

**CIRCULARITY, RELIABILITY, AND THE COGNITIVE
PENETRABILITY OF PERCEPTION**

Jack Lyons
University of Arkansas

Several years ago, Jerry Fodor (1984) argued that the modularity of the perceptual systems was good news for epistemology. In particular, on the assumption that perceptual systems are modular in his (1983) sense of the term, they are informationally encapsulated, which means that their operation is not sensitive to the beliefs, desires, and such of the larger organism. This would allay worries about the theory-ladenness of observation; if perception is modular, what we see is not affected by what we want to see or expect to see or have been trained to see. What one observes is determined by the outputs of the perceptual modules, and modules are cognitively impenetrable (i.e., informationally encapsulated), so if different theoretical camps disagree about what they've observed, the blame lies elsewhere than observation.

Recent years have seen a resurgence of interest in the cognitive penetrability of perception (Raftopoulos 2001, Pylyshyn 2003, Macpherson forthcoming, Stokes forthcoming). The epistemological implications of cognitive penetrability in particular have received special attention in a recent book by Athanassios Raftopoulos and paper by Susanna Siegel (Raftopoulos 2009, Siegel forthcoming).

Raftopoulos (2009) starts with a set of concerns very similar to Fodor's, and the view he develops is a modified and nuanced version of Fodor's own. Raftopoulos argues that even though much of what Fodor calls observation is cognitively penetrated, nevertheless an early stage of perception is encapsulated and therefore immune to the skeptical and relativistic worries that exercise Fodor. Siegel (forthcoming) argues that if perception is not encapsulated, this causes difficulties for a commonly held epistemological view I'll call "Seemings Internalism" (SI), which holds that one's belief that x is F is prima facie justified any time it is based on one's having a perceptual experience that x is F .¹ She doesn't think that all cognitive penetration of

perception is epistemologically vicious, but she thinks that some is, and this is enough to cause trouble for SI. She seems inclined to think that perception is cognitively penetrable, but rather than trying to make that argument, she explores the epistemological consequences (primarily for SI) of the assumption that it is.

Siegel's thesis is thus a conditional one (if perception is penetrable, then SI is in trouble), and it is a lot less interesting if the antecedent is not true. At first glance it would seem that an empirical defense of cognitive encapsulation would threaten to trivialize Siegel's position,² but in fact it does not. Even if Raftopoulos, e.g., is right about encapsulation,² it is obvious that perceptual *belief* is subject to top-down influences and is therefore cognitively penetrable; therefore, the issue of cognitive penetrability of perception (or perceptual belief) is one that we need to take very seriously. We need to know whether all cognitive penetration is epistemically pernicious or whether some kinds are acceptable, and if there is some of each, we will need to know what kinds of cognitive penetration are licit and what kinds are illicit. To do this, we'll need a better understanding of what's epistemically wrong with top-down influence or cognitive penetration in the first place.³ The standard story is that the problem is one of circularity. I argue that this is not true; rather, the problem is that some forms of cognitive penetration diminish the reliability of perception; the forms of cognitive penetration that do not reduce reliability are epistemically benign. Corresponding claims hold regarding the loci at which penetration occurs.

The cognitive scientific literature contains some detailed articulations of exactly what cognitive penetration is, often developed in an effort to block certain putative counterexamples from refuting one's defense of encapsulation. Without in any way impugning the importance of this work for cognitive scientific purposes, I will sidestep all these controversies and employ a very liberal understanding of cognitive penetration as simply the influence upon perception (in a sense to be clarified shortly) of the "cognitive" states (beliefs, desires, goals, etc.) of the organism. Because my purposes are epistemological—I want to ask which forms of cognitive penetration are pernicious—I will try to avoid prejudging important issues by starting with a very broad and inclusive understanding of cognitive penetration, later introducing refinements and distinctions as appropriate.

1. Perceptual Belief and Top-down Influence

I claim that perceptual belief is cognitively penetrable. What do I mean? Raftopoulos (2009, Raftopoulos & Müller 2006), like Pylyshyn (2003), holds that the result of early vision is a viewer-centered representation akin to Marr's $2\frac{1}{2}$ -D sketch: it contains information about "spatiotemporal [properties], spatial relations, surface shading, orientation, color, binocular stereopsis, size, shape and movement" (Raftopoulos & Müller, 210).⁴ Early

vision is informationally encapsulated, but its content is limited to properties like those just listed. Perceptual identification, e.g., ‘this is a dog’, is the result of a later, theoretically infected process (which Raftopoulos 2001, 2009 calls “observation”). Perceptual identification involves top-down penetration in that, among other things, one has to have learned what dogs and bananas look like.

Perceptual beliefs include beliefs like ‘there’s a dog in front of me’, ‘there’s a stapler on the table’, ‘it’s raining’, ‘Martha’s here’, and such. These, anyway, are the sorts of beliefs I will take to be perceptual beliefs; I’m avoiding contentious examples like ‘there’s an 84-year-old table’ (Feldman 2003), ‘there’s something edible on the table’ (Nanay 2010), or ‘I caused that to happen’ (Siegel 2005). When I say that these are perceptual *beliefs*, I don’t mean to make any assumptions about the contents of perceptual *experience*; a conservative theory about the contents of perceptual experience (e.g., that experience only represents low-level shape and color properties, etc.) is consistent with the claim that we have perceptual beliefs about dogs and tables, as such, provided that perceptual belief is understood in some other way than in terms of a very directly corresponding perceptual experience.⁵ In any case, the contents of these beliefs are far removed from the contents of the end product of early vision, which, as Pylyshyn says, “extends to the construction of the sort of percept that we might have of a totally unfamiliar scene . . . where nothing is recognized as familiar” (2003, 123).

This view about the informational encapsulation of early vision is controversial, but my point is that *even if it’s right*, the epistemological problem remains. Raftopoulos goes to great lengths to show that perception is safe from the epistemological threat of cognitive penetrability, but if there’s something inherently epistemically evil about top-down influence, then most of our ordinary perceptual beliefs are in jeopardy, even if early vision is encapsulated. The cognitive penetrability of perception, broadly construed, makes Siegel’s conditional claim (*if* perception is unencapsulated, SI is in trouble) even more relevant, for even the staunchest defenders of encapsulation concede that most of what SI would count as perception is unencapsulated. For SI to work for beliefs like ‘the phone is ringing’, there would have to be a nondoxastic perceptual experience with the content that the phone is ringing. Supposing that there is such an experience, even Pylyshyn doesn’t think *that* is encapsulated.

For these reasons, it is important to determine which kinds of cognitive penetration are epistemically problematic and which are not.

2. What’s Wrong with Cognitive Penetrability?

What, exactly, is the epistemological problem with cognitive penetrability, and what kinds of penetration are thus epistemologically problematic? Suppose for the moment that perception is highly cognitively penetrable.

More specifically, suppose that what we see, or think we see, is highly sensitive to our training, our expectations, even our desires. Suppose, however, that this penetrability, though prevalent, is not so pervasive as to be obvious—we don't just see whatever we expect or desire, regardless of the actual distal stimuli—nevertheless, the effect is real. Thus, I'm more likely to see something as an apple if I had a prior expectation that I'd see an apple here; I'll overestimate its size depending on how hungry I am; I'll judge its color to be a shade closer to what I've experienced as typical than this one actually is; etc. There seems to be something vaguely troublesome about such possibilities, but where exactly should the epistemologist locate the problem?

