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Is Seeing Believing?¹

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1. Introduction

The precise nature of the connection between perceptual experience and empirical knowledge is one of the traditional problems of philosophy. That much of our knowledge is somehow based on our perceptual experience has been a common element of many otherwise disparate views as to how beliefs about empirical matters are justified. Although this relationship is now often conceived to be causal rather than logical, it is still rarely doubted that there is some kind of intimate connection between experience and justified belief. Any view of this kind leads quite naturally to the idea that the function of perceptual experience in our epistemic economy is to lead to knowledge of those matters of fact that cause or are represented by that experience. Although I do not wish to deny that this is one epistemic role that experience can play, I will argue below that there are others as well. I will also argue that perceptual experience, as traditionally conceived, is not a necessary component in the acquisition of knowledge by means of the senses. The relation between sensory experience and perceptual knowledge is both more complicated and less intimate than many philosophers assume.

It may not generally be the case that truth is stranger than fiction, but it is certainly so with regard to the possibilities for things going wrong with the processes of visual perception. Although it is traditional for philosophers to appeal to hypothetical rather than actual examples in motivating and justifying their conclusions, my impoverished imagination and some doubts that my project is entirely one of conceptual analysis leads me to draw my examples from the empirical literature. Accordingly I would like to start with a few summaries of reported cases in order to motivate my discussion and help suggest some plausible hypotheses about the relation between perceptual experience and perceptual belief. Although there are serious problems in interpreting the apparently bizarre patterns of behavior that some of the subjects in these cases exhibit, in my initial description I will take the published reports more or less at face value. I will later consider just how plausible is the description of the more troubling of these cases. These case histories will serve, I hope, to generate a sense of puzzlement about how perception works. Attempting to clear up these puzzles regarding abnormal cases will lead to some conclusions that, hopefully, apply to more normal cases as well.

2. Some Case Studies

2.1 Visual knowledge without visual experience

Case 1

Some cases of cerebral achromatopsia (color blindness due to brain damage) display a preserved ability to locate boundaries between areas on the basis of color information without any awareness of what property it is that defines the boundary. M.S. becomes ill with a virus and suffers neurological damage as a result. One striking finding is apparent complete color blindness. All peripheral components of the color vision system are, however, demonstrably intact. M.S. denies seeing color, cannot sort objects by color, cannot name the colors of objects shown to him, and in most circumstances behaves as if he were completely color blind. In some circumstances, however, M.S. is able to recognize figures whose shapes are specified only by color boundaries. When asked what differentiates figure from ground M.S. is unable to provide an answer. Visually, the figure looks exactly the same as the ground, according to M.S.²

Case 2

The patient suffered a stroke that resulted in extensive bilateral damage to several parts of the visual cortex among other areas.³ In his own words, he had been, "Sitting, eating breakfast...looked up and everything went black" (31). His condition was (mis?)diagnosed as blindness due to bilateral cerebral infarction (stroke). He was re-examined two years later and at that time denied any recovery in his visual abilities. He had, however, been living independently and was able to cook for himself, type, and walk without assistance in unfamiliar surroundings. He had never availed himself of any services for the blind and had failed to apply for any of the benefits or services for the visually disabled available to him through the Veterans Administration.

Visual examination of the patient revealed that he had small (30 degrees) spared areas in the upper right quadrant of both visual fields. Within this spared area his visual acuity was no worse than that of a moderately nearsighted individual. The patient was able to read words, although inaccurately and with difficulty, and was able to recognize objects and faces presented visually. What makes this case more interesting than a simple case of earlier misdiagnosis is the patient's resolute refusal to admit that he was able to see. When asked how he was able to successfully perform these visually mediated tasks he denied any awareness of visual perception and made responses like "I feel it," "I feel like something is there," "it clicks," or "I feel it in my mind" (33). I should also mention that with the exception of some mild memory and language impairment the patient showed no evidence of confusion or dementia. His independent life-style and failure to apply for benefits on the basis of his claimed blindness would also seem to rule out a mercenary motive for his denial of visual experience.

