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PERCEPTUAL BELIEF AND NONEXPERIENTIAL LOOKS

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How things look (or sound, taste, smell, etc.) plays two important roles in the epistemology of perception.[1] First, our perceptual beliefs are epistemically justified, at least in part, in virtue of how things look. Second, whether a given belief is a perceptual belief, as opposed to, say, an inferential belief, is also at least partly a matter of how things look. Together, these yield an epistemically significant sense of 'looks'. A standard view is that "how things look", in this epistemically significant sense, is a matter of one's present perceptual phenomenology, of what nondoxastic experiential state one is in. On this standard view, these experiential states (a) determine which of my beliefs are perceptual beliefs and (b) are centrally involved in justifying these beliefs.

As an alternative to this view, I want to argue that there is a nonexperiential sense of 'look' as well and that this sense of 'look' is at least as epistemically significant a sense as any experiential sense. That is, the connection between what an agent is justified in believing and how things look to her in this nonexperiential sense is more direct than the connection between what she is justified in believing and how things look in any experiential sense. In addition, this same nonexperiential sense of looks can be used to solve the classic problem of distinguishing perception from inference.

I won't actually be arguing against the standard view; the goal is mainly to articulate an alternative. If, however, the epistemologically interesting sense of 'looks' is the one that is most directly connected to justified belief and/or to perceptual belief, then the epistemologically interesting sense is not an experiential sense. The existence of nonexperiential 'looks', 'sounds', and the like serves to undercut an important source of motivation for the standard view. So although I won't try to show that the standard view is false, I will show that there is considerably less reason to believe it than is usually assumed.

A Short Taxonomy of Looks

There are notoriously many different senses of 'looks'. Chisholm (1957, 1966) famously distinguished between comparative and noncomparative uses of '*x* looks *F* to *S*'. To believe that *x* looks—in the comparative sense—*F* to me is to believe that *x* looks to me the way that *F* things normally look.[2] Such a belief cannot be epistemologically basic, for it depends on additional beliefs, viz., beliefs about how *x* looks and how *F* things normally look. Chisholm argues that these additional beliefs must involve 'look' in the noncomparative sense, as a description of the intrinsic character of the state, not its relation to other states. It is common to add to these two senses epistemic and/or doxastic senses of 'looks' (e.g., Alston 2002), but we must be careful to distinguish purely epistemic or doxastic senses from those that make an essential reference to an experiential state. According to the experiential-epistemic sense, *x* looks *F* to *S* iff the way *x* looks to *S* prima facie justifies *S* in believing that *x* is *F*; the purely epistemic sense allows that *x* looks *F* to *S* iff *S* is prima facie justified in believing that *x* is *F*. Similarly, according to the experiential-doxastic sense, *x* looks *F* to *S* iff the way *x* looks to *S* disposes *S* to believe that *x* is *F*, while according to the purely doxastic sense *x* looks *F* to *S* iff *S* is disposed to believe that *x* is *F*.[3] The difference between the pure and the experiential senses is that the latter explicitly involve the agent's perceptual phenomenology. Thus, the reference to "the way *x* looks to *S*" is to be read as picking out a particular experiential state.

The comparative, noncomparative, experiential-doxastic, and experiential-epistemic senses of 'looks' are all experiential senses; they make essential reference to the agent's experiential states. They are literally about how things look. It is clear that the purely epistemic and doxastic senses of 'look', 'appear' and the like, on the other hand, are metaphorical and really have little if anything to do with looking or appearing. If I say that it looks as if the Republicans are going to win this election, I'm using either the purely epistemic or the purely doxastic sense; I am clearly not making any claims about *vision*.[4] What makes these metaphorical senses metaphorical, however, is *not* that they make no essential reference to visual *experience* but, rather, that they make no essential reference to *vision*. There is another sense of 'looks', which makes no essential reference to experiential states either, but which is a literal sense nonetheless.

According to what I will call the "perceptual output sense" of 'looks', *x* looks *F* to *S* iff one of *S*'s visual systems is outputting an identification of *x* as *F* (likewise, *mutatis mutandis*, for perceptual output senses of 'sounds', 'smells', etc.). This is an important sense of 'looks', and it describes neither the intrinsic nature of an experiential state nor a relationally characterized fact about the experiential state. Something can (perceptual-output-)look different ways to different agents who have the same visual experience, and something can (perceptual-output-)look a certain way to an agent who has no visual experiences at all. Nonetheless, this is a literal and epistemically significant sense of 'look'.

So we have three basic kinds of 'looks' locutions: (i) those that describe an experiential state, (ii) the metaphorical uses like the purely doxastic or epistemic senses, and (iii) a literal yet nonexperiential use that describes the output of a perceptual system. This last kind has been overlooked, so to speak, and I want to remedy that now.

Perceptual Systems and Their Outputs

I need to explain what is meant by the claim that a visual system is outputting an identification of *x* as *F*. To do so I will have to make a number of theoretical cognitive scientific assumptions, which I think are plausible but which cannot be defended here.

I presume, first of all, that the mind consists of or at least contains a number of modules, or cognitive systems. Fodor (1983), of course, has made the concept of a cognitive module a familiar one. Fodor's own understanding of modularity, though setting the stage for most subsequent discussion, is quite restrictive, especially in its assumptions of innateness and informational encapsulation.[5] Many authors opt instead for a kind of "weak modularity", which relaxes the more restrictive of Fodor's conditions.

