

An Internalist Account of Color*

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A Commentary on Mausfeld's paper

The Dual Coding of Colour

Color pervades our visual experience, and has even seemed to some to be essential to any visual experience. Socrates, in Plato's *Charmides*, remarks, "And sight also, my excellent friend, if it sees itself must see a colour, for sight cannot see that which has no colour." Yet despite its pervasive influence on our most dominant sense, color remains an enigma whose proper scientific and philosophical enquiry remains a point of much debate.

Color has been identified in scientific theories with wavelengths of light, and with reflectance functions of surfaces. Color has been identified in philosophical theories with objective properties of a mind-independent world, and with subjective perceptions of observers. The range of such theories does not suggest any convergence by scientists or philosophers to a commonly accepted framework for investigating color.

This might seem remarkable in light of modern technological advances that allow us, with high fidelity, to record, transmit, and display color for television, cinema, and virtual reality. How could we achieve such technology without a commonly accepted framework? In his paper "The dual coding of colour" Rainer Mausfeld proposes that the simplified representations of color that have been developed for technological purposes are in part responsible for retarding the development of an adequate account of the full range of color phenomena. He goes on to propose an ethological-internalist framework for investigating color that holds promise for developing an adequate account.

I agree that the pointillist approach to color representation that serves well for technology can be an impediment to an adequate account of color if taken seriously as the proper framework for developing such an account. Technological devices transmit and display colors one pixel at a time, and the representations of color required for this purpose are three-dimensional, e.g., RGB or HSB representations. But this representation which is adequate at the pixel level, is inadequate to account for the richer and higher-dimensional range of color experiences that arise as soon as one looks more globally than the pixel level. And I agree with Mausfeld that to assume that the pointillist representation is somehow

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original or foundational, and that the richer color experiences that arise more globally are secondary, is to get started in exactly the wrong direction for developing an account of color. Instead, the global level is the correct starting point, and the colors experienced with pointillist displays should fall out as special or degenerate cases of the more global theory.

Mausfeld's internalism is the point of greatest interest for me. It places emphasis on the internal representations that human vision constructs from retinal images, and the role of color in those representations. In particular, Mausfeld proposes that human vision builds representations for two distinct categories of visual entities: surfaces and illuminations. Color is one of the free parameters that must be specified in both of these representations.

Internalism is a subjectivist approach to color. Colors are not identified with objective properties of a mind-independent world, such as wavelength or reflectance. They are instead firmly identified with the internal representations constructed by the viewer. Moreover, the causal connections that might normally obtain between objective properties of an external world and the internal representations that are constructed, is not a primary concern of the internalist. Instead the internalist studies human visual experiences of color, and builds an account of the representations that underlie those experiences.

The only aspect of the external world that Mausfeld feels obliged to include in the internalist analysis is the physico-geometric properties of the light incident at the retina. These allow us to understand the relationships between the internal representations of the viewer and the equivalence classes of the physical inputs by which they were triggered.

This is where I would like to suggest that Mausfeld's internalism could be made even more thorough-going. Mausfeld is steadfast in distinguishing reference to higher-level entities of the physical world, such as "surface", "physical object" and "event", from their internal representational counterparts constructed by the human visual system. He refuses, I think properly, to mix these categories. I propose that this mixing should also be refused for the lowest level physico-geometric properties of light. Just as human vision builds internal representations of surfaces and objects and events, it also build internal representations of the low-level geometric properties of light. The internalist does not need to abandon internalism to speak of these geometric properties, or to build theories of their relationship to the other, higher-level, representations constructed by human vision.

Indeed it is problematic, and might not even be possible, to be a consistent internalist and yet continue to refer to mind-independent objects and their properties with any

degree of confidence. For on the internalist view all visual experience of the world can be ascribed to the creation of internal representations, and these representations need not bear any particular causal or resemblance relations to any supposed mind-independent realm. What is true of vision is, presumably, true of all other sensory modalities as well. So it then becomes difficult to get any independent access to the properties of any presumed mind-independent realm, and therefore difficult to compare even the most basic of these presumed properties, such as the physico-geometric properties of light, to the internal representations of the observer. What the internalist can do consistently is to compare different levels of internal representations with each other, and then theorize about the causal and semantic relations between them. The internalist can do this quite consistently even for internal representations of the most basic of the geometric properties of light and their relationship to internal representations of surfaces, objects, events, and their many properties. But if the internalist wants to make contact with any presumed mind-independent properties of a presumed mind-independent world, there is much work to be done to show how this is in principle possible, given internalist assumptions about perception. I buy the internalist assumptions, and I am happy to abandon claims to confident knowledge of a mind-independent realm. Psychophysical, neurophysical, and computational investigations of visual perception can continue in their current forms quite successfully without such assumptions of confident knowledge of a mind-independent realm, and restricting themselves only to internalist principles. And I think they should.