I want to be clear from the outset that the issue here concerns the epistemological implications of cognitive penetrability, not of believed cognitive penetrability, or evidence for cognitive penetrability, etc. Obviously if you have reasons to think your perception is highly susceptible to certain kinds of top-down influence, your beliefs should be modified accordingly, and if they aren't, you are doing something epistemically wrong. But the question here concerns the epistemological consequences of cognitive penetrability actually being true, whether or not the epistemic agent is aware of it. In fact, it is best to focus on cases where the agent is unaware of any top-down influence on her perceptual beliefs. This enables us to draw conclusions about *prima facie* justification, starting with claims about *ultima facie* justification, having ruled out the presence of defeaters.⁶

Fodor and Raftopoulos tend to frame the epistemological issues in terms of the debate from the philosophy of science concerning the theory-ladenness of observation. If observation is affected to a substantial degree by theory, then scientific disputes are going to be intractable; you and I can't appeal to observation to settle our disagreements, because the disagreement will yield different perceptions of the same stimuli. There are two main worries here. One is that top-down influence will make consensus impossible if scientists start from different theoretical positions. Another is that theoretical beliefs will be self-corroborating, without any independent check on reality. But how do we translate such worries from the philosophy of science to epistemology (that is, epistemology of the 'S-knows-that-p' variety)?

The issue of consensus is a serious one, but it is unclear whether there would be anything *epistemically* bad about a failure of consensus. It is obvious that justification, knowledge, truth, rationality, and the like have little or nothing to do with what one is able to convince others to believe. Intractable disagreement would be unfortunate, but it's not immediately obvious how intractability by itself would threaten my knowledge, provided that my theory is correct, or my justification, whether my theory is correct or not.

Of course, the fact that equally intelligent, rational, well-trained perceivers see something different than I do *might* undermine my justification, were it known to me. But (a) this is itself controversial,⁷ and (b) it doesn't

speak to the current topic, which concerns the epistemic import of cognitive penetration, not known or believed penetration.

One influential solution to the Gettier problem, the defeasibility theory, holds roughly that any fact that would, if *S* were aware of it, undermine *S*'s justification for believing that *p*, will undermine *S*'s knowledge that *p* whether *S* is aware of that fact or not (Klein 1976). Cognitive penetration—believed or not—might threaten our perceptual knowledge in this way. However, as just mentioned, it is uncertain whether the existence of differently perceiving peers would undermine my justification even if I were aware of it. Furthermore, the proposal doesn't seem to go far enough, for cognitive penetrability seems to threaten the *justification* of perceptual beliefs; it is not merely a "Gettierizing" condition that undermines the knowledge status of a belief while leaving its justificatory status perfectly intact. For that reason, I'll focus on cognitive penetration as a threat to justification, not to knowledge.

The issue of self-corroboration is more directly connected to justification. In one guise, the worry goes like this: if you start out believing system *A*, then you'll receive observations that corroborate system *A*; if you start out believing system *B*, then you'll receive corroboration for *B*, etc. What gets confirmed depends on what system you start in, but there is no objective reason and hence no rational ground for preferring one starting system to another. The argument could be developed in a way that parallels the isolation argument against coherentist theories of knowledge and justification: the evolution of the belief system is determined entirely by factors internal to the belief system, without significant contact with an external reality. Two or more different systems might do equally well *vis-à-vis* coherence and the like, but unless there is something outside of both systems that could lend credence to one system over the other, there is no reason to prefer one to the other and thus no good reason to prefer one's own system or any of the elements of it, which only receive their support from the rest of the epistemically arbitrarily selected system.

This sort of skeptical argument, however, assumes a very specific kind of top-down influence, one that is far more prevalent and potent than is empirically plausible. Suppose, for example, that top-down influence is merely probabilistic in the sense that theory-consonant observations are more likely than they would otherwise be but that objective facts are still significant determinants of what is observed. The parallel with the isolation argument disappears, and it's hard to see exactly what the remaining skeptical argument from theory-ladenness might be. Many factors keep our perceptual access to the world from being infallible—poor observation conditions, camouflage, distraction, sleepiness, etc.—why should prior beliefs be more than another such factor? So it is only a very thoroughgoing theory-ladenness that poses an obvious isolation-like epistemological threat, a theory-ladenness so implausible that no one bothers to argue against it. Raftopoulos, Fodor, and Pylyshyn, for example, all target a much more modest kind of cognitive penetrability.

The argument just examined draws a global skeptical conclusion: all beliefs are unjustified. The global skepticism would follow if the whole of the belief system is without any rational, non-question-begging basis. But if recognition that cognitive penetration of perception is only probabilistic undermines this argument, perhaps a more realistic kind of cognitive penetration makes for a more local circularity? Siegel (forthcoming) doesn't think that all top-down influence is epistemically vicious, and she doesn't think it would lead to a global skepticism, but she thinks that top-down influence (of a type far more empirically plausible than the type just discussed) can lead to local cases of unjustified beliefs. Even if cognitive penetration doesn't render all beliefs unjustified, it can render unjustified the beliefs that result fairly directly from it.

Siegel (forthcoming) has two main examples of illicit cognitive penetration. In the first, Jill is antecedently convinced for no good reason that Jack is angry; consequently, he looks angry to her, and she bases a (renewed) belief that Jack is angry on this appearance. In the second case, a researcher believes that she is seeing animalcules in the microscope slide, because she seems to see them, and she seems to see them because of a prior belief in preformationism. Siegel suggests that the problem here is one of circularity: if I believe that x is F because I see x as F , and I see x as F because I believe that x is F , the situation resembles a gossip circle, in which you come to believe that p on the basis of my say-so, but I forget and now believe that p on the basis of your say-so. There is indeed something epistemically wrong in Siegel's cases. However, circularity can't be the whole story, and maybe not exactly any of it.⁸

SI, recall, holds that an agent is *prima facie* justified in believing that x is F when that belief is based on a perceptual experience as of x being F . Epistemic circularity, as traditionally conceived, is a matter of improper basing. Suppose that a given perceptual belief that x is F is based on an experience as of x being F . If that experience were in turn *based on* the prior belief that x is F , we would be confronted with a genuine epistemic circularity, by the transitivity of the basing relation. But of course the experience is not based on the prior belief. Experiences aren't *based on* anything; only beliefs are (epistemically) based on things (on other beliefs, experiences, etc.). An experience may be *caused by* a prior belief—due to cognitive penetration—without being based on it. But circularity only occurs when one thing is based, directly or indirectly, on itself (or on a different belief token with the same content, etc.): when A is a reason for B , which is a reason for A ; when A is S 's evidence for B , and B is S 's evidence for A , etc. There is something wrong with the kind of cognitive penetration illustrated by Siegel's cases, but circularity doesn't capture what's wrong.

Nor does circularity account for what's wrong with other forms of cognitive penetration. Suppose perception is modulated by desire so that I see x to be F because I really want x to be F . Here's another illicit form

of cognitive penetration, but it's clearly not an instance of circularity. It's wishful thinking, a different epistemic vice altogether.

