Philosophy and Phenomenological Research
Vol. LXXVI No. 2, March 2008

The Content of Color Experience

FRANCES EGAN
Rutgers University

According to the central thesis of *Seeing, Doing, and Knowing*, sensory systems are automatic sorting machines that classify distal stimuli for the purposes of physical manipulation and investigation. The results of this classificatory activity are changed associative dispositions and conscious memories. The book is a detailed working out of the implications of this thesis, with an emphasis on perception of *color*. The central thesis is important and the arguments for it persuasive. Moreover, the book is filled with a host of fascinating detail. But an important feature of the account—the relativity of colors, and sense features more generally, to *actions* or *tasks*—leads to serious trouble.

According to the account developed in *Seeing, Doing, and Knowing*, colors are *sense features*:

> A *sense feature* is a property a distal stimulus appears to have by virtue of an act of sensory classification. For example, the *colors* are the properties that distal stimuli appear to have when color vision assigns them to classes in accordance with its own classification scheme. (14)

So *red*, then, is the property that ripe tomatoes, fire engines, and stop signs appear to have when color vision co-classifies them.[1]

Color experience, like other sense experience, is generated by the classificatory activity of the sensory system. Two objects sharing a sense feature, such as *color* or *shape*, is an indication that the visual system has co-classified them.

> … classificatory sameness and difference are expressed as phenomenal sameness and difference. (90)

[1] Color vision is defined functionally as the visual discriminative capacity that relies on sensors that react differentially to light differing in wavelength only to ground differential learned (conditioned) responses (166).

Since sense features are 'appearance properties', that is, properties that distal stimuli appear to have, and since colors, in Matthen's account, are sense features, then distal properties such as surface spectral reflectance (SSR) can be colors only if distal stimuli can appear to have particular SSRs (or ranges of SSRs). "…appear to have…" is an intensional context; we cannot freely substitute a predicate in the object position even if color vision classifies stimuli on the basis of the physical property picked out by that predicate. The upshot is that if the color vision system discriminates some objective property in the stimulus, and that property is not a property that objects can appear to have, then, on Matthen's account, that property is not color, but only the *ground*, or physical basis, of color.

Dispositionalists about color, such as John Locke, would agree. They hold that *red* is the disposition of objects to produce the 'looks-red' state in a normal observer in standard conditions. If a normal observer is in the looks-red state when and only when the color vision system detects property P, then property P, on this view, is not *red*, but (merely) the physical ground of *red*. Color for the dispositionalist is essentially relational.

Color is a relational property on Matthen's view as well. But his view differs from dispositionalism in two important respects. In the first place, color properties are specified not by their tendency to produce experiences of a particular sort in perceivers, but rather by their tendency to produce *actions* of a particular sort, typically what Matthen calls "epistemic actions." Epistemic actions include coming to have a perceptual belief, or making further classifications or generalizations (230). Secondly, Matthen's view, unlike dispositionalism, privileges no single kind of color perceiver or illumination condition. Many different kinds of perceivers can have veridical color experiences. Stressing these two features, Matthen calls his view, variously, *Action-Relative Realism* and *Pluralistic Realism*. I shall return to these two features below.

Since the view is realist about color, color attributions can be, and often are, *true*—distal objects really can be the color they appear to be. Moreover, color perceivers *know* the truth conditions, or veridicality conditions, of their color experiences.[2] Let's consider how such knowledge is accounted for in *Seeing, Doing, and Knowing*.

Matthen notes that a single visual experience of a canary-yellow thing, or even just an electrical stimulation of the brain to produce a flash of canary-yellow in the absence of an object, suffices for a subject

[2] Sense experiences have truth conditions on Matthen's account, because sense awareness has propositional form—it can be expressed as a set of singular propositions to the effect that a particular individual belongs to a certain class, and exemplifies a certain property. (14)

to classify something as canary-yellow (250). He calls this fact about color experience *Transparency*.

Now consider the two propositions:

(1) x looks canary-yellow.

(2) x is canary-yellow.

(1) does not imply (2), although there is obviously a logical connection between them, which is captured by following schema:

> *Look Exportation*: *Col* is the color-property something visually appears to have when it looks *Col*. (256)

Look Exportation is a consequence of *Transparency* (256). It says, in effect, that we instinctively know the meaning of a color sensation, i.e. we know what a color sensation says about an object that appears so colored. Something is not canary-yellow merely because it presents a canary-yellow look. Rather, it is canary-yellow if and only if it *really* is the way it looks. So, color perceivers know:

> *The Fundamental Principle of Color Attribution*: 'x is *Col*' is true if and only if x really is the color something visually appears to be when it presents the *Col*-look. (257)

The Fundamental Principle of Color Attribution functions in the same way as Tarski's Disquotation Principle. As Matthen puts it,

> Tarski's Disquotation Principle takes advantage of our semantic grasp of the sentence 'snow is white' to convey the truth conditions of this sentence. In much the same way, the Fundamental Principle of Color Attribution takes advantage of our perceptual grasp of color-looks to specify the color-property that this look presents. (257)

On Matthen's account then, the subject's grasp of the truth conditions of a color experience—her knowledge of the property attributed to the stimuli by such experiences—requires no collateral empirical knowledge. The truth condition is revealed to the subject just in virtue of having the experience. And so an attribution of canary-yellow to an object will be false if that object is not really the color that something appears to be when it presents the 'canary-yellow look'.