I have tried elsewhere (2001) to clarify this notion of weak modularity: the conception in question is the cognitive neuroscientific understanding of a cognitive system. On this view, all modules in Fodor's sense are systems, but not all systems are modules in Fodor's restrictive sense. To mention just a few features incompatible with Fodorian modularity, some cognitive systems might very well fall short of total encapsulation (they may have partially but not fully restricted information trade with other systems), and some systems may result from learning (Elman, et al. 1996). Nor need cognitive systems be domain specific in any very robust sense. The term 'module' is a handy one, however, and I will retain it, though I will use it interchangeably with the term 'cognitive system' and will use it for this weak notion of modularity, rather than the strong Fodorian one. On my view, a cognitive system for some task is an isolable cognitive mechanism that specializes in that task and exhibits a kind of functional unity. I will summarize the basic view here; the argument for it, along with a good deal of elaboration, can be found in my (2001).

Systems must be isolable in the sense of being independently capable of performing those tasks in which they specialize, in the absence of other mechanisms. This feature is illustrated by the cognitive neuroscientific methodology of double dissociation. If some disease or brain lesion produces an impairment with respect to task *A* but leaves performance spared with respect to task *B*, that is some reason for thinking that *A* and *B* are subserved by distinct systems. However, such a single dissociation of *A* from *B* is compatible with *A* and *B*'s being handled by the same system if *A* is more difficult, the damaged system continuing to perform normally on the easy tasks but exhibiting deficits on the

difficult ones. Suppose, for instance, we discover a patient with prosopagnosia: a selective deficit for recognizing faces, even while ordinary object identification is (relatively) unimpaired. Does this mean that there is a distinct face recognition system, or merely that face recognition is more difficult and thus more sensitive to injury? A double dissociation, where one population is impaired on *A* but not *B* and another population is impaired on *B* but not *A*, resolves this question. If *A* dissociates from *B* and *B* from *A*, it must be that different cognitive systems underlie performance of the different tasks, the one system being damaged in the one population, the other system in the other.[6]

All cognitive mechanisms, qua cognitive, effect a mapping of representational states.[7] Cognitive systems are said to be systems, or modules, *for* something. There is a module *for* face recognition (equivalently: there is a face recognition module) only if there is a module that specializes in face recognition, i.e., it does little or nothing else. If face recognition is performed by a more general purpose visual module and not a separable component, then there is nothing that specializes in face recognition and consequently no system *for* face recognition. This is not a substantive requirement that systems be domain specific; it is instead a constraint on nomenclature: we can't properly *call it* a face recognition system unless that's all (or pretty much all) the system does.[8]

Finally, suppose there is a system for face recognition, and suppose also that there is a system for gustation. It clearly does not follow from this that there is a system for gustation-or-face-recognition. Cognitive systems must exhibit a certain functional unity; not just any gerrymandered collection of systems is itself a system. The task must be unitary with respect to the implementing mechanisms in the sense that no proper part of the implementing mechanism performs any part of the task.[9]

Clarifying the concept of a cognitive system, or module, takes us part of the way toward an understanding of perceptual systems, but we will need to know what the difference is between perceptual and nonperceptual modules. By 'perceptual system', or 'perceptual module', I intend whatever it is that contemporary cognitive science means by the terms. Thus an account of perceptual systems, like the account of cognitive systems more generally, should aim at capturing the conception operative in cognitive science. Given the role I am reserving for perceptual systems, I clearly cannot delineate the class of perceptual systems in epistemological or phenomenological terms. Fortunately, cognitive science is notoriously unconcerned with either epistemology or phenomenology. A theory that captures current cognitive scientific assumptions about perceptual systems will be a theory that proceeds in terms of representations and computational processes, not in terms of reasons or raw feels.

What distinguishes perceptual from nonperceptual systems, I think, is this: perceptual systems take their inputs from the world and not from the larger organism. A perceptual system is a cognitive system that starts with the stimulation of sense organs by physical energy as input and processes information about the current environment, where none of the inputs to any of the

subsystems are under the direct voluntary control of the larger organism. Delineating perceptual systems thus, on the basis of their inputs, yields a characterization of perceptual systems that is neutral with respect to their phenomenological properties. Similarly, what distinguishes one kind of perceptual system from another, e.g., auditory from visual systems, is the kind of information they process rather than any phenomenal experiences they produce.

It is important that cognitive systems can be assembled out of simpler subsystems; in fact, this appears to be commonplace. Vision, for instance, seems to comprise a number of distinct systems, many of which sum together to form larger visual systems. Visual processing splits fairly early on into the famous "what" and "where" systems (Ungerleider and Mishkin 1982; Goodale and Milner 1992). These systems contain a number of subsystems, including a system for the detection and analysis of motion, systems for computing object boundaries from surface discontinuities, and the like. Color vision is handled separately by a different system. Yet these systems "come together again" to bind object color, location, and identity into a single comprehensive representation. Slightly different visual systems are known to exist in the different hemispheres, at least in the ventral pathways, with the left being thought to specialize in relatively abstract visual information and the right in relatively specific information; alternatively the left may be engaged in "entry level" categorization, while the right is engaged in subordinate level categorization (Marsolek 1999). (The entry level is the level at which subjects tend to spontaneously identify perceptually presented objects, e.g., 'apple' 'chair' [Jolicoeur, et al. 1984]. It is to be contrasted with subordinate levels, e.g., 'Granny Smith', 'Macintosh', and superordinate levels, e.g., 'fruit', 'furniture', 'object'.) Thus, face recognition is normally subserved by the right hemisphere, general visual object recognition by the left.