2.2 Visual experience without visual knowledge

Case 3

B.M. has had the entire right half of her cortex removed to control very severe and otherwise untreatable epileptic seizures. In spite of this radical surgery, most of B.M.'s cognitive and perceptual abilities appear to be normal. Her IQ is normal and she performs within the normal range on a number of other tests. She is partially blind to stimuli in the left visual field, but in the spared visual field most tests of visual function put her within the normal range. In particular, her spatial acuity is normal, as is her color

vision. There is one striking area, however, in which B.M.'s visual abilities are severely impaired. She has almost no ability to identify or recognize faces, a condition known as prosopagnosia. This impairment does not just involve remembering what name to associate with a face or whether she has seen a face before but extends to judgments as to whether simultaneously presented photographs are photographs of the same face or not. If the photographs are identical she can detect this identity but if there is a difference, say in expression, her ability to detect identity falls to near chance levels. In addition, familiarity does not seem to help, since B.M. fails to recognize photographs of her mother's face, with whom she lives, or even photographs of her own face.

In spite of her severe impairment on tasks involving facial identity it is clear that the source of B.M.'s difficulty is not a general problem with identity or an inability to detect the features of faces. B.M. is capable of producing names in response to verbal cues and of describing familiar people when prompted with their name; she can even recognize individuals on the basis of visual information. Her ability to classify faces by gender and age is nearly normal, as is her ability to make judgments about emotional states on the basis of facial expression. B.M.'s visual impairment is remarkably specific to facial identity and coexists with a relatively normal ability to visually mine facial features for information about age, gender, and emotional state.⁴

3. Some preliminaries

I propose to explore questions about the relation between perceptual experience and perceptually obtained knowledge or belief. Although I have no detailed account of the nature of perceptual experience, I can roughly sketch the general nature of perceptual experience and how it differs from perceptual belief. Perceptual experience is imagistic, rich and detailed, and its components are modality specific. By modality specific I mean that the elements of perceptual experience can be differentiated by the sensory modality that produces them. The visual experience of a square is different from the tactile experience of a square. The other three characteristics are closely connected, and some idea of what I have in mind may be made clear by considering the difference between the visual experience of a square object and the belief that that object is square. The visual experience of a square, as Berkeley pointed out long ago, must be of some color, and this color must be either homogeneous or differentiated. I can, by contrast, merely believe of an object that it is square without also believing it to be of some particular color. This difference is not confined to the secondary qualities. The visual experience of a square must represent it as standing in some more or less definite spatial relation to the other objects in my field of view; this again is not true of my belief. Although this crude characterization is clearly inadequate in several respects, I hope that the characteristics of visual experience will become somewhat clearer in what follows.

In addition to the general characteristics of perceptual experience just mentioned, it is commonly held that there is a limited set of qualities that are present in the experiences associated with each sense. For vision, my main object of concern in this paper, it is traditional to maintain that our experience includes only color and shape. Whatever knowledge we manage to obtain visually of other properties is somehow derived from, causally or logically, our experience of this limited set of sensible qualities. Although this traditional view has waxed and waned in popularity over the years, and relatively few contemporary philosophers would be willing to endorse it without serious qualification, it is this traditional conception of visual experience that I will be investigating in this paper. My justification for proceeding in this somewhat arbitrary way is twofold. First, I suspect there is more sympathy for this conception of visual experience than the published literature might indicate. Second, and more importantly, even those who do not subscribe to the traditional conception of visual

experience typically wish to enrich, not impoverish, its properties. The puzzles I discuss below are puzzles even for such enriched conceptions of the content of visual experience. I will return to this point below.