Furthermore, memory has the same structure as cognitive penetration, and we don't want to say that there's anything circular or otherwise epistemically vicious about memory. What normally happens, according to SI, is that I have the belief that *p*, which causes me to have a kind of memory seeming as of *p*, on which I base my current belief that *p*. (It is not that remembering is part of the content of the seeming state, but rather that seeming-to-remember that *p* is a different mode of seeming than seeming-to-see that *p* or *p*'s seeming true in some other way.) So the mere fact that a belief that *p* causes an appearance state that *p*, which causes another belief that *p*, cannot by itself render the overall process circular. If it did, memory would always result in unjustified belief—at least when operating normally, as just described. Obviously, it does not.⁹

It is not entirely uncontroversial that there are such things as mnemonic seemings, but on the assumption that there are, they constitute a paradigm case of the cognitive penetration of appearance states. In fact, prior beliefs have a much greater effect on the content of memory appearances than they do on perceptual appearances. Anyone who thinks that the cognitive penetration of perception is invariably pernicious would have to explain why the cognitive penetration of memory is not. In fact, not only is the cognitive penetration of memory epistemically innocent, what would be pernicious is if mnemonic seemings were *not* heavily modulated by prior beliefs. Memory, of course, is different from perception. But why? It is natural to reply that memory is *supposed* to be cognitively penetrated, while perception is not. But (a) this line can only be taken seriously by a proponent of some kind of proper functionalist epistemology (Plantinga 1993, Bergmann 2006, Graham forthcoming)—which none of the defenders of SI are, and (b) this claim involves substantive (and quite probably false) assumptions about the nature and phylogeny of perception.¹⁰

Finally, invoking some broader understanding of circularity won't help, for there are innocent cases of cognitive penetration of belief. Suppose you and I are out hiking, and I'm convinced that there are a lot of snakes nearby. This belief primes my visual system, making me more likely to see through their camouflage. I am more likely than you are to spot the snakes along our path, because of this belief. There is nothing epistemically wrong here; my snake beliefs are perfectly well justified. But again, it shares the same overall structure as Siegel's pernicious cases: the belief that *p* causes a seeming that *p*, which causes a (renewed) belief that *p*. But if it's circular in the pernicious case, it must be circular here as well, which would make my snake belief unjustified, since the kind of circularity alleged here is always vicious. Since my snake belief is justified, the top-down influence of belief must not introduce circularity, either here or in Siegel's cases.¹¹

The discussion of memory suggests an alternative to the circularity account of what's wrong with cognitive penetration. The more convincing examples of illicit cognitive penetration involve penetration from unjustified belief, so perhaps it is possible to distinguish between the good (or innocuous) cases of cognitive penetration and the vicious cases by borrowing a move familiar from early reliabilism. Goldman (1979) distinguishes between belief-dependent and belief-independent processes: the former take beliefs as inputs, while the latter do not. On this version of reliabilism, a belief-dependent process produces justified belief on a given occasion only if all the doxastic inputs to that process on that occasion are justified. This requirement is supposed to capture the fact that inference can only preserve justification and not create it (the conditional reliability of an inferential process doesn't allow inference from unjustified premises to yield justified conclusions), and it also implies a parallel view made more explicit by others (e.g., Senor 1993) about memory: if my current memory belief that p results from an earlier belief that p , then the current belief is justified only if the earlier one was.

Suppose, then, that we adopt this component of early reliabilism and apply it to the present worry: beliefs produced by belief-dependent processes are justified only if the beliefs that serve as inputs are themselves justified, and this is why the bad cases of cognitive penetration are bad and the good ones are good; the former involve unjustified penetrating beliefs, and the latter involve justified ones. This proposal fails, however, for several reasons.

First, it's just not true that belief-dependent processes produce justification only if the input beliefs are all justified. Introspection is a belief-dependent process, but surely I can be justified on the basis of introspection in believing that I believe that p , where the belief that p is itself unjustified (Lyons 2009). Maybe a modified version of the proposal will get introspection right, but it's not obvious that it will continue to cover top-down influence in the desired way.

Second, not all cases of cognitive penetration involve beliefs doing the penetrating; some, for example, involve penetration by desires. It would be easy enough to claim that all cognitive penetration by nondoxastic states produces unjustified belief, but this isn't very plausible. I'm highly motivated to know whether there are any snakes along our hiking trail, and this motivation makes me more likely to spot the snakes that are there. The nondoxastic cognitive penetration here doesn't detract from the justification. Nor is all cognitive penetration by nondoxastic states innocent: I might have such a pathological fear of snakes that I "see" them everywhere; surely these perceptual beliefs are unjustified.

Third, and most importantly, the distinction between the good and the bad cases of cognitive penetrability has little or nothing to do with the epistemic status of the penetrating beliefs. Suppose my visual system is primed to spot snakes because I believe—for no good reason at all—that there are likely to be snakes along the trail. If this unjustified belief primes

my visual system for snakes, making me thereby better at spotting actual snakes on the path, then the resulting perceptual beliefs seem to be justified, despite the role of cognitive penetration in their genesis, and despite the role of unjustified beliefs in that cognitive penetration.

This seems to be true regardless of whether the unjustified belief affects the early experiential state or the late experiential state. A very early top-down influence of the sort that Raftopoulos and Pylyshyn so strongly resist would be not be obviously worse than an influence only at the level of SI's seemings. On the other hand, it really does matter if the influence is post-perceptual. If the perceptual belief is not "there's a snake" but instead something like "there's a long, cylindrical, tapering, coiled brown object with darker brown stripes," and my unjustified belief that there are a lot of snakes nearby influences my move from this belief to the belief that there's a snake in front of me, then this latter belief is unjustified. This *really would* be circular.

3. Is There Anything Wrong with Cognitive Penetrability?

I have been arguing that the extant accounts of what is epistemically wrong with top-down influence of prior beliefs on perception fail to explain just what, if anything, the problem is. One might be tempted at this point to simply deny that there is anything epistemically wrong with top-down perception after all. I've been trying to show that cognitive penetration is not the epistemic evil it is sometimes thought to be, but I will have gone too far if I inadvertently convince the reader that cognitive penetration never interferes with justification.

Let us return to Jill, who seems to see that Jack is angry because she believes him to be, and the microscopist who seems to see an embryo in the sperm because of her antecedent preformationism. Siegel holds that neither of the corresponding beliefs based on these seeming states are *prima facie* justified. I myself am fairly well convinced by these examples, but I'm afraid that the seemings internalist—Siegel's primary target—won't be much moved. SI takes its internalism very seriously, claiming that the appearance state is sufficient for *prima facie* justification, so that the etiology of the appearance is screened off as epistemically irrelevant. It is only insofar as the agent has beliefs or experiences pertinent to that etiology that the etiology can make any epistemological difference. If you're appeared to *F*-ly, then you're *prima facie* justified in believing there's something that's *F*, according to SI, *regardless of how you came to be* appeared to *F*-ly. So SI will (or ought to) simply claim that Jill is justified, and so is the preformationist; they might not know (they may be Gettiered, as discussed earlier), but both Jill and the preformationist are doing the best they can with the information available to them and thus are justified in believing as they do. Of course to render this

response plausible, we have to carefully set up the cases so that the agents don't have any defeaters for the relevant beliefs, but unless the cases are set up this way, they don't speak to SI anyhow, since SI is only a thesis about *prima facie* justification.