Accurate boxologies of these things are exceedingly complex, but a simplified and fictionalized depiction appears in Figure 1. Boxes are drawn to indicate some of the relevant systems. The upper box that takes retinal irradiation as input and returns objection identifications as outputs corresponds (roughly) to one theory (Biederman 1990) about the computational nature of the left

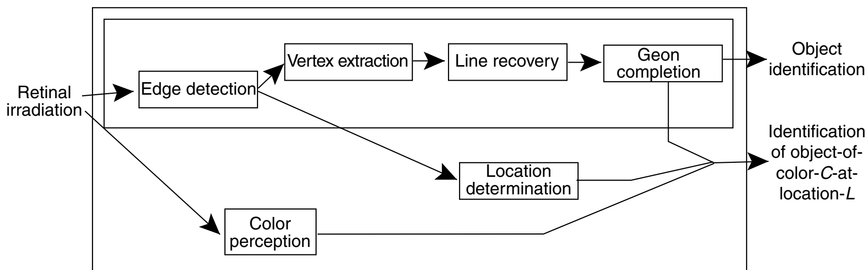

Figure 1

hemispheric ventral pathway; the location determination system corresponds to the dorsal pathway; and the color perception box corresponds to a system involving cortical area V4. The ventral system by itself computes object identities, but in conjunction with the dorsal system produces representations of object-location pairs. These two, in conjunction with color perception, yield object-color-location triples: e.g., 'there is a red ball in front of me and to the left.'

Thus, several perceptual systems are represented in Figure 1, including an edge detection system, a color perception system, an object identification system, etc. The picture that emerges is one in which several smaller systems working relatively independently of each other add up to form larger perceptual systems. These systems may very well interact, despite their being independent of each other—no one doubts that it is possible to go blind without going deaf, the ventriloquism effect notwithstanding. The perceptual systems start with the transduction of energy by the sense organs and feed their outputs into more central, nonperceptual systems: practical and theoretical reasoning systems, the various memory systems, and so forth.

Though the basic functional architecture of the perceptual systems may be innately specified, the actual operation of such systems is patently affected by learning. My face recognition system can't identify someone as my mother unless it knows what my mother looks like, and this is clearly not innate. Expertise often brings with it changes in the outputs of perceptual systems. Though I am following convention in calling it a "face recognition system", it is quite possible that the system in question is responsible for additional fine-grained judgements, not just those concerning faces. An expert bird watcher with prosopagnosia lost the ability to visually recognize bird species, and a farmer with the disorder could no longer tell which of his cows was which (Farah 1990). It is likely that such beliefs were also outputs of this perceptual system.

Perceptual systems frequently produce lower level outputs, among which are sensations and the various experiential states, but the highest level outputs are generally representations of objects as having certain properties and/or belonging to certain categories. I will call such high level outputs of perceptual systems "identifications". These identifications are, at least in the unmarked case, doxastic; i.e., these outputs are beliefs. Though the term 'belief' is used very rarely in these areas of cognitive science, this is the most straightforward way of reading the talk in the literature about object recognition and the like: to recognize an object, to categorize it, to identify it, is at least typically to *judge* it to be a member of a certain category.

Of course, we don't always accept the outputs of our perceptual systems; we don't always believe what they tell us. My visual system is classifying this stimulus as a chicken, even though I know it's a rubber toy. Does this mean that the high level outputs of the perceptual systems were not beliefs after all? No. A belief, on a standard view, is a mental representation with a certain

functional role. An identification with a certain familiar causal role counts as a belief; one that lacks that causal role is not a belief. The property of being a belief is not an essential property of a mental state but one that the state can gain or lose over time. Thus, when the output of the visual system is accepted or otherwise allowed to play the cognitive role definitive of belief, that output representation *is* the belief that there's a chicken in front of me; otherwise, it merely *looks*—in the perceptual output sense—as if there is a chicken in front of me.

It is imperative that the account just sketched makes no appeal to phenomenology or experiential states of any sort. A creature could have perceptual systems in the present sense without there being anything it is like to be that creature, without the creature having anything that would count as *experiences* at all. Still, as I have defined the perceptual output sense of 'look', things might nevertheless *look* a certain way to that creature. Though experiential states are commonly among the outputs of normal perceptual systems, this is not a defining feature of perceptual systems, nor is this sort of output the sort relevant to the perceptual output sense of 'look', 'sound', and the rest.

How Things Can Look Different, Even Though They Look the Same

Having explained the nonexperiential, perceptual output sense of 'look', I now must try to show that this is not a mere stipulation, but a real and natural sense of the term. Learning frequently results in a change in how things look in the perceptual output sense, without necessarily changing how they look in any experiential sense. Perceptual learning does sometimes affect what nondoxastic experiential states one has: what used to sound (in some experiential sense or other of the term) like an uninterrupted stream of phonemes now sounds (in this same sense) like a sequence of words, with pauses in between them that weren't heard before. What is important, however, is that learning does not always affect the experiential state. Thus, two agents (or two different time-slices of the same agent) can have identical experiential states but different perceptual outputs. Consider a few representative examples:

(a) You and I have identical visual experiences, but the face looks like Joe to you and just looks like a face to me.
(b) Walking through a field, you and I come across a copperhead. I'm a professional herpetologist, and it looks like a copperhead to me, though only like a snake to you (it also, of course, looks like a snake to me). Nonetheless, you and I have identical visual experiences.
(c) I can now hear the difference between a melodic minor scale and a diminished scale; they sound quite different to me. Several years ago, they sounded the same as each other to me (i.e., I couldn't tell the

difference), though neither sounds any different now than it ever did (i.e., the experiential state itself seems to be the same).

(d) *X* is an expert chicken sexer. Some chicks look male to *X* and some look female, even though the experiential states do not differ in any articulable way; nor do they differ from those of a novice.