4. Some Puzzles

4.1 Is seeing necessary for believing?

It is, of course, not true that it is necessary to see an object in order to have a belief about it. I can come to believe that the carpet in the seminar room is brown by being told by someone I trust that the carpet is brown. What would be more interesting to learn is that I can come to believe (accurately?) that the carpet is brown when the only source of information I have is the operation of my eyes and the rest of my visual system, without the visual experience that normally is involved in seeing color. In such a case, if this is a genuine possibility, vision is operating directly to give me beliefs about color without the mediation of any visual experience. Case 2 above is such a case. The patient denies any visual experience but at the same time acquires (more or less) accurate beliefs about the objects around him, beliefs whose only possible source is the operation of vision.⁵

There are reasons to be a little skeptical that Case 2 is really correctly described. The patient in Case 2 has mild language difficulties and his descriptions of his experience are somewhat ambiguous. Although he insists that he does not see in the way he did before his strokes, he does talk of feeling that something is there. Given his degraded visual abilities it may be that he still has visual experience but that it is different from the kind of visual experience he had before his strokes. Since the patient is also described as being somewhat aphasic, i.e., suffering from language difficulties, and suffering from fairly severe attentional deficits, a certain amount of skepticism about the case is in order. Case 1, although less general and consequently less striking, is partly for the same reason more convincing. M.S. is demonstrably completely color blind by almost every test imaginable. Moreover, M.S., like most achromatopic subjects, describes his visual experience as lacking color. In addition, M.S. is not alone in his apparent combination of total loss of color vision with the ability to discriminate some boundaries that are defined solely in terms of color difference. There are now a handful of known cases like M.S., and they all share with M.S. the ability to recognize boundaries that separate areas that are experientially indiscriminable. These cases would seem to show that in this limited domain it is possible to have beliefs that are based on visual information without the relevant visual experience.

4.1 Is seeing sufficient for believing?

As we have seen, there is some reason to suppose that visual experience is not a prerequisite for obtaining accurate beliefs on the basis of visual information. It may seem like old news to be told that visual experience is also not sufficient for the formation of beliefs based on visual information. I can, for example, look at a begonia in good light, with my glasses on, and still fail to form the belief that there is a begonia before me. It is a familiar point that we can see an object and that object can present some distinctive appearance to us and we can still fail to recognize that object. I fail to recognize begonias even when visual experience is indicative of the presence of a begonia because I don't know what begonias look like. This sort of failure of visual experience to lead to the appropriate belief, although instructive, is not my concern here. These kinds of failures throw little light on the causal structures that produces visual belief.

What is more puzzling and more instructive than these familiar failures to recognize the things that we see are the kinds of pathology exemplified in Case 3. Here we have people who, although they appear to perform normally on most visual tasks, are strikingly deficient in one limited domain. B.M. is not lacking in experience of faces; she sees them everyday and is just as impaired in recognizing the most familiar faces as she is in recognizing new faces. She has no general difficulty in recognizing the things that she sees, since her visual abilities are nearly normal with regard to other categories of objects. And most important she does not lack visual experience of faces and their parts. Her ability to classify faces by gender, age, and emotional expression strongly suggests not only that she sees faces and their parts but that she is also visually aware of the details of these parts and their relation to one another. There is no evidence that her visual experience of faces differs in any marked way from that of an unimpaired person. None of the ordinary explanations as to how a person can have visual experience of an object and still fail to form the belief that normally accompanies that experience seem to apply.

4.3 Does seeing have anything to do with believing?

My discussion so far suggests, I think, a certain kind of model of how vision works. This model is incomplete, but consideration of it and the ways in which it is incomplete will prove instructive in arriving at a more adequate picture of visual perception. By way of motivating this model I will make a brief digression into artificial vision.