Why think that the proponent of SI will handle the cases in this way? Consider how SI handles two other problematic areas. Some have argued that SI's handling of memory is too liberal, allowing one to fabricate justification out of thin air (Senor 1993). If I never did have any reason to believe that *p*, but I unjustifiably believed it anyway, and I now believe it because I seem to remember it, then according to SI, I'm *prima facie* justified now, even though I wasn't even *prima facie* justified before. This seems implausible; mere time and persistence should not turn an unjustified belief into a justified one. SI defenders, of course, remain unmoved; there has hardly been an embarrassed exodus from SI's account of memory. But if they don't find the memory case objectionable, it's unlikely that they're going to be persuaded by Siegel's examples either.

Turning to a different area, SI implies that if I have a certain perceptual experience as the result of a long history of expertise and perceptual learning, and you have the same experience as the result of last night's neurosurgery (done, of course, without your knowledge), we're equally justified in the corresponding perceptual beliefs. Again, this seems implausible. In addition, it is highly reminiscent of a favorite style of internalist argument against reliabilism. Truetemp (Lehrer 1990) has had a device secretly implanted in his head, a device that precisely registers ambient temperatures and produces the appropriate, reliable temperature beliefs in him. Truetemp accepts these beliefs though he has no idea where they come from and no confirmation of their reliability. Lehrer doesn't say, but let us specify that Truetemp has temperature sensations that correspond to his beliefs about the ambient temperature (he has a certain experience when it's 93 degrees, a slightly different experience when it's 93.2, etc.). Then Truetemp's belief that it's 84.6 degrees out is *prima facie* justified, according to SI. This seems to be just as damaging a counterexample to SI as it is to the simple kind of reliabilism it was initially developed to refute. The history of the cognitive capacity matters. At least it matters to our intuitions (Lyons 2009, 2011); SI had better take our intuitions seriously—its main virtue is that it (supposedly) comports well with our intuitions. But SI is a completely synchronic view; it can't accommodate such historical/etiological factors. I'm not sure what the defenders of SI will say in response to this sort of case, especially given the central role this and similar cases have played in motivating internalist theories like SI in the first place. But I wouldn't be too surprised if they simply dug in their heels and insisted that Truetemp is justified after all.

Restricting the justifiers to states that are synchronically available to the agent commits SI to quite a bit more than either internalism or evidentialism more generally mandate. Nothing prevents an evidentialist, for example,

from claiming that an agent's memory beliefs are justified now only if she previously had good evidence for these beliefs. Nor must an internalism that is motivated more by the enduring and portable character traits of the cognizer ignore the difference between capacities that have come about as the result of a learning process and those that have recently spontaneously and fortuitously arisen.

Siegel's examples involve top-down influence from beliefs, but perhaps a more convincing case against SI can be derived from top-down influence from desires. If I really want x to be F and therefore see x as F (when it's not) and consequently believe that x is F , then SI, if it takes the option I've been predicting, will simply bite the bullet and claim that the causes of the appearance are epistemically irrelevant. But this move is especially implausible in the present case, for what could be a clearer instance of wishful thinking? And what is a clearer instance of unjustified belief (more specifically, not even *prima facie* justified belief) than wishful thinking? Nor does this seem to be an especially unusual or abnormal case of wishful thinking. When we think of cases of wishful thinking, we aren't thinking of extraordinary cognizers with the superhuman ability to will themselves to believe what they want to be true; we're thinking of ordinary people whose desires make what they want to be true seem to actually be true. Top-down influence of perception and other seeming states is not just some arcane possibility from the edges of some scientific frontier; it is part of our ordinary understanding of ordinary wishful thinking.

This point is worth dwelling on. SI includes a very strong commitment to synchronic availability, and as such it cannot ascribe any epistemic significance to the causal ancestry of a given appearance state. But this means that SI cannot recognize the illegitimacy of typical cases of wishful thinking, because it cannot recognize *the fact that it is wishful thinking* as having any epistemological relevance whatsoever. For in typical cases of wishful thinking, the agent is unaware that she's engaging in wishful thinking; she believes something because it seems true, or because she seems to see it, or because she seems to remember it, etc. The seemings are caused by the agent's desires—this is what makes something wishful thinking—but SI's restriction to synchronically available justifiers carries with it the claim that the influence of desire here is epistemically irrelevant.¹² So SI has to claim that the typical instance of wishful thinking is an instance of *prima facie* justified belief, and because victims of wishful thinking don't typically have defeaters, an instance of *ultima facie* justified belief! For SI to bite the bullet here would be for it to hold that the epistemology of (typical) wishful thinking perfectly parallels the epistemology of (typical) perception: an agent has an appearance as of p , which *prima facie* justifies her in believing that p .

I myself would think that this bullet just can't be bitten, that an epistemology that licenses wishful thinking in this way simply can't be taken seriously.¹³ I think Siegel is right that cognitive penetration by belief is

sometimes (though not always) epistemically pernicious. But I think the best argument against SI is one that proceeds from cognitive penetration by desire. However, if the proponents of SI choose to dig in and embrace the counterintuitive responses to this and the other problematic cases—cognitively penetrated perception, memory with an unjustified original, Truetemp, as well as wishful thinking—and the counterintuitiveness does not dissuade them from their view, it is at least some accomplishment to have put the commitments of SI clearly in view.

4. When Is Top-down Influence Conducive to Justification?

I have been trying to extend Siegel's argument that top-down influence is sometimes an impediment to justification, contrary to the synchronic availability assumptions of SI. And contrary to what Fodor and Raftopoulos seem to think, top-down influence is sometimes epistemically innocuous. And I have argued that there are flaws in the standard extant accounts of what is bad about cognitive penetration and when such penetration is bad. So which cases of top-down influence are good and which are bad, and why?

There is a fairly obvious answer, which is simply that the good kinds of cognitive penetration are the kinds that increase reliability, while the bad ones are the ones that decrease it. The best cases of cognitive penetration, epistemically speaking, are cases of perceptual learning. Far from interfering with the justification of perceptual beliefs, experts in the relevant domain have more justified perceptual beliefs than novices. The expert who identifies a bird as a pileated woodpecker is more justified in this perceptual judgment than the novice, who is simply guessing (Goldman 2011). This is because expertise and perceptual learning *improve* perception; they make one better at perceptual judgments, more liable to get things right. This is largely a matter of reliability.¹⁴ Defenders of the encapsulation of perception might object that perceptual learning is not genuinely an instance of cognitive penetration (Raftopoulos 2001), but this relies on a narrower understanding of perceptual learning than I'm employing here. Again, I'm concerned with top-down influences on perceptual *belief*, not (merely) top-down influences on perceptual *experience*, and no one denies top-down penetration of perceptual beliefs like 'there's a pileated woodpecker' (or even 'there's a bird').

In the cases where my heightened awareness makes me better at detecting snakes in my path, we have another case of epistemically innocent or virtuous cognitive penetration. And again, we have a case of increased reliability, or at least, no decrease in reliability. As long as the cognitive penetration doesn't detract from reliability, it doesn't pose an epistemological threat; there's nothing epistemologically unacceptable about this kind of cognitive penetration.

