissimilarity among distal stimuli. These ideas (the 'Sensory Classification Thesis' and the 'Sensory Ordering Thesis') form the subject matter of Parts I and II.

The idea that sensory systems classify stimuli is familiar, but Matthen develops it in fresh ways. Sensory appearances are the result, not the basis, of the classificatory activity of sensory systems. Colour vision does not categorize ripe tomatoes as red and unripe tomatoes as green because the former look red and the latter look green. Rather, ripe tomatoes look red and unripe tomatoes look green because our colour vision assigns them to the sensory classes 'red' and 'green'. Vision does not categorize objects according to their colour appearance, but objects appear coloured because vision categorizes them according to its own colour classification scheme. More generally, appearance follows sensory

classification and is the record of such classification; it is not the basis or ground for sensory classification (Matthen's 'Posteriority of Appearance Thesis').

Although sensory classes like 'red' and 'green' do not correspond to physical classes, they are not arbitrary. They are 'action-relative', grounded on how the perceiver, given its biological make-up, is disposed to respond to various physical properties of the environment (e.g. light wavelengths and surface reflectances). A sensory classification scheme is right or wrong depending on whether it promotes or disrupts the perceiver's species-typical activity. Matthen calls this proposal the 'Thesis of Pluralistic Realism'.

Part III develops pluralistic realism for colour. Here, Matthen builds on my own writings that use comparative colour vision to chart an 'ecological' middle course between subjectivism and objectivism [1,2]. Subjectivists hold that colour is an attribute of visual sensations (or cannot be specified without reference to colour sensations), objectivists that it is an observer-independent, physical property (e.g. surface reflectance). Matthen maintains that colour sensory classes are specifiable in the language of physics, although they do not correspond to quantities in the laws of physics. Unlike traditional realists (or objectivists), however, he holds that colour is not an intrinsic property of objects; it is a response-relative or action-relative property that results from the sorting activity of sensory systems. Furthermore, different animals have different sensory colour classes, and hence experience things as having different colours. For example, the pigeon and the honeybee can discriminate wavelengths in the ultraviolet region, and pigeon colour vision is tetrachromatic (four appropriately chosen lights are needed to match the hue of any test light), whereas normal human colour vision is trichromatic (only three lights are needed). Thus, different

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Available online 4 January 2006

animals have crosscutting sensory classification schemes, and these schemes can all be equally correct.

One difference between Matthen's view and mine concerns colour experience. I argue [2] that there are phenomenological constraints on the concept of colour that need to be balanced with the behavioural and functional criteria for colour vision. Matthen rejects this idea and proposes purely functional definitions of colour and colour vision that make no reference to colour as consciously experienced. But without an adequate scientific account of colour experience, which we do not yet possess, this approach leaves both human and non-human (e.g. avian) colour experience in an explanatory limbo.

An account of sensory experience is offered in Part IV. A sensory experience is an internal 'signal' that the sensory system has made a certain sensory classification. The link between signal and classification evolved as a result of natural selection and is 'conventional'. On this basis, Matthen argues that it is misguided to ask questions like 'Why should a particular sensory classification be linked to a particular sensory experience, or indeed any experience at all?'. This 'explanatory gap' problem is 'ill-posed' (p. 242), because it assumes there is some 'natural match' between the internal signal and the sensory property apart from the conventional link established by evolution. I find this argument unconvincing. Why should the issuing of such an internal signal have any subjective and qualitative character for the organism? To propose that the signal is 'conventional' does not address, let alone answer, this question.

Part V concerns visual reference. Here original arguments are given to show that vision refers its sense-features not merely to spatial locations, but instead to moveable, material objects. Matthen also gives an interesting account of the 'feeling of presence' in vision: the feeling of being related to particular objects in visual perception involves our being able to move our bodies appropriately in relation to them. By contrast, we cannot move our bodies in relation to visualized or depicted objects; hence visual imagery and picture viewing lack this feeling of presence. (Similar analyses has been given by phenomenologists [3]). Matthen hypothesizes that

visual imagery lacks the feeling of presence owing to lack of engagement of the dorsal visual system (which underlies visually guided movement), but this seems unlikely, for there is evidence that dorsal pathways are involved in the ability to visualize spatial relations and locations [4]. (Matthen makes no use of the mental-imagery literature, a curious omission in an otherwise scientifically well-informed book).

Matthen's account of the feeling of perceptual presence has an important implication for debates about consciousness: experience has phenomenal features that are not representational features. Two experiences – a visual perception and a vivid visualization – can be identical with respect to the sense-features they represent, but feel different: the first involves a 'feeling of presence', the latter does not. Although Matthen calls attention to this point (p. 316), he does not take its full measure. It undermines representational theories (e.g. [5]), according to which 'what it is like' to have a given experience is entirely a matter of the features represented by that experience. Contrary to representationalism, perception and imagination can represent the same sense-features, while having phenomenally different subjective characters.

This book contains interesting discussions of many other matters. Definitions and theses abound, so this book will appeal especially to philosophers, but cognitive scientists will find much that is valuable here.

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doi:10.1016/j.tics.2005.12.006

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