(c) and (d) are paradigm cases of what a psychologist would count as perceptual learning; (a) involves learning, but it differs from the more interesting kinds of perceptual learning in that it doesn't require repeated exposure and subsequent enhancement of discriminatory abilities. (b) is a sort of intermediate case, though I suspect it's closer to (c) and (d) than to (a).

In each case the experiential states are the same, despite the fact that things *look* different. Consequently, there must be a nonexperiential sense of 'look'. This, I suggest, is the perceptual output sense. The claim that it *looks* like Joe to you but not me in (a) amounts to the claim that your face recognition system produces an 'it's Joe' output, while mine does not. Its looking like a copperhead to me but a snake to you in (b) is a matter of my visual system delivering the belief that there's a copperhead in our path, while yours delivers the belief that there's a snake in the path. To say that minor and diminished scales sound different to me, though they used to sound the same (c), is to say that my auditory system now yields identifications of diminished scales and of minor scales, where it used to output identifications of "dark-sounding" scales. And if the chicken sexer and the novice have identical experiential states, yet a particular chick looks male to the expert and not to the novice (d), then the best explanation for this is that the expert's visual system classifies distal stimuli as male or female, while the novice's does not.

Note that the sense of 'look' that is being evoked here is not a purely doxastic or purely epistemic sense. Nor is it in any way metaphorical. The examples crucially involve a particular sense modality. Even the experiential-doxastic and experiential-epistemic senses of 'look' are less strictly concerned with vision than the current examples. My current visual experience might dispose me to (justifiably) believe that I'm confronted with Bruce's favorite venomous reptile, but clearly it is only in a relatively extended and metaphorical sense that anything could *look* to me like Bruce's favorite venomous reptile. Even if the snake in (b) looks in an experiential-epistemic or experiential-doxastic sense like a copperhead, it also looks like a copperhead in some important, more restrictive sense of 'looks'. This is the perceptual output sense.

My argument requires only that cases (a)–(d) are possible, but I think a stronger claim can be supported. I think that cases like this are not only possible, but actual, and in fact quite common. Some of the cases might require a more careful formulation before this is at all obvious. In the face recognition case, for instance, it is clear enough that faces don't look—experientially—any different on becoming familiar ones, but it is tempting to think that whatever learning occurs does so outside of the perceptual system. If the belief glossed as

'it's Joe' is the belief that the person here *is named* "Joe", then of course this is not the output of a perceptual system, and the learning involved does indeed take place outside the perceptual system. However, to count as a face recognition system, the system must in some sense attribute identities to faces. To visually recognize or identify someone is not necessarily to be able to specify the person's name (or occupation or connection to oneself, etc.), which presumably takes place outside the face recognition system, but rather to activate some minimal representation of the individual. This must occur within the face recognition system in order for it to count as a face recognition system.

What, though, is my evidence for thinking that the experiences are the same in the sorts of examples under discussion? In the chicken sexing case, it is mostly conjecture, based on the fact that chicken sexers are unable to specify what cues they are using. They will certainly claim that males "look different" from females, but it would be question-begging to infer from this alone that males cause different experiential states than females. In the other cases, I have introspection to go on, in diachronic, within-agent versions of the relevant sorts of cases. Introspection is a dubious source of information about the workings of the mind, but here the issue is how things seem, and it is unlikely that we will get more reliable information from some other source. And cases (a)–(c) above represent the way it seems to me that things seem to me. The people I met yesterday don't look (experientially) different than they did yesterday when I saw them for the first time, though now I recognize them and then I didn't. Copperheads don't look any different to me now than they used to, but now they look copperheady, and before they just looked snaky. Likewise with the musical/auditory case, and it seems that similar phenomena occur in other modalities as well. Developing a more discriminating palate does not, as far as I can introspect, alter the gustatory qualia in the way that, say, quitting smoking does; it alters one's psychological responses—including one's classificatory and discriminatory responses—to the relevant stimuli.

One might insist that the experiential aspects do change in the kinds of cases at issue. Even if this is true, it is clear that they change very little, not enough to fully account for the drastic change in classificatory capacity. These sorts of cases are, after all, quite different from the case of learning a new language. Even if copperheads somehow produce in me a different experiential state than they used to, this experiential difference is too slight to amount to much; the difference that really matters and that perceptual learning produces is the higher level change in identification capacities. If distal stimuli were suddenly to begin causing in me the same kinds of experiential states they do in an ornithologist, I doubt I would notice the difference. But even if I did, without an accompanying change in identifications (i.e., a change in the doxastic/classificatory outputs of my perceptual systems), there would be no epistemologically significant sense in which some object suddenly now *looks* like a two-year-old ivory billed woodpecker.

Again, it is worth repeating that all that's really needed here is that the cases as described are possible. And they clearly are. In fact, far more extreme possibilities obtain. Consider a proprietary sense of 'zombie' according to which zombies not only lack qualia, but lack experiential states altogether; they are otherwise just like us. Suppose two such zombies are walking through a field. A snake in the grass reflects photons into the eyes of both zombies, activating their perceptual systems, all of which produces in one of them the cognitively spontaneous belief that there's a snake, and in the other (a professional herpetologist zombie) the cognitively spontaneous belief that there's a copperhead. The latter zombie would be inclined, despite the fact that she has no experiential states, to say that it looked copperheady to her. And, I submit, she would be right.