On the other hand, the cases of intuitively pernicious cognitive penetration are cases where the cognitive penetration makes the overall process less reliable.¹⁵ If top-down influence is so extreme that I see snakes or the Virgin Mary everywhere I look, then the top-down processing is interfering with the reliability of perception. Siegel's cases are convincing cases of unjustified belief because they are cases where the agent's beliefs influence her perception to such an extent that she would see Jack as angry (or the sperm as containing an animalcule) *whether this was true or not*. This insensitivity to the facts is probably what has always bothered us about the possibility of cognitive penetrability, that it threatens to make our beliefs insufficiently dependent on the perceiver's environment and thus, insufficiently likely to be true.¹⁶

Earlier I conceded that more liberal versions of internalism do not face all the difficulties that SI does concerning wishful thinking and other forms of cognitive penetration. However, the distinction between the good and the bad forms of cognitive penetration poses a challenge for any internalist theory. The standard, internalist-friendly accounts of which kinds of cognitive penetration are epistemically impermissible and what is wrong with that kind of cognitive penetration are all flawed. On the other hand, there is a plausible externalist theory of which kinds of cognitive penetration interfere with justification and why. So although a generic internalism is not refuted by the possibility of top-down influence (as SI is), it owes us a story about which top-down influences are epistemically acceptable and which are not. The only promising story currently on offer is a reliabilist story and thus one the internalist cannot accept.

It is natural to describe the deleterious effects of top-down influence as a kind of insensitivity to the evidence. This would be a fair characterization, except that the way epistemologists use the term 'evidence' renders it inaccurate. Epistemologists typically count as evidence only that on which the agent is basing or could base her belief; evidence is restricted to the agent's actual or possible *grounds* for belief. Even in the bad cases of cognitive penetration, the agent is perfectly sensitive to the "evidence," thus construed. The agent's belief matches the agent's perceptual experience just fine; the belief is based properly on the experiential state. It is the experiential state that isn't up to the task. The problem is thus better characterized as insensitivity to the facts, or insensitivity to the environment.

This insensitivity might explain why the more intuitively convincing cases of unjustified penetrated belief tend to involve unjustified penetrators. An unjustified belief is unlikely to be true and thus especially prone to interfere with the reliability of perception; insofar as penetrating beliefs are self-corroborating, false ones are going to lead to experiential states that will conduce to further falsehood. However, this is only a rough correlation; it's really the nature of the penetration, not the penetrator, that determines whether justification is impaired. If Jill's belief that Jack is angry makes her

less sensitive to his actual mental state, i.e., less likely to get it right, then this is bad penetration; if it makes her more sensitive, then it's good. In the end, this has less to do with whether she's right or even justified in her belief about Jack's psychological state and more to do with the details of how the cognitive influence affects perception.

Consider four different ways in which cognitive penetration might operate (there are surely more): (i) it might bias perceptual processes in favor of the agent's expectations (this is how we are supposed to interpret Siegel's cases); (ii) it might facilitate pop-out of certain patterns (as in my snake detection cases); (iii) it might increase the perceptual salience of diagnostic features relevant to confirming or disconfirming expectations, without a preference for the confirming features (so Jill's belief might make her more keyed in to Jack's state, whatever it may be); (iv) it might call on past experience to resolve ambiguities in the stimulus array, in the way that the constraints adduced by vision researchers (e.g., the Uniqueness and Continuity constraints of Marr and Poggio 1979) do (because color and lighting conditions must be solved for simultaneously, color vision processes might use past shape-color correspondences to influence color detection); size/distance determinations might be similarly assisted by shape information, as in the Ames Room illusion (Ittleson 1952).¹⁷

All four of these "modes of influence" affect the content of perception. Of the four, only (i) seems to be invariably vicious; (ii) and (iii) seem fine, and with (iv) it seems to depend on the range and recency of past experience that is brought to bear. If the influence results from a slow associative process, it will tend to be affected only by enduring, stable features of the world. If it is quick and labile, it will be subject to the temporary whims of the agent. The more the process leans toward the former, the more justified the resulting belief is; the more it leans toward the latter, the less justified.

Subjects presented with a monochrome picture of a banana will judge it to be more yellowish than they would an identically colored square (Hansen et al. 2006). Assuming this to be a genuinely perceptual effect, three salient possibilities leap to mind: (1) subjects' current, occurrent belief that bananas are yellow has genuinely top-down effects on the perceptual state, making the banana look more yellow; (2) subjects' longstanding belief that bananas are yellow has the top-down effect; and (3) subjects' history with yellow bananas has produced an associative connection whereby low-level perceptual features of bananas (and not the banana identification itself) prime yellow in the color detection system, producing a lateral, rather than top-down, effect on the perceptual state. Does it make any epistemological difference which of these three scenarios obtains? There is an important difference between (1) and (2): these two proposals predict different short-term effects of convincing a subject that not all bananas are yellow. (1) says the penetration effect would reduce; (2) says it wouldn't. My own—admittedly reliabilist—epistemological intuition is that cognitive penetration

a la (1) is more of a threat to justification than cognitive penetration *a la* (2). On the other hand, I see no epistemological difference between (2) and (3).

Nor is it possible to make any solid generalizations of the form ‘penetration by perception is epistemically good’, ‘penetration by desire is bad’. We have already seen that some penetration by belief is good, some bad. Similarly, not all penetration by desire is bad; it’s not even true that all penetration by and in conformance with desire is bad, or even counts as wishful thinking. I’m out hunting for morel mushrooms, and my desire primes my visual system, allowing me to spot more than I would otherwise. This is a good, or at least innocuous, case of penetration. Again, it is the nature of the process, not the penetrator, that determines whether the penetration is vicious or benign. And again, this seems to be a matter of whether the reliability of the process is impeded.

5. The Locus of Penetration

Orthogonal to the distinction among the four modes of influence is a distinction among five loci at which the influence might occur.¹⁸ (a) The influence might be pre-perceptual, affecting eye fixation or spatial attention but not affecting the inner workings of the perceptual processes; (b) it might be an early experiential effect, operating during the process of and affecting the nonconceptual output of early perceptual processes, i.e., the kind of cognitive penetration Pylyshyn and Raftopoulos deny; (c) it might be a late experiential effect, leaving the nonconceptual early perceptual states unaffected but influencing the nondoxastic seemings, or appearances, that SI’s epistemology relies on; (d) it might be a genuinely perceptual, but non- or post-experiential effect, if, e.g., the thing (literally!) looks like a copperhead to you but only like a snake to me, despite the fact that your nondoxastic visual experiences are identical to mine (Lyons 2005b, Goldman 2011); (e) it might be entirely post-perceptual, as, for example, when vision can’t tell me whether I’m seeing the cat or a handbag across the room, until I hear the cat behind me and decide it must be a handbag after all¹⁹—we’re thinking in this last case of the kind of interpretation of observation that traditional proponents of theory-ladenness dismissed as “too easy” (Hanson 1961).

Raftopoulos and Siegel both rule out (a) as a genuine species of cognitive penetration, and (e) is obviously not a type of cognitive penetration of *perception* (some might even say the same about (d)), but I want to consider them all together, so as not to prejudge the specifically epistemological issues to which we now turn.