Computer scientists have recently devoted some attention to the task of developing artificial systems for recognizing faces. Some of these systems are reasonably successful in classifying faces as familiar or unfamiliar. That is to say, you train the system on a restricted set of faces and then present it with a broader range of faces. The system, if everything goes well, will produce one kind of output for the faces from the training set and a different kind of output for other faces. One characteristic of successful systems of this sort is that they ruthlessly discard information that is irrelevant to their task. If the algorithm does not require information about facial blemishes like moles or warts, the system will never extract these features from the image. In this regard, they are very different from human vision, since visual experience contains a large amount of information about features of the world that are irrelevant to the perceptual task at hand. Another interesting feature of these systems is that the features of the image they rely on in successfully performing their task are often quite different from those that seem salient to human beings. Although the presence or absence of moles may make a difference to those image properties the system does rely on, it may be the case that the presence or absence of facial moles as such is never represented anywhere in the course of processing. Face recognizers do not have as one of their goals the parsing of the face into individual features and may rely on much more abstract image properties instead. In fact, success in computational vision would come more easily than it does if researchers could rely on our intuitions about which features of the image are important for particular tasks and which are not.

Consideration of the cases presented above suggests that in some ways human vision is similar to these artificial vision systems. Prosopagnosia is plausibly thought to be the result of damage to brain systems that are devoted to extracting information about facial identity and nothing else. That is why the impairment can be so selective. Moreover, there is no reason to suppose that such a special purpose system would make any more use of those features of faces that are salient in visual experience than do artificial vision systems. Case 3 would seem to provide some positive evidence for this claim. In Case 1 we see that the outputs of visual processing can remain intact even if brain damage interferes with the representation in experience of

some of the image features that contribute to generating those outputs. The part of the visual system that is concerned with detecting material boundaries has no concern with identifying the difference between the two sides of the boundary. Thus brain damage can produce the result that a boundary is detected in spite of the fact that there is no information in visual experience about *how* the boundary was detected.

These considerations suggest a model of human vision consisting of a collection of special purpose mechanisms that are individually concerned with detecting certain features of the visual world and collectively providing us with our perceptual beliefs. If this is true, then there is a puzzle about what role visual experience plays in vision. As we have seen, such dedicated mechanisms need not require anything resembling visual experience in order to carry out their assigned tasks. We can recognize faces, but why do we see eyes, noses, and warts as well? We can detect object boundaries and material changes, but what is the point of filling in these regions with color, as we normally do? Enriching the range of properties that may be represented in visual experience will not help. Adding spatial boundaries that are not color boundaries or adding facial identity to visual experience leaves the problem untouched. There is still a puzzle about the presence in visual experience of the traditional elements of color and shape that appear, on the current model, irrelevant to producing our visual beliefs. Visual experience provides us with our rich phenomenology, but on this model it seems disconnected from the main business of vision, which is telling us what the world is like. It may be pleasant to be aware of some of the features that underlie the outputs of visual processing, but this awareness can be misleading. Moreover, it seems to contribute nothing practical to our well-being. The question at hand is then, "Can we, with our rich phenomenology, do anything that could not be done by someone completely lacking visual experience, like the patient in Case 2?"

5. Some Answers

5.1 A few cautionary remarks

We should not be overly hasty in jumping to sweeping conclusions about the irrelevance of visual experience to normal functioning on the basis of cases like these. The case description does not tell us that the patient suffers no deficiency in the formation and assessment of perceptual beliefs. Although his abilities are surprising, there may be other abilities that he lacks. Some deficiencies in visual functioning are surprisingly hard to detect on the basis of casual observation of behavior. Color blindness, for example, is a defect of visual function that is only clearly revealed in rather special circumstances. Although color blindness has presumably been present in the human population throughout recorded history the first clear recognition of this common disorder occurs in the seventeenth century and the nature of the deficit was not well characterized until the early nineteenth century.

5.2 A limited proposal

As a partial step towards restoring visual experience to some of its former glory I will argue that there is at least one way in which it contributes to visual belief. One difference between those of us with visual experience and those real and imagined people that lack visual experience in whole or part is that we possess, on the basis of our visual experience, information about how we came to have our visual beliefs. The patient in Case 2 just knows, or as he puts it "feels things in his mind." He is ignorant of how he came to know or believe the propositions he believes as a result of the operation of his visual system. Similarly, in Case 1, M.S. has no information about what difference identifies the boundaries he believes are present. Having visual

experience allows us to know that some of our beliefs are visually derived; having color experience allows us to know that some of our beliefs are based on color differences. In these cases the visual experience does not provide the evidence on which the belief is based, nor does it figure in the causal production of those beliefs. Nevertheless, it provides information about those beliefs.