A slight air of paradox is bound to attend the claim that things look certain ways to zombies, or that there are nonexperiential senses of 'sound', 'taste' and the like. This air is dispelled, however, by the essential role of perceptual systems. To say that x looks red to me—in this sense of 'looks'—is to say that the belief that x is red (or something very much like a belief) is the output of one of my perceptual systems, in particular, one of my visual systems. There is nothing metaphorical about this use of 'look'. Even subtracting out the experiential component, there is a vast difference between 'that looks like Joe' and 'it looks like someone has broken into your house and stolen your VCR'. When I say that something sounds like a diminished scale, I don't (typically) mean merely that I think it's a diminished scale or that I have some reason to think it is a diminished scale, and I am not (or not merely) reporting the contents of my experience. I am describing a belief, but a certain kind of belief, one that has a very tight connection with perception, in particular, audition. That connection is that the belief is the output of an auditory system.

Thus, I think that the perceptual output sense of 'looks' captures a real and natural usage of the 'looks' locution. Because the understanding of cognitive systems appealed to here is more elaborate than our folk concepts of faculties and the like, the perceptual output sense of 'looks' developed here will be more detailed and precise than the version employed by the folk. Nonetheless, the intuitive appeal of the examples illustrates that there really is some already existing folk notion that is being explicated.

Nonexperiential Looks and the Justification of Perceptual Beliefs

I promised to argue that this perceptual output sense of 'looks' is epistemically significant. The fact that it looks like Joe to you and not to me has a lot to do with why you are justified in believing it's Joe and I'm not. The snake's looking copperheady to me is a large part of what justifies me in believing that it's a copperhead. But the only obvious sense in which something looks like Joe to you or like a copperhead to me is the perceptual output sense.

Compare this with the main epistemological alternative. "Experientialism" is the view that nondoxastic experiential states can serve as evidence to justify beliefs. Such states are intended to provide a solution to the famous regress problem by serving to confer justification without being themselves in need of it. On this view, my being appeared to redly—that is, the nondoxastic state of being appeared to redly—justifies my belief that I'm appeared to redly and, on certain versions of experientialism, also justifies my belief that there's something red nearby. These latter versions of experientialism, sometimes classified as direct realist theories, allow perceptual beliefs about external objects to be epistemologically basic, while more traditional versions (e.g., Descartes 1984; Chisholm 1966) do not.[10]

"Cognitive essentialism" (Pollock 1986) is the view that evidential relations hold necessarily; this conjoined with experientialism entails that which experiential states justify which beliefs is a necessary matter. A cognitive essentialist who also embraces experientialism and direct realism will hold that there are true epistemic principles of the following form (Pollock 1986; Huemer 2001):

> *S*'s being appeared to ϕ-ly is sufficient for *S*'s being prima facie justified in believing that there is something ϕ nearby.

Other experientialists deny cognitive essentialism and hold that something else is needed to make being appeared to ϕ-ly a prima facie reason to believe that there is something ϕ nearby. Alston (1988) requires that the experiential state be a reliable indicator of the truth of the belief; Steup (2000) requires that the agent have evidence for thinking that the experiential state be a reliable indicator of the truth of the belief; Markie (2004) requires that the agent be following her own (contingent) epistemic norms in believing that there is something ϕ nearby on the basis of her being appeared to ϕ-ly. What these views all have in common is that each claims that (a) how things look determines at least in part whether a perceptual belief is prima facie justified, and (b) how things look, in this sense, is a matter of what nondoxastic experiential state the agent is in.

It is plausible to hold that the beliefs we have been discussing are basic beliefs; that is, those beliefs about copperheads and Joe and the like do not depend on evidential relations to other beliefs for their prima facie justification. If this is right, then the experientialist must endorse direct realism, and the current examples show that the cognitive essentialist versions of such a view are false. For the examples show that you and I might have the same sensory experience, even though what perceptual beliefs are justified for us differs. So the experientialist must abandon either cognitive essentialism or direct realism.

Nonessentialists claim that there is some factor in addition to the experiential state, which determines which beliefs that state justifies. But if this is true, then the connection between how things look and what we are justified in believing is considerably weakened. It is now this additional factor—reliability,

evidence of reliability, or what have you—that is doing nearly all the work. The experiences themselves no longer need to have any intrinsic connection to the belief; all that is required is that the experiences be in some sense discriminable; the real epistemic work is being done by the additional factor.

An alternative is to reject direct realism, insisting that the basic beliefs are restricted to beliefs about our experiential states and that perceptual beliefs are justified on the basis of these, rather than directly on the basis of the experiential states themselves. It is obvious, however, that such a move results in an even further attenuated connection between how things look and which of our perceptual beliefs (these being beliefs about external objects) are justified.

If there is a reasonably close connection between how things look and what we are perceptually justified in believing, then the connection is between belief and perceptual output looks, not between belief and experiential looks. You are justified in believing that Joe's here because the face looks—in the perceptual output sense—like Joe to you; I am justified in believing that a diminished scale is being played because it sounds—in the perceptual output sense—like a diminished scale to me. If it hadn't (perceptual-output-)sounded that way, I wouldn't be justified in believing it was a diminished scale. Thus, while there is no necessary or even very close connection between nondoxastic experiential states and prima facie justified perceptual beliefs, there may yet be a tight, and perhaps even necessary, connection between perceptual system outputs and prima facie justified perceptual beliefs. Not only is the perceptual output sense of 'look' and its ilk an epistemically significant sense, it is more epistemically relevant, or at least more directly epistemically relevant, than any experiential sense.