For scientific purposes, of course, it is important—and difficult—to distinguish effects at these different loci. For certain polemical epistemological purposes, the differences between (a) – (e) matter quite a bit; if the top-down influence on Jill’s belief about Jack’s anger or the preformationist’s belief

about the contents of the sperm are post-perceptual, then those particular cases aren't counterexamples to SI, for SI only speaks to the beliefs that are directly based on and correspondent to the seeming state, and if the contents 'anger' and 'animalcule' only occur post-perceptually, then they only occur in beliefs outside the ambit of SI.²⁰ But polemical concerns aside, is there any epistemological significance to the locus of penetration? I think the answer is no, or at least not much, and what there is, is again swamped by the nature of the penetration.

One contrary view would be that penetration at (b) or (c) is somehow more intractable or incorrigible than perception at the other loci and therefore more epistemologically pernicious; pre- and post-experiential effects might be easier to correct or avoid. This doesn't seem right. Most of us are able to shift more or less voluntarily between the young woman and the old woman in the famous reversible figure, or between the two views of the Necker cube, presumably through a pre-perceptual (a)-type shift of attention. These stimuli aren't problematic because we know they're illusions, we know to keep at it until the reversal comes, etc. But if, somehow, beliefs or expectations have mode-(i) self-affirming influence on perception at locus (a), and they do so for real world stimuli, this would be every bit as worrisome as if the locus were (b) or (c). The scientific controversy surrounding the locus of influence is proof that ordinary agents won't be able to tell the difference among penetration at loci (a) – (c), or even that there's any top-down influence at all, for that matter.

I think—though I may be alone in this—that there is a gap between the late experiential states and perceptual beliefs, which allows for the possibility of cognitive penetration between the seeming state and the perceptual belief. For example, I don't really believe that we're ever appeared to scarlet-tanagerly, though some of us do sometimes have the genuinely perceptual belief "there's a scarlet tanager."²¹ If I'm right, and there is such a thing as penetration at locus (d), it should have the same epistemic status as penetration at (c); after all, if I'm right, many philosophers of perception are mistaking the former for the latter. Again, it's the mode, rather than the locus, of penetration that makes the epistemological difference.

Finally, some, maybe much, of what seems to be perceptual penetration may actually be post-perceptual. One further possibility in the yellow banana case is (4) the experiential state is not affected, but because of their knowledge that bananas are yellow, subjects think they are being appeared to yellowly, even though they're not. A post-perceptual locus becomes more plausible as "higher-level" properties come into play. Maybe 'embryo' and 'angry' enter into the contents of perceptual belief or perceptual experience, but if not, Siegel's cases are really cases of an agent having a certain perceptual belief and "interpreting" it as a perception of anger or embryos. The epistemological outcome is the same; post-perceptual penetration is no less intractable than perceptual penetration. Once again, the protracted scientific

and philosophical debate about such examples indicates that subjects cannot introspectively tell whether their perception is cognitively penetrated and if so, at which locus. If there were dramatic intractability differences across the different loci, determining the locus wouldn't be so difficult.

6. The Outlook for Justification

Part of what motivates Fodor and Raftopoulos seems to be a desire to defend a psychological theory of cognitive penetrability that makes the world safe for justified belief. They do so by arguing that cognitive penetration is limited to certain loci. I have urged that the locus of penetration doesn't matter much to the epistemology of perception; what matters is the mode of penetration, and in particular, whether the process is one that makes perception worse or better, where 'worse' and 'better' are truth-linked notions. I want to briefly review some grounds for optimism before closing.

One argument for optimism comes from Raftopoulos's (2009) synthesis of a large body of empirical literature on the timing of top-down effects in vision. Although top-down influence reaches to areas as early as V1, the influence is delayed.²² Stimulus onset is followed by an entirely feedforward, bottom-up process that produces an initial representation of the scene. After this initial representation is constructed, the top-down processes engage, but they are restricted to manipulating the representation produced by the feedforward sweep. The neuroanatomical connections are in place for a process that primed the visual system *prior* to its sampling of the environment, and the cost of doing it after sampling is at least 170 milliseconds. The payoff may be significant limitations on the degree to which top-down processing can bias perception in favor of antecedent expectations, therefore limitations on the extent to which a perceiver who expects p will see p , whether p is true or not.

It is uncontroversial, I think, that cross-modal transfer or integration tends toward greater reliability in real-world scenarios (even if not in the laboratory). Whether it is short term, as in the ventriloquism effect (e.g., Bischoff et al. 2007), or long term, as in visuo-auditory calibration (e.g., Knudsen & Brainerd 1991), cross-modal integration makes us better at perceiving our environments, given that prism goggles and actual ventriloquists are relatively rare. It is not known how much of this integration is top-down, though high level cross-modal influences, as when emotional music affects the visual perception of facial expressions (Logeswaran & Bhattacharya 2009) suggests that some is.

Even the misperception of color due to known shape-color correspondences might result from a phenomenon that is generally conducive to reliability. As mentioned earlier, the visual system often has to solve for color and lighting conditions simultaneously. Depending on the details as explored

above, a color perception system that uses shape or category membership to determine color could then use that information to determine local lighting conditions, which in turn could be used to determine the colors of unidentified nearby objects.

Lastly, perceptual learning is clearly good news for epistemology. Regardless of its locus of influence, the overall effect of perceptual learning is surely a greater number of justified beliefs. Similarly, the top-down effects in the snake- and morel-spotting examples earlier lead to greater reliability. It is likely, however, that the most significant effect of cognitive penetrability is an increase in power, more so even than reliability. Following Goldman (1986), a reliable process is one that has a high ratio of true to false beliefs, while a powerful process is one that produces a large number of true beliefs or has a high ratio of true beliefs to times queried. Reliability is an antidote to error, while power is an antidote to ignorance. When the novice and the expert both form ‘there’s a pileated woodpecker’, the expert is more reliable. In addition, however, the expert forms ‘there’s a bird’ and ‘there’s a pileated woodpecker’ where the novice only forms ‘there’s a bird’; other kinds of perceptual learning allow the expert to spot items in the environment to which the novice would have been blind; these are increases in power. A closely related benefit is one of precision. Cross-modal integration is thought to lead to more precise estimates of an object’s location than unimodal perception (Alais & Burr 2004). Perhaps top-down effects on perception have a similar effect.