This seems right. But another piece of the picture developed in *Seeing, Doing, and Knowing* seems fundamentally at odds with this account of the truth conditions of color experience.

In the central chapter on *Pluralistic Realism*, Matthen says that an act of classification is *wrong* if it disrupts a specialized function that the classification is supposed to aid (206). A color perceiver makes a mistake if a color classification disrupts some activity that normally depends on the classification. Color classification is used for making inductions about various unobservable properties of objects. Suppose that, because the lighting is bad, a subject misclassifies a piece of yellow fruit as *green*, and thus takes the fruit to be unripe when it is in fact ripe. Matthen says,

> … the perceiver forms the false expectation that the fruit is not ripe. We say that she has committed a perceptual error because her inferential activities were disrupted by her classifying the fruit as green in violation of her normal practice.(208)

The perceptual error, Matthen appears to be saying, consists not simply in the subject misclassifying the fruit as green, but in her *further* classifying the fruit as not ripe. The implication is that if the subject had not gone on to make the further classification, she would not have made a perceptual error.

Sense experience, according to the account developed in chapters 8 and 9 of *Seeing, Doing, and Knowing*, gets its meaning from the genetically and developmentally specified uses to which sensory classification is put. These uses include making inductions about the health of conspecifics, re-identifying objects, segmenting the scene into figure and ground, and other epistemic actions. According to the view Matthen calls *Action-Relative realism* (206), the meaning of a sensory state is given by its

> *Primary Sensory Content*: The primary content of a sensory state is that the situation is right for a certain action or actions, these actions having been associated with this state by evolution. These actions may include epistemic actions. (233)[3]

This is a different account of the meaning of sensory states, at least with respect to color experience, than the 'Tarskian' account described earlier. The Primary Sensory Content of an experience is supposed to be transparent, or immediately available, to the subject. The Primary Content of a color experience, according to Action-Relative Realism, includes that the object or situation is appropriate for various actions or further classifications, what J.J.Gibson might have called 'epistemic affordances'. Matthen is claiming not simply that color classifications

[3] Primary Sensory Content is contrasted with *Secondary Sensory Content*, which is "the physically specifiable environmental situation in which it is functionally correct to perform the associated action." (233)

in fact ground further inductions about the health of conspecifics, say, or the edibility of fruit, but rather, that aptness for these further classifications and associated actions is part of the meaning of the color experience itself.

Primary Sensory Content, so understood, appears to be incompatible with the *Transparency* principle cited earlier, which holds that a single experience of canary-yellow suffices for the subject to grasp the meaning of the color experience. The epistemic affordances of various canary-yellow colored objects—even affordances that subjects typically perceive *by* perceiving that the object is canary-yellow—will often not be revealed to the subject in a single flash of canary-yellow. A single flash induced directly by brain manipulation is sufficient, according to *Transparency* and the 'Tarskian' account explained earlier, for a subject to know the meaning of a color attribution, but it is not sufficient to reveal the Primary Sensory Content of a color experience. Thus Matthen offers two incompatible accounts of the meaning of color experience. Action-Relative Realism, with its commitment to the Primary Sensory Content thesis and the relativization of sensory content to actions or tasks, in my view, gets the meaning of color attributions in sense experience *wrong*.

I am not denying that the aptness of objects and situations for various actions and further classifications—their epistemic affordances—can be grasped in a single experience. I am not insisting that the subject must *infer* the fruit's ripeness from its color. A subject may simply *see* that a fruit is ripe or edible, *by seeing that it is yellow*. What I am denying is that the aptness of the object or situation for various tasks and further classifications is part of the content, and hence the truth conditions, of the color attribution in experience.

Matthen's Action-Relative Realism, and its associated notion of Primary Sensory Content, has a host of problematic consequences. What should one say about a perception-based judgment that an inedible object, say a piece of clothing, or a paint chip, is *the very same color* as a piece of fruit? It is surely not to say that the paint chip is apt for eating. But it is not clear that Action-Relative Realism can make sense of the idea that an inedible object *could be* the same color as fruit. The view appears to fragment color into colors-for-fruits, colors-for-clothes, colors-for-paint-chips, and so on. Canary-yellow objects do not all have the same 'aptness potential'—a canary-yellow sweater is apt for getting attention, but not for eating. The affordances of objects are determined by the *kinds* of objects that they are, and further inductions from color classifications tend to be reliable only for objects of the same type. So Action-Relative Realism fails to account for the fact that we often do classify food, clothing, and paint chips as the same color, even though

attributions of color to these various objects support a diverse collection of further inductions and associated actions.