Perceptual output looks, however, are epistemically significant in a very different way than experiential looks are standardly held to be. On the experientialist view, the way things look serves as a nondoxastic body of evidence for the perceptual belief. On the perceptual output view, however, how things look is not to be construed as something distinct from and causally antecedent to the perceptual belief; it is not a ground on which the belief is based. To say that the look justifies the belief is merely to say that the belief's being the output of a perceptual system is (a part of) what justifies the belief. Experiential looks are supposed to justify beliefs by serving as grounds, or evidence, for them. By contrast, the perceptual etiology of the belief contributes to that belief's justification by virtue of the fact that beliefs with such an etiology are prima facie justified. Perceptual output looks thereby justify beliefs by figuring into that on which the beliefs's justification supervenes, not by serving as evidence.

The first major epistemological role ascribed to how things look is captured by what we might call the "Looks Principle": our perceptual beliefs are epistemically justified, at least in part, because of how things look, sound, taste, smell, or feel to us. The intuitive appeal of this principle can lend a specious plausibility to experientialism. It is natural to take the Looks Principle as claiming that perceptual beliefs receive their justification from the corresponding experiential

states. This latter claim might be true, but it does not follow from the Looks Principle, for the Looks Principle, as stated, fails to distinguish between experiential looks and perceptual output looks. Thus we cannot infer experientialism from the Looks Principle. The existence of nonexperiential looks undercuts this important motivation for experientialism.

Perception, Inference, and How Things Look

There is a second major epistemological role attributed to how things look; this is to help delineate between perception and inference. Perception is connected to how things look in a way that inferential belief is not. Looking around the room, I form a number of beliefs: my coffee cup is to the left of a pile of CDs; the light on the printer is on, and it is green; the dog is asleep, and the carpet needs to be vacuumed. I look at the clock, and find myself with the following beliefs: that there's a white round thing near me with black markings and two narrow black rectangular bars forming an acute angle; that there's a clock in front of me; that it's currently 10:55 (pm). I hear a familiar sound and form the belief that my telephone is ringing. I answer it and form a number of beliefs: Jane is talking to me; my sister is talking to me; the youngest of my three sisters wants to know what my summer plans are. Which of these beliefs are perceptual beliefs and which are inferential?

The perception/inference distinction is typically framed in terms of such factive states as seeing *F* or seeing that *p*, but I want to focus on the nonfactive state of having the perceptual belief that *p*. One can have the false perceptual belief that there's a cat in the room, though one cannot falsely *see* that there's a cat in the room. Taking the target to be perceptual belief rather than perception allows us to focus on the perceptuality rather than the factivity.

A natural and straightforward account of perceptual belief is this: my belief that *p* is a perceptual belief if and only if I believe that *p* because things look (sound, smell, etc.) as if *p*. My belief that it's cold in here counts as a perceptual belief if I hold it because it feels cold, but not if I hold it because someone I trust tells me it's cold. My belief that it's Jane on the phone is intuitively a perceptual belief, because it sounds like Jane; my belief that the youngest of my three sisters is on the phone is intuitively not a perceptual belief, because there is no obvious literal sense in which it *sounds* like the youngest of my three sisters on the phone.

This natural suggestion can be cashed out in at least two different ways. The experientialist version is this:

> My belief that *p* is a perceptual belief iff my belief that *p* is based on a perceptual experiential state with the content that *p*.[11]

The restriction to perceptual experience is essential, as many epistemologists believe in nonperceptual experiences, such as mnemonic experiences (Pollock

1986; Audi 1998) or even purely intellectual experiences (Plantinga 1993; Pust 2000), and surely being based on nonperceptual experiences is not sufficient for being a perceptual belief. How easy or difficult it will be to draw the distinction between perceptual and nonperceptual experiences is unclear. Rather than worry about this, however, I want to explore an alternative approach, one that invokes an already specified conception of perceptual output looks:

> My belief that *p* is a perceptual belief iff my belief that *p* is the output of one of my perceptual systems.

This latter approach gives us a "Perceptual System Theory" of perceptual belief.

Which beliefs do we intuitively want to count as perceptual beliefs? The class of perceptual beliefs cannot be specified merely by the contents of those beliefs. My belief that it's raining may result from my looking out the window, or it may result from my listening to the weather report on the radio. In the former case it's presumably a perceptual belief; in the latter case it is not. Still, our perceptual beliefs are beliefs about chairs, desks, apples, and other entry level categories, as well as their locations, colors, sizes, motions, etc., but also more subordinate level categories, like face identifications, individual objects, and the like. 'There is something red in front of me', 'the book is on the desk', and 'Susan is wearing a blue shirt' will be among the sorts of propositions that are sometimes perceptually believed by normal people. Propositions like 'the Edsel was only produced for three model years' or 'it's going to snow a lot next winter' are never perceptually believed, at least not by normal humans. These are largely contingent facts about us; creatures with different sense organs have perceptual access to information that for us is only available inferentially.

The Perceptual System Theory (PST) nicely captures these facts, while doing justice to the intuition that which beliefs are perceptual beliefs is determined by how things look. Beliefs about entry level categories and their properties, though not about the production history of Edsels, are sometimes the outputs of perceptual systems. When they are, they are intuitively perceptual beliefs; when they are not, they are intuitively not perceptual beliefs.

This, however, does little to differentiate PST from its experientialist rival. Where PST distinguishes itself is in cases like those described in the previous section. Intuitively, where the face looks like Joe to you but just like a face to me, even though we have the same experiential states, your belief that it's Joe is a perceptual belief. Though I might happen to believe that it's Joe, this belief is not a perceptual belief for me. The novice chicken sexer has the same experiential state as the expert. Both believe they are looking at a male, and they base this belief on their experiential state. But this belief is a perceptual belief for the expert; the novice, by contrast, is simply guessing.