Siegel is right that top-down influence is bad news for a certain popular epistemological theory. But we should not think that top-down influence is, or would be, bad epistemological news. There is no need to defend a psychology that makes the world safe for epistemology. Some kind of cognitive penetration of perception is undeniable, and even if it were shown that penetration is confined to certain loci, this wouldn’t have direct epistemological consequences. Though I think there is little reason so far for skeptical pessimism, the real epistemological take-home lessons will depend on the details of the mode of penetration.²³

Notes

1. I will use ‘appearance’, ‘seeming’, and ‘(perceptual) experience’ interchangeably. SI, or something like it, has been endorsed by Audi (1998), Pollock (1986), Huemer (2001), Feldman (2003), Pryor (2000) and others. Simpler formulations of SI state something like ‘*S*’s having a perceptual experience that *p* is sufficient for *S*’s being *prima facie* justified in believing *p*’, but the better formulations invoke reasons or the basing relation (since one could easily be appeared to redly but only believe that there’s something red nearby for some other—terrible—reason). I intend for ‘*x*’ to occur transparently here, but nothing will hinge on the details. I’m ambivalent about the name, but I’m less happy with the other names. ‘Direct realism’ (Pollock 1986) suggests a metaphysical view that has

little to do with this epistemological view, and besides, SI isn't epistemically direct enough for my tastes (Lyons 2009). 'Dogmatism' (Pryor 2000, Siegel forthcoming) has historically applied to *any* nonskeptical epistemology, including those of Chisholm (1977) and Goldman (1986), neither of whom endorse SI. (In addition, Siegel's "dogmatism" is a view composed of SI and a directness claim, and she states more than once that the SI component is her real target.) 'SI' could also stand for "Standard Internalism" or, for reasons we will see later, "Synchronic Internalism". SI is an internalist view (since experiential states are "internal" in the relevant sense and are held to be sufficient for *prima facie* justification); it is compatible with an "external object foundationalism" (Lyons 2009), aka "modest foundationalism" (Feldman 2003), though neither entails the other. SI is a kind of "experientialism" (Lyons 2009), and I'll interpret it as a type of evidentialism (Conee and Feldman 2004), although not all experientialists or evidentialists endorse SI.

2. He only defends a "semi-encapsulation" claim, though the details won't concern us here.
3. 'Top-down influence' and 'cognitive penetration' aren't strictly interchangeable, but they are close enough for the present purposes that I will use them more or less indifferently for the sake of variety.
4. Raftopoulos and Pylyshyn both prefer the term 'perception' for early vision; I'll be using 'perception' in its broader, more ordinary, sense. Both also restrict their attention to vision, though it is likely that they think that other sense modalities operate along similar principles.
5. My own view (2005a, 2005b, 2009) is fairly liberal about the contents of *perception*—i.e., perceptual *belief*—but somewhat more conservative about the contents of perceptual *experience*. This is facilitated by the endorsement of a radically nonexperientialist epistemology, according to which nondoxastic experiential states play little or no direct role in justifying beliefs. Other epistemologies can get a similar mix of conservative and liberal views, simply by keeping the theory of perception and the theory of experiential content separate. There is, to be sure, something attractive about having one theory suffice for both, but it's not so attractive that other options can't get off the ground.
6. There are two generally recognized types of justificatory defeaters: evidential defeaters (including rebutting and undercutting defeaters (Pollock 1986)), and normative defeaters. Evidential defeaters are bits of evidence the cognizer possesses that disrupt the justification of a belief, either by providing *prima facie* justification to an incompatible belief (in the case of rebutting defeaters) or by providing evidence against the cogency of the reason for the original belief (thus, my belief that I'm in a room with red lights is an undercutting defeater for my inference from being appeared to redly to believing that there's something red nearby). A normative defeater is a factor that disrupts justification in cases where an agent believes something only because she hasn't done something she should have done (e.g., checked her voicemail, read the latest medical journal, tried to remember counterevidence, etc.). (This is similar to, but more general than, the gloss on normative defeaters in Lackey 2005.) An evidentialist will try to subsume all defeat under the heading of evidential defeat, though nonevidentialists will hold that some normative defeaters are not evidential defeaters.

7. See the recent literature on the epistemology of disagreement (e.g., Christensen 2009, Feldman 2006).
8. The circularity diagnosis of cognitive penetrability is not central to Siegel's paper, and in conversation, she characterizes the problem as more akin to confirmation bias than to circularity. Her main goal is to point out problems for SI, while mine is to distinguish between the good and bad cases of cognitive penetration. For that purpose a proper diagnosis of the bad cases is needed, and circularity is certainly an initially plausible candidate.
9. On the other hand, Tom Senior and Dustin Stokes both insist (in correspondence) that there really is something epistemically problematic about memory thus understood and that this is a failing of SI's account of memory.
10. Surely there would have been natural selection against perceptual processes or capacities that were *as cognitively penetrable as* memory. This might support the claim that there are limits to how penetrable perception is supposed to be, but it doesn't support the claim that perception isn't supposed to be penetrable at all. Sometimes, as we will notice momentarily, top-down influence might improve our perceptual capacities.
11. Depending on the details, this sort of case may not be the sort of thing Siegel would take to be an example of cognitive penetration; perhaps the effect typically results from changes in focal attention, for example. Since we are concerned with hypothetical cases, however, we can simply restrict our attention to the possible cases where the effect does count as genuine cognitive penetration. In any case, the question at hand is simply whether a certain belief etiology—the belief that *p*'s causing a seeming that *p*, which then causes the belief that *p*—counts as circular, not whether it counts as cognitive penetration in a narrow sense of that term.
12. Tom Senior has pointed out to me that the problem for SI here is really about availability, rather than synchrony. Desires may affect perception synchronically. It is because SI restricts the justifiers to *synchronically available* factors that it gets the wrong answer here.
13. A proponent of encapsulation could (though I have no reason to think one would want to) try to defend SI by noticing that I have moved from the hypothetical, two paragraphs back, to the typical, one paragraph back. The hypothetical case is all fine, but the current paragraph assumes that typical—actual—cases of wishful thinking involve cognitive penetration by desires. But if early vision is encapsulated, then (in the visual case at least, and maybe the same is true for other types of seeming) the way things seem is not affected by desire, and so the argument of the last paragraph is based on a false assumption. This move, however, won't help SI, for SI requires a very different understanding of seeming or appearance than that which is plausibly the output of early, encapsulated visual processes. SI requires seemings with conceptual contents, contents parallel to ordinary perceptual beliefs, while Raftopoulos and Pylyshyn are quite clear that the outputs of the early visual modules have no such contents. Still, the “higher level” the property perceived, the more plausible the claim that the perception is influenced by desires: the husband sounds sincere, because the wife wants him to be telling the truth; *A*'s smile looks flirtatious to *B*, because *B* wants *A* to be interested, etc. Consequently, one apparent way out would be to endorse a conservative theory of the contents of perceptual experience,

denying that anything can literally sound sincere, look flirtatious, etc. However, (a) this move won't help with wishful memory (if there are memory seemings, their contents are quite high-level), (b) proponents of SI are usually—though not always—proponents of fairly liberal views about the contents of experience and thus won't want to retreat along this line, and (c) it won't really take care of wishful thinking, anyway: it will (at best!) provide an argument for the claim that wishful thinking of the sort I'm concerned with is *rare*, not that it's *unjustified*.