Since the experience of *seeing* a person to my left is different from the experience of *hearing* a person to my left, this difference can tell me that my belief that there is a person to my left is based on or derived from visual as opposed to auditory evidence. Similarly, since there is a difference between the experience of seeing a *color* boundary and seeing a *texture* boundary, this difference can allow me to know that my belief that there is a boundary present is based on color as opposed to texture differences. This kind of information may seem of little practical value but a little reflection shows otherwise. Our senses are far from perfect and their reliability varies with the circumstances of perception. Not only does the reliability of the senses vary with external conditions, but the different senses vary in different ways. In a dim light vision is very unreliable for many tasks while audition is unaffected. In a noisy environment audition is severely impacted while vision may be perfectly reliable. Even within a single sense there is similar variation in reliability. Under some illuminants color differences are unreliable guides to finding edges, while texture differences are quite conclusive. Under other viewing conditions, texture is unreliable while color is trustworthy. Thus, having information about the sources of our belief can be very helpful in determining how trustworthy our beliefs are in various circumstances. If I am walking down a dark street and entertain the belief that there is a person lurking in the bushes, it is of great practical value to know whether this belief is based on hearing him breath, as opposed to visually discerning a dim outline. People without perceptual experience would be impaired in their ability to adjust the confidence with which they hold their perceptual beliefs to the circumstances of perception.

There is some empirical evidence to support this contention. Studies have been done of achromatopsics who have spared ability to detect color boundaries in which they are also asked to provide confidence ratings about their judgments of the presence or absence of a boundary. Their confidence in their judgments did not change with variation in task difficulty and performance, while normal subjects did vary their confidence appropriately. Lacking color experience, subjects like M.S. are not able to tell that their judgments are based on color information and are not able to accurately assess the reliability of such judgments as the conditions relevant to color perception vary. Thus although color experience may not directly produce the relevant beliefs it is implicated indirectly, in the assessment of the reliability of such beliefs.

It is not my claim that such a mechanism for informing perceivers of the origins of perceptual belief necessarily must operate through the medium of perceptual experience. Rather, I am claiming that it is a fact about human beings that we do obtain this information in this way. There may be other possible sentient beings who obtain this information using other mechanisms; nothing I have said here in any way bears on this possibility. Unless this possibility is ruled out, it remains an open question as to why visual experience plays this role in us. Such possibilities seem to suggest that the role of perceptual experience in reliability assessment is not the whole story about the epistemic function of experience.

5.3 Some vague conclusions

I do not think that the role of perceptual experience is limited to enabling us to assess the reliability of our perceptual beliefs, but I will only wave my hand in the di-

rection of some other possibilities. One obvious problem with the conception of human perception as a collection of special purpose mechanisms is that human beings are not specialized animals. The most distinctive feature of human beings is the degree of plasticity in our behavior and the range of different environments in which we can function. Special purpose mechanisms do not adapt with any degree of ease to new tasks. Our ability to learn new discriminations and novel systems of perceptual categories is impressive, and I suspect that something like visual experience is implicated in this ability. There may, after all, be something right about the philosophical tradition that perceptual belief requires perceptual experience, although the exact nature of the connection may not be what is traditionally supposed.

Notes

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²M.S.'s color vision was first characterized in Mollon *et al.* (1989). Further details can be found in Heywood *et al.* (1991).

³The description of this case is drawn from Hartmann *et al.* (1991).

⁴The description of this case is drawn from Sergent and Villemure (1989).

⁵It might be objected that Case 2 merely shows that *awareness* of visual experience is not causally necessary for visual belief. I am not sure whether this separation of experience and awareness is well motivated but in any event it merely shifts the location of my puzzle. The question now becomes one of the connection between *conscious* experience and belief. See McGinn (1991), Chap. 4 for a discussion of these issues.

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