What propositions I am capable of perceptually believing depends on the nature of my perceptual systems, but it does not seem to depend on the nature of

my perceptual experiences. A decent mechanic can just *see* (a fortiori, perceptually believe) that a nut is a 17 mm nut; I have to either guess or figure it out by trying various wrenches. This difference between us is not obviously a difference in experiential state. The mechanic's perceptual systems produce finer-grained outputs in this domain than mine do, but this need not be reflected by any experiential difference. Similarly, the professional herpetologist's belief that there's a copperhead is a perceptual belief, and perhaps the ornithologist's belief that there's a two-year-old ivory billed woodpecker is a perceptual belief. Finally, it seems to me to be intuitively plausible to hold that zombies in our proprietary sense can have perceptual beliefs—they aren't necessarily *blind*, after all.

One interesting feature of PST, and I take this to be a virtue of the theory, is that it allows us to turn to the cognitive sciences to resolve certain difficult questions about whether a given belief is a perceptual belief or not. Consider another example. While looking at Jane I form the belief that Jane is in front of me, and intuitively, this is a perceptual belief. However, I also form the belief that a sibling of mine is in front of me. Is this belief also a perceptual belief? My personal guess is that the sibling belief is not the output of any perceptual system but is instead in the same camp with the belief that the person in front of me is named 'Jane'. If so, the belief will count as inferential rather than perceptual. On the other hand, my belief that there's a conspecific in front of me might be the output of a perceptual system and thus count as a perceptual belief. The idea, roughly, is that while *conspecific* might be a perceptual kind, *sibling* most likely isn't. Things *look* like conspecifics (in the perceptual output sense), but they don't *look* like siblings to me. Rather, they look like Pat, Ann, Jane, or Mike, whom I know to be my siblings, thus allowing me to infer that one of my sibs is nearby. I don't need to identify someone first, however, to be justified in believing he or she is a conspecific.[12]

Now I don't mean to suggest that *sibling* couldn't be a perceptual kind. For all I know some species recognize siblings by scent, for instance: some mice might, as it were, "smell like a brother" to other mice. Even the claim that things don't look like sibs to me is intended merely as a fact about *my* siblings; yours may be different, and some visual systems may have access to that fact.

In saying all this, I am expressing my hunch about how the science is going to turn out, about how the perceptual systems actually work. My guess is that our perceptual systems classify things as humans, and even as particular individuals, though not as siblings. This guess is based in part on the fact that there is a set of visually accessible features that reliably, even if imperfectly, distinguishes humans from other things and a set of visually accessible properties that the different views of an individual person have in common, which pretty reliably distinguishes that individual from others, but there is not a set of visually accessible features that reliably distinguishes siblings from other things. In any case, this hunch of mine is something that scientific research can in principle confirm or refute. In such an event, we should modify our inventory or perceptual beliefs accordingly.

Which of an agent's beliefs could be perceptual beliefs depends not merely on the agent's innate perceptual capacities but on its learning history. Perceptual learning is surely bounded and constrained, but in a way that is impossible to fully delimit *a priori*. Churchland famously discusses a group of hypothetical perceivers, who are trained to see by a group of future scientists. "They do not observe the western sky redden as the Sun sets. They observe the wavelength distribution of incoming solar radiation shift towards the longer wavelengths (about 0.7×10^{-6} m) as the shorter are increasingly scattered away from the lengthening atmospheric path they must take as terrestrial rotation turns us slowly away from their source" (1979, 29). Though it is an empirical issue, I am doubtful of the nomological possibility of such a scenario. It is important, however, to see exactly where the doubt lies.

One crucial difference between Churchland and me is that his scenario is laid out in terms of children being taught certain speech dispositions until these dispositions become spontaneous. However, even if it is possible for children to be trained in the way Churchland describes, this would not indicate a *perceptual* change. On my view, the effect would not count as genuinely perceptual unless it occurred at the level of the perceptual system and not merely at the level of spontaneous verbal reports. The latter would be a different kind of learning from perceptual learning, and I don't think we should classify its effects as altering the way they *see*; it wouldn't change their perceptual beliefs but merely the way they spontaneously reported these beliefs.

I am quite willing to grant—indeed, insist—that learning changes how/what we see, in the sense that it changes what perceptual beliefs we have and are capable of. Nonetheless, I want to reserve such a description for a particular kind of change, and not just any old change that comes as a result of expertise and not just any change in those beliefs that are caused by the stimulations of sense organs. It is an empirical question which changes are perceptual and which are not, and my guess is that in the end we will want to distinguish cases like the physicist "seeing" a proton in a cloud chamber from cases like the histologist seeing an abnormal cell growth. As the scare quotes indicate, I am predicting that it is not the output of the physicist's *visual* system that has changed, but some inferential capacity outside the visual system. In the histologist's case, however, it is likely that the changes really are changes to the outputs of the visual system; if so, the change is genuinely a perceptual change.

In any case, PST will allow us to adjudicate such issues. What perceptual systems a creature has and what they produce as outputs are questions that can in principle be empirically answered. Thus PST offers hope of a principled solution to such perennial problems as whether the physicist sees or merely infers a proton in a cloud chamber.