14. It is also a matter of other, nearby, truth-linked notions, like safety, sensitivity, and power. I won't discuss these technical concepts much, aside from power, as the main concern here is with justification, and these concepts are more closely connected to knowledge, or epistemics (Goldman 1986) more broadly. Sosa (2007) argues that nondoxastic experiences can nevertheless be epistemically evaluable, depending on whether they are virtuously acquired. I take this to be a variant of the reliability proposal and will not distinguish it from the view I am urging.
15. I formulate this in terms of process reliabilism, though I think it would all transpose without much trouble to an indicator reliabilism.
16. Siegel's aforementioned suggestion that cognitive penetration results in something akin to the confirmation bias is consistent with my diagnosis here; what's wrong with the confirmation bias is that it makes us less reliable, less sensitive to the facts, more likely to believe that *p*, whether *p* is true or not.
17. Let me reiterate that I am using an intentionally broad understanding of 'cognitive penetration' here; I am well aware that various authors rely on various, narrower, understandings and will deny that some of the possibilities just listed would count as "genuine" cognitive penetration. My discussion here is not intended as a polemical argument against these authors but as an exploration of the epistemological implications of various influences on experience and/or perception. For that purpose, the most inclusive understanding of 'cognitive penetration' is appropriate.
18. I mean that the distinctions are conceptually orthogonal; I don't mean to deny any empirical link, and certainly not statistical ones. I don't intend for this five-part distinction to imply that no more fine-grained division is possible or even fruitful.
19. Sometimes in this last type of situation, a genuinely perceptual (or perhaps more likely pre-perceptual) effect might ensue, so the thing now *looks* like a handbag, and I can't figure out how I could have mistaken it for a cat in the first place. This sort of case, of course, is *not* what I have in mind when thinking about post-perceptual effects.
20. Similarly if these are instances of type-(d) penetration. However, I think that if things literally look to be *F* to *S*, where *F* is not a way *S* can be appeared to, this refutes a thesis very much in the spirit of SI, that the contents of perceptual seemings delimit the contents of perception.
21. The reason for this view is that I don't think there's necessarily a *nondoxastic*, *visual experiential* difference between the person who knows what a scarlet tanager looks like and the person who doesn't (Lyons 2005b, 2009). There are, of course, phenomenological differences; I just deny that they are visual experiential differences.

22. I am concentrating on object-centered attention, here, not spatial attention, since it is only the former that directly affects the contents of perception. See Raftopoulos (2009) for a much fuller discussion.
23. Thanks to Tom Senior, Susanna Siegel, Dustin Stokes, and the philosophy department at Southern Methodist University (especially Philippe Chuard, Justin Fisher, and Robert Howell) for helpful comments on an earlier draft.

References

- Alais, D. & D. Burr (2004). The ventriloquist effect results from near-optimal bimodal integration. *Current Biology* 14, 257–262.
- Audi, R. (1998) *Epistemology: a contemporary introduction to the theory of knowledge*. New York: Routledge.
- Bergmann, M. (2006). *Justification without awareness: A defense of epistemic externalism*. New York: Oxford University Press.
- Bischoff, M., B. Walter, C.R. Blecker, K. Morgen, D. Vaitl & G. Sammer (2007). Utilizing the ventriloquism-effect to investigate audio-visual binding. *Neuropsychologia* 45, 578–586.
- Chisholm, R. (1977). *Theory of knowledge, 2nd Ed.* Englewood Cliffs, NJ: Prentice Hall.
- Christensen, D. (2009). Disagreement as evidence: The epistemology of controversy. *Philosophy Compass* 4, 756–767.
- Conee, E. & R. Feldman (2004). *Evidentialism*. Oxford: Oxford University Press.
- Feldman, R. (2003). *Epistemology*. Upper Saddle River, NJ: Prentice Hall.
- Feldman, R. (2006). Epistemological puzzles about disagreement. In S. Hetherington, ed., *Epistemology Futures*. Oxford: Oxford University Press.
- Fodor, J. A. (1983). *Modularity of mind*. Cambridge, MA: MIT Press.
- Fodor, J. A. (1984). Observation reconsidered. *Philosophy of Science* 51, 22–43.
- Goldman, A. I. (1979). What is justified belief? In George Pappas, ed. *Justification and knowledge*. Dordrecht: Reidel.
- Goldman, A. I. (1986). *Epistemology and cognition*. Cambridge: Harvard UP.
- Goldman, A. I. (2011). Commentary on Jack Lyons's *Perception and Basic Beliefs*. *Philosophical Studies* 153, 457–66.
- Graham, P. (forthcoming). "Epistemic entitlement". *Nous*.
- Hansen, T., M. Olkkonen, S. Walter, & K. R. Gegenfurtner (2006). Memory modulates color appearance. *Nature Neuroscience* 9, 1367–1368.
- Hanson, N. R. (1961). *Patterns of discovery*. Cambridge: Cambridge University Press.
- Huemer, M. (2001). *Skepticism and the veil of perception*. Lanham, MD: Rowman and Littlefield.
- Ittleson, W. H. (1952). *The Ames demonstrations in perception*. Princeton, NJ: Princeton University Press.
- Klein, P. D. (1976). Knowledge, causality, and defeasibility. *Journal of Philosophy* 73, 792–812.
- Knudsen, E. & M. S. Brainard (1991). Visual instruction of the neural map of auditory space in the developing optic tectum. *Science* 253, 85–87.
- Lackey, J. (2005). Memory as an epistemically generative source. *Philosophy and Phenomenological Research* 70, 636–658.
- Lehrer, K. (1990). *Theory of knowledge*. New York: Routledge.
- Logeswaran, N. & J. Bhattacharya (2009). Crossmodal transfer of emotion by music. *Neuroscience Letters* 455, 129–133.
- Lyons, J. C. (2005a). Clades, Capgras, and perceptual kinds. *Philosophical Topics* 33, 185–206.
- Lyons, J. C. (2005b). Perceptual belief and nonexperiential looks. *Philosophical Perspectives* 19, 237–56.

- Lyons, J. C. (2009). *Perception and basic beliefs: Zombies, modules, and the problem of the external world*. New York: Oxford University Press.
- Lyons, J. C. (2011). Response to critics. *Philosophical Studies* 153, 477–88.
- Macpherson, F. (forthcoming). Cognitive penetration of colour experience: Rethinking the issue in light of an indirect mechanism. *Philosophy and Phenomenological Research*.
- Marr, D & T. Poggio (1979). A computational theory of human stereo vision. *Proceedings of the Royal Society of London. Series B, Biological Sciences* 204, 301–328.
- Nanay, B. (2010). Action-oriented perception. *European Journal of Philosophy* 18.
- Plantinga, A. (1993). *Warrant and proper function*. New York: Oxford University Press.
- Pollock, J. (1986). *Contemporary theories of knowledge*. Savage, MD: Rowman & Littlefield.
- Pryor, J. (2000). The skeptic and the dogmatist. *Nous* 34, 517–49.
- Pylyshyn, Z. W. (2003). *Seeing and visualizing: It's not what you think*. Cambridge, MA: MIT Press.
- Raftopoulos, A. (2001). Is perception informationally encapsulated? The issue of the theory-ladenness of perception. *Cognitive Science* 25, 423–51.
- Raftopoulos, A. (2009). *Cognition and perception: How do psychology and neural science inform philosophy?* Cambridge, MA: MIT Press.
- Raftopoulos, A. & V. C. Müller (2006). The phenomenal content of experience. *Mind and Language* 21, 187–219.
- Senor, T. D. (1993). Internalistic foundationalism and the justification of memory belief. *Synthese* 94, 353–376.
- Siegel, S. (2005). The phenomenology of efficacy. *Philosophical Topics* 33, 265–284.
- Siegel, S. (forthcoming). Cognitive penetrability and perceptual justification. *Nous*.
- Sosa, E. (2007). *A virtue epistemology*. Oxford: Oxford University Press.
- Stokes, D. (forthcoming). Perceiving and desiring: A new look at the cognitive penetrability of experience. *Philosophical Studies*.