It is not clear, then, that ripe tomatoes, fire engines, and stop signs, *can be* the same color, according to Action-Relative Realism. They could be the same color, it seems, only if the actions associated with color attributions to these objects are construed simply as 'aptness for further inductions of an unspecified sort'. But then the 'action-relative' component of all colors would be the same, and the relativization to action in the account of color would be trivial.

The above point generalizes for other sense features, for example, *shape*. Perceived roundness in objects of type X might support a particular set of actions and further classifications, while perceived roundness in objects of type Y supports a different set. Nonetheless, we do, in perception, co-classify different types of objects as the *same shape*. Shape perception, like color perception, supports a wide variety of inductions, but this 'aptness-potential' is not part of the meaning of our attributions of shape in sense experience.

In summary, then, Action-Relative Realism gets the meaning of much perceptual experience wrong. We make the perceptual classifications we do because, historically, such classifications served various functions necessary for survival, but once the classification scheme is in place we can "detach" a particular classificatory act from the functions historically served by the classification scheme, for the purpose of evaluating its correctness. Unless a perceptual error disrupts some downstream function it may go undetected, but that is a different matter. The subject described earlier makes a perceptual error, whether or not 'her inferential activities were disrupted' by her classifying the yellow fruit as green, that is, whether or not she goes on to mistakenly judge that the fruit is not ripe. She may, for example, have the false belief that yellow mangoes are over-ripe; the false belief "cancels out," as it were, the normal effects of the perceptual error. But she has made a perceptual error, a mistaken color attribution, nonetheless.

As noted above, the account of sense features in *Seeing, Doing, and Knowing* relativizes color not only to actions or tasks, but also to type of perceiver. Different species have somewhat different color vision systems; they detect different properties in the light or process these properties differently. Pigeons, for example, have four types of wavelength sensitive cones, rather than the three characteristic of normal human color vision. They have a cone-type that detects wavelengths in the ultra-violet range. Moreover, pigeon color vision has three opponent processes to our two. Pigeons therefore make different color classifications than we do. Furthermore, their classifications subserve different tasks and give rise to different color experiences. Pigeons use

color vision in aerial navigation; they may well see *directions* as colored.

Matthen concludes, plausibly, that pigeons see different colors than we do. They see 'ultraviolet colors'. Informally, *Pluralistic Realism* holds that every species that makes different color classifications, as a result of different peripheral mechanisms or different processing, contributes its own batch of colors to the color pool. All these colors are equally real.

Matthen argues convincingly that anthropocentrism with regard to color is unjustified. Defining color by reference to human color vision fails to do justice to the diversity of color experience in other species. On Matthen's view, color is a heterogeneous collection of properties generated from wavelength sensitive data for a variety of specialized purposes by cognitive systems with different evolutionary histories (186).

Correctness conditions for color attributions, in Matthen's account, apply only *within* species, and are relative to the "genetically and developmentally specified uses" (263) subserved by classificatory schemes. Humans use color vision to support inductions about the edibility of food. Pigeons use color vision for aerial navigation. The failure of pigeons to classify distal stimuli by the human trichromatic scheme would count as an error only if not doing so disrupts some innately specified pigeon activity. Since, presumably, it does not, the pigeon classification scheme is not erroneous. A species that used color vision to identify fruit against a background of leaves would possess an incorrect color scheme if its subjective similarity ordering failed to maximize the difference between fruit and foliage.

The extent to which Matthen's account enables us to make cross-species comparisons is not clear. He says that canine color vision is not 'deficient', even though dogs are dichromats and so can discriminate wavelengths of light less finely than we can. But there is a clear sense in which we have *better* color vision than dogs, even though, at least arguably, no canine activity is 'disrupted' by their not having trichromatic color vision. It seems just as obvious that dogs have a better sense of smell than we do, even though no human activity is disrupted by our comparatively limited olfactory discriminative abilities.

As before, the trouble comes from relativizing colors to tasks. It seems right to say that pigeons see different colors than we do. Anthropocentrism, of the sort advocated by dispositionalists, with its reference to the standard observer, seems unjustifiably parochial. But what justifies the claim that pigeons see different colors is the evidence that their visual mechanisms are differentially sensitive to light in the ultraviolet range, where ours are not, and not the fact that color vision subserves

different tasks for pigeons than it does for us. Putting the same discriminative ability to different further uses would not by itself entail a multiplicity of colors.

This amended view allows us to make better sense of cross-species comparisons. Dogs do have a better sense of smell than humans; they can make much finer discriminations than we can. And *because* they have a better sense of smell, their olfactory sense can subserve a whole host of additional functions for dogs. The relativity of sense features to tasks does not allow Matthen to account for the plausible cross-species comparisons that we do make.