PST offers such a natural response to the problem of distinguishing perception from inference that it might seem trivial in one of two ways. First, it may seem circular to claim that perceptual beliefs are those beliefs that are produced by perceptual systems. But I have argued that perceptual systems can be

understood in nonepistemic terms, and more generally, can be understood independently of understanding what perceptual beliefs are. So there is no circularity here. Second, PST might sound trivial in the sense of being too obvious to bother defending. For some reason, however, PST is not obvious to everyone. In fact, it seems to be a minority view; to my knowledge I am the only one who holds it.[13] Though many epistemologists are regrettably silent on what they take perceptual beliefs to be, the received view seems to be a kind of experientialism; experiences certainly play a major role in classic treatments of perceiving (e.g., Chisholm 1957; Jackson 1977). So PST calls for extended defense.

Conclusion

How things look was supposed to be relevant to the epistemology of perception in two important ways: first, looks were supposed to figure into the justification of our perceptual beliefs; second, looks were supposed to figure into the delineation of our perceptual beliefs by separating perceptual from inferential beliefs. I have tried to explicate a nonexperiential sense of 'looks' and the like, namely, the perceptual output sense. I have argued that perceptual output looks are at least as epistemologically significant as experiential looks. How things look in the perceptual output sense is a better predictor of what one is justified in believing than is how things look in some experiential sense. And how things look in this perceptual output sense provides a better demarcation principle for distinguishing perception and inference than does how things look in an experiential sense.

It is intuitively plausible that looks are epistemologically significant, but experientialist theories of the justification of perceptual beliefs, or of the delineation of perceptual beliefs, are not the only way to capture this central fact. The existence of nonexperiential looks undermines any quick inference from this obvious fact about the epistemic significance of looks to any controversial thesis about the epistemological role of nondoxastic experiential states.[14]

Notes

1. For expository convenience I formulate issues in terms of how things look. Standard disclaimers apply. The present formulation only fits comfortably with nonhallucinatory cases, where there really is something that looks some way; however, nothing of any significance will ride on this. Also, I follow common practice by focusing mainly on vision, though what I will say about vision will apply to the other sense modalities as well.
2. '*x*' occurs in this discussion transparently and is not taken to have ontological import; see note 1. Nor do I mean to be making any substantive commitments to

the metaphysics of perception; I use the ‘looks’ rather than the ‘appeared-to’ idiom simply because it is less obtrusive in the present context.

3. This is not, of course, intended to be an exhaustive classification of ‘looks’ locutions.
4. Of course, these metaphorical senses are generally compatible with the literal senses. If I say, in the purely doxastic sense, that the tower looks round from here, this doesn’t rule out the tower’s looking round to me in one or more of the experiential senses.
5. Fodor (1983) has either five (pp. 36–7) or nine (pp. 47–101) diagnostic criteria for modularity, depending on how (and where) you count. Many of these are quite controversial. Fodor explicitly denies that he is defining the term ‘module’, and it is best to read him not as offering an account of what modules are but as propounding a high-level empirical theory: that cognitive capacities exhibiting some of these five or nine properties tend to have most or all of the rest of them.
6. Such an inference requires a number of assumptions, including one of premorbid uniformity of cognitive architecture and localization across subjects. This has been much discussed elsewhere, and I have nothing to add to that discussion here.
7. That is, a cognitive mechanism computes a function which has representational states as its range or domain (or both).
8. To claim that a system is domain specific is not merely to claim that the system specializes in some task or other but that this task is sufficiently narrow or constrained.
9. A part of a task is to be construed as a subset of the ordered input-output pairs that constitute the task. This is not the same as a subtask, which is a task computed on the way toward computing the overarching task. Vertex extraction is presumably a subtask of visual object recognition, while visually recognizing puppies is a part of visual object recognition. Again, a more detailed treatment is in my (2001).
10. By ‘direct realism’ here I mean an epistemological view. The relation between such a view and a direct realist theory of the metaphysics of perception is far from clear. Allowing beliefs about external objects to be epistemologically basic does not obviously commit one to any particular view about sense data and the like.
11. Experientialists who hold that experiential states have neither conceptual nor propositional content will have to develop a more elaborate account than the natural one suggested here, since beliefs have both conceptual and propositional content. Claiming that experiential states have nonconceptual content, of course, does not preclude their having conceptual content as well.
12. Translating the outputs of perceptual systems into English is a difficult matter, as is the case with translating any beliefs into English, though the difficulty may be more a matter of getting the pragmatics right than of getting the semantics right. Perhaps it would be better to say that the visual system classifies distal stimuli as humans, or better yet people, rather than conspecifics. One need not have a concept answering exactly to *conspecific* in order to engage in the relevant classification. Nothing hinges on my describing the output as conspecific detection; I do so only because this is how the cognitive scientists are prone to talk,

ethologists especially, even though nonhumans presumably lack the concept *conspecific*. Nonetheless, it should be perfectly clear what is meant by saying that the pigeon or its visual system classifies some distal object as a conspecific but not as a sib.

13. Fodor *seems* to be presupposing something like PST in a well-known exchange with Churchland concerning observation (Fodor 1984, 1988). However, this is not a thesis he argues for, nor does he develop observation as an especially epistemological notion in the way that perceptual belief is here. Furthermore, on closer examination, it is not obvious that it really is PST that Fodor is presupposing. He does think that what one observes is determined by one's perceptual modules. But this is like saying that how things look is determined by one's perceptual modules. Because of the ambiguity central to the present paper, such a claim is quite compatible with experientialism. In fact, Fodor seems to hold that the outputs of the perceptual modules are ipso fact nondoxastic, and this view is actually incompatible with PST; it is likely experientialism, rather than PST that Fodor is presupposing, after all. I do follow Fodor in thinking that the modules are important, but I differ with him concerning *how* they are important.
14. Versions of this paper were presented at the Midsouth Philosophy Conference and to the philosophy department at the University of Arkansas. Thanks to those audiences for helpful